



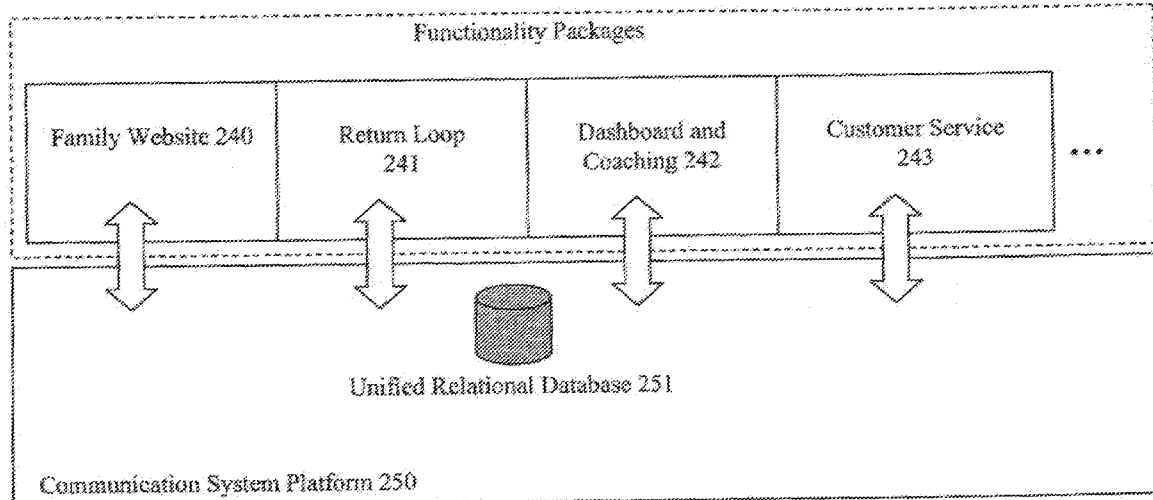
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(19) **United States**(12) **Patent Application Publication**
Williams et al.(10) **Pub. No.: US 2010/0145719 A1**(43) **Pub. Date: Jun. 10, 2010**(54) **USE OF COACHING MESSAGES IN A
CLOSED COMMUNICATION SERVICE**(60) Provisional application No. 60/514,172, filed on Oct.
24, 2003.(75) Inventors: **Michael David Williams**, Boulder,
CO (US); **Paul S. Hudnut**, Fort
Collins, CO (US); **Paul Davost**,
Louisville, CO (US)**Publication Classification**(51) **Int. Cl.**
G06Q 50/00 (2006.01)
H04L 12/16 (2006.01)
(52) **U.S. Cl.** **705/2; 705/347; 370/260**
(57) **ABSTRACT**

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Methods and systems for use of member-to-member, member-to-target and automatically generated coaching messages in a closed communication service are provided. According to one embodiment, a closed communication service is provided which is configured to facilitate and encourage communications among members of a caregroup and a target of the caregroup. The target of the caregroup uses a hardcopy-based communication appliance associated with the caregroup to transmit and receive electronic communications via the closed communication service to and from the members of the caregroup. Identification, creation and delivery of appropriate member-to-member and member-to-target coaching messages are facilitated by allowing one or more administering caregivers of the members of the caregroup to view metrics relating to electronic communications exchanged via the closed communication service.

(73) Assignee: **CARINGFAMILY, LLC**,
Louisville, CO (US)(21) Appl. No.: **12/547,587**(22) Filed: **Aug. 26, 2009****Related U.S. Application Data**(62) Division of application No. 10/971,916, filed on Oct.
23, 2004.

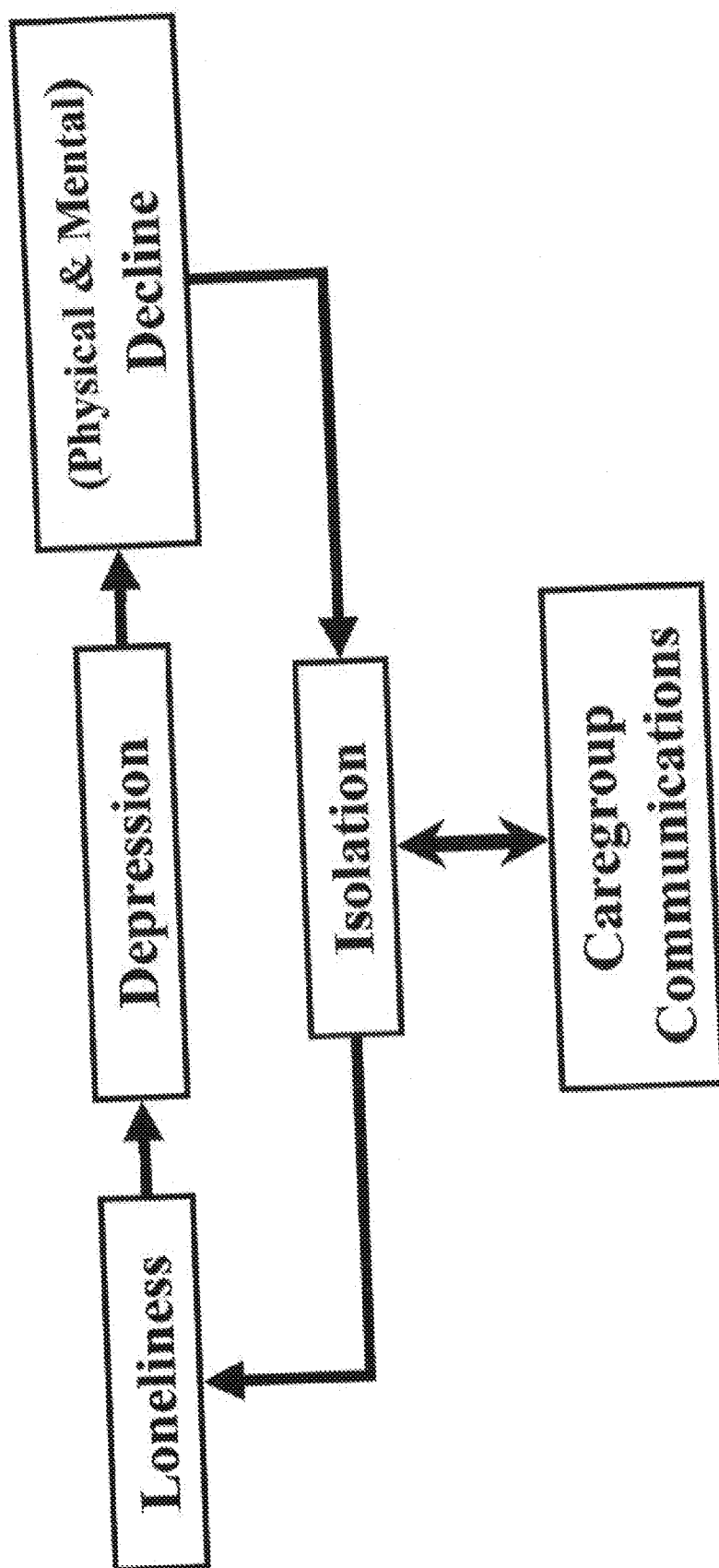


FIG. 1

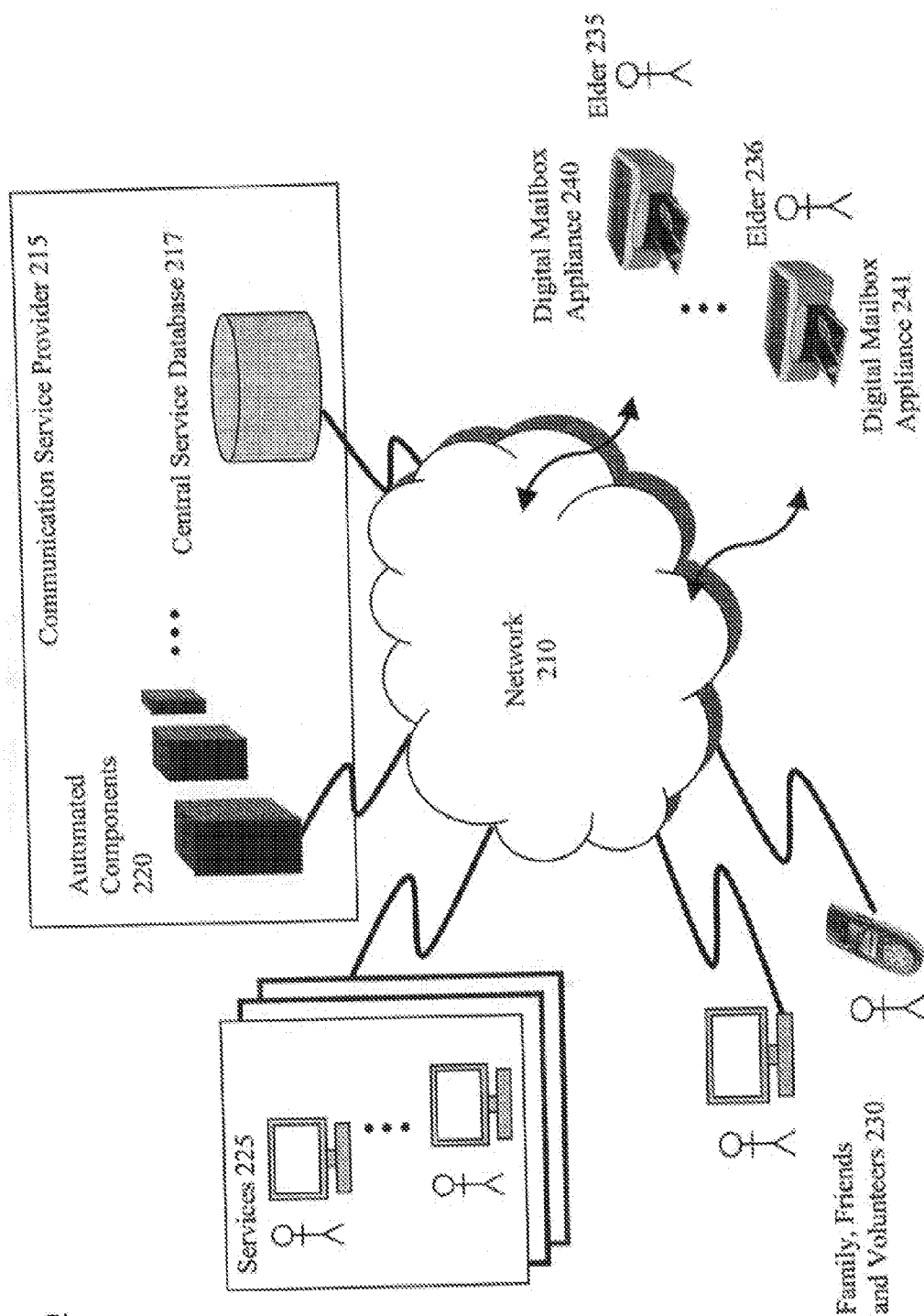


FIG. 2A

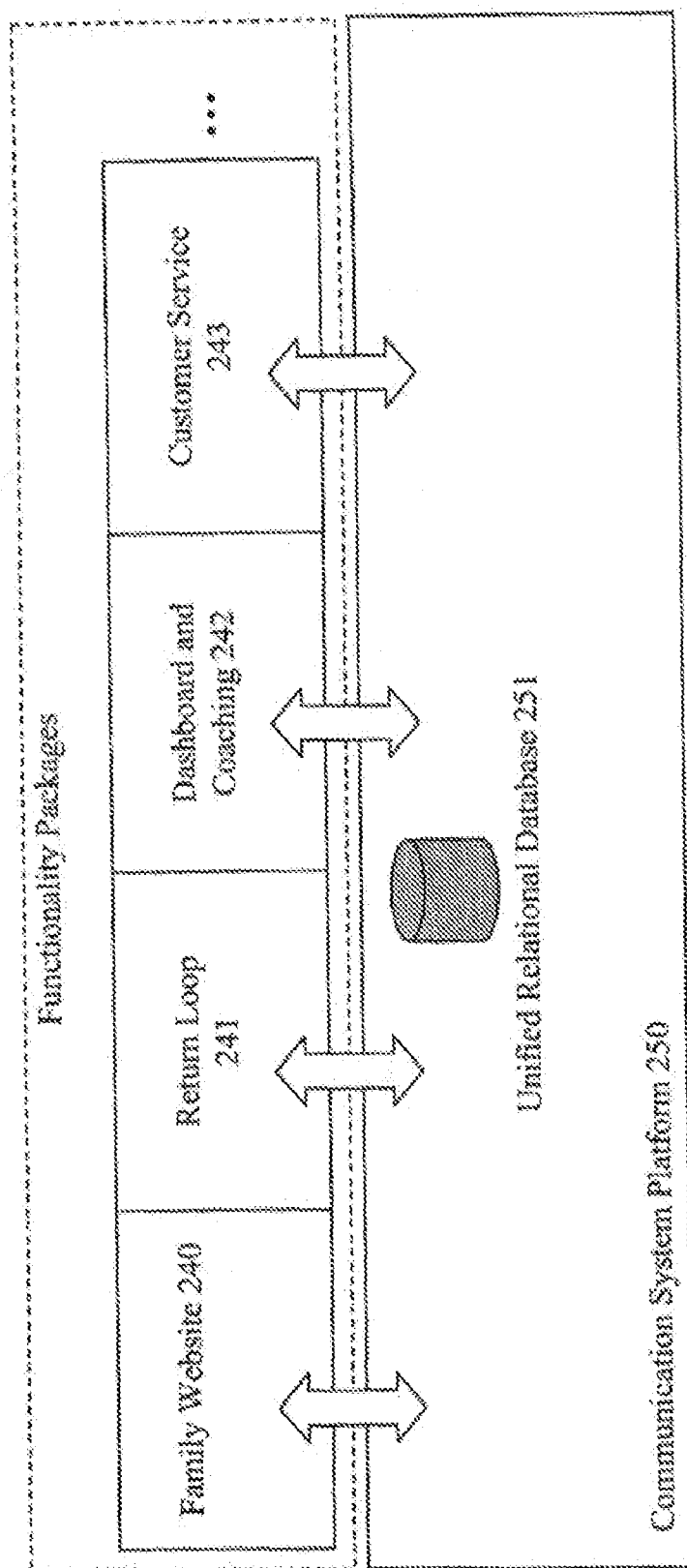


FIG. 2B

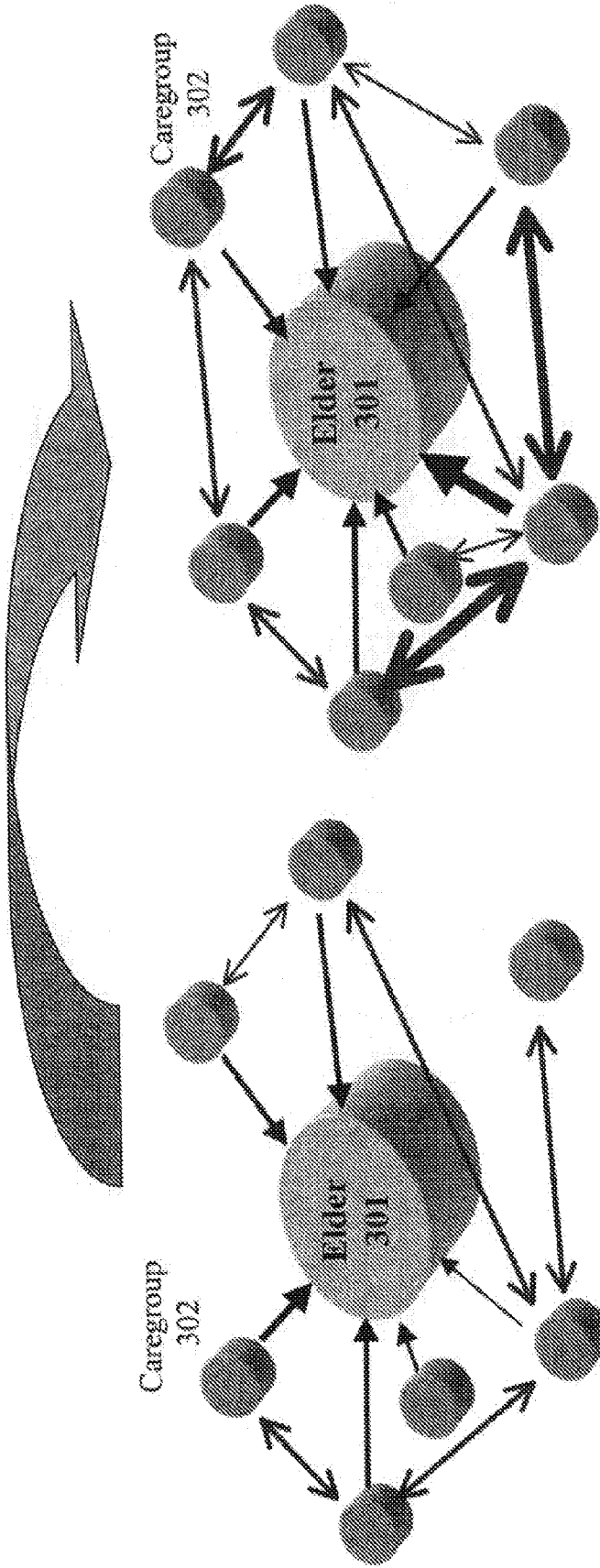


FIG. 3B

FIG. 3A

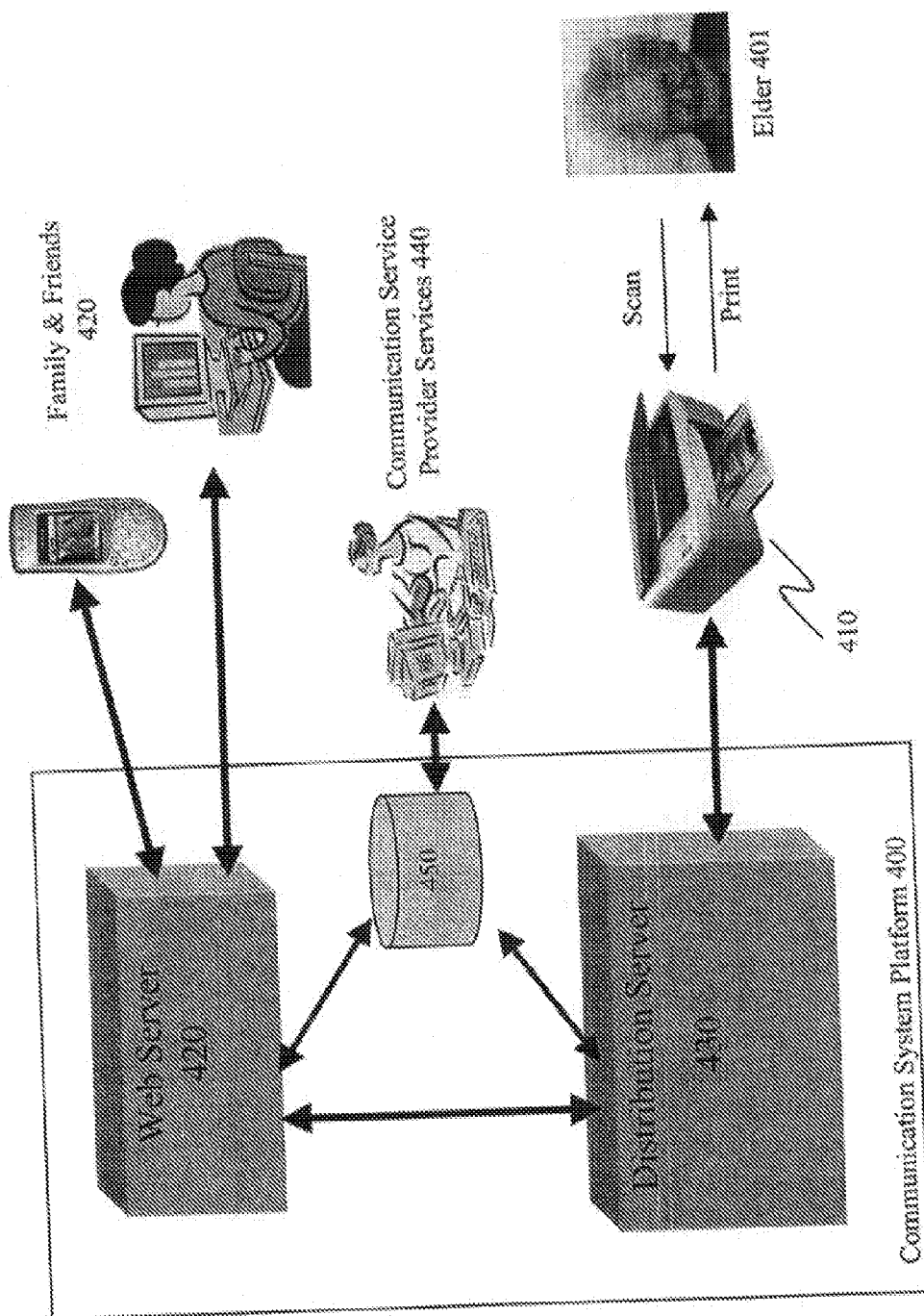


FIG. 4

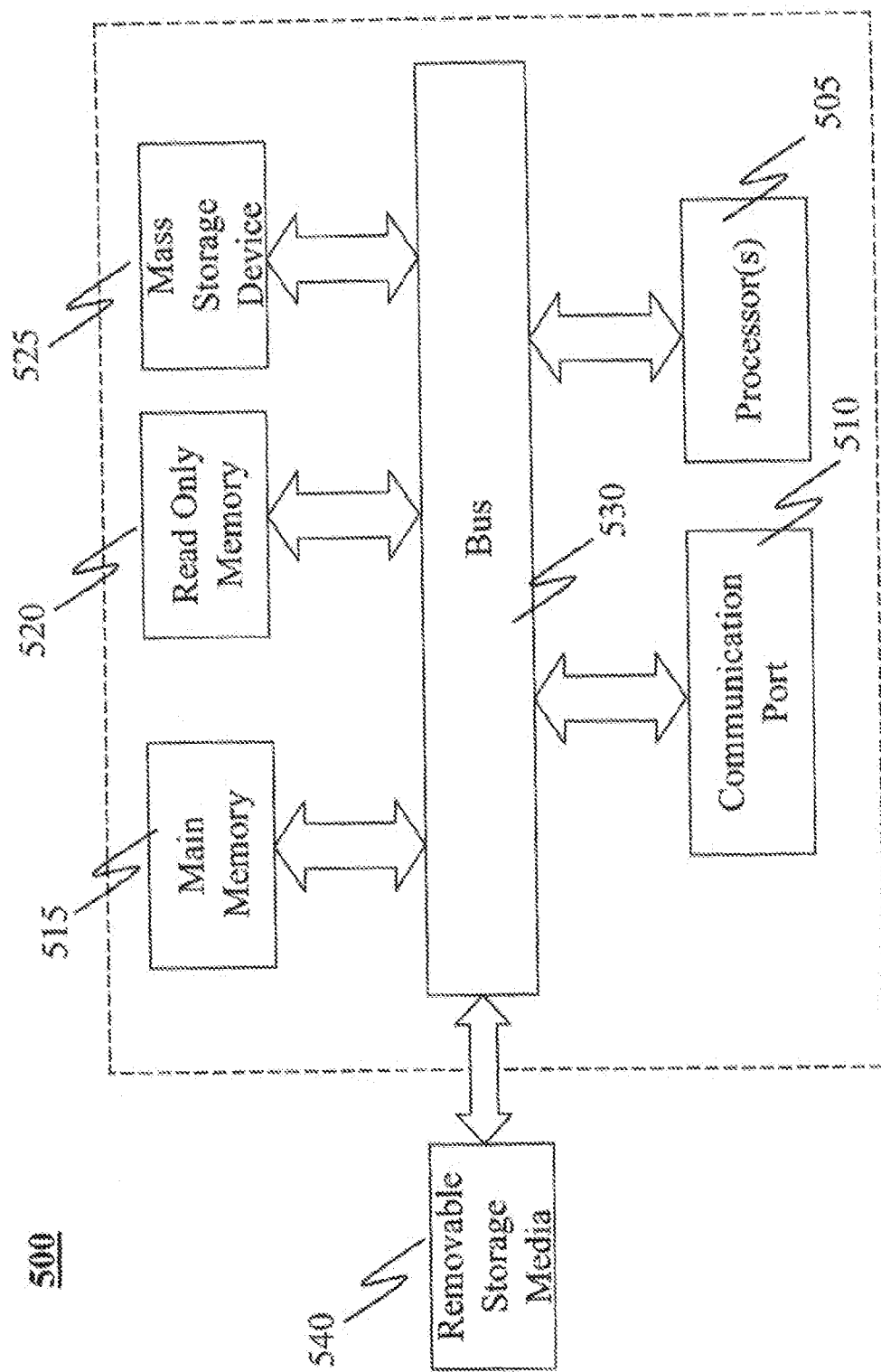


FIG. 5

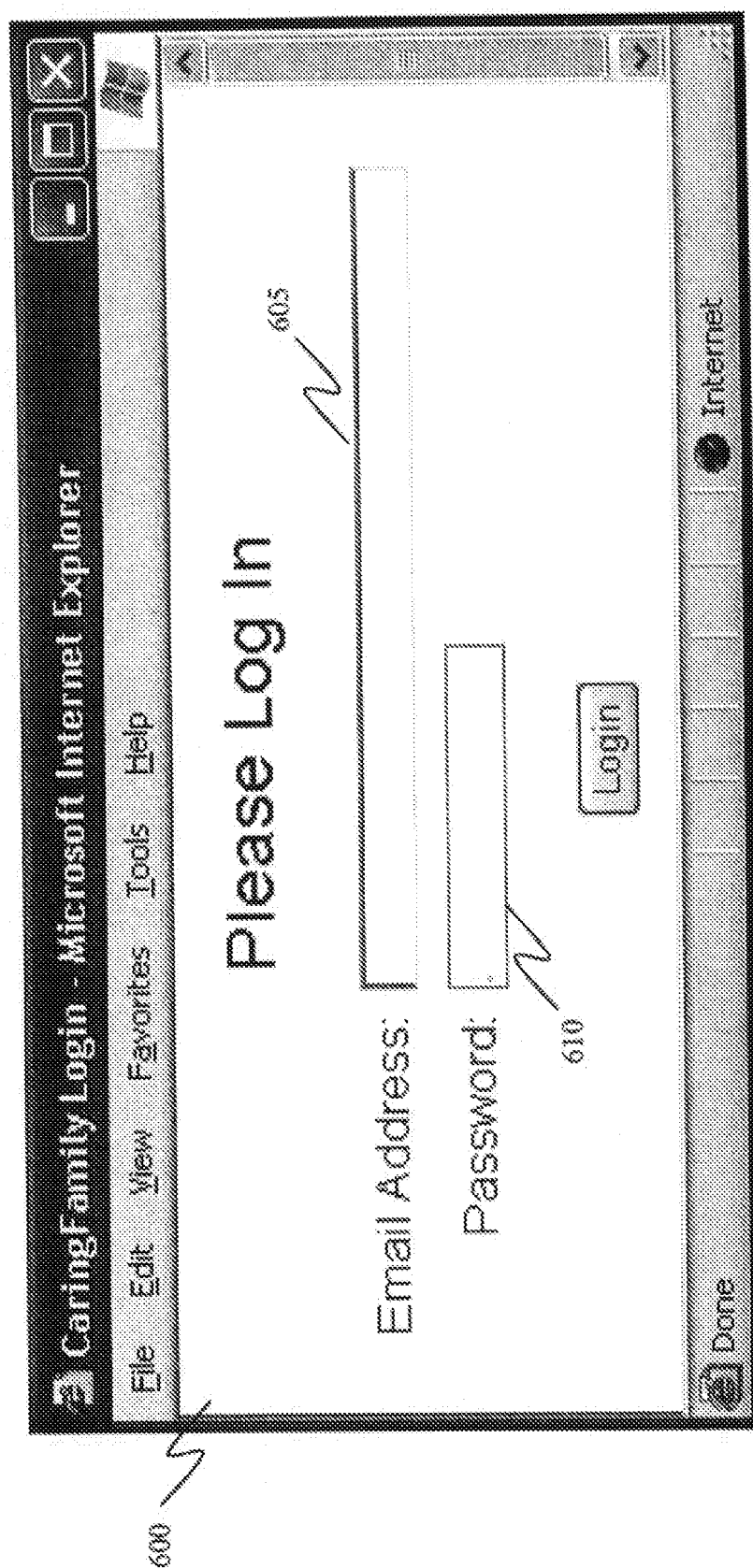


FIG. 6A

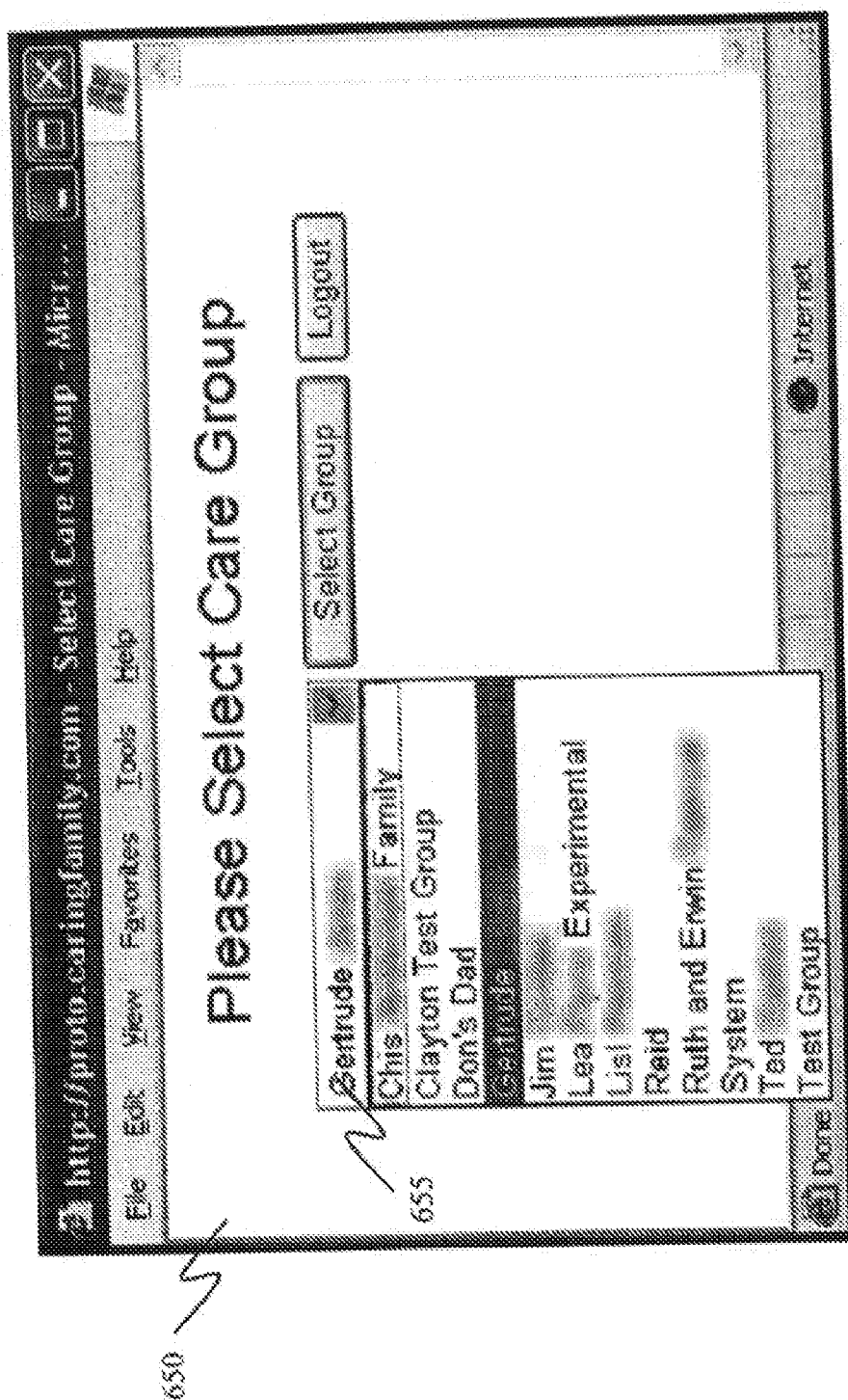
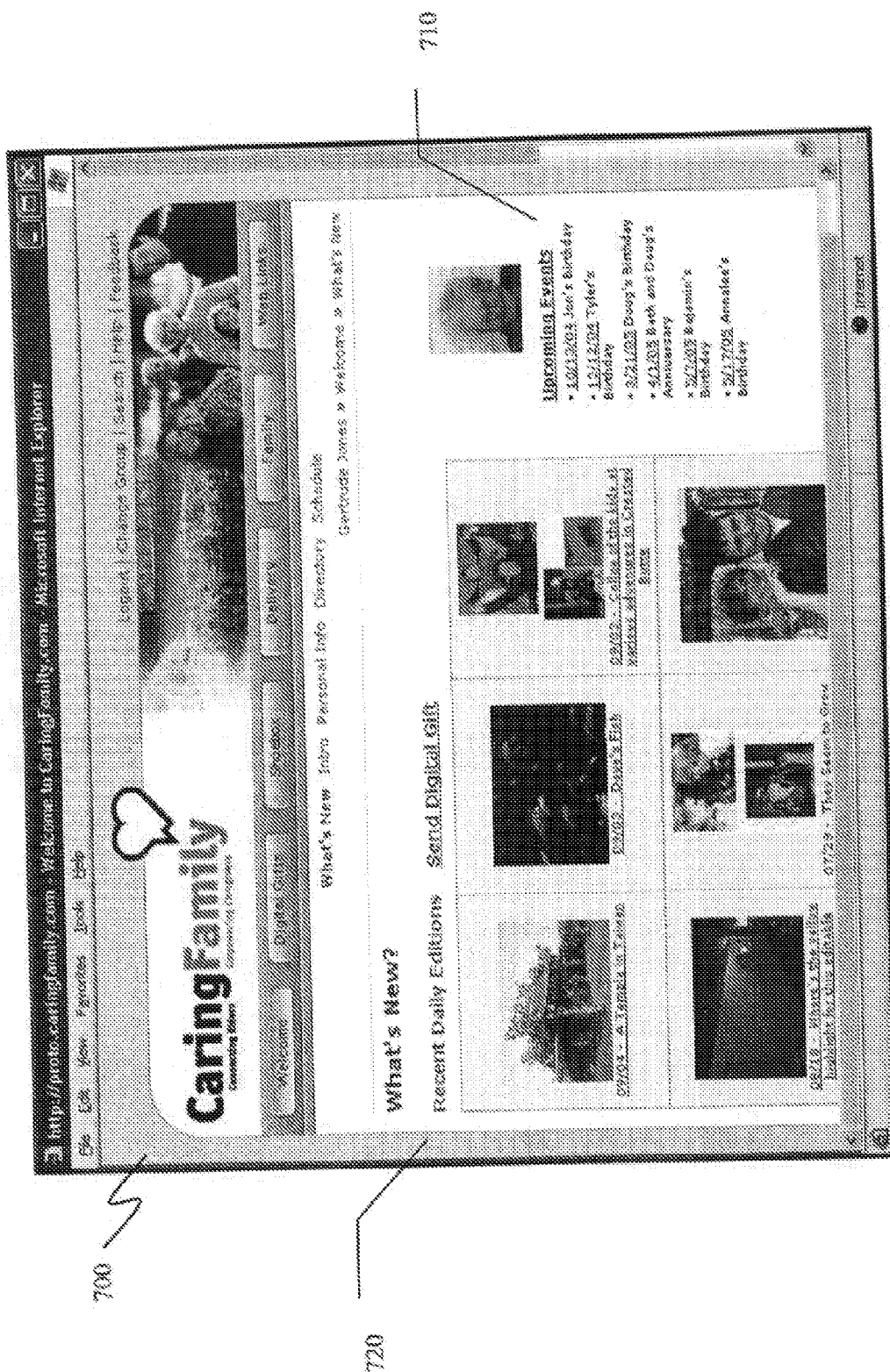
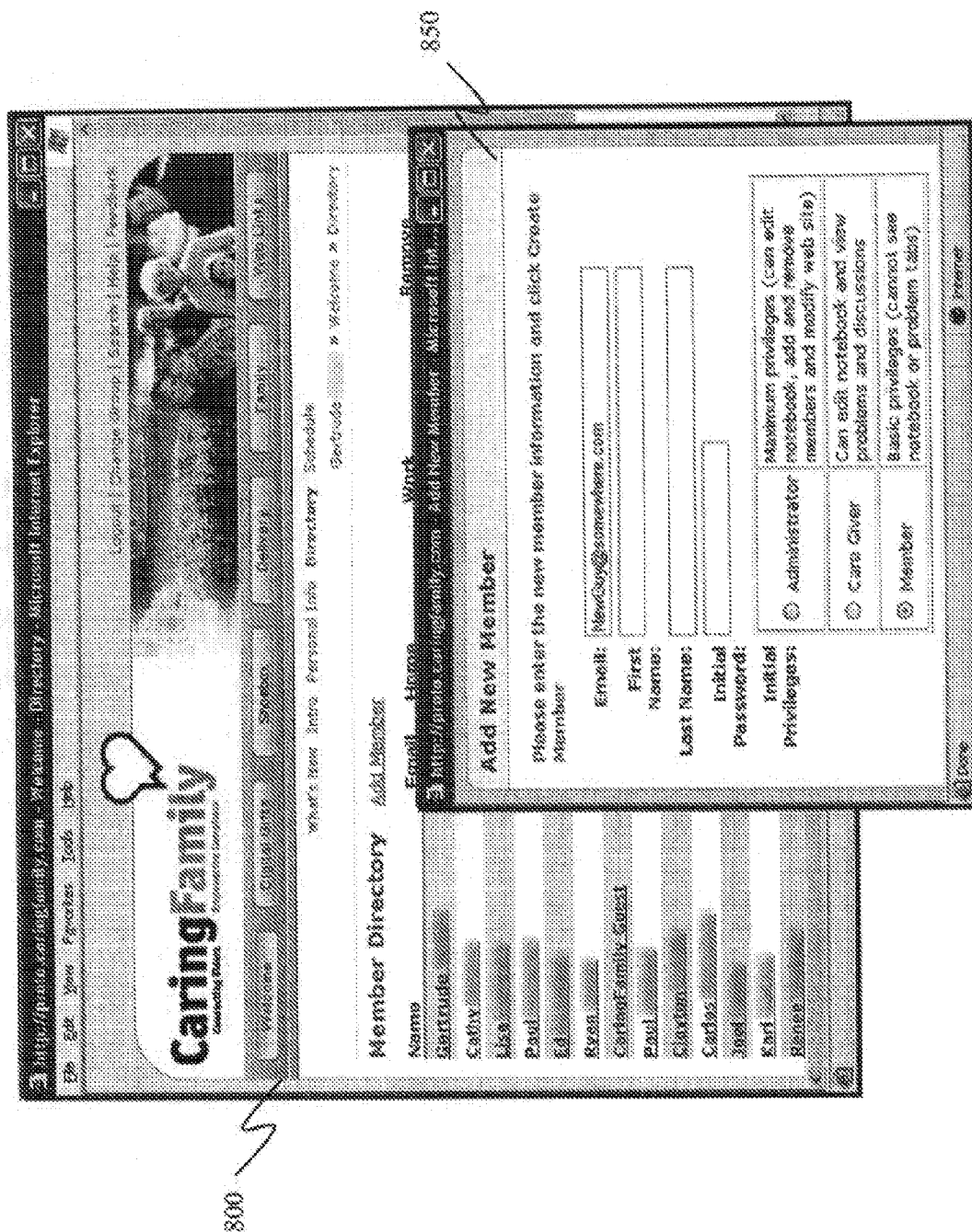


FIG. 6B





826

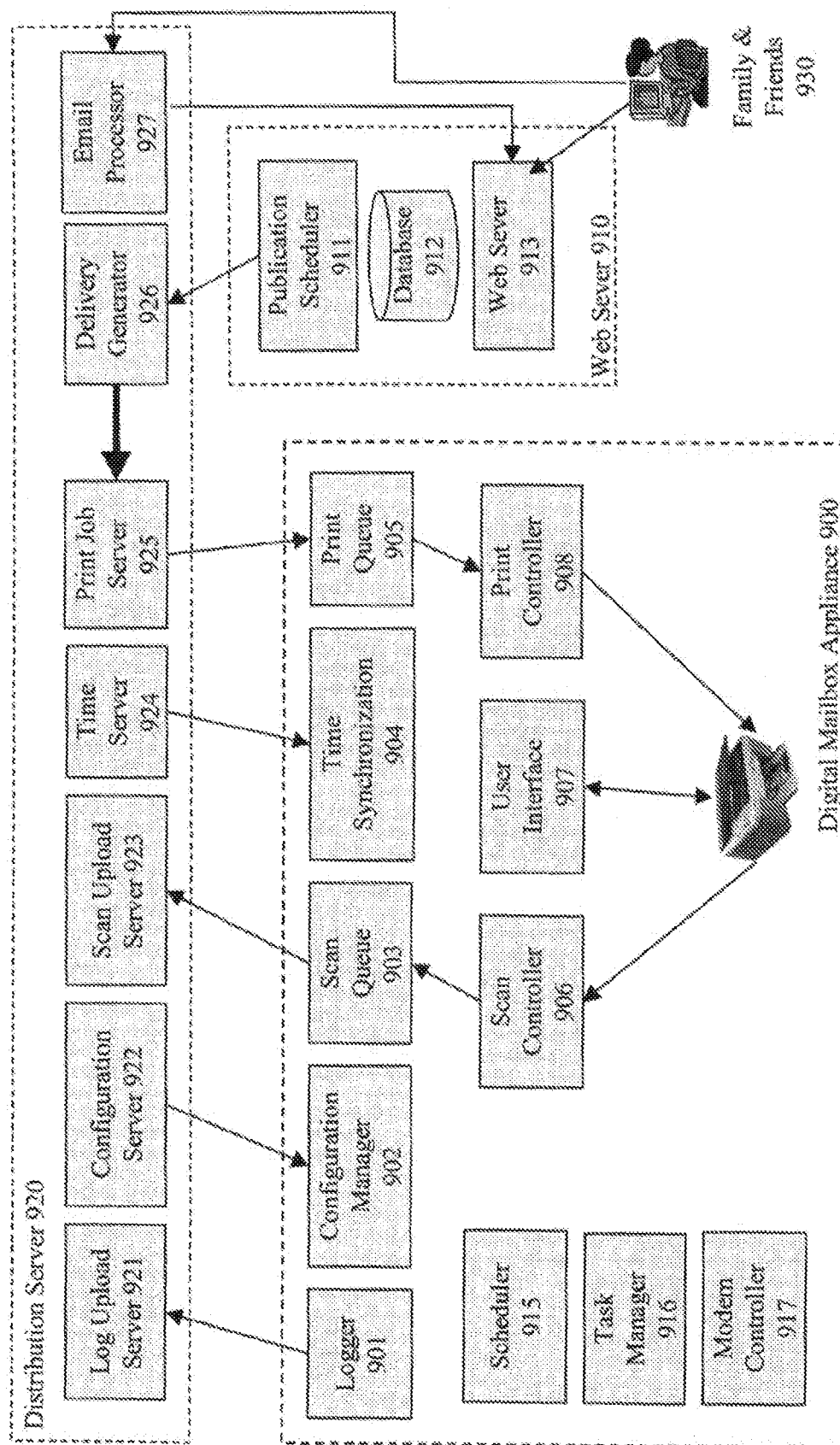


FIG. 9

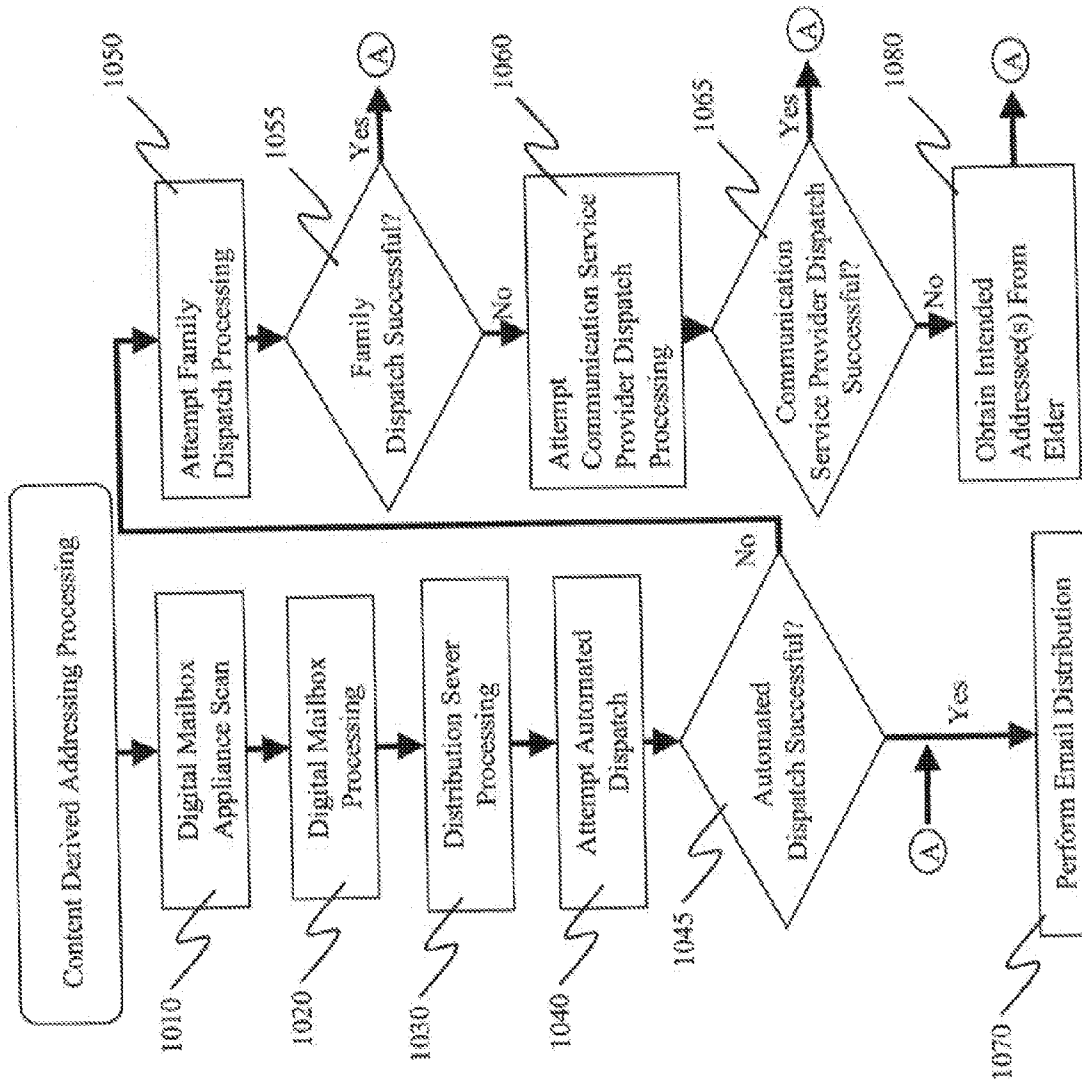


FIG. 10

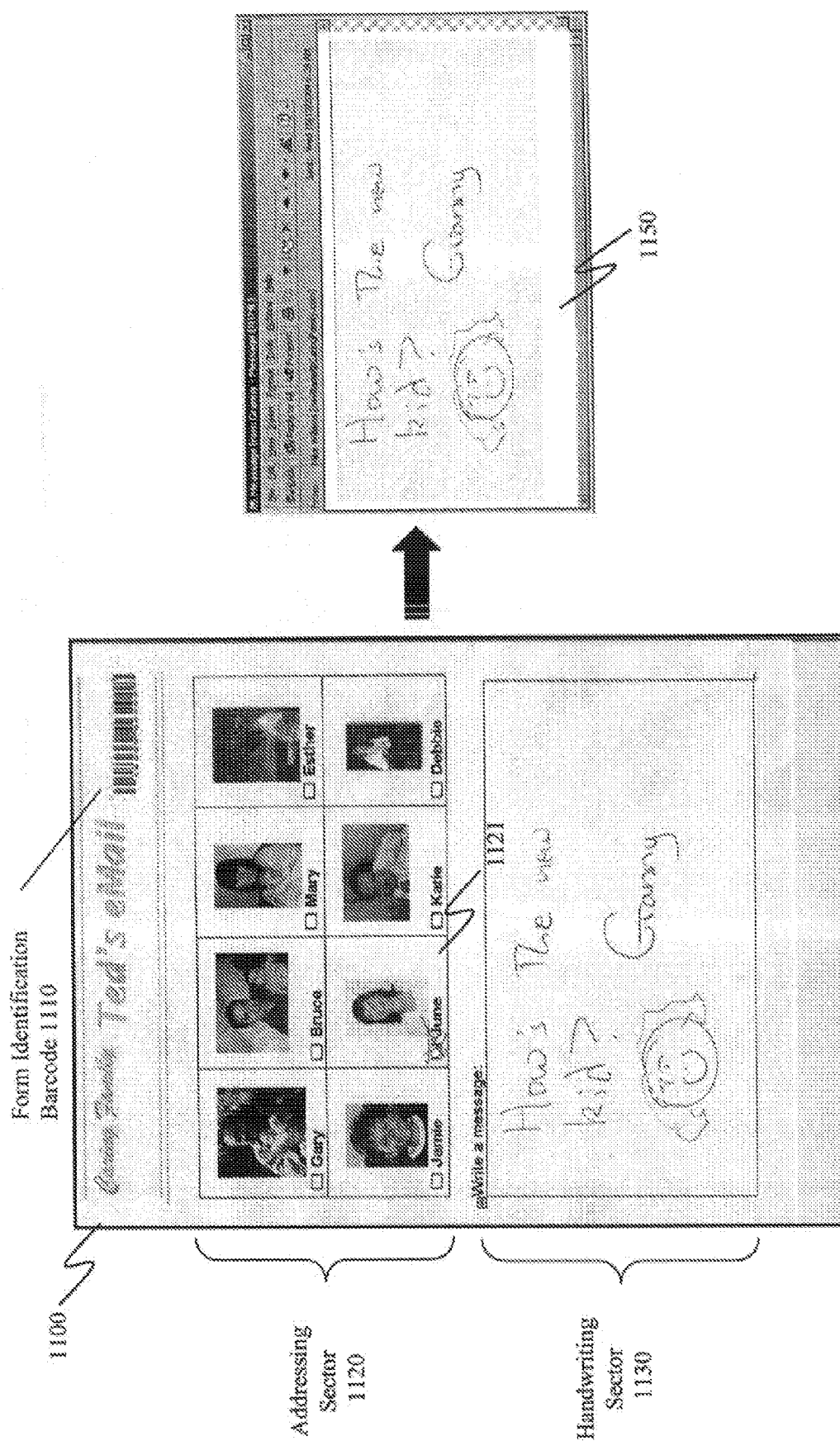


FIG. 11

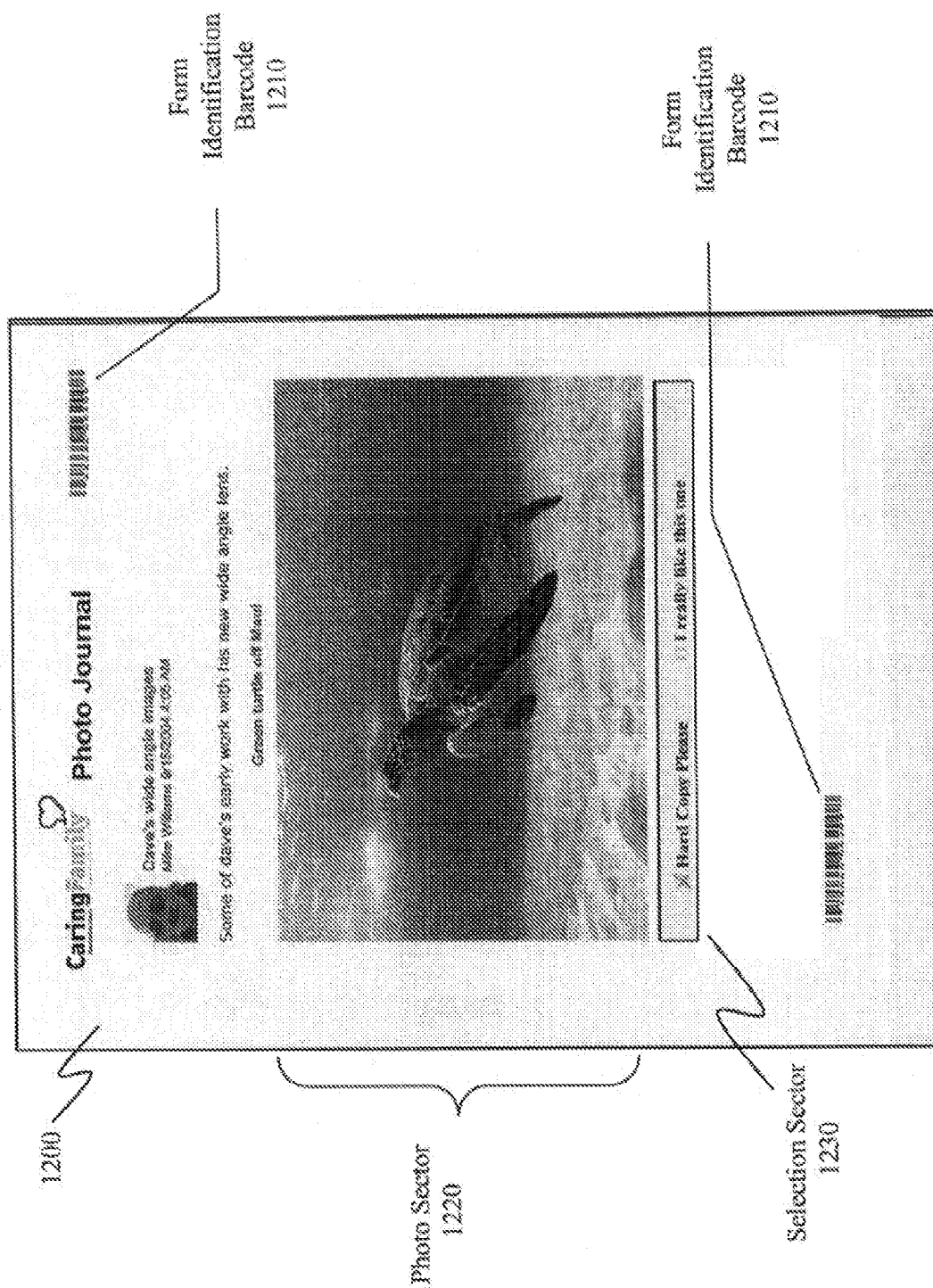


FIG. 12

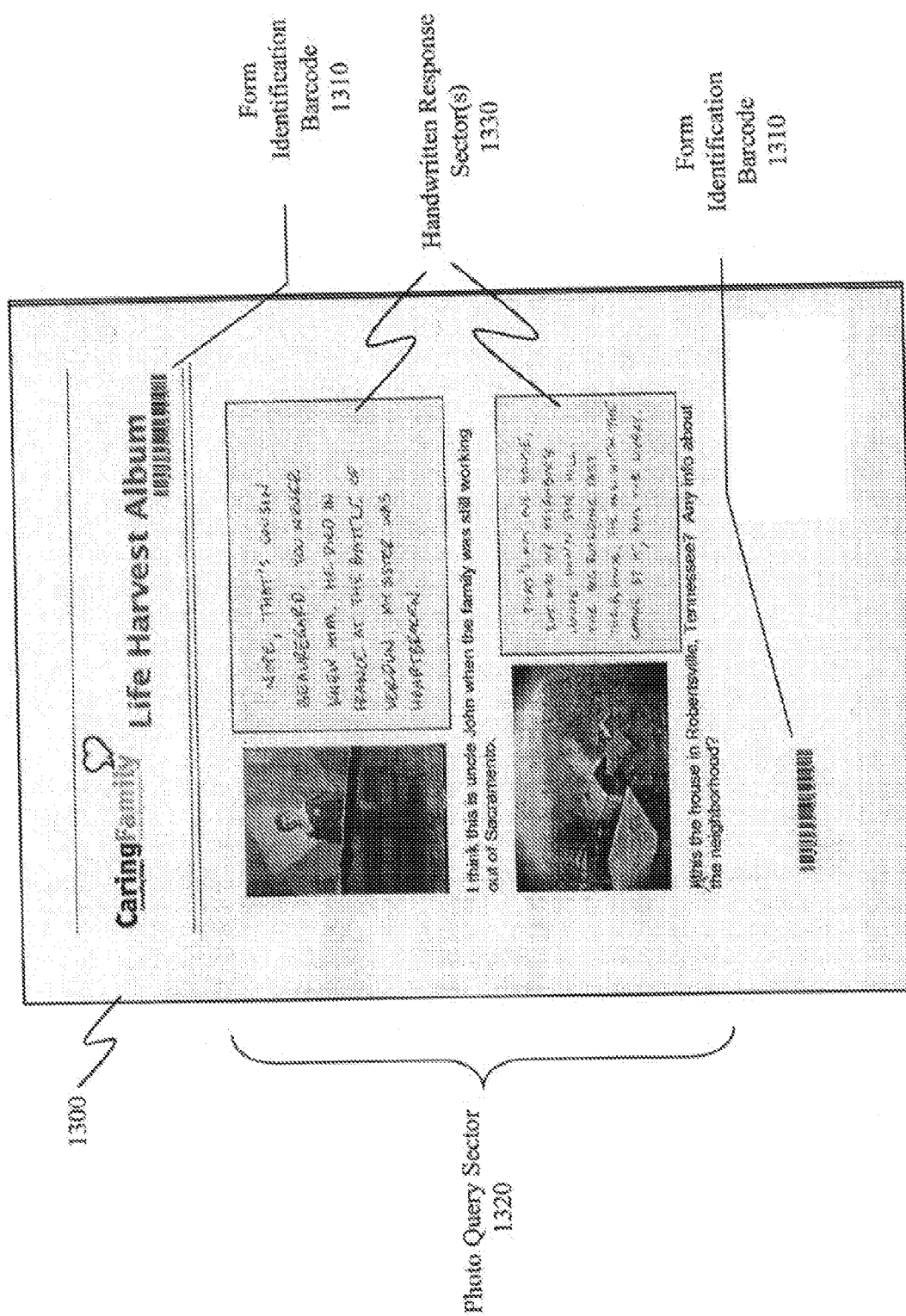










FIG. 13

1400

Caringfamily **Gertrude's eMail**

Form Identification Barcode 1410

Addressing Sector 1420

 <input type="checkbox"/> Gary	 <input type="checkbox"/> Bruce	 <input type="checkbox"/> Mary	 <input type="checkbox"/> Esther
 <input type="checkbox"/> Jamie	 <input type="checkbox"/> June	 <input type="checkbox"/> Katie	 <input checked="" type="checkbox"/> Everybody

1421

Write your quick message:

1430

Handwriting Sector

Going to dentist Friday morning and to play Bingo in the afternoon. So, will talk on Saturday.

1440

Form Identification Barcode 1410

Gertrude Hall

FIG. 14

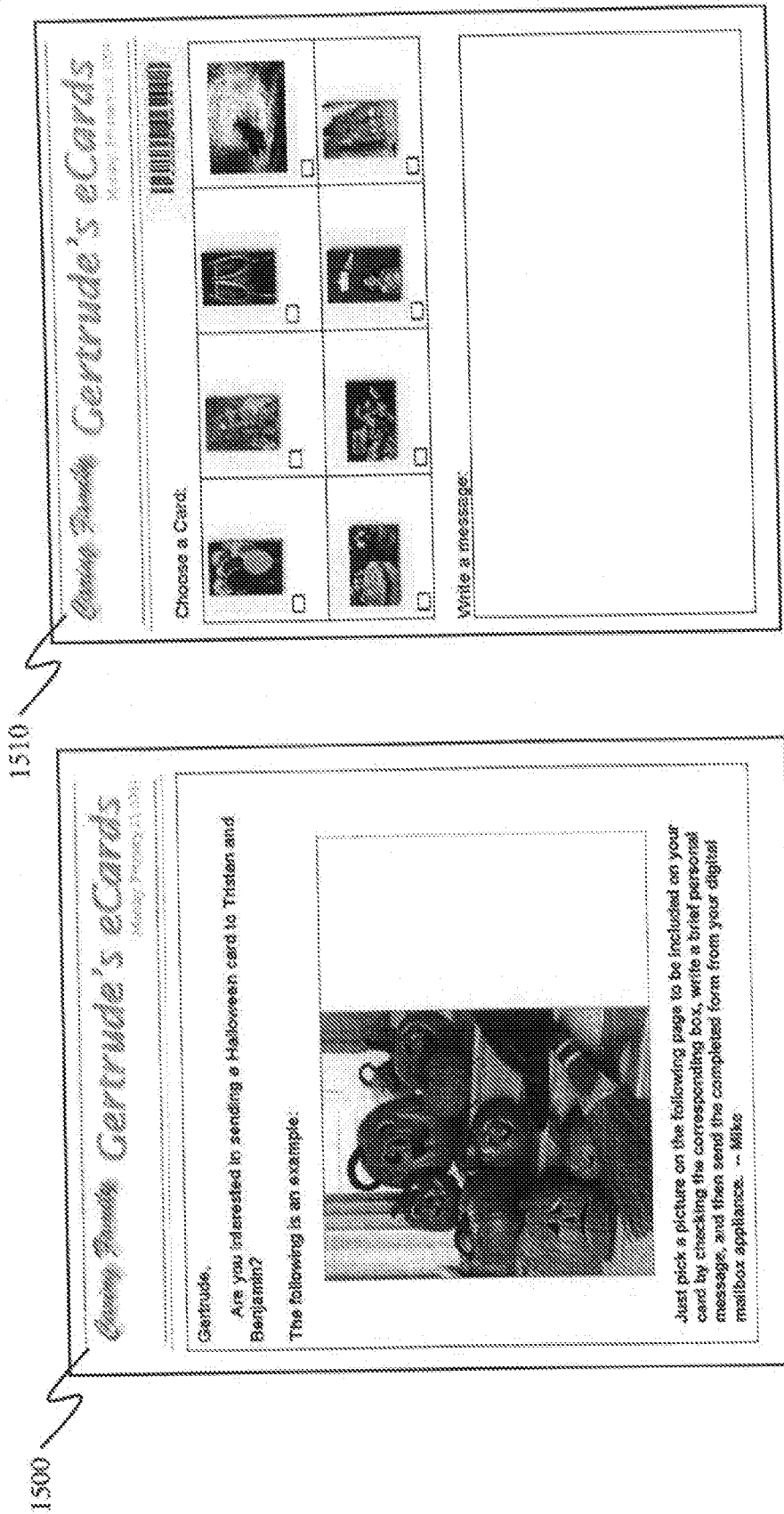


FIG. 15

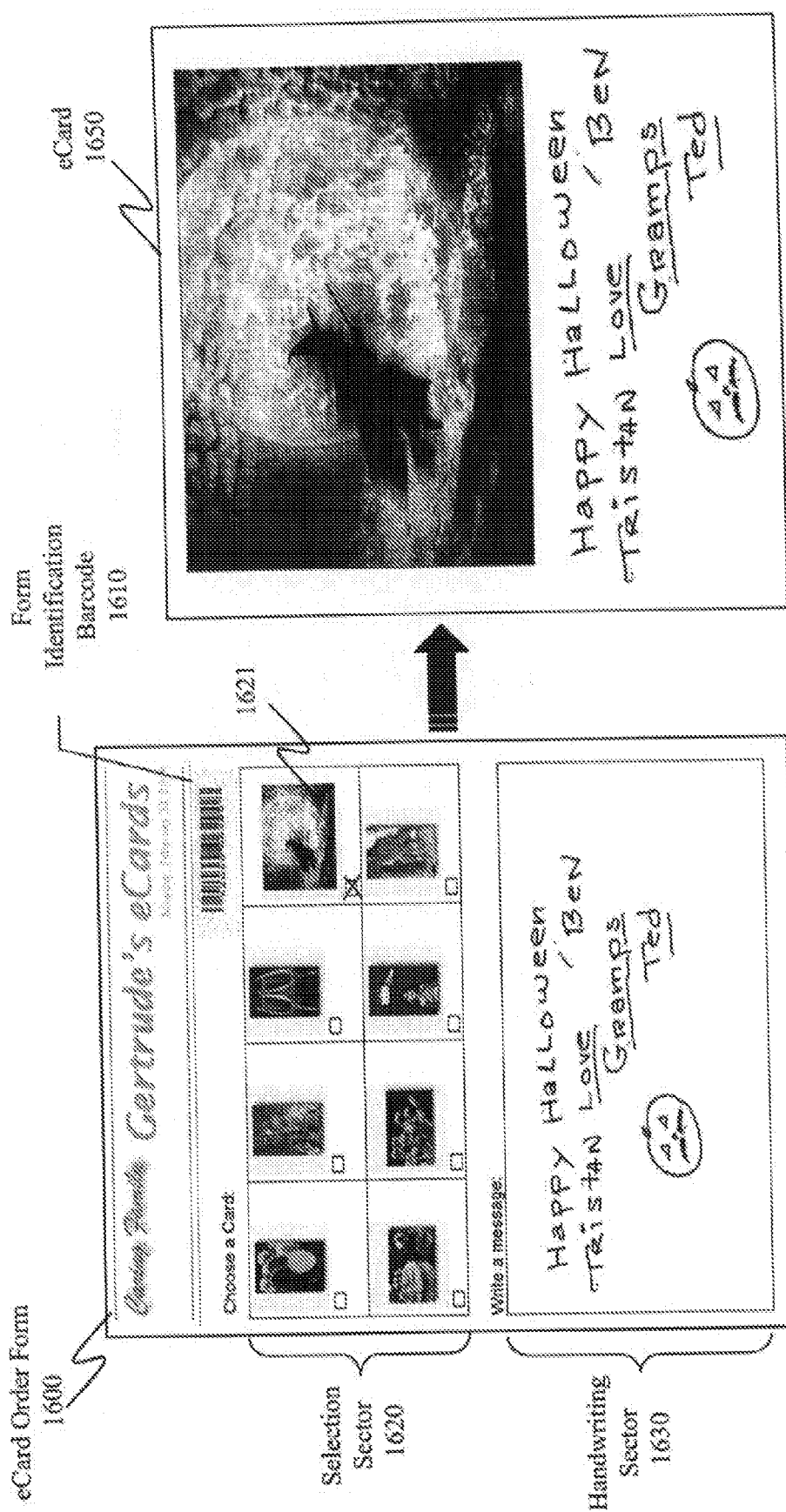


FIG. 16

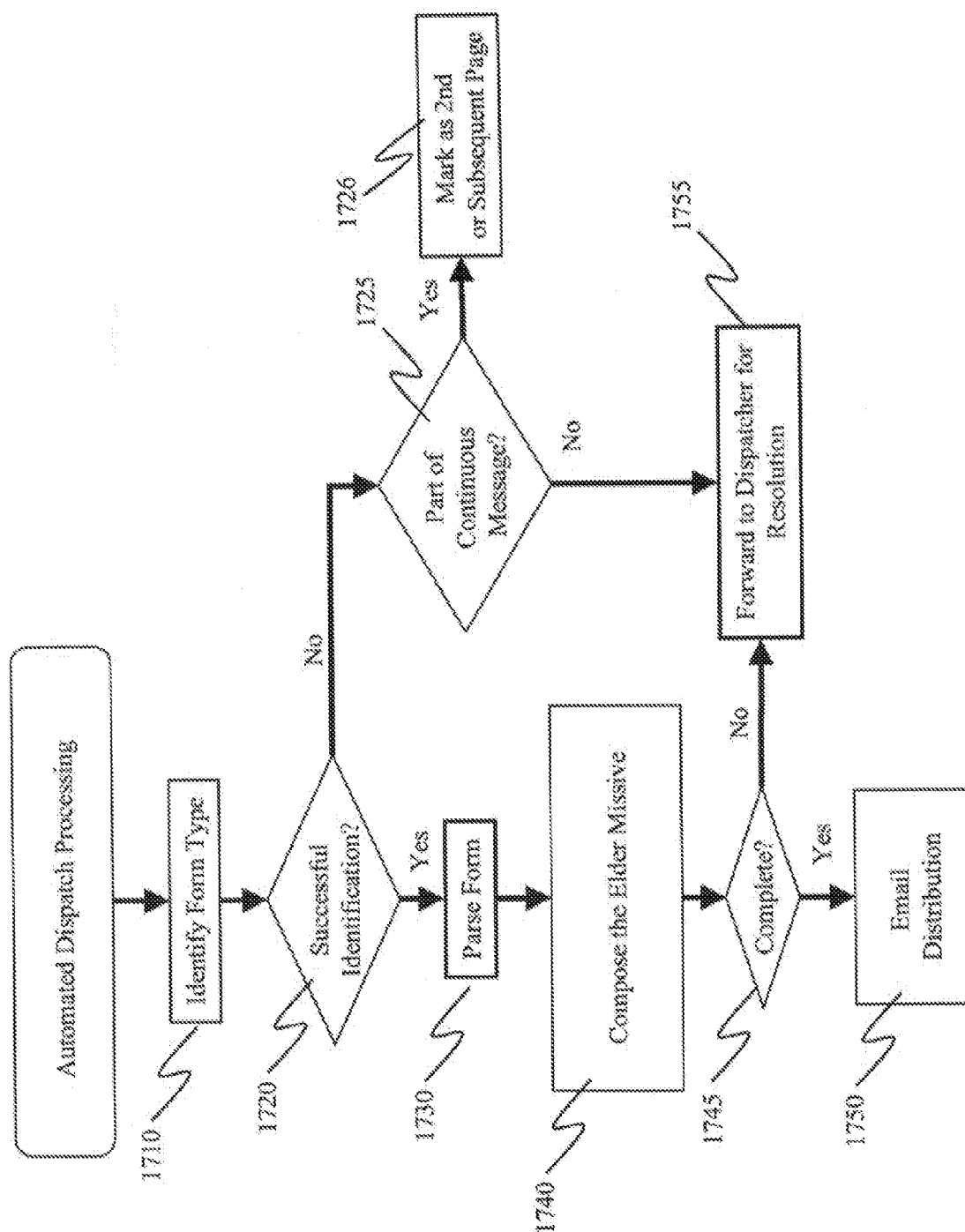


FIG. 17

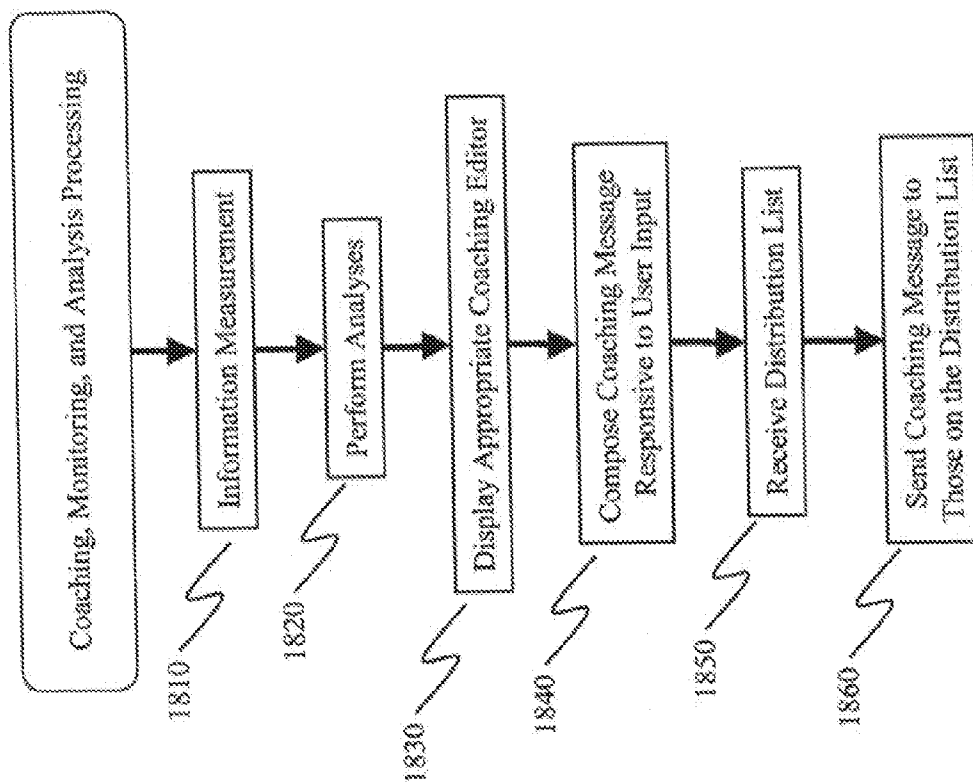


FIG. 18

Send Email Newsletter - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Send Email Newsletter

Care Group:

Send To:

Cc (optional):

Editions Count:

Initial Text:

[Tools Home](#)

1900

1910

1920

1930

1940

1950

FIG. 19

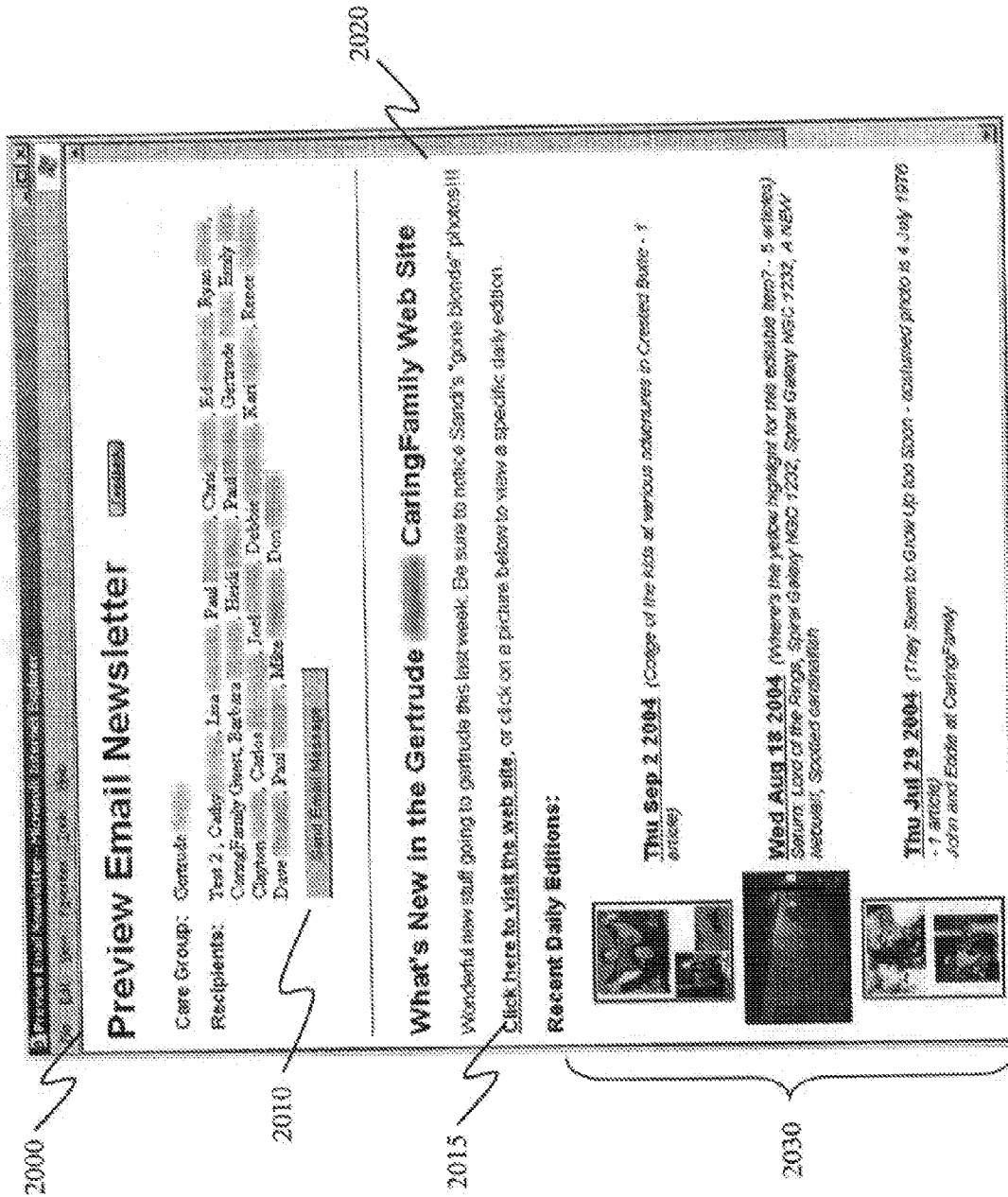


FIG. 20

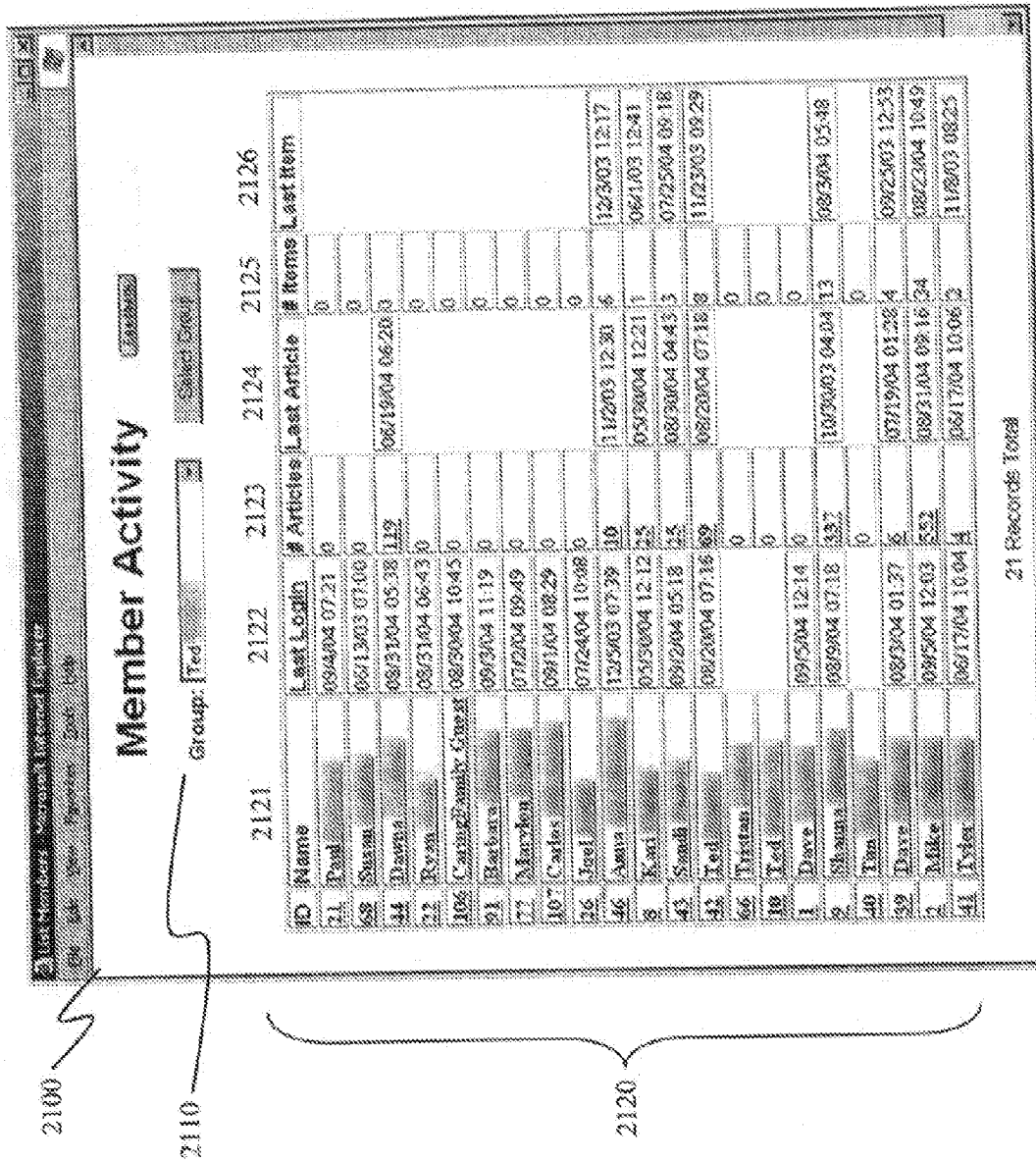


FIG. 21

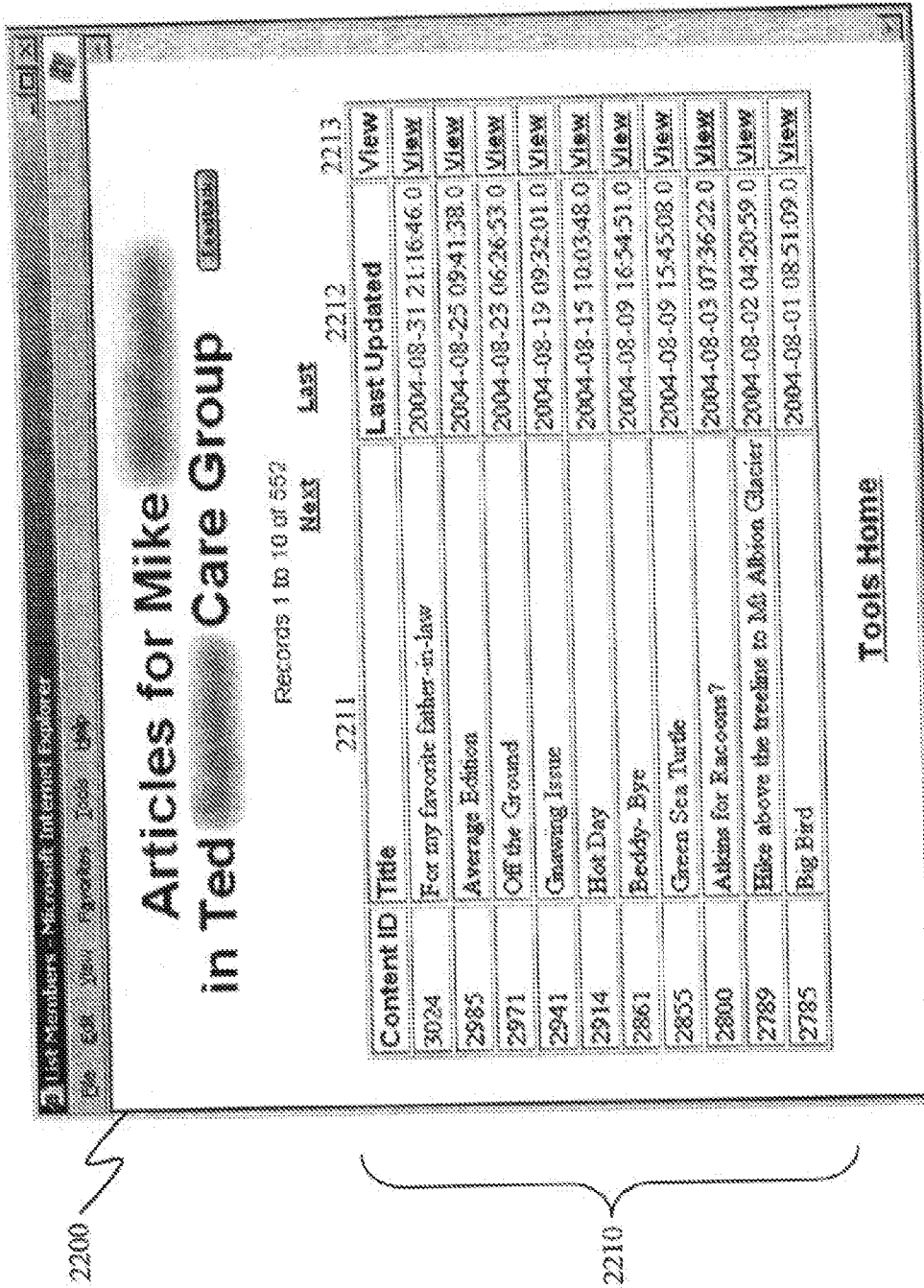


FIG. 22

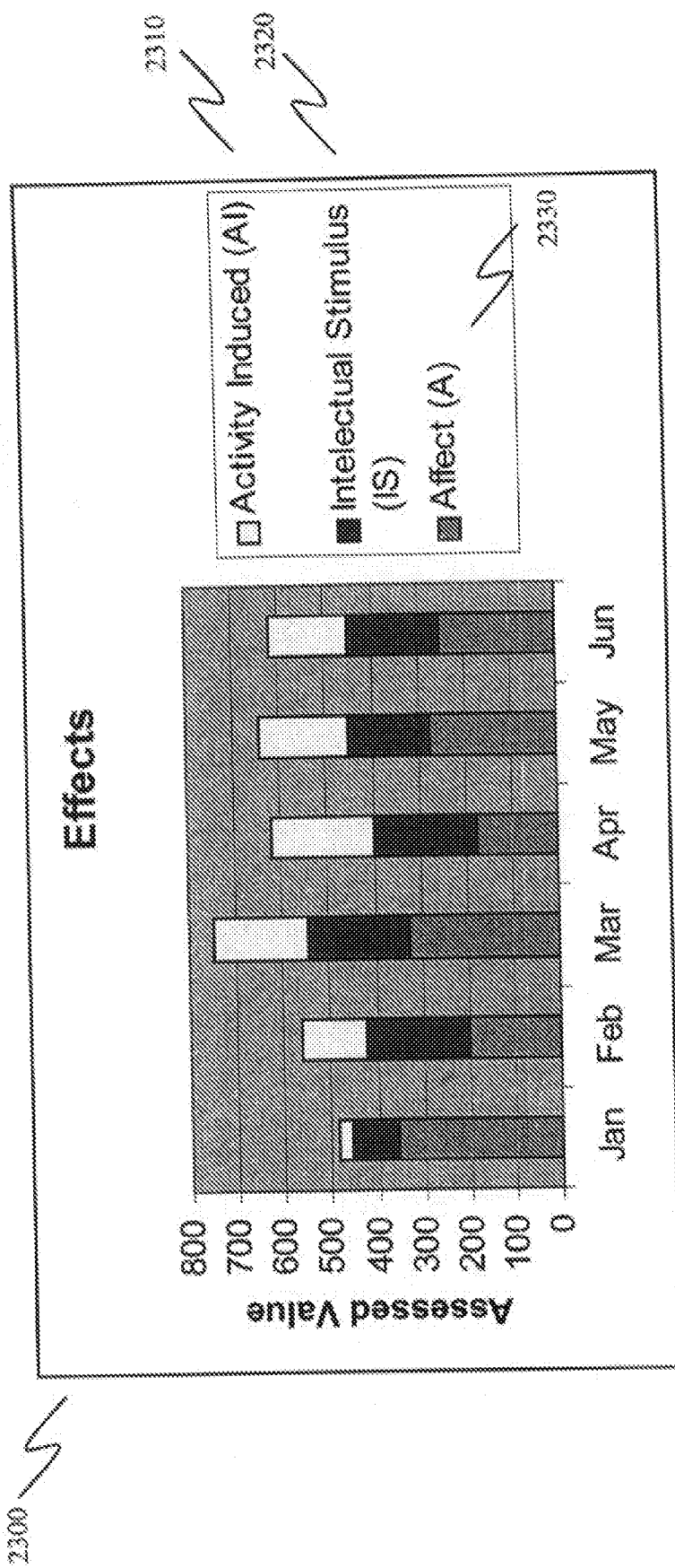


FIG. 23

2400

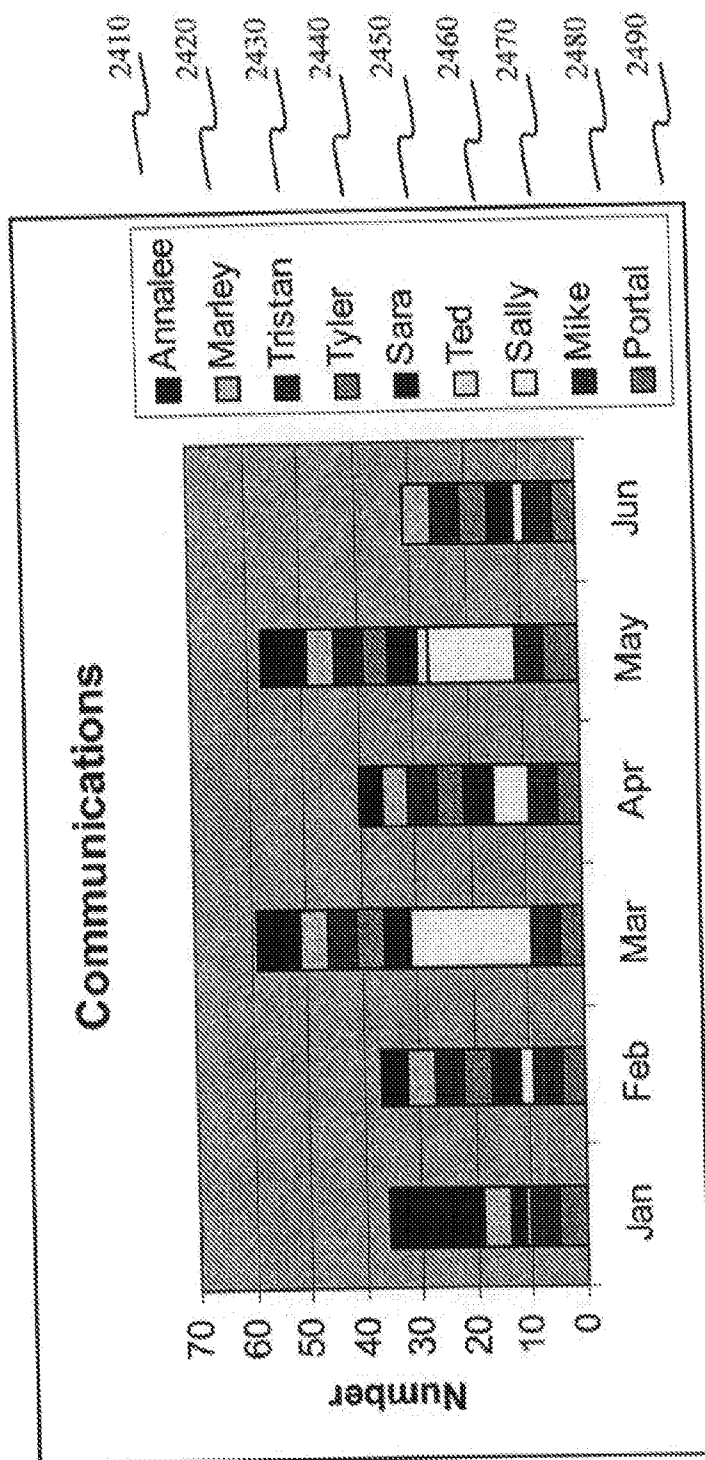


FIG. 24

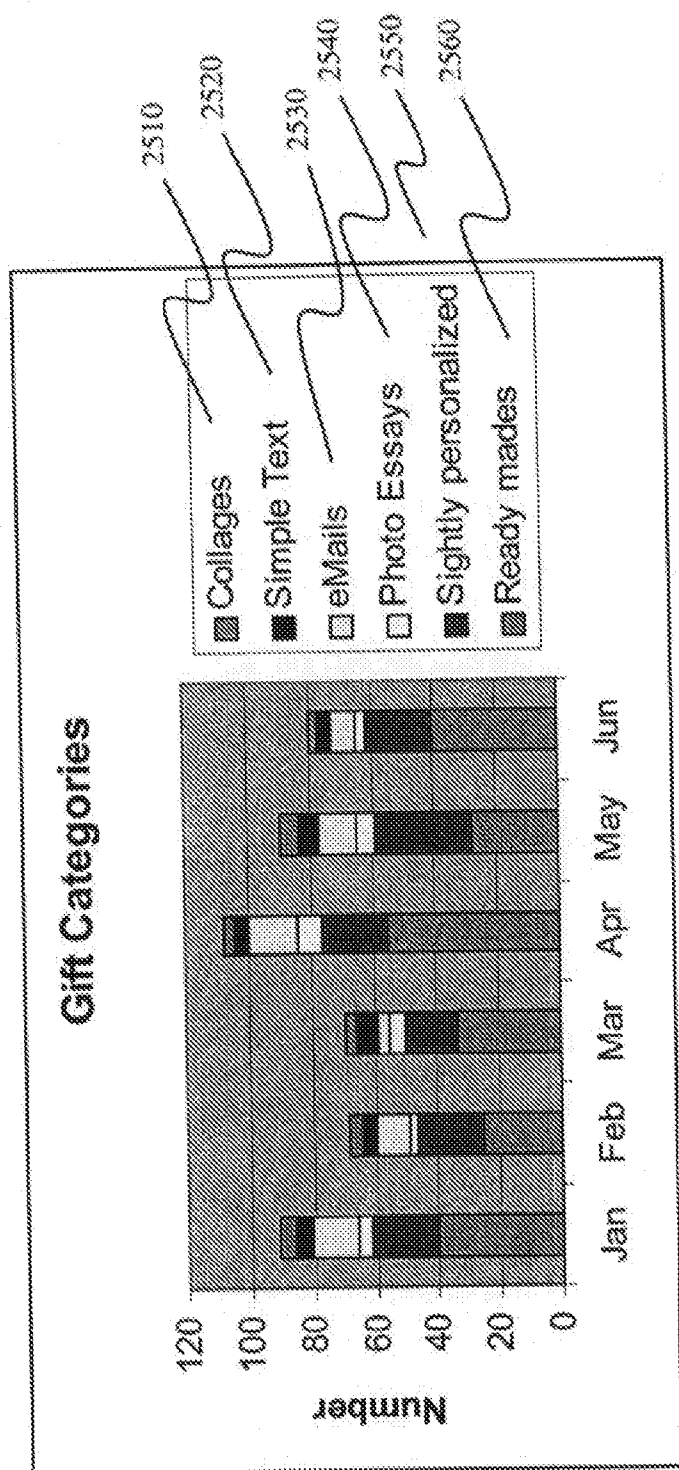


FIG. 25

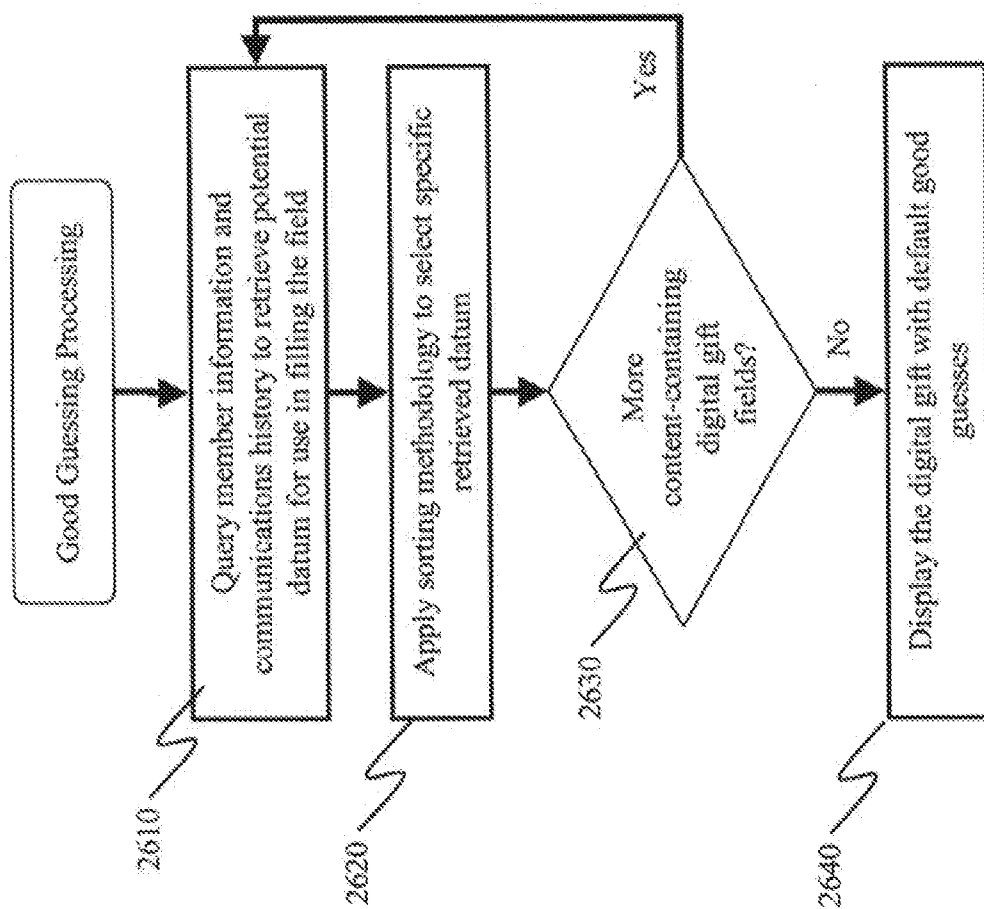


FIG. 26

2700

2710

The screenshot shows a web browser window with the address bar displaying 'http://www.caringfamily.com/'. The page title is 'CaringFamily' and the subtitle is 'Caring for your family'. The main content area is titled 'Personal Information' and contains a form with the following fields:

- First Name: [text input]
- Last Name: [text input]
- Email Address: [text input] (the text is used for logging in)
- Nickname: [text input]
- Birthday: [text input]
- Address: [text input]
- City: [text input]
- State: [text input]
- Zip Code: [text input]

Below the form, there is a section titled 'Options For This Care Group' with a list of privileges: Administrator, Edit Schedule, Edit Personal Info, Edit Preferences, and View Contacts. To the right of the form, there is a section titled 'What's New' with a list of items: What's New on Newsletter, Emergency on Notification, and a photo of a person.

A dialog box titled 'Change Name and Email' is overlaid on the main form. It contains the following fields:

- First Name: [text input]
- Last Name: [text input]
- Email Address: [text input] (the text is used for logging in)
- Nickname: [text input]
- Birthday: [text input]
- Password: [text input]
- Repeat Password: [text input]
- Password Hint: [text input]

The dialog box also has a 'Cancel' button and a 'Save' button.

FIG. 27

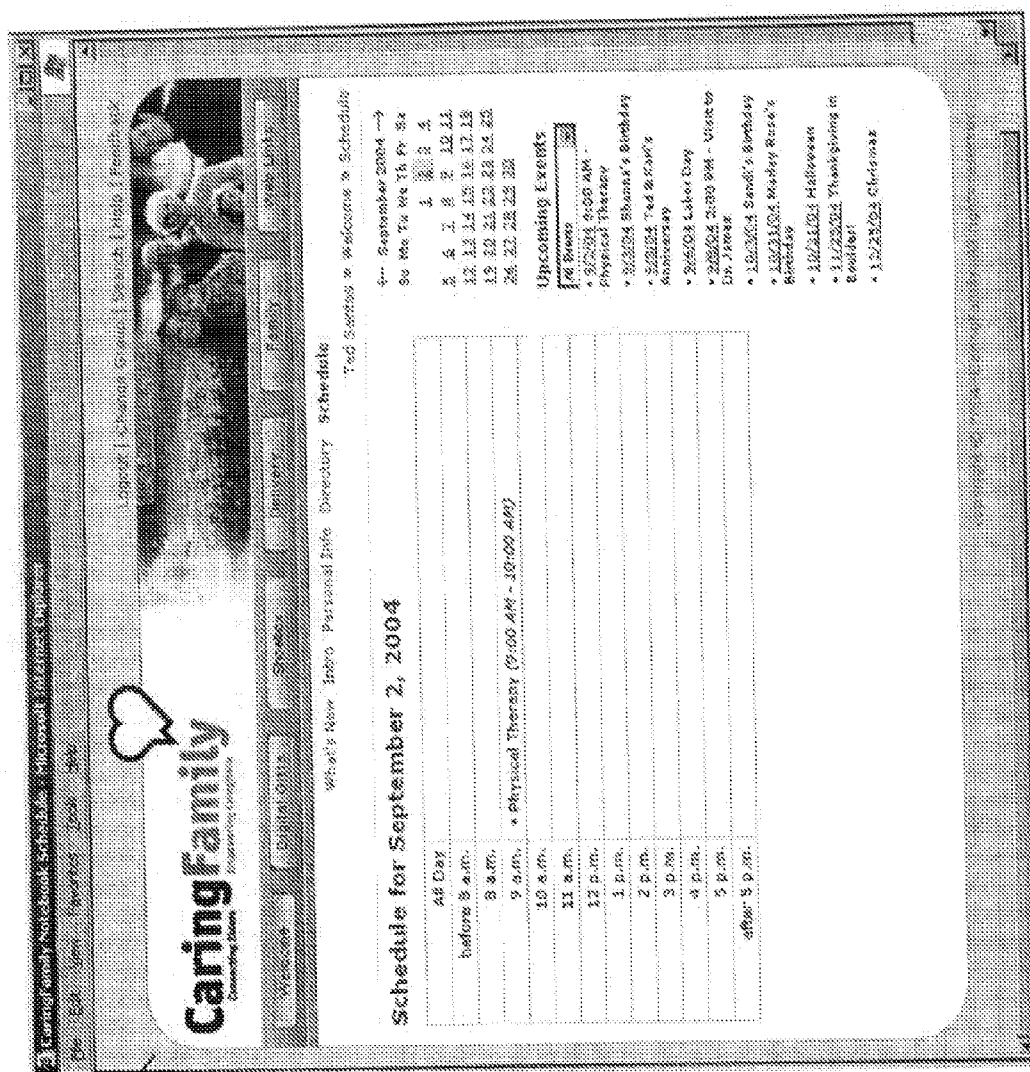


FIG. 28

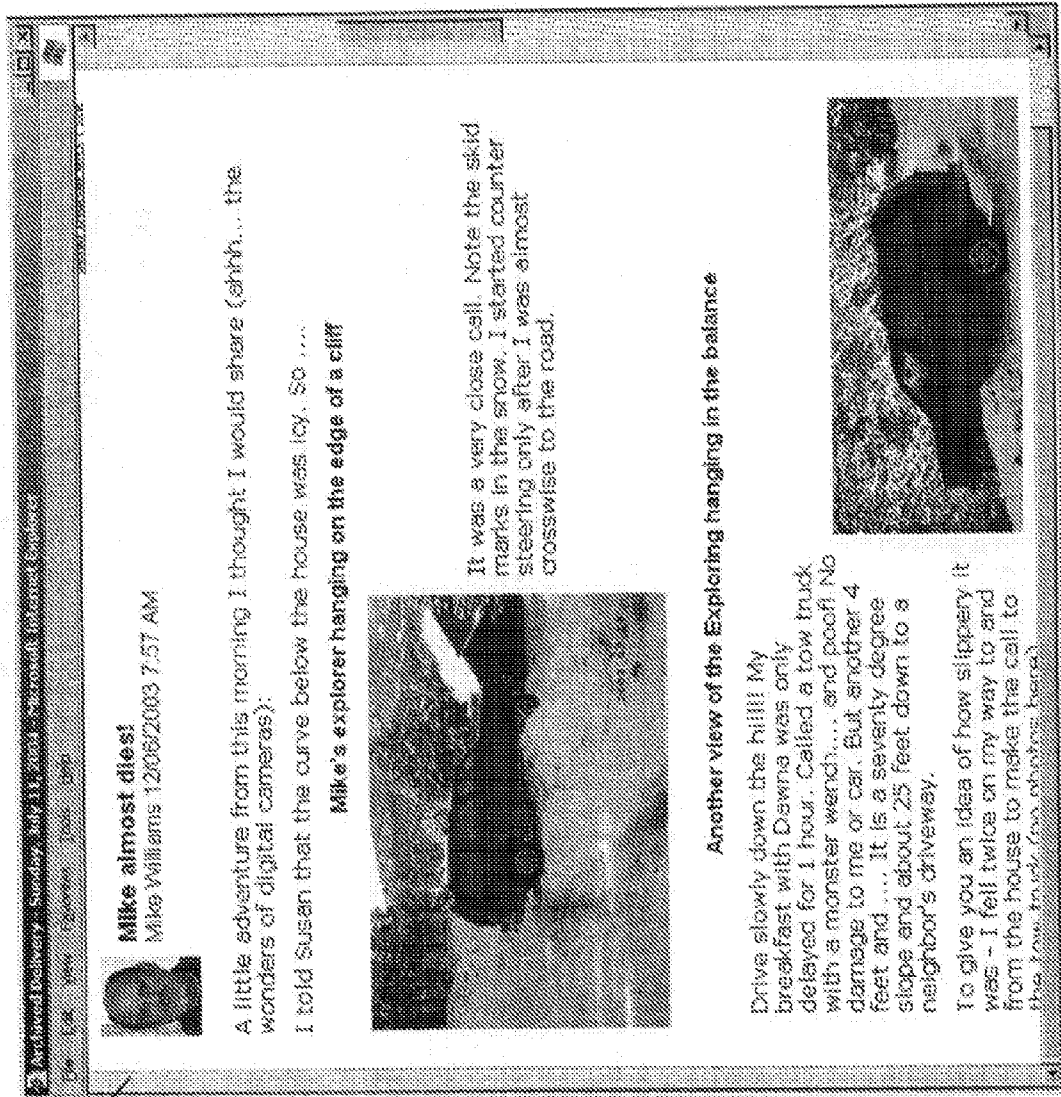
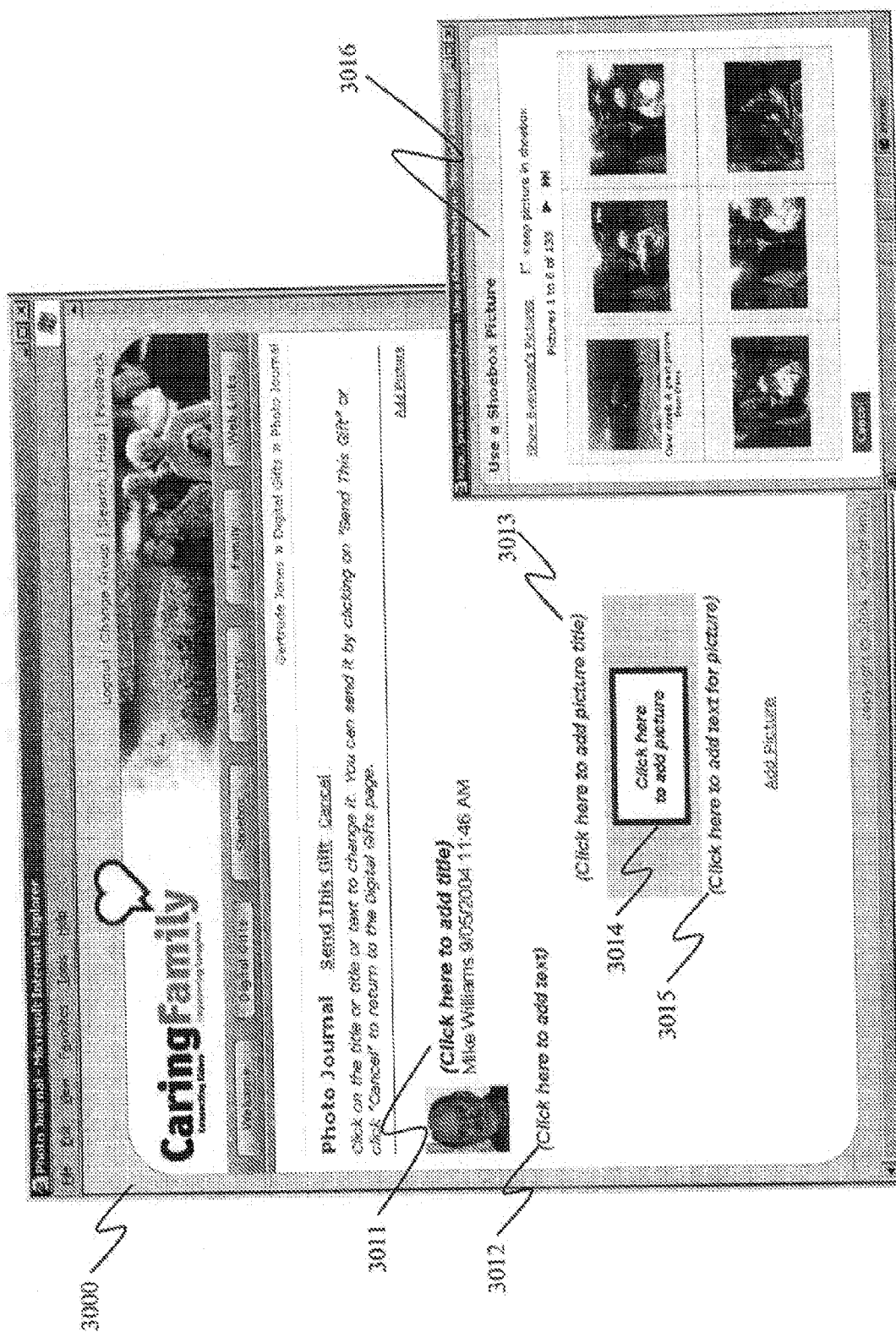


FIG. 29



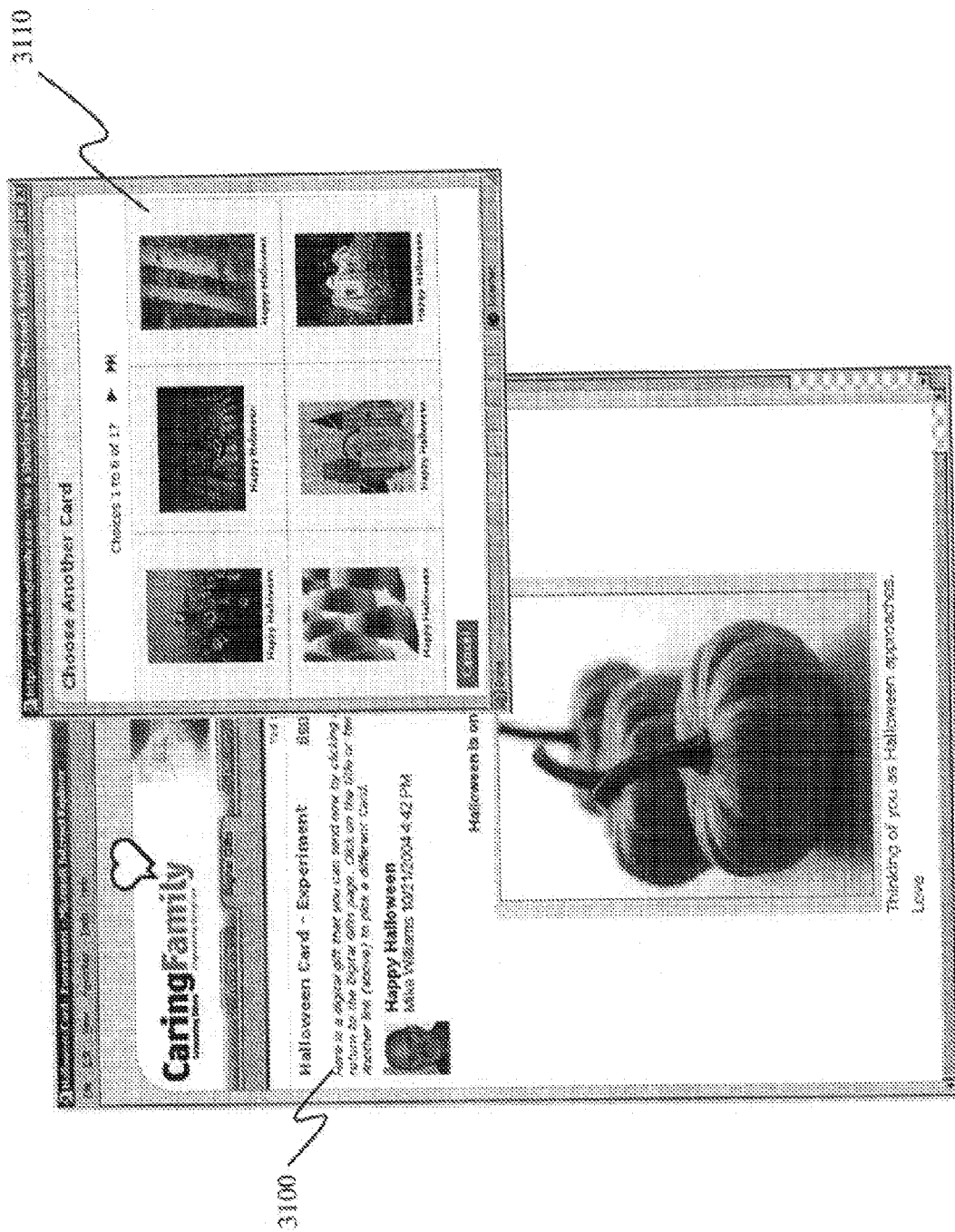


FIG. 31

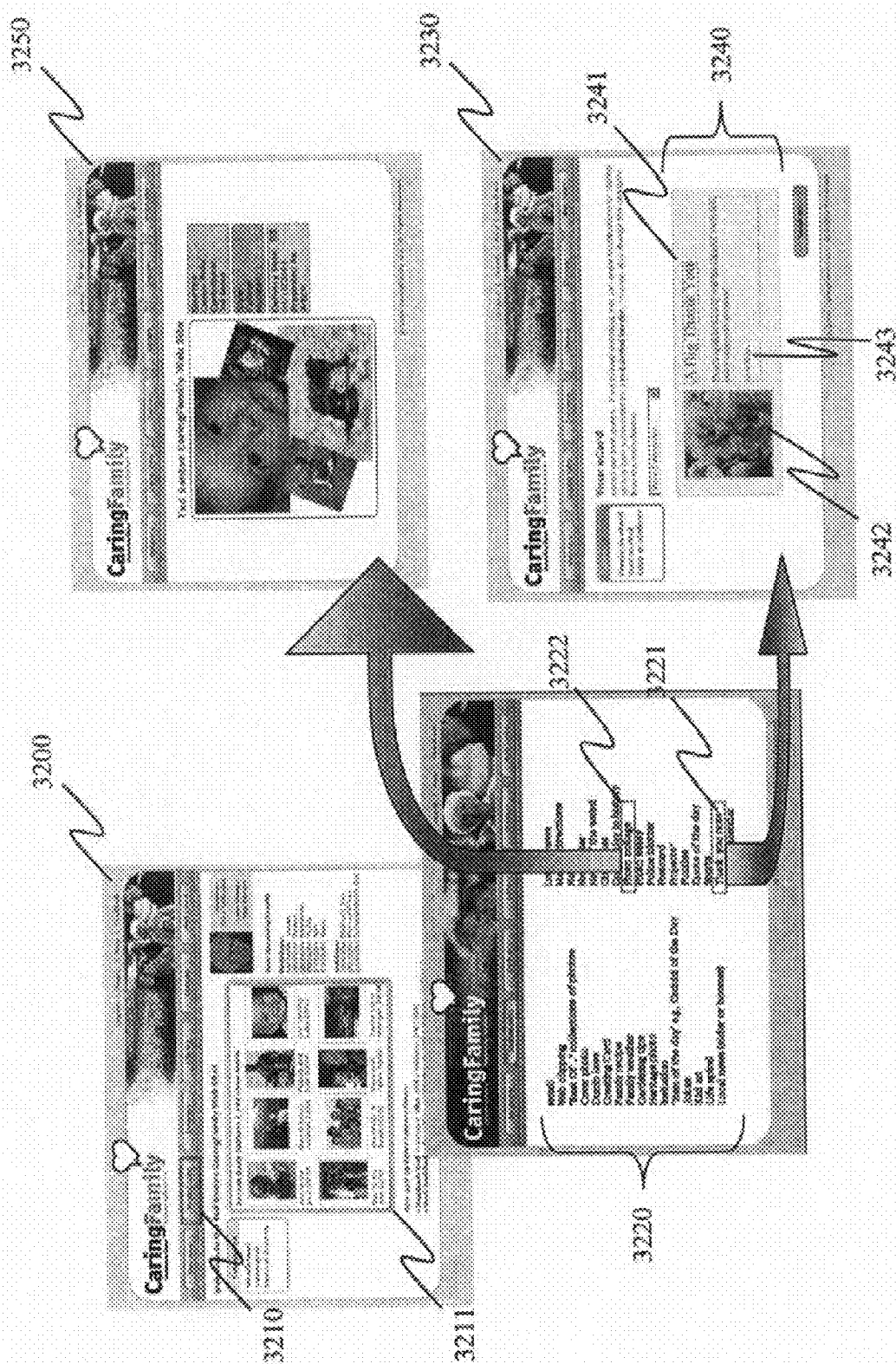


FIG. 32

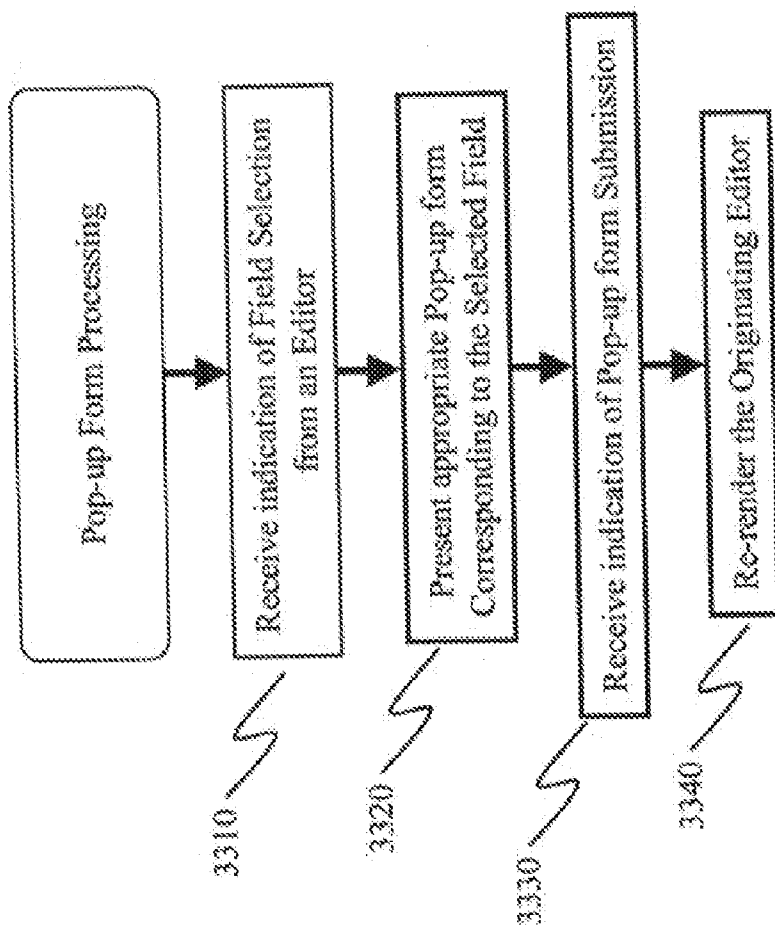


FIG. 33

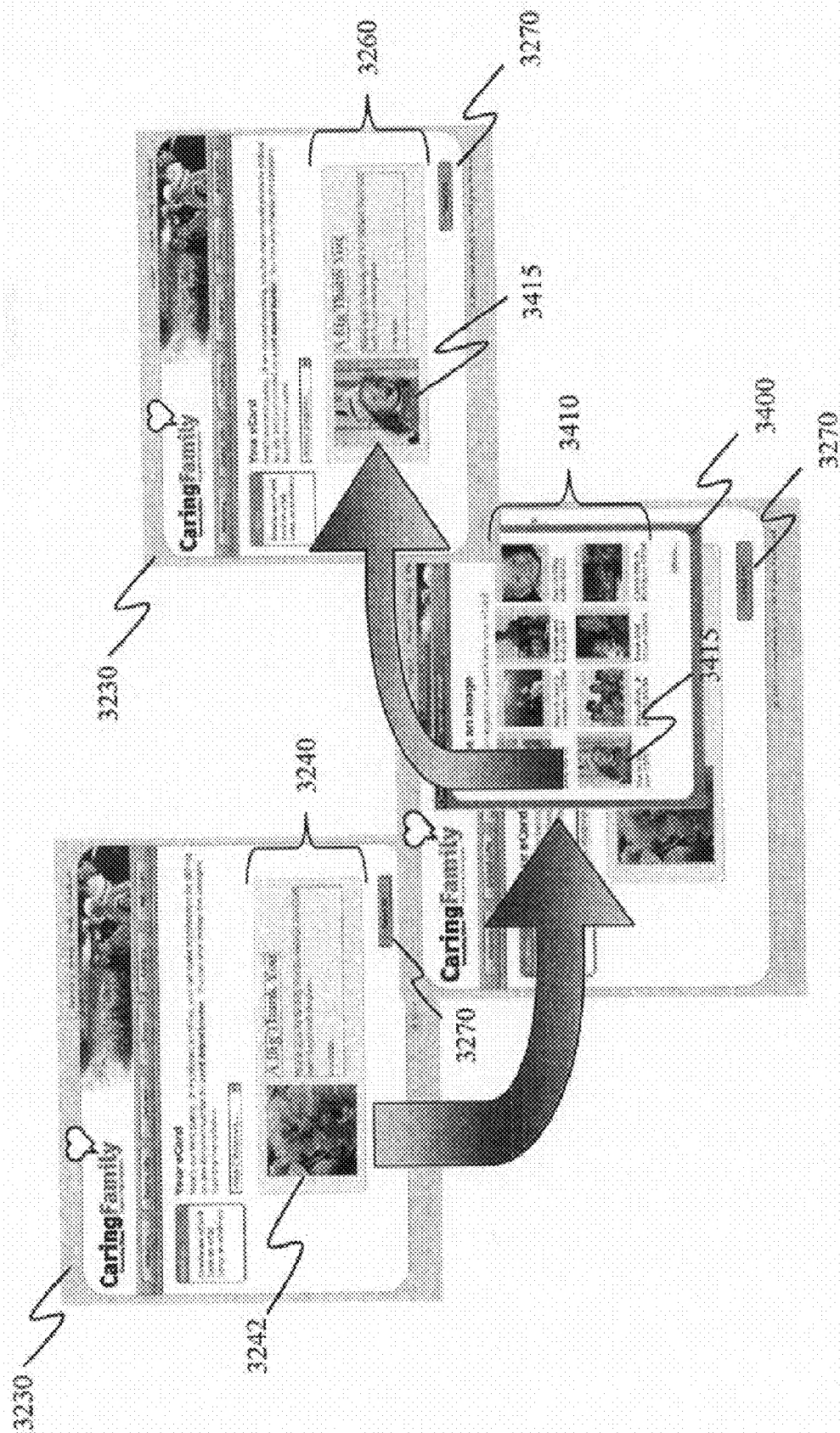


FIG. 34

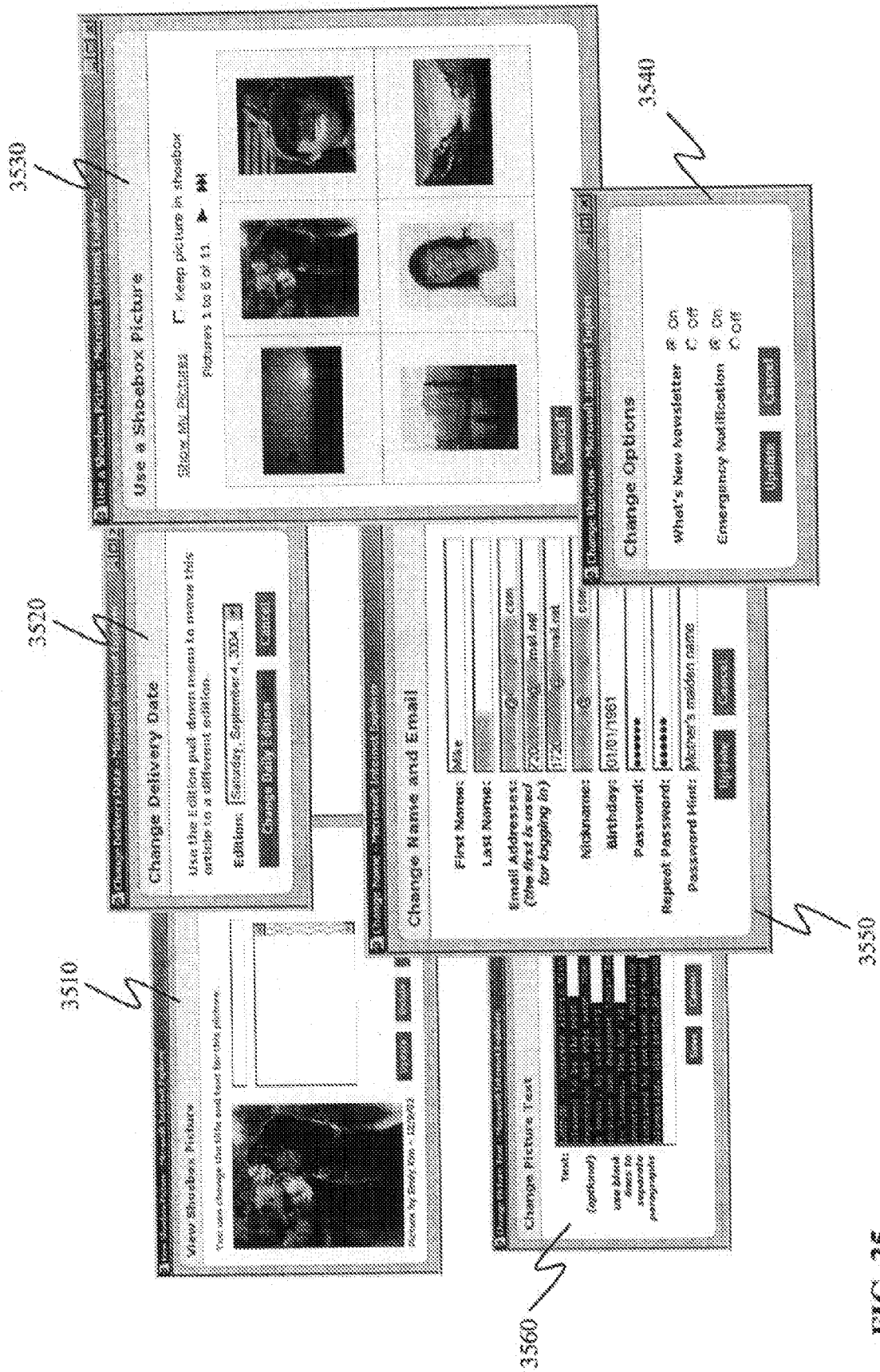


FIG. 35

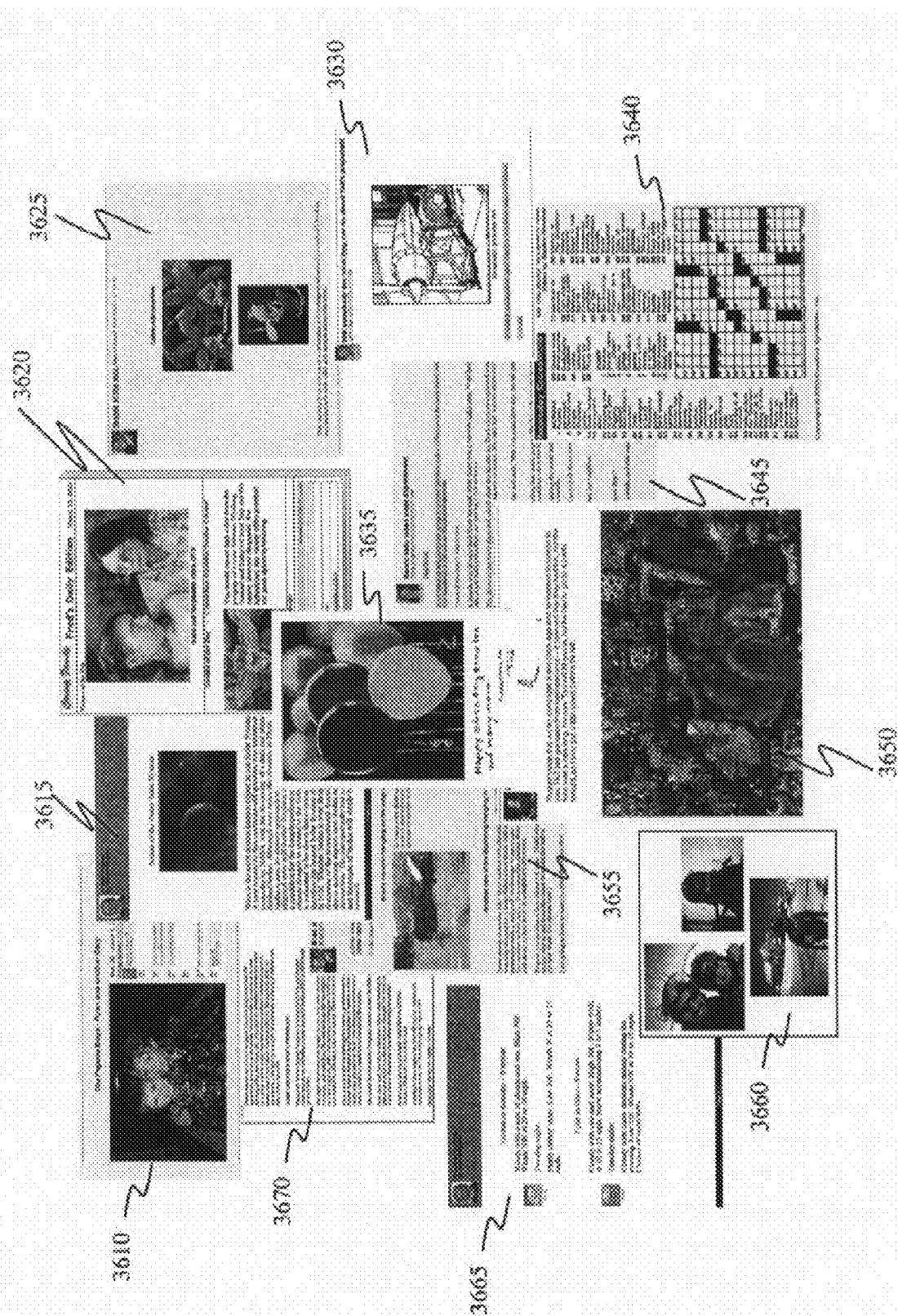
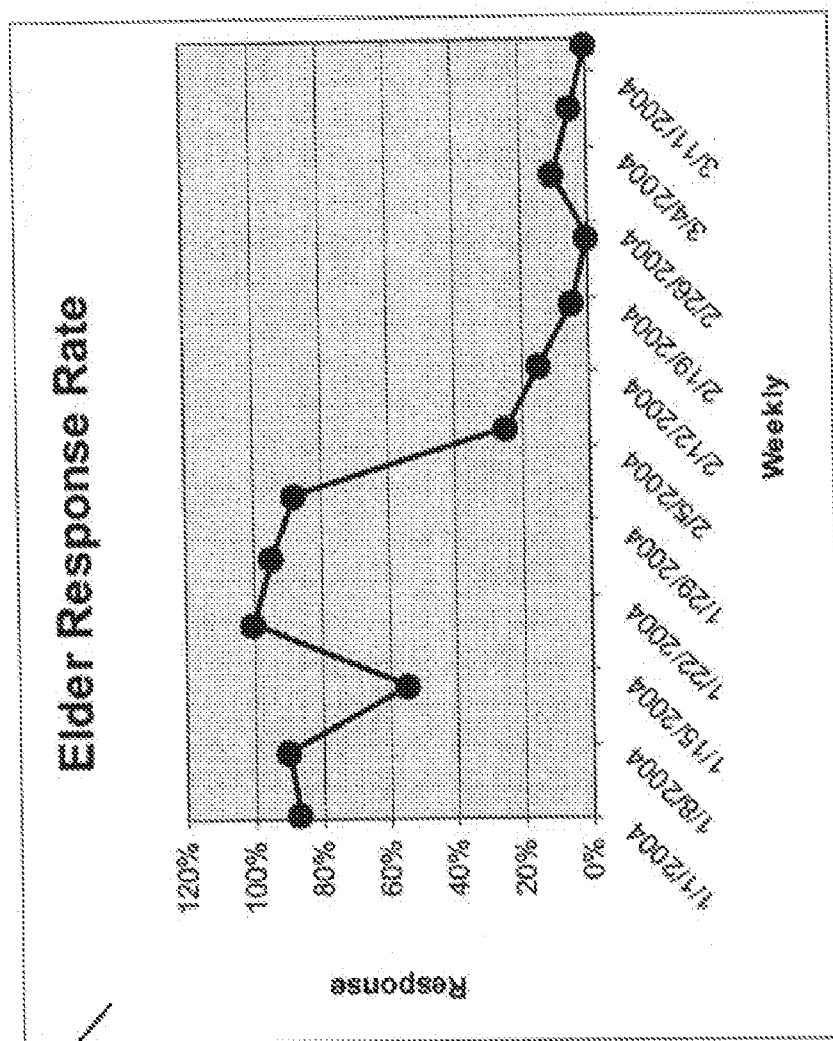
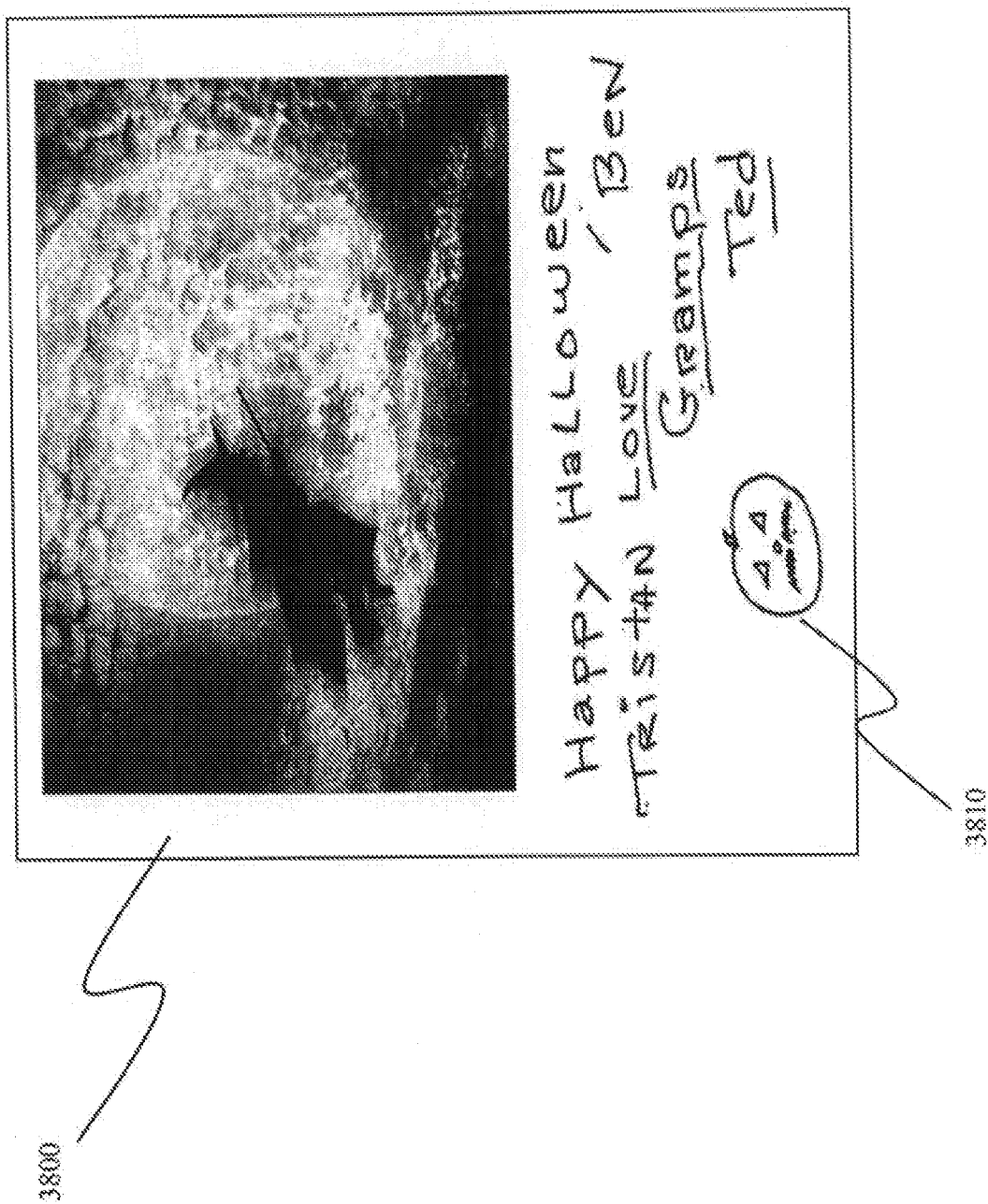


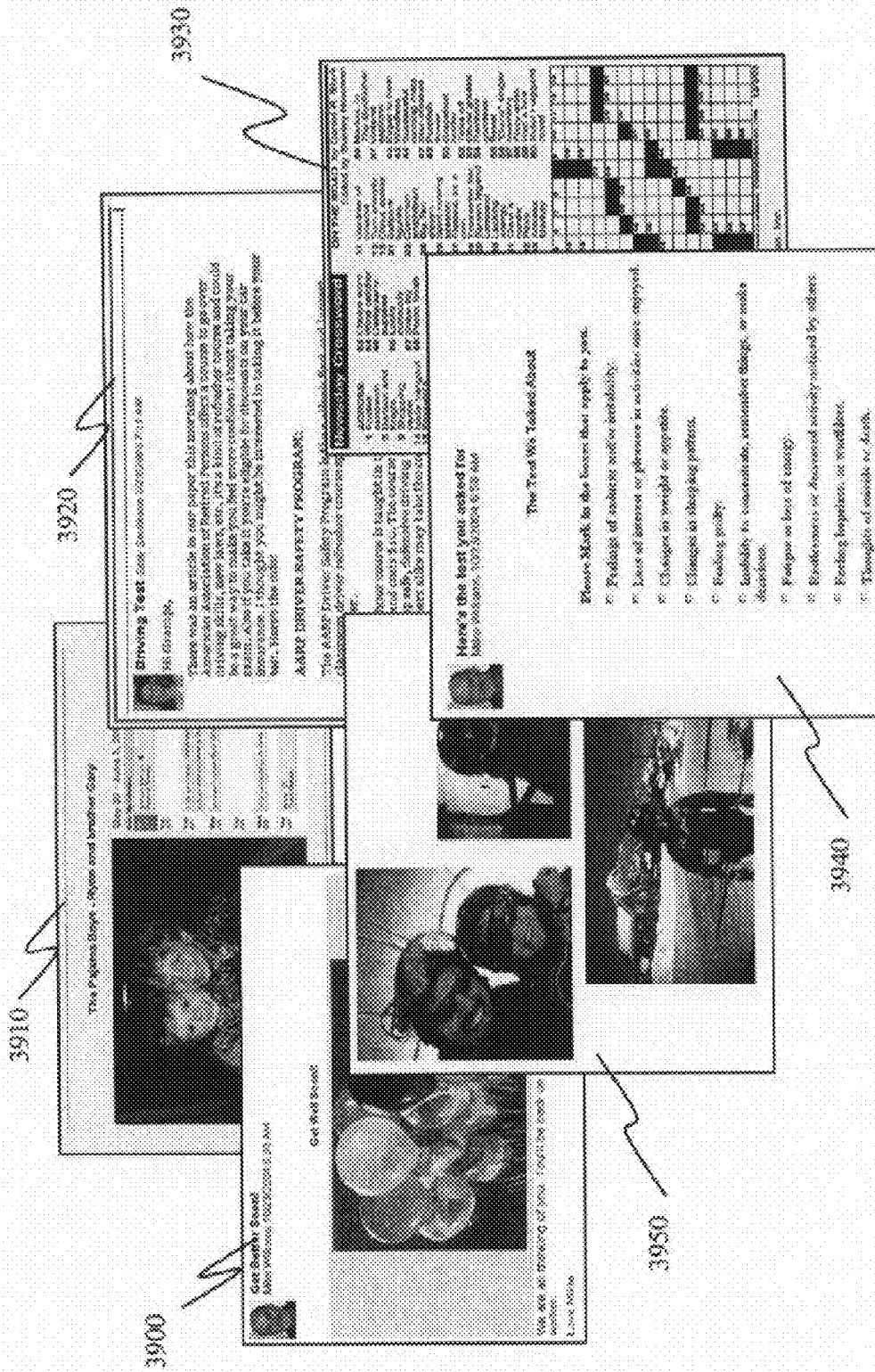
FIG. 36



3700

FIG. 37





USE OF COACHING MESSAGES IN A CLOSED COMMUNICATION SERVICE

[0001] This application is a divisional of U.S. patent application Ser. No. 10/971,916, filed Oct. 23, 2004, which claims the benefit of Provisional Application No. 60/514,172, filed Oct. 24, 2003 both of which are hereby incorporated by reference in their entirety for all purposes.

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BACKGROUND

[0003] 1. Field

[0004] Embodiments of the present invention generally relate to a closed communication service for members of caregroups and subjects that are the targets of the caregroups, and in particular to the use of member-to-member, member-to-target and automatically generated coaching messages in a closed communication service that facilitates and encourages generation and delivery of digital gifts among the members of caregroups and the associated subjects to, among other things, decrease subjects' risk of developing various physical and/or psychological conditions.

[0005] 2. Description of the Related Art

[0006] Medical research suggests increased social interaction may (i) decrease the risk of developing a physical or mental condition, disorder, disability or illness, or a chronic condition; and (ii) have a profound effect on the longevity and well-being of an elder in decline.

[0007] Faber, A., & Wasserman, S. (2001). Social support and social networks: Synthesis and review. In Levy, J., and Pescosolido, B. (eds.) *Social Networks and Health*. Advances in Medical Sociology, 8, 29-72. Stamford, Conn.: JAI Press.

[0008] "Research has shown that lack of social interaction leads to disabilities, depression, and even death for the elderly."

[0009] Glass, Thomas: Population based study of social and productive activities as predictors of survival among elderly Americans, August 1999 in the *British Medical Journal*

[0010] "Social and productive activities that involve little or no enhancement of physical fitness lower the risk of all causes of death as much as exercise does."

[0011] "Social engagement was as strong as anything we found in determining longevity. It was stronger than things like blood pressure, cholesterol, or other measures of health."

[0012] "Physical fitness is important, but social engagement is turning out to be just as critical to longevity. What I tell people is, 'Find something you really like doing that involves other people, whether it's playing cards or walking in the mall.' Social engagement adds a sense of purpose to people's lives. It also seems to add years to those lives."

[0013] "Conclusions Social and productive activities that involve little or no enhancement of fitness lower the risk of all causes of mortality as much as fitness activities

do. This suggests that in addition to increased cardiopulmonary fitness, activity may confer survival benefits through psychosocial pathways. Social and productive activities that require less physical exertion may complement exercise programmes and may constitute alternative interventions for frail elderly people."

[0014] Social Isolation and Social Loneliness by Madelyn Hall and Betty Havens (http://www.hc-sc.gc.ca/seniors-aines/naca/writings_gerontology/writ18/writ18_3_e.htm)

[0015] Social isolation and social loneliness are situations that tend to increase as people age, and as family and friend-networks become smaller. Social contacts generally decrease after retirement, and may continue to decline with the deaths of family members and friends, and changes in residence following widowhood, mobility difficulties, and ill health

[0016] Social isolation and social loneliness have consistently been found to be associated with health. Social isolation and loneliness negatively influence health; and, conversely, declining health status may also lead to increased social isolation and accompanying feelings of loneliness. Perceived loneliness has been found to be one of the strongest predictors of health status among institutionalized seniors, and numerous studies have demonstrated that health is related to the emotional well-being of people in their later years. A greater use of health care services, such as physician visits and prescription medications, have also been found to be related to higher levels of loneliness. In addition, self-rated health is related to feelings of loneliness, in that there appears to be a relationship between higher levels of loneliness and lower self-ratings of health.

[0017] On the possibility of communications providing important intellectual stimulus:

[0018] Verghese, J., Lipton, R. B., et al. (2003). Leisure Activities and the Risk of Dementia in the Elderly. *New England Journal of Medicine*. 348; 25. 2508-2516.

[0019] "... elderly persons who did crossword puzzles four days a week had a risk of dementia that was 47 percent lower than among subjects who did puzzles once a week."

[0020] Yapko, Michael D. Originally published by *Psychology Today*: May/June 97

[0021] "We've known for decades that relationships serve as buffers against illness and emotional disorders. The people who are at the greatest risk for depression are those who are most lonely."

[0022] Ellen McGrath—Originally published by *Psychology Today*: July/August 2003

[0023] "Checking in on people's well-being and not just on their activity schedule contributes to a sense of connectedness that is a major buffer against depression at every stage of life. Paying as much attention to family feelings as family activities is one of the best protections you can use to combat family depression."

[0024] NIMH Depression research:

[0025] "Depression frequently co-occurs with a variety of other physical illnesses, including heart disease, stroke, cancer, and diabetes, and also can increase the risk for subsequent physical illness, disability, and premature death."

[0026] "recent NIMH studies show that 13 to 27 percent of older adults have subclinical depressions that do not meet the diagnostic criteria for major depression or dys-

thymia but are associated with increased risk of major depression, physical disability, medical illness, and high use of health services. Subclinical depressions cause considerable suffering, and some clinicians are now beginning to recognize and treat them."

[0027] Surgeon General Report on Depression—"Psychosocial Treatment of Depression":

[0028] Most research to date on psychosocial treatment of mental disorders has concentrated on depression. These studies suggest that several forms of psychotherapy are effective for the treatment of late-life depression, including cognitive-behavioral therapy, interpersonal psychotherapy, problem-solving therapy, brief psychodynamic psychotherapy, and reminiscence therapy, an intervention developed specifically for older adults on the premise that reflection upon positive and negative past life experiences enables the individual to overcome feelings of depression and despair (Butler, 1974; Butler et al., 1991). Group and individual formats have been used successfully."

[0029] From The Effect Of Social Isolation And Loneliness On The Health Of Older Women (<http://www.pwhce.ca/EffectSocialIsolation.htm>)

[0030] "The odds of being lonely were more than double for those who lived alone versus those who lived with others, and about 1.4 times greater for those who felt their health was poor, who were widowed, or who had few social contacts. Having more than four chronic illnesses was also a significant influence, as was evidence of limited functioning. Because these factors are independent, they are additive. The result, then, is that a widow who lives alone, sees few other people and feels her health is poor would be almost six-and-a-half times more likely to be lonely than a married individual who lives with a spouse, sees many people on a regular basis, and is in good health."

[0031] "The odds of being socially isolated (having fewer contacts) were 1.7 times greater for women than men, 1.3 times greater among those who were older with poor self-rated health, and 1.1 times greater for those with more chronic illness. An accumulation of these effects would mean that a woman over age 80 and in poor health would be almost five-and-a-half times more likely to be socially isolated than men younger than age 80 and in better health."

[0032] From: John W. Rowe, M.D. and Robert L. Kahn, PhD, "Successful Aging: The MacArthur Foundation Study," Random House, 1998

[0033] "Active engagement with life is achieved by close personal relationships with family and friends, and with continued involvement in productive activities."

[0034] "As a rule, people whose connections with others—family, spouse, and members of a organization—are relatively strong tend to live longer."

[0035] From: Jon F. Nussbaum Pennsylvania State University Loretta L. Pecchioni Louisiana State University James D. Robinson University of Dayton Teresa L. Thompson University of Dayton Communication and Aging (Lea's Communication Series). LAWRENCE ERLBAUM ASSOCIATES, PUBLISHERS 2000 Mahwah, N.J. London

[0036] "people without close interpersonal ties are more than twice as likely to die than their counterparts with close interpersonal ties Not only does communication play an important role in determining people's men-

tal and physical health, but, in addition, after they become ill, their communicative relationships seem to influence how quickly they get well."

[0037] From: "Cognitive impairment, depressive symptoms, and functional decline in older people," by Kala M. Mehta, D. Sc., Kristine Yaffe, M. D., and Dr. Covinsky, in the June 2002 Journal of the American Geriatrics Society 50, pp. 1045-1050.

[0038] "... the relative risk of 2-year functional decline doubles for those with cognitive impairment and/or depressive symptoms."

[0039] From: UC Davis Health Article on Depression:

[0040] "A strong network of social support is both important for prevention and recovery from depression."

[0041] Regarding risks to caregivers: From <http://www.reutershealth.com/wellconnected/doc31.html>

[0042] "Studies show that caregivers of physically or mentally disabled family members are at risk for chronic stress."

[0043] "Spouses caring for a disabled partner are particularly vulnerable to a range of stress-related health threats including influenza, depression, heart disease, and even poorer survival rates. Caring for a spouse with even minor disabilities can induce severe stress."

[0044] "Intervention programs that are aimed at helping the caregiver approach the situation positively can be very helpful at reducing stress and helping the caregiver maintain a positive attitude."

[0045] "Wives experience significantly greater stress from caregiving than husbands, and, according to a 2000 study, tend to feel more negative about their husbands than caregiving husbands feel about their wives."

[0046] "Specific risk factors that put caregivers at higher risk for severe stress or stress-related illnesses include the following:

[0047] Having a low income.

[0048] Being African American. (African Americans tend to be in poorer physical health than Caucasians and so face greater stress as caregivers to their spouses than their Caucasian counterparts.)

[0049] Living alone with the patient.

[0050] Helping a highly dependent patient.

[0051] Having a difficult relationship with the patient."

[0052] From: Helpguide, http://www.helpguide.org/elder/alzheimers_disease_dementias_caring_caregivers.htm

[0053] "Seven out of every ten Alzheimer's patients live at home. Family and friends provide more than 75% of home care. Paid caregivers provide the remaining 25% of home care."

[0054] "Depression is more common in those giving care to patients with Alzheimer's Disease than it is in the patients themselves. 15% of all people over age 65 are depressed. 20% of those with Alzheimer's Disease are depressed. 50% of the caregivers for Alzheimer's patients are depressed."

[0055] "The elder with Alzheimer's Disease or other dementia may decline so much that they no longer seem like the same person. The caregiver is relating to a vestige of the former human being. The caregiver may get no rewards for their daily efforts, and they may feel isolated from the outer world and deeply depressed. Depression is the most common ailment of the caregiver: depression from the isolation, depression

because of the unrelenting caregiving, depression because they are unable to relieve the elder's pain and misery. The caregiver may find themselves wishing that the elder would die, not only to end the elder's miserable state of life, but also to end the caregiving."

[0056] "The range of emotional and physical problems that the caregiver may develop are:

[0057] increased stress and tension

[0058] depression, often continuing for several years after the patient has died

[0059] anxiety

[0060] anger

[0061] guilt

[0062] grief

[0063] frustration

[0064] decreased overall life satisfaction

[0065] decreased satisfaction with social networks

[0066] strained family relationships that may result from resentment and miscommunication about caring for the elder

[0067] increased health problems and greater use of healthcare services

[0068] increased use of psychotropic medications

[0069] isolation"

[0070] "In addition to increased mental and physical stress, the caregiver for an elder with Alzheimer's or other dementia may become physically abusive to the elder. This physical abuse sometimes is in response to the patient's physical aggression toward the caregiver."

[0071] "The caregiver must always guard their own mental and physical state. Two avenues of self-care are:

[0072] Take care of your own health so that you can care better for the elder with dementia.

[0073] Avoid isolation: seek support and relief."

[0074] This site also suggests the following existing support and relief mechanisms for caregivers:

[0075] "Join a formal caregiver support group. This reduces your depression and distress, and it ends up improving life for the patient.

[0076] Meet with other family caregivers, away from the elder, to support each other.

[0077] Join a computer support network.

[0078] Get professional individual counseling and support. Research has shown that this, above all, can relieve the strain of caring for the Alzheimer's patient.

[0079] Maintain a sense of humor.

[0080] Accept or ask for help from others.

[0081] Consider respite care to temporarily relieve you from your caregiving duties."

[0082] From: Family Caregiver Alliance http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=393

[0083] "Caregiving is the backbone of the American long-term care system: the value of the services provided by informal caregivers (family or friends of seriously ill loved ones) is estimated at \$257 billion annually."

[0084] Consequently, a need exists for methods and systems for managing and influencing the quantity, quality, effect and timeliness of communications to one or more target

(s) of a social support network, such as one or more elder(s) or their resident caregiver, from their social support network.

SUMMARY

[0085] Methods and systems are described for use of member-to-member, member-to-target and automatically generated coaching messages in a closed communication service. According to one embodiment, a closed communication service is provided which is configured to facilitate and encourage communications among members of a caregroup and a target of the caregroup. The target of the caregroup uses a hardcopy-based communication appliance associated with the caregroup to transmit and receive electronic communications via the closed communication service to and from the members of the caregroup. Identification, creation and delivery of appropriate member-to-member and member-to-target coaching messages are facilitated by allowing one or more administering caregivers of the members of the caregroup to view metrics relating to electronic communications exchanged via the closed communication service.

[0086] Other features of embodiments of the present invention will be apparent from the accompanying drawings and from the detailed description that follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0087] Embodiments of the present invention are illustrated by way of example, and not by way of limitation, in the figures of the accompanying drawings and in which like reference numerals refer to similar elements and in which:

[0088] FIG. 1 illustrates a typical cycle of decline that may be experienced by an elder family member.

[0089] FIG. 2A is a block diagram conceptually illustrating a high-level architectural view of a communications system in accordance with one embodiment of the present invention.

[0090] FIG. 2B is a block diagram conceptually illustrating various collections of functionality packages and their relation to the communication system platform according to one embodiment of the present invention.

[0091] FIG. 3A conceptually illustrates communication flow among a social support network.

[0092] FIG. 3B illustrates increased communication with the targeted recipient as well as among the social support network resulting from use of an embodiment of the present invention.

[0093] FIG. 4 is a block diagram conceptually illustrating a communication architecture according to one embodiment of the present invention.

[0094] FIG. 5 is an example of a computer system with which embodiments of the present invention may be utilized.

[0095] FIG. 6A illustrates a member login user interface screen according to one embodiment of the present invention.

[0096] FIG. 6B illustrates a caregroup selection user interface screen according to one embodiment of the present invention.

[0097] FIG. 7 illustrates a caregroup home page user interface screen according to one embodiment of the present invention.

[0098] FIG. 8 illustrates a member registration user interface screen according to one embodiment of the present invention used by caregroup administrators to register a new member to their caregroup.

[0099] FIG. 9 is a software architecture block diagram conceptually illustrating application-level software components

of the distribution server, web server, and internal components of the digital mailbox according to one embodiment of the present invention.

[0100] FIG. 10 is a flow diagram illustrating a method of performing content derived addressing according to one embodiment of the present invention.

[0101] FIG. 11 illustrates a sample completed routing form and resulting email message delivered to the addressee according to one embodiment of the present invention.

[0102] FIG. 12 illustrates a sample completed return-reply requested form that may be created and delivered to a digital mailbox appliance responsive to a caregroup member request according to one embodiment of the present invention.

[0103] FIG. 13 illustrates another sample completed return-reply requested form that may be created and delivered to a digital mailbox appliance responsive to a caregroup member request according to one embodiment of the present invention.

[0104] FIG. 14 illustrates another sample completed routing form that may be provided by the communication service provider to a digital mailbox appliance user and customized for the user according to one embodiment of the present invention.

[0105] FIG. 15 illustrates a sample coaching message and associated form that may be directed to a digital mailbox appliance user according to one embodiment of the present invention.

[0106] FIG. 16 illustrates a sample completed greeting card form, eCard form, originated at a digital mailbox appliance and a resulting eCard generated responsive thereto according to one embodiment of the present invention.

[0107] FIG. 17 is a flow diagram illustrating a method of performing automated dispatch according to one embodiment of the present invention.

[0108] FIG. 18 is a flow diagram illustrating a method of performing coaching and monitoring analysis according to one embodiment of the present invention.

[0109] FIG. 19 illustrates a user interface screen depicting a coaching message editor for a weekly summary according to one embodiment of the present invention.

[0110] FIG. 20 illustrates a review coaching message user interface screen according to one embodiment of the present invention.

[0111] FIG. 21 illustrates a member activity user interface screen summarizing information regarding communications by members of a particular caregroup according to one embodiment of the present invention.

[0112] FIG. 22 illustrates a drill down member activity user interface screen listing communications by a specific member of a caregroup according to one embodiment of the present invention.

[0113] FIG. 23 illustrates an exemplary chart or dashboard monitor for effects of communications delivered to a particular elder that may be displayed within a user interface screen according to one embodiment of the present invention.

[0114] FIG. 24 illustrates an exemplary chart or dashboard monitor of communications delivered to a particular elder by caregroup member that may be displayed within a user interface screen according to one embodiment of the present invention.

[0115] FIG. 25 illustrates an exemplary chart or dashboard monitor of digital gifts by category delivered to a particular elder that may be displayed within a user interface screen according to one embodiment of the present invention.

[0116] FIG. 26 is a flow diagram illustrating a method of performing good guessing according to one embodiment of the present invention.

[0117] FIG. 27 illustrates a member personal information user interface screen according to one embodiment of the present invention.

[0118] FIG. 28 illustrates an elder's schedule user interface screen according to one embodiment of the present invention.

[0119] FIG. 29 illustrates an example of a user interface screen depicting a photo essay type digital gift according to one embodiment of the present invention.

[0120] FIG. 30 illustrates a user interface screen depicting an initial (blank) photo essay (or photo journal) type of digital gift with embedded edit stimulus markers according to one embodiment of the present invention.

[0121] FIG. 31 illustrates a user interface screen depicting a personalizable ready made eCard type of digital gift resulting from good guessing according to one embodiment of the present invention.

[0122] FIG. 32 illustrates various user interface screen shots, selection from a collection of digital gifts and good guessing defaults according to one embodiment of the present invention.

[0123] FIG. 33 is a flow diagram illustrating a method of interacting with pop-up forms according to one embodiment of the present invention.

[0124] FIG. 34 illustrates customization and re-rendering of a pop-up in the context of a note editor according to one embodiment of the present invention.

[0125] FIG. 35 illustrates examples of various pop-ups according to one embodiment of the present invention.

[0126] FIG. 36 illustrates examples of various digital gifts according to one embodiment of the present invention.

[0127] FIG. 37 is a graph illustrating a sample plot of an elder's response rate over time.

[0128] FIG. 38 illustrates a specific example of a Halloween card 3800 sent during a field test implemented by the assignee of the present invention.

[0129] FIG. 39 illustrates examples of various samples of coaching or therapeutic digital gifts according to one embodiment of the present invention in the form of a collage.

DETAILED DESCRIPTION

[0130] Methods and systems are described for improving the well-being or reducing stress of a primary caregiver of an elder subject. According to one embodiment, a digital mailbox system facilitates receipt and transmission of electronic communications without requiring the end user to have a personal computer. The digital mailbox system includes a novel architecture through which the various interacting parties may use an electronic communication access system that suits their particular needs and technological comfort level thereby adding grace back to the lives of both the elder and their social support network. The novel architecture may provide various tools and applications to promote communications among members of a social support network. For example, according to one embodiment, collaborative and/or individual publishing tools are provided via a website interface to enable collaborative and/or individual development of a daily delivery of a digital publication, such as a newsletter-like publication or the like, for communication to elders by friends, caregivers, family and volunteers. In one embodiment, members of a social support network may select and/or customize content for inclusion in the digital publication

from various predefined data streams (e.g., jokes, business news, global news, local news, health and wellness news, sports news, puzzles, cartoons, weather, etc.) based upon interests, hobbies and/or cognitive needs (e.g., intellectual stimulation) of the intended recipient. For example, the kinds of material typical of newspaper syndicated features can be provided, such as horoscope, literary quote of the day, “on this day in history”, “health tip of the day”, and the like, selected by the members of the elder’s social support network to be appropriate to the elder’s interests. In one embodiment, members of a social support network may create or harvest existing family content, such as digitized photos, daily deliveries, digitized art created by children (a/k/a “kid art”), and use it to create various compositions to share among one another and/or the digital mailbox appliance user. In one embodiment, ex-officio members, such as physicians or other professional caregivers, may monitor an elder’s health status and send/receive confidential communication with the family, the elder or the caregiver, through the digital mailbox appliance.

[0131] Meanwhile, an elder may make use of a dedicated hardcopy device for sending and receiving electronic communications without the need for a computer, keyboard or mouse. In this manner, the novel architecture acts as a communications transformer by receiving electronic communications in one form from the originator of the communication and outputting the electronic communication in a form suitable for access by an intended recipient thereby facilitating communication to and from those disinclined or unable to use computers, the internet, and/or home networks.

[0132] In the following description, numerous specific details are set forth in order to provide a thorough understanding of embodiments of the present invention. It will be apparent, however, to one skilled in the art that embodiments of the present invention may be practiced without some of these specific details. In other instances, well-known structures and devices are shown in block diagram form.

[0133] Embodiments of the present invention include various steps, which will be described below. The steps may be performed by hardware components or may be embodied in machine-executable instructions, which may be used to cause a general-purpose or special-purpose processor programmed with the instructions to perform the steps. Alternatively, the steps may be performed by a combination of hardware, software, customer service personnel associated with a communication service provider, caregroup members serving in a customer service role and/or firmware.

[0134] Embodiments of the present invention may be provided as a computer program product, which may include a machine-readable medium having stored thereon instructions, which may be used to program a computer (or other electronic devices) to perform a process. The machine-readable medium may include, but is not limited to, floppy diskettes, optical disks, compact disc read-only memories (CD-ROMs), and magneto-optical disks, ROMs, random access memories (RAMs), erasable programmable read-only memories (EPROMs), electrically erasable programmable read-only memories (EEPROMs), magnetic or optical cards, flash memory, or other type of media/machine-readable medium suitable for storing electronic instructions. Moreover, embodiments of the present invention may also be downloaded as a computer program product, wherein the program may be transferred from a remote computer to a requesting computer by way of data signals embodied in a

carrier wave or other propagation medium via a communication link (e.g., a modem or network connection).

[0135] While according to one embodiment, a digital mailbox system is described as a communication mechanism among families and elders, other embodiments of the digital mailbox system are equally applicable to facilitating electronic communications to and from other groups of individuals, such as developmentally disabled adults. Furthermore, the communications may include unrelated individuals within a common social support network.

[0136] While, for convenience, embodiments of the present invention are described with reference to an Application Service Provider (ASP) model, embodiments of the present invention are equally applicable to various other operational models. For example, the systems and methods described herein may be deployed in accordance with a model in which the application is hosted internally by a organization and made accessible to various distributed locations of the organization.

[0137] Terminology

[0138] Brief definitions of terms used throughout this application are given below.

[0139] The phrase “administrating caregiver” generally refers to a member of a caregroup that has certain administrative privileges within the communication system platform. In one embodiment, administrating caregivers have access and permissions to operate a communications service dashboard. Administrating caregivers may have the ability to add or remove members to the caregroup, update family data, manage member viewing, editing and notification permissions, originate coaching prompts, configure many of the VPN and digital mailbox appliance behaviors like time of elder’s daily delivery, default printing font, etc. Caregroups may have one or more administrating caregivers.

[0140] The term “caregroup” and the phrases “social support network” and “family support network” generally refer to a collection of individuals, including family, friends, caregivers, volunteers and/or service providers, who are registered members of a VPN associated with a user of communication appliance, such as a digital mailbox appliance. An individual may be a member of multiple caregroups. Members may have different viewing, editing and notification permissions independently associated with each caregroup in which they participate. For example, administrative caregiver permissions described above are one such set of permissions.

[0141] The term “carousel” generally refers to a software implemented content buffering mechanism that may receive and store content at one rate and output the stored content at another rate. In one embodiment, one or more carousels are provided by a communication service provider that allow members of a family support network to collect material, such as family photos, items of information, articles, personalized messages, jokes, etc., that will be incorporated over time in a periodic digital publication delivered to an elder. In this manner, a family member can automatically direct selected data feed content to a carousel or manually place original and/or personalized content into a carousel, whenever he or she has time to do so. Then, content from the carousel may be included in various periodic digital publications intended for the elder, such as a daily delivery, when space permits and as needed to provide content in such periodic digital publications. The buffering provided by use of one or more carousels, e.g., photo carousels or personalized content carousels, may be used to smooth the resulting communication over varia-

tions in how much time the members of the family support network have to devote to communication or contribution of content or photos. Like photos, items of information from data feeds may also be collected in carousels for use over time. A predetermined or customizable delay may be established before buffered carousel content can be used in the periodic digital publication. This allows members of the family support network to examine, filter, edit, personalize and/or delete unwanted items before they are delivered to the elder. A brief, personal note on a cartoon or joke can add to its affective impact by pointing out a special meaning of the item for the elder or the family.

[0142] The phrase “coaching message” generally refers to a message intended to directly or indirectly encourage activity. According to one embodiment coaching messages are messages originated internal to a caregroup VPN either from the communication service provider or a caregroup member or the user of a communication appliance associated with the caregroup VPN that encourages or “prompts” the generation of a new message within the caregroup. For example, a coaching message may directly or indirectly encourage communication with the user(s) of a digital mailbox appliance or encourage the use of new or under used content types available within the communication system platform. Coaching messages may be originated by staff members and/or administrators of the communication service provider, administrating caregivers, or even the user (e.g., an elder) of a digital mailbox appliance. According to one embodiment, various coaching editors are provided within the communication system platform to assist administrating caregiver(s) with the task of creating and sending coaching messages. According to another embodiment, an ex officio professional healthcare provider may send private coaching messages to a patient, or to the administrative caregiver(s).

[0143] In one embodiment, the communication system provider may detect a behavior (or an individual user or a family) and generate a coaching message to one or more family members in response to what is detected. For example, a coaching message may simply encourage a family member to check in by logging onto the family VPN. Certain automatically generated coaching messages may also encourage use of new or under used content types, boost personalization or even add to the member’s personal data to enhance the overall experience. Other types of coaching messages may supply intellectual stimulation to the elder, recognize family “days of note,” encourage an increase in the affective content of correspondence directed to the elder, encourage wider group participation, require specific responses from the elder, and the like.

[0144] The terms “connected” or “coupled” and related terms are used in an operational sense and are not necessarily limited to a direct connection or coupling.

[0145] The phrase “content derived addressing” generally refers to a process that permits a user of a communication appliance, such as a hardcopy-based communication appliance or a hardcopy-based email appliance, to send a message to one or more caregroup members without having to specify an email address, phone number or the like. Rather, the message itself contains sufficient information to allow a communication service provider to determine the intended addressee(s). According to one embodiment, with a single press of a button on a hardcopy-based communication appliance an elder may have a message delivered electronically to any caregroup member as part of an email message.

[0146] The phrase “digital gift” generally refers to an electronically delivered communication sent by a participant in a social support network or by the individual(s) that are the focus of the social support network. Examples of digital gifts include collages of digital photos, simple text messages, email messages, photo essays, eCards, ready made communications, FamilyWeather, customized/customizable Health and Wellness tips, Kid Art and personalized ready made communications. According to one embodiment, certain ready made digital gifts for delivery to (or from) an elder can be personalized within a few seconds to a few minutes and electronically delivered message (to or from an elder). Digital gifts may be responses to queries, created in digital gift editors, parsed out of standard email formats, or derived from paper forms supplied to the user of a hardcopy communication appliance. Digital gifts often have attractive and emotive decoration and layout. Digital gifts may also contain customized health and wellness status indicators (including, but not limited to mood, sleep, eating, measurements of body fluids or status). According to one embodiment, the printed form of digital gifts that are deliverable to a digital mailbox appliance may be adapted for an elder’s personal requirements (e.g., large fonts, high contrast presentation, even adaptation for color blindness).

[0147] The phrase “digital mailbox appliance” generally refers to a communication appliance or component configured to be associated with a caregroup VPN through a closed communication service. In one embodiment, a digital mailbox appliance is a hardcopy-based communication appliance that (i) accepts hardcopy input, e.g., paper-based messages, and creates a digital representation of the hardcopy input for electronic delivery, e.g., email delivery of such digital representation or digital gifts based on such digital representation, to one or more members of the caregroup associated with the digital mailbox appliance; and (ii) creates hardcopy output, e.g., paper-based messages, responsive to electronic delivery of communications from caregroup members that are directed to the user of the digital mailbox appliance. According to one embodiment, digital mailbox appliances are remotely maintained by a communication service provider responsive to calls to the communication service provider initiated by the digital mailbox appliances. Depending upon the particular embodiment, a digital mailbox appliance is both simpler than a multifunction printer (MFP) and more functional than an MFP. According to one embodiment, a digital mailbox appliance is simpler than an MFP in that it excludes many MFP features, such as a copier, a universal serial bus (USB) connection to and operation with a PC (or network of PC’s), local control of quality (print and scan). According to one embodiment, a digital mailbox appliance is more functional than a MFP in that it connects to and depends on a closed communication service, in that it schedules daily printing, in that it connects to the closed communication service at a time of its choosing (modem management based on local configuration). It is envisioned that a digital mailbox appliance may be embedded within other consumer devices, such as printers, fax machines, or the like. Also, in embodiments in which hardcopy output is not desired or needed, the digital mailbox appliance may comprise or be part of a cell phone, a personal digital assistant (PDA), or other current or future handheld wireless devices.

[0148] The term “eCard” generally refers to an generally refers to an electronically delivered communication in the form of a card, such as a greeting card.

[0149] The term “elder” generally refers to an aging family member, such as a parent or grand parent. Typically, the elder is the user of a digital mailbox appliance and a center of focus of a social support network, such as a caregroup, and a target recipient of communication services. An elder might also be an isolated or disabled family member.

[0150] The phrase “ex-officio member” generally refers to a member of a caregroup that has been granted access because of some commercial or support group relationship to the caregroup. Without limitation, examples include the entity or organization that provides the communication service, church groups (e.g., the elder’s shut-in committee of their church), an “attending” home care agency, supporting personnel in an assisted living situation, physician, nurse, physician’s assistant, insurance provider . . . etc. Ex-officio members typically have access to specialized customer support tools (though a communication service provider customer services website). The tools available and access to information within them may be configured for each caregroup-ex-officio role.

[0151] The phrase “helper member” generally refers to a volunteer or commercial caregiver with member status within a caregroup permitted by the administering caregiver. Examples of helper members include members of a church group, employees of a home care agency, a geriatric consultant, or members of a specialized supporting group (e.g., for Alzheimer’s care).

[0152] The phrases “in one embodiment,” “according to one embodiment,” and the like generally mean the particular feature, structure, or characteristic following the phrase is included in at least one embodiment of the present invention, and may be included in more than one embodiment of the present invention. Importantly, such phrases do not necessarily refer to the same embodiment.

[0153] If the specification states a component or feature “may,” “can,” “could,” or “might” be included or have a characteristic, that particular component or feature is not required to be included or have the characteristic.

[0154] The phrase “photo essay” generally refers to a story accompanied by one or more photos. Photo essays are typically about an event or adventure and typically include a paragraph or two about each photo and may include several pages of annotated photos. Examples of photo essays include, without limitation, a story about a trip to Belize by the great granddaughter, stories about diving trips, a photo home tour of a recently purchased condo, pet essays, a retirement party, a classroom party, a Tahiti cruise in planning, participation in a major running race, several local parades, kids climbing a rock wall, and fishing trips. According to one embodiment of the present invention, a photo essay digital gift editor is provided that makes it easy to format and create this kind of content.

[0155] The phrase “presentation components” generally refer to editable elements of a digital gift in a digital gift editor.

[0156] The term “project” generally refers to multi-day and/or multi-person communication activities, such as the joint creation of an archive of family recipes, an annotated collection of old family photos, a turn taking game (e.g. scrabble, chess, checkers, . . .) etc.

[0157] The term “responsive” includes completely or partially responsive.

[0158] The term “scan,” when used as a noun, generally refers to a digital representation of a page of correspondence originated at a digital mailbox appliance.

[0159] Overview

[0160] Social isolation and loneliness are problems for many elders, and such conditions are strongly associated with health problems and reduced feelings of well-being. To address this problem, the methods and systems described herein seek to promote what Liechti and Ichikawa (1999) call affective awareness: “a general sense of being in touch with one’s family and friends.” According to various embodiments of the present invention, communications from a social support network to the individual(s) that are the focus of the social support network are designed to carry not only an informational message but also, more importantly, a message of engagement and caring.

[0161] Studies of family communication have shown that the actual content or information exchanged during or in a communication is not the most important aspect of a communication. Rather, it is the expression of interest in the relationship that is of importance as a result of the initiation of a call or sending of a card or email message. Patrick and Metcalf {Patrick, E. and Metcalf, C. (nd) Mediated communication between extended family and friends: A case study. Motorola Labs User Research Report at <http://internet2.motlabs.com/user/vmc-study/>.} have indicated, “The most striking implication . . . is that communication for shared experience, so important in maintaining distance relationships, is not adequately supported by the communication media available today.” Embodiments of the present invention also attempt to address this need.

[0162] Meanwhile, not only elders but also family caregivers need support that increased and better communication can provide. Biegel and Schultz (1999), in their introduction to a special issue of Family Relations devoted to family caregivers, note both the prevalence of family caregiving and the burdens it creates. These can include lack of support and assistance from other family members. Picot and Lowell (2001) estimate that there are more than 25 million family caregivers in the United States, and that many feel a significant burden. In the extreme, family caregivers can suffer caregiver burnout (Lee et al. 2001). The Family Caregiver Alliance estimates that “the value of the services provided by informal caregivers (family or friends of seriously ill loved ones) is estimated at \$257 billion annually.” And, the Center for Health Aging has found that “Depression is more common in those giving care to patients with Alzheimer’s Disease than it is in the patients themselves. 15% of all people over age 65 are depressed. 20% of those with Alzheimer’s Disease are depressed. 50% of the caregivers for Alzheimer’s patients are depressed.”

[0163] Embodiments of the present invention seek to manage and influence the quantity, quality, effect and timeliness of communications to a target of a social support network, such as an elder, from their social support network to create a large and consistent communications channel to disrupt and/or break the cycle of isolation that leads to decline and death. Use of the communications systems and methods described herein are thought to greatly improve communications among isolated elders and their social support networks (primarily their families) and such improved communications are expected to provide a palliative effect. Embodiments of the present invention seek to manage and influence the quantity, quality, effect and timeliness of communications to a target of

a social support network, such as an elder's primary caregiver (s), from their social support network to create a large and consistent communications channel to disrupt and/or break the cycle depression that often leads to health problems and a decline in the level of care for the elder. Use of the communications systems and methods described herein are thought to greatly improve communications among primary caregivers and their social support networks (primarily their extended families) and such improved communications are expected to provide a supportive and healthy effect.

[0164] Embodiments of the present invention provide methods and systems for creating a virtual private network (VPN) connecting non-computer users with their social support networks who do use computers, camera phones, and/or email appliances. In one embodiment, coaching techniques are employed to influence the quantity, quality, effectiveness and timeliness of electronic communications to and from individuals frequently isolated from family and friends.

[0165] Information technology methods and systems are described herein that seek to empower participants in a social support network by simplifying the task of creating and initiating communications. In the context of various embodiments described herein the methods and systems seek to allow family members to provide more effective support to an elder living independently. For example, various communications tools make it easier for family caregivers to provide stimulating and useful information to the elder, helping to sustain health, activity and engagement.

[0166] Embodiments of the present invention operate as a communication transformer making it possible for family members to communicate with elders using the Internet, without requiring the elders to operate or maintain a computer. It is contemplated that the methods and systems described herein will make it easier for family caregivers to share information and ideas among themselves, and increase the general level of communication within the family generally as well as to and from the elder.

[0167] In one embodiment, a proprietary device or set of devices referred to as a "digital mailbox" allows electronic communication with elders. The digital mailbox provides a much simpler user interface for the elder than email or other existing computer applications. The digital mailbox may incorporate features of a fax machine, a photo printer, and a scanner, backed by servers operated by a communication service provider. A member of a social support network is able to generate email or create a digital gift or contribute to a periodic publication which is delivered to the elder as a high-quality hardcopy with no intervention required by the elder via the communication service provider. According to one embodiment, the elder can send correspondence to a member of his/her social support network from his/her digital mailbox by simply placing it on a flat scanner bed and pressing a single button. No typing or dialing is required. As described further below with respect to content derived addressing, addressing the correspondence may accomplished by checking off address information on a routing form provided by the communication service provider and customized for the elder. In another case described below the addressing the correspondence is automatic because the form being used is an explicit reply to a prior communication. Thus, elders can receive and send electronic messages, including images, with no use of a computer and with an extremely simple interface.

[0168] According to one embodiment of the present invention, a communication system in which the digital mailbox operates provides an online interface, such as a password protected portion of a web portal, into which participants in a social support group may login. The communication system may include various automated communication tools that allow family members or others in an elder's social support network to send engaging, interesting and useful information to the elder. In view of empirical evidence suggesting elders specifically value predictable communication, versus just getting emails every now and then, embodiments of the present invention facilitate the delivery of information to the elder on a predictable schedule, even when the schedules of the participants in the social support network do not permit such regular communications. The communication system may also provide tools that help family members support one another in their various caregiver roles.

[0169] According to one embodiment of the present invention, the digital mailbox appliance provides an unattended printing feature. This unattended printing aspect of the digital mailbox appliance has significant impact. In one embodiment, to receive messages and digital gifts the elder does not have to turn anything on, to login, to use a keyboard, or mouse, or even a TV-like remote control. Gifts and messages simply appear at a regular time of day much as does the mail delivered by the US Post Office.

[0170] The communication system may also gather information about the communications exchanged within participating social support networks to allow assessment of the impact of the communications on elders and/or caregivers. Impact metrics may then be viewed and analyzed in graphical form by a social support network administrator, such as a family representative or other administrating caregiver. Exemplary impact metrics may include simple counts, assessed value or other measures of effects, communications and gift categories by member, by type, and/or during a specified time period. Effect monitoring may include calculating an assessed value of affective communications, communications that induce intellectual stimulus and/or communications that induce activity. Communication monitoring may include a simple count of digital gifts originated by participants in a social support network and/or the individual(s) that are the focus of the social support network. Digital gift monitoring and analysis may include categorization of digital gifts and tracking of the number of digital gifts in the categories (e.g., collages, simple text messages, email messages, photo essays, ready made communications, and personalized ready made communications).

[0171] FIG. 1 illustrates a typical cycle of decline that may be experienced by an elder family member. Isolation may begin in any of a number of ways, e.g., death of a spouse, kids moving away, restrictions to mobility. Isolation usually leads to a sense of loneliness. Loneliness often causes or amplifies depression (clinical or sub-clinical). Depression is strongly linked with both physical and mental decline. Physical and/or mental decline may lead to further loss of mobility and/or less frequent interactions with others. This in turn increases isolation and the downward spiral continues. Family communications can interrupt the isolation slowing and even reversing the decline.

[0172] FIG. 2A is a block diagram conceptually illustrating a high-level architectural view of a communications system 200 in accordance with one embodiment of the present invention. In the embodiment depicted, the communications sys-

tem includes a communication service provider **215**, services **225**, digital mailbox appliances **240** and **241** used by elders **235** and **236**, respectively and family, friends, and volunteers **230** communicatively coupled through a network **210**.

[0173] According to one embodiment, the network **140** is a public communications network, such as the Internet; however, it is contemplated that smaller scale communication systems may be implemented within a private communications network, such as a local area network (LAN) (e.g., an Ethernet LAN or a token ring LAN), an Intranet, an Extranet, a wide area network (WAN) comprising multiple inter-linked LANs and/or leased lines or any other communication structure designed to carry data between a plurality of computers associated with a particular enterprise or organization.

[0174] While for simplicity, in this example, only two elders **235** and **236** are discussed as being subscribers of communication service provider **215**, it is to be understood that the communications service provider **215** may scale to serve any number of elders and associated caregroup members. Additionally, as mentioned above, while various embodiments of the present invention are described in the context of the communication service provider **215** serving as a communications transformer between elders and their family and friends, the concepts described herein are broadly applicable to other social support networks caring for or looking after one or more individuals that are cognitively or physically unable to use a computer system or simply disinclined to use a computer system to send and receive email.

[0175] Furthermore, for sake of illustration, embodiments of the present invention are described in the context of a configuration of a communication system in which there is a one-to-one-to-one relationship between digital mailbox appliances, elders, and caregroups and messages are exchanged among the elder associated with a particular digital mailbox appliance and the corresponding caregroup members. However, it is contemplated that multiple individuals, such as an elder dyad (say man and wife), could share a digital mailbox appliance and caregroup. Additionally, digital mailbox appliance to digital mailbox appliance messages may be sent in scenarios in which an elder using one digital mailbox appliance is a member of the caregroup of another elder using another digital mailbox appliance.

[0176] In one embodiment, elders **235** and **236** are able to participate in exchanges of messages with their families and friends via digital mailbox appliances **240** and **241** using familiar paper-based communications. The digital mailbox appliances **240** and **241** preferably reside in the elders' residence and connect to the communication service provider **215** via a residential phone line. According to one embodiment the digital mailbox appliances **240** and **241** comprise multi-function photo quality printers (e.g., color or grayscale, inkjet or laser) with flatbed scanners and modems and are operated by local software configured and managed remotely by the communication service provider **215**. To accommodate single phone line residences, the digital mailbox appliances **240** and **241** may be specifically designed to effectively share a single phone line with the elders' normal phone usage. In alternative embodiments, the digital mailbox appliances **240** and **241** may be configured to interface with the communication service provider through digital subscriber line (DSL) service, cable modem, integrated services digital network (ISDN) service, or other broadband or narrow band service. In alternative embodiments, the digital mailbox appliances **240** and **241** may include one or more other forms

of output devices in addition to or instead of a printer, such as a video monitor or a text-to-speech conversion apparatus.

[0177] In the present example, elders **235** and **236** represent individuals participating in and having access to a communication service provided by the communication service provider **215**. While the participants or users of the digital mailbox appliances, e.g., elders **235** and **236**, are the focus of the communication service, typically, the subscriber to the communication service (i.e., the payer) is one or more members of a participant's caregroup.

[0178] The communication service may include communications transformation and management services to facilitate electronic communications among the participants and their social support networks. For example, as described in further detail below, members of the elders' social support networks may access and use tools and templates for formatting and creating various types of digital gifts and for creating collaborative publications for the elders **235** and **236**.

[0179] According to the present example, the communication service provider **215** comprises automated components **220** and a central database **217**. Automated components **220** may include multiple websites supporting family members, customer service operations for the communication service provider **215**, research team service tools, coaching and communications management systems and tools, mailbox configuration management systems, publication and delivery systems, email services customized to caregroup management and digital mailbox appliance publication services, etc. The central database **217** is a central repository for all systems programs and manages data on caregroups, elders, individual members, family photos, digital gifts and their component parts, specific delivery information for each communication, digital mailbox log histories, configuration information, etc. Further details regarding the hardware and software infrastructure of an exemplary communication service provider are provided below.

[0180] Services **225** may represent pre-screened service providers selected to meet various needs of the subscriber base (e.g., digital mailbox appliance users) of the communication service provider **215**.

[0181] In one embodiment, a unique identifier is assigned to each digital mailbox appliance that is permanently stored in a non-volatile memory of the digital mailbox appliance. This digital mailbox appliance identifier may be used for initial connection and registration of the end user, e.g., elder, into their supporting VPN. The digital mailbox appliance identifier may also be used to validate the digital mailbox appliance each time it attempts to connect to the communication service provider **215**. Further, the identifier permits the elder to move their digital mailbox appliance to a new location (e.g., a convalescent home, a relative's home, etc.) and maintain seamless service. The digital mailbox appliance identifier may also be used by the communication service provider **215** to facilitate interpretation of problem reports, logged events, etc.

[0182] FIG. 2B is a block diagram conceptually illustrating various collections of functionality packages **240-243** and their relation to the communication system platform **250** according to one embodiment of the present invention. In the example depicted, the communication system platform **250** includes a unified relational database **251**, the digital mailbox appliances associated with particular elder(s) and corre-

sponding caregroup, a publication and distribution server, customer service personnel, and basic web and email services.

[0183] In the present example, for purposes of explanation, the digital mailbox service is described as a number of functionality packages **240-243**. Each functionality package **240-243** interacts with the unified relational database **251** of the communication service platform. These functionality packages **240-243** provide services variously to family members, elders, communication service provider personnel and ex-officio caregroup members. The services provided typically have some automated components, some specialized website elements for family members and/or customer support personnel of the communication service provider, as well as some specialized elements of the unified relational database **251**. Some software and system components are common to more than one functionality package. For example, digital mailbox logging may be used by several of the functionality packages in slightly different ways. Similarly, an email parsing component may be utilized by multiple functionality packages.

[0184] According to one embodiment, a family website functionality package **240** is unique for each caregroup and thereby supports individual family VPNs into which members login. Because the digital mailbox appliances are associated with and embedded in a family VPN, the communication service provider is able to prevent SPAM and viruses from invading the elder's environment. While, due to the appliance environment, elders are largely immune to viruses, the communication service provider may whitelist (e.g., expressly define) all potential senders for the elder and automatically filter all deliveries for viruses. According to one embodiment, whitelist-based filtering involves creating a list of addresses of people that are authorized to send communications to the user of the digital mailbox appliance and caregroup members and filtering communications that are not on the authorized list. Meanwhile, because all web pages delivered to the elder go through custom rendering engines and because the digital mailbox appliance is not a standard PC using a standard operating system, worms are prevented from accessing the elder's side of the communication system.

[0185] The primary purpose of the family website service is to facilitate communication between family members and the target elder(s). The family website functionality package **240** interacts with a distribution server (not shown) of the communication system platform to deliver family communications to the elder's digital mailbox appliance. The family website functionality package **240** also facilitates the creation of communications by providing various digital gift editors that simplify the task of customization and personalization, suggesting ready made digital gifts, and allowing members to view what other members have sent to the elder.

[0186] A return loop functionality package **241** manages traffic sent from the digital mailbox appliances. Missives received from a digital mailbox appliance are typically originated by the elder. However, it is contemplated that various support and service personnel working in the elder's environment may occasionally send communications via the elder's digital mailbox appliance. According to one embodiment, the return loop functionality package **241** includes dispatcher workbench websites for both family dispatcher volunteers and customer service personnel of the communication service

provider. Further discussion of manual and automated dispatching of traffic sent from digital mailbox appliances is provided below.

[0187] A dashboard and coaching functionality package **242** performs communications assessment, monitoring, and provides the coaching environment used to influence and manage electronic family communications to and from the elder through the communication system platform **250**. The dashboard and coaching functionality package **242** may include various monitoring charts, tables, and instruments described further below. The dashboard and coaching functionality package **242** may also provide a collection of coaching editors to help administrating caregiver(s) in creating and sending coaching messages (also called "prompts") to other caregroup members and/or the target elder(s).

[0188] A customer service functionality package **243** serves as an access point for customer support personnel of the communication service provider. The customer service functionality package **243** may also provide a range of traditional services to the communication service platform **250**, other services, or other of the functionality packages **240-242**. For example, in one embodiment, one or more of online (or phone) purchase and registration, testing, responding to bugs, recovering data, identifying the frequency of problems, and repairing communications flow problems may be supported via the customer service functionality package **243**.

[0189] Additional custom interfaces (not shown) for services can also be provided to restricted sets of the database permitting ex-officio membership (as granted by the family) to home care agencies, geriatric consultants, assisted living personnel, support groups, etc.

[0190] One or more research service interface functionality packages (not shown) may also be provided. Such specialized service interfaces may be used to support specific scientific research projects funded by the government or foundations. The various different research service interface functionality packages may create specialized links into the VPNs associated with families supporting elders in various circumstances (e.g. Alzheimer's dyads, elder alone, assisted living, etc.). The interfaces may limit access in accordance with the corresponding research plan. For example, some interfaces may allow access to detailed data on a subset of the caregroups represented within the communication service provider's subscriber base while limiting access to statistical data regarding other caregroups.

[0191] A digital mailbox operation and management functionality package (not shown) may serve as a network operations center (NOC) for the communication service provider's collection of VPNs. According to one embodiment, the digital mailbox operation and management functionality package may include web-based tools for the communication service provider's customer service personnel and various software programs to remotely monitor and/or manage the digital mailbox appliances' (ink levels, logging, mailbox behavior configuration, software updates, heartbeat, error and error recovery . . . etc.). The digital mailbox operation and management functionality package also includes software components that support final stage publication and delivery of family digital gifts and missives originated by the elder.

[0192] FIG. 3A and FIG. 3B illustrate before and after communication flows, respectively, among a social support network based on the findings of various pilot studies. While communications are complex and varied (there is no single channel, there is no simple uniform effect on participants),

increases in communication between the elder and family members, as shown by heavier arrows, and also increased or newly-established communication among other family members have been observed. Notably, communications increases to and from the elder through the communication service provider as well as outside the service (e.g., phone). Communication also increases among members of the social support network (again within the service provided by the communication service provider as well as outside). Within the context of family communications sending a communication often provokes one or more responses, which in turn create more responses establishing complex dialogs binding families into a shared experience.

[0193] FIG. 4 is a block diagram conceptually illustrating a communication architecture of a communication system platform 400 according to one embodiment of the present invention. This highly simplified description of major conceptual blocks is intended primarily to illustrate the major flows of information from the caregroup members, e.g., family and friends 420, using various appliances to the elder 401 (through the elder's digital mailbox appliance 410) with the communication service provider and other service personal participating as necessary.

[0194] In this simplified illustration, the communication system platform 400 provides interfaces for the elder 401 via digital mailbox appliance 410, family and friends 420 of the elder 401, and communication service provider services 440. In this example, the communication service provider may provide various services, such as monitoring, tracking, and analysis of family communications, to support the administering caregiver in his/her coaching role.

[0195] Given the personal and potentially sensitive nature of communications that are contemplated to be exchanged through the communication system platform 400, participants should expect any entity serving in the capacity of a communication service provider to implement and enforce strict privacy policies. This is particularly important in the context of communications between healthcare professionals and the elder, the primary resident caregiver or the administrative caregiver in view of various national and state standards to protect the privacy of personal health information, such as the Health Insurance Portability and Accountability Act (HIPAA).

[0196] In one embodiment the closed nature of the communication service seeks to protect families and their elders from the familiar risks of Internet communication including spam, viruses, spyware, unsolicited commercial offers, and more. While the communication service provider may collect personal information during the course of use by members of caregroups and the targets of the caregroups with the goal of establishing and maintaining caregroup VPNs, this information may be used to protect and empower the participants in various ways, including limiting access to caregroup VPNs, allowing families to share the caregiving load, and prohibiting advertising and/or solicitation by external commercial entities. In one embodiment, admission to caregroups may be limited to family, friends, and other approved caregivers and/or service providers designated by the elder and the family. Furthermore, privileges within the caregroup may be defined by the elder and/or an administering caregiver. In one embodiment, an ex-officio healthcare provider may collect information on a participant patient's health and send private digital gifts to such patient. By way of the closed communication service enabling wide, but exclusive, membership in

an elder's caregroup and by aggregating information about the types and frequency of communication within these groups, families are empowered to share the caregiving load and are able to work together in new and more efficient, effective ways to support their elders.

[0197] According to the present example, the communication system platform 400 provides a communications transformer that emphasizes familiar paper output for elders and leverages the increasing use of computer technology by their families and friends. In this manner, a solution is provided to address the disparate technologies used for communication and styles of communication among various members of a family support network. Each member of the family support network may use a system adapted to their individual lifestyles. As will be described further below, the communication system platform 400 exploits the power of collaboration and community to share the load of creating personalized communications for aging loved ones.

[0198] The communication system platform 400 includes a web server 420, a distribution server 430, and a central service database 450. Participating family members may send emails, digital gifts, or camera phone messages to the elder 401 through traditional email and/or the web server 420, which hosts the family VPN websites. Communications, such as email, Multimedia Messaging Service (MMS) messages from camera phones, and digital gifts are stored in the central service database 450 and forwarded to the distribution server 430 for processing into an appropriate printable format and stored for delivery to the elder's digital mailbox appliance 410 by the communication service provider services 440, which delivery may be automated or may include manual intervention by a customer service representative or an administering caregiver as described further below.

[0199] According to one embodiment, the digital mailbox appliance 410, which would typically reside in the elders' home, has two functions. It provides for unattended printing (e.g., periodic digital publications to which various members of the caregroup have contributed) and permits the elder to scan self addressing content for delivery as email to one or more of the members of her caregroup.

[0200] According to one embodiment, the quality of the hardcopy output of the digital mailbox appliance 410 and the color scan input is such that color snapshots can readily be incorporated into the digital gifts sent to or from the elder 401, respectively.

[0201] In a preferred embodiment, the digital mailbox appliance 410 comprises a new multi-function device priced at about \$250 (or less) retail and provides ≥ 300 dpi color printing, flatbed scanning, scheduled polling, a large status display, a single-button control panel, a hidden auxiliary control panel, a high-output speaker, a proprietary communications interface, physical forms storage, remote connectivity over an analog phone line, as well as remote monitoring and management.

[0202] Design trade-offs for a digital mailbox appliance 410 targeted for elders and similarly situated individuals are atypical. For example, print speed is not perceived to be a key issue. However, the speed of the communications link is perceived to be relatively important. In one embodiment, personal printing features, such as low-cost inkjet technology are mixed with enterprise features, such as remote monitoring and management. According to one embodiment, copying will not be offered despite the presence of all of the necessary hardware to provide copying capabilities. In one embodi-

ment, the digital mailbox appliance **410** includes no standard computer interface and functions solely as a standalone appliance rather than as a computer peripheral.

[0203] According to various embodiments of the present invention, instead of the frustration of a personal computer, a digital mailbox appliance provides to elders or other digital mailbox appliance users the welcome familiarity of simple paper-based communications. The elders' digital mail arrives automatically. Deliveries to the digital mailbox appliance **410** may be configured to occur every day on a pre-set schedule. To send a handwritten note seniors press a single button to initiate scanning and delivery of the note. Various benefits of the digital mailbox appliance **410** include its simplicity, security, robustness, low-maintenance, remote supportability by the family or communication service provider personnel. Additionally, paper-based communications having configurable font size tailored to the recipient accommodates visual impairments. Because the printed output can be customized on the level of an individual digital mailbox user numerous needs and preferences can be accommodated (consider color-blindness, contrast requirements, . . . etc.).

[0204] Note that in this description, in order to facilitate explanation, the web server **420**, distribution server **430**, central service database **450** and communication service provider services **440** are generally discussed as if they each reside on or are part of a single computer system. However, it is contemplated that such servers, databases and services may each actually comprise multiple physical and/or logical devices connected in a distributed architecture. Additionally, in alternative embodiments, the functions performed and the data stored may be consolidated and/or distributed differently than as described.

[0205] FIG. 5 is an example of a computer system **500** with which embodiments of the present invention may be utilized. The computer system **500** may represent a web server, presentation server, a distribution server and/or other computer systems involved in the communication system platform. According to FIG. 5, the computer system **500** includes one or more processors **505**, one or more communication ports **510**, main memory **515**, read only memory **520**, mass storage **525**, a bus **530**, and removable storage media **540**.

[0206] The processor(s) **505** may be Intel® Itanium® or Itanium 2® processor(s), AMD® Opteron® or Athlon MP® processor(s) or other processors known in the art. Communication port(s) **510** can be any of an RS-232 port for use with a modem based dialup connection, a 10/100 Ethernet port, or a Gigabit port using copper or fiber. Communication port(s) **510** may be chosen depending on the network environment in which the computer system **500** operates, such as the Internet, a Local Area Network (LAN), Wide Area Network (WAN), or any network to which the computer system **500** connects.

[0207] Main memory **515** may be Random Access Memory (RAM), or any other dynamic storage device(s) commonly known in the art.

[0208] Read only memory **520** may be any static storage device(s) such as Programmable Read Only Memory (PROM) chips for storing static information such as instructions for processors **505**.

[0209] Mass storage **525** may be used to store information and instructions. For example, hard disks such as the Adaptec® family of SCSI drives, an optical disc, an array of disks such as RAID, such as the Adaptec family of RAID drives, or any other mass storage devices may be used.

[0210] Bus **530** communicatively couples processor(s) **505** with the other memory, storage and communication blocks. Bus **530** may be a PCI/PCI-X or SCSI based system bus depending on the storage devices used.

[0211] Optional removable storage media **540** may be any kind of external hard-drives, floppy drives, IOMEGA® Zip Drives, Compact Disc-Read Only Memory (CD-ROM), Compact Disc-Re-Writable (CD-RW), Digital Video Disk-Read Only Memory (DVD-ROM).

[0212] FIG. 6A illustrates a member login user interface screen **600** according to one embodiment of the present invention. In this example depicted, if an individual is a member of only a single caregroup, the member logs in to the caregroup VPN by entering his/her email address into an email address field **605** and entering his/her password into a password field **610** of the member login user interface screen **600**. If, however, the individual is a member of multiple caregroups, then a caregroup selection user interface screen, such as that illustrated in FIG. 6B may be used to solicit information regarding the desired caregroup VPN into which the member would like to login.

[0213] FIG. 6B illustrates a caregroup selection user interface screen according to one embodiment of the present invention in which the user is a member of multiple caregroups. According to one embodiment of the present invention, each digital mailbox appliance has one and only one caregroup. Caregroup members are typically family and friends of the elder using the digital mailbox appliance. After logging in via a member login user interface screen, such as that illustrated in FIG. 6A, if the member participates in more than one caregroup they are asked to select the caregroup VPN into which they want to be placed.

[0214] FIG. 7 illustrates a caregroup home page user interface screen **700** according to one embodiment of the present invention. According to one embodiment, once logged in members work within a website that encapsulates the VPN of the social support network of a particular elder with a digital mailbox appliance. In the present example, the home page includes a list **710** of various upcoming events, such as birth dates of various family members. The home page also includes an area **720** depicting thumbnail representations of recent "Daily Deliveries" thereby allowing members to review digital gifts that have been sent to the elder.

[0215] FIG. 8 illustrates a member registration user interface screen **800** according to one embodiment of the present invention used by caregroup administrators to register a new member to their caregroup. In one embodiment, an administering caregiver is provided with the ability to register new caregroup members. The administering caregiver(s) have administrative privileges and may therefore add members through a pop-up editor in the website as shown by member registration user interface screen **850**.

[0216] If the communication service provider already has information regarding the member by way of the member being part of another caregroup, for example, then the member is simply added to this caregroup with all their existing directory information. If not, additional initial information is requested. According to one embodiment, new members are sent an email requesting that they opt-in and directing them to a registration page and further training (as appropriate).

[0217] In the present example, to add a new member to a family support network, the administering caregiver navigates to a member directory user interface screen **800**, selects

the “Add Member” link, and then enters the new member information on the member registration user interface screen 850.

[0218] In alternative embodiments, phone to a customer service representative of the communications service provider or to an automated telephone system or other web interfaces may be provided to the administering caregiver to add new caregroup members. Furthermore, administering caregivers may act as recruiters and provide a list of desired members to the communication service provider. Subsequently, the communication service provider may send an email introduction to each of the individuals listed by the administering caregiver and allow the individual family members to opt-in.

[0219] FIG. 9 is a software architecture block diagram conceptually illustrating application-level software components of a distribution server 920, a web server 910, and internal components of a digital mailbox appliance 900 according to one embodiment of the present invention.

[0220] According to the software architecture depicted, the web server 910 includes a publication scheduler 911 that gathers up digital gifts and publishes them to the delivery generator 926 based on a schedule configurable by the administering caregiver(s), a centralized database 912 holding all caregroup data, and a web server 913 providing the web site services to the caregroup members, to the customer service groups, to the digital mailbox network operators and managers, and to the research team running clinical trials.

[0221] In the example depicted, the distribution server 920 includes a log upload server 921, a configuration server 922, a scan upload server 923, a time server 924, a print job server 925, an edition generator 926 and an email processor 927.

[0222] According to one embodiment, communications to and from any digital mailbox appliance 900 occurs only when initiated by the digital mailbox appliance 900. The scheduler 915 notifies the task manager 916 which launches the modem controller 917 which establishes contact with the distribution server 920. An alternative method of connection occurs when the user puts an item (form, reply requested, paper clipping, anything . . .) on the scanner and presses the send button (part of the User interface 907). The send button initiates execution of a scan through the scan controller 906 which puts a compressed digital representation of an image of the item on the scan queue 903 and then establishes a connection to the distribution server 920 by notifying the task manager 916 which directs the modem controller 917.

[0223] Once connection is established a number of communications processes take place between elements of the distribution server 920 and the digital mailbox appliance 900. In one embodiment, the processes that occur during a connection fall into three major categories: 1) delivery of print jobs to the digital mailbox appliance 900, receipt of the scan jobs from the digital mailbox appliance 900, and remote maintenance of the digital mailbox appliance 900.

[0224] In one embodiment, remote maintenance consists of 1) tracking logged mailbox events (e.g., print and scan events, problem occurrences, program operation histories, heartbeat history, . . . etc.), 2) time synchronization, 3) configuration update (e.g. phone numbers for the modem to call under various conditions, contact schedules, software version information), 4) digital mailbox status information (e.g., ink levels) and 5) applications software updates.

[0225] The log upload server 921 collects logging reports from each digital mailbox appliance logger 901 and records

them in the database 912 appropriately indexed to the corresponding digital mailbox appliance 900 (using the mailbox’s unique ID, for example). Recognized digital mailbox appliance errors are specially noted and appropriate alerts are sent to representatives of the communications service provider.

[0226] The configuration server 922 maintains and transmits configuration changes to the configuration manager 902 of each digital mailbox appliance 900 (recognized by its unique ID, for example). Configuration changes (such as the scheduled time of printing the elder’s regular delivery) from a variety of sources (such as the administering caregiver through the caregroup’s VPN) are registered in the database 912 and updated into the configuration manager 902 with each contact with the appropriate digital mailbox appliance 900.

[0227] According to one embodiment, scans are initiated by the elder pressing a single “Send” button. The scan controller 906 launches a scan process, compresses the scan into JPEG format and places the scan in the local scan queue 903. The scan queue 903 holds the image(s) accumulated until they are transferred to the scan upload server 923. The scan upload server 923 gathers scans sent from each digital mailbox appliance 900 and registers the scans in the database 912. These scans are then delivered to the intended recipient(s) via automated dispatch processes that are launched as described below.

[0228] The time server 924 updates the local clocks of each digital mailbox appliance 900. According to one embodiment, each time a digital mailbox appliance 900 contacts the distribution server 920, the time server 924 updates the digital mailbox appliance’s local clock through the Time Synchronization process 904. In alternative embodiments, in which the digital mailbox appliance 900 is configured to receive calls, the time server 924 may periodically push time updates to the digital mailbox appliance 900. In other embodiment, the time server 924 may provide time information to the digital mailbox appliance 900 responsive to explicit requests by a digital mailbox appliance.

[0229] The print job server 925 collects and sends print jobs to the appropriate digital mailbox appliance 900. According to one embodiment, each time a digital mailbox appliance 900 contacts the distribution server 920, the print job server 925 updates the digital mailbox appliance’s local print queue 905.

[0230] The delivery generator 926 periodically creates a print job for each digital mailbox appliance. The print job is formatted as specified by preferences stored in the database 912 and includes each of the digital gifts defined in the database 912 that are scheduled for the next delivery to the digital mailbox appliance 900. According to one embodiment, the publication of the caregroup’s digital gifts, the timing of publication, the timing of scheduled contact from the digital mailbox appliance 900 and the timing of printing at the digital mailbox appliance 900 is set by the administering caregiver (s).

[0231] At the time schedule for delivery, the scheduler 915 notifies the task manager 916 which launches the print controller 908 to print the print jobs on the print queue 905. According to one embodiment, some print jobs are specially marked for immediate delivery. Such print jobs are printed at the first available opportunity, such as (1) upon completion of the next send operation, (2) upon completion of the digital

mailbox appliance's initial connection after being powered up, or (3) at the next scheduled delivery time(s), whichever is first.

[0232] The email processor 927 provides traditional email services and parses and manages email transmissions, Short Message Service (SMS) messages, instant messages via ICQ, AIM, MSN, Jabber, Yahoo, Gadu-Gadu, Tlen, Netsend and other IM protocols, and/or MMS messages. Such transmissions and messages may be translated into digital gifts and stored in the database 912 for later batch delivery with a daily delivery, for example. Email messages are also transmitted to members of caregroups on behalf of a user of a digital mailbox appliance, for example when self addressing messages are received and parsed from the digital mailbox appliance. According to one embodiment, handwritten missives originated at a digital mailbox appliance are transmitted by email as attached images or embedded images. Alternatively, a Universal Resource Locator (URL) or other hypertext link may be transmitted to the recipient(s) to allow more efficient delivery and provide the recipient control over when the images are retrieved and displayed.

[0233] FIG. 10 is a flow diagram illustrating a method of performing content derived addressing according to one embodiment of the present invention. This process begins as items are scanned into the digital mailbox appliance by the user of the digital mailbox appliance. In one embodiment, an elder may initiate delivery of a correspondence to a member of his/her caregroup by simply placing it on a flat scanner bed and pressing a single button. No typing or dialing is required. Additionally, the elder need not be aware of the individual intended recipients' preferred electronic communications delivery mechanism (e.g., email device, facsimile, digital mailbox appliance, computer system, wireless handheld, etc.) or their "addresses" (e.g., email address, fax number, unique digital mailbox appliance ID, cell phone number, IM username, etc.).

[0234] At block 1010, responsive to an indication that a page of a correspondence is present on the flatbed scanner, the digital mailbox appliance "scans" the page to create a digitized version in the form of an image file having a particular graphic, raster or image file format, e.g., Joint Photographic Experts Group (JPEG), JPEF File Interchange Format (JFIF), Tag(ged) Image File Format (TIFF), PostScript, Encapsulated PostScript (EPS), Computer Graphics Metafile (CGM), PICT, Graphics Interchange Format (GIF), Bitmap (BMP), Portable Document Format (PDF) or the like.

[0235] At block 1020, the digital mailbox appliance may perform various limited local processing, such as scan conversion, storing of the scan, error recognition and reporting, time stamping and logging the scan, local transaction processing, buffering multiple scans, contacting the distribution server of the communication service provider and forwarding the scan(s) and re-tuning scan parameters of the digital mailbox appliance flatbed scanner as appropriate. According to one embodiment, the scan resolution, file type and compression specification are managed as a part of the digital mailbox appliance configuration definition and are updateable from the distribution server.

[0236] According to one embodiment, when the scan of the document by the digital mailbox appliance scanner is complete, the raw bitmap is converted into a JPEG image file that is then saved in an internal upload message queue in a file system local to the digital mailbox appliance. This file system may be either in persistent (non-volatile) memory or RAM,

depending upon how the digital mailbox appliance is configured. If the local file system is in persistent memory, then if there is a power failure, the document will not be lost and may be sent upon restoration of power.

[0237] According to one embodiment, the digital mailbox appliance may initiate a connection with the communication service provider via an internal modem concurrently with the initiation of a scan. Once the digital mailbox appliance has connected to the Internet, it may look for the existence of any scanned images in its internal upload message queue. The digital mailbox appliance may then upload any files that are in the upload queue. Each time the digital mailbox appliance successfully uploads a file to the distribution server, it may delete the file from the upload queue.

[0238] In one embodiment, if there are no files in the upload queue once the modem has connected. If the scanner is still in the process of scanning, the digital mailbox appliance may remain connected to the Internet, wait until the scan is complete, and then upload the scanned message to the distribution server. This process may be repeated until the upload queue is empty and the scanner is no longer scanning. In this manner, the elder may scan multiple documents during one connected session to the Internet.

[0239] According to one embodiment of the present invention, various locally detectable errors, such as recognition of blank pages, empty scanner, backside-down pages (i.e., form facing away from scanner as determined by bleed through sensing), duplicate pages, etc., may be resolved locally or reported to the elder (e.g., in the form of an error notification, such as a buzz, screen update, etc.).

[0240] According to one embodiment, custom forms are provided to the elder for use in generating correspondence. "Decorations" on any given form may be designed to have a minimum scan compression size (e.g., on the order of 40K bytes to 150K bytes) that exceed a typical blank page (e.g., scan size of between approximately 5K bytes and approximately 15K bytes) or upside-down scan. Pages scanned upside-down typically result in a larger scan size (e.g., $\geq 15K$ bytes, but less than 40K bytes) than blank pages as a result of bleed through. In this manner, a simple evaluation of the size of the resulting scan may be performed to categorize the scan as one resulting from a legitimate and acceptable page of correspondence, an empty scanner, a blank page, or an upside-down page.

[0241] At block 1030, the distribution server performs processing of sets of scan(s) (i.e., one or more uploaded messages originated by the digital mailbox appliance). According to one embodiment, once a scanned image is uploaded, it is saved to the central service database of the communication service provider within a scan data structure along with additional data extracted from the scan (e.g., scanned image file name, date and time information, sizing, etc.) and a scan. For purposes of facilitating coaching by the administrative caregiver, for example, the scan may also be registered in the central service database as having been originated by the particular digital mailbox appliance using the unique digital mailbox ID, for example.

[0242] After the set of scans has been successfully stored in the central service database, a notification may be sent to the automated dispatch processing to initiate the automated dispatch processing of block 1040 where automated dispatching software may examine the set of scans for item identification marks, such as a barcode, a MaxiCode (i.e., a two dimensional barcode used by United Parcel Service (UPS) on pack-

ing slips for package sorting and addressing), or other identification marks sufficiently identifiable by linear barcode scanning, 2D barcode scanning or Optical Character Recognition (OCR) techniques, to facilitate automated dispatch of the set of scan(s) as described further below.

[0243] At decision block **1045**, a determination is made whether automated dispatch was successful. If automated dispatch is successful and a particular set of scans is capable of automated dispatch without manual intervention, then processing continues with block **1070**. Otherwise, processing branches to block **1050**.

[0244] According to various embodiments, one or more assisted dispatch processes may be provided as a fallback strategy if automated dispatch processing cannot be successfully completed. In one embodiment, partial processing by the automated dispatch process is preserved and supplied to the assisted dispatch processes to minimize human time and effort.

[0245] In one embodiment, if a set of scans cannot be automatically dispatched by the automated dispatch processing of block **1040**, the set of scans are placed on an inbound queue for family dispatch processing. When sets of scans are placed on the inbound queue for family dispatch processing, they may be time stamped to ensure timely handling. If a time threshold is exceeded for a particular set of scans, they may be dequeued and placed on an inbound queue for dispatch processing by the communication service provider.

[0246] At block **1050**, a family dispatch process is performed. At this point in the distribution cycle, image, core data (from, date/time, sizing, . . . etc.), and partial automated dispatch processing (e.g., form identification, resolution of zero or more addressee(s), component parsing (subimage, original), etc.) has already been completed. According to one embodiment, the family dispatch process comprises a manual process of determining the intended recipient(s) of the set of scans.

[0247] The responsibility for performing the family dispatch process may be shared or rotated among individuals in the caregroup or may be performed by the administrating caregiver. Regardless, the individual(s) serving in the role of family dispatcher is preferably both capable of interpreting the desires of the elder based on familiarity and specific knowledge and motivated to serve the elder.

[0248] At decision block **1055**, a determination is made whether family dispatch was successful. If family dispatch is successful, meaning the family dispatcher has handled and a particular set of scans within an acceptable timeframe by identifying one or more members of the caregroup as intended recipients of the set of scans, and marking the set of scans for delivery to the intended recipients (e.g., by including appropriate address information in a distribution list associated with the set of scans), then the distribution of the set of scans continues with block **1070**. Otherwise, processing branches to block **1060**. The family dispatcher may also manually pass the set of scans and current dispatch state on to the communication service provider dispatcher. Forwarding to the communication service provider dispatcher may also be automated with a vacation setting, for example.

[0249] At block **1060**, a communication service provider dispatch process is performed. According to one embodiment, the communication service provider dispatch process comprises a manual process of determining the intended recipient(s) of the set of scans and tagging, labeling or otherwise marking the set of scans accordingly.

[0250] At decision block **1065**, a determination is made whether communication service provider dispatch was successful. Assuming the communication service provider dispatcher is capable of identifying one or more members of the caregroup as intended recipients of the set of scans, then the dispatcher fills in the proper address information for the one or more addressees and the distribution of the set of scans continues with block **1070**. Otherwise, at block **1080**, the intended addressee(s) may be solicited from the elder via in-band or out of band communications.

[0251] According to one embodiment, a workbench application and tools are provided to the dispatchers (e.g., the family dispatcher(s) and/or the communication service provider dispatcher(s)) to facilitate review and analysis of incoming sets of scans for dispatch. For example, a tool for quick orientation flipping may be provided, such as a website “reader” with one click rotation. As a last resort, a family or communication service provider dispatcher may initiate a query to the elder through a communication delivered to the elder’s digital mailbox appliance, by phone, or otherwise.

[0252] FIG. **11** illustrates a sample completed routing form **1100** and resulting email message **1150** delivered to the addressee according to one embodiment of the present invention. According to the present example, the user of the digital mailbox appliance is supplied with pre-formatted routing forms that allow the user to “address” correspondence by simply checking off address information on a routing form. The pre-formatted routing forms may be periodically mailed to the digital mailbox user or printed on his/her digital mailbox appliance.

[0253] The routing form **1100** of the present example includes a form identification barcode **1110** and various information segments, such as an addressing sector **1120** and a handwriting sector **1130**. As will be described further below, based upon the content and location of the various sectors as identified by the form type, the forms may be parsed by image processing routines running on the distribution server.

[0254] In the example depicted, the user of the digital mailbox appliance has marked one of the members **1121** of his/her caregroup as the intended recipient of a brief handwritten message provided in the handwriting sector **1130**. If automated dispatch is desired, the intended addressee **1121** may be determined by applying various image processing algorithms to the address sector **1120** as described further below. For example, in one embodiment, an original version of the address sector **1120** of the routing form **1100** may be compared to the completed (marked) version of the address sector **1120** of the routing form **1100** to determine whether one or more addressees have been marked.

[0255] According to alternative embodiments, the user of the digital mailbox appliance may be provided with pre-printed addressee identification labels containing the names and/or photos of the members of the user’s caregroup and identification marks, such as a barcode, data matrix, semicode, MaxiCode, or the like, uniquely associated with individual members of the caregroup. The elder might be encouraged to think of them as addressing “stamps.” The user then “addresses” correspondence prior to scanning by affixing one or more preprinted labels in a specified area of the routing form. Identification labels may also be created to represent certain subgroups of the caregroup members, such as grandkids, nieces, nephews, children, and everyone. In this manner, the user of the digital mailbox appliance may easily direct correspondence to appropriate subgroups of his/her car-

egroup when appropriate. According to another alternative embodiment, the user has reusable addressing card(s) that they lay down on the flatbed along with the correspondence, photo or clippings they intend to send. Addressing card variations include, (1) a “to card” for each possible recipient (and one for everybody—the aggregate) and (2) a single plasticized card with check boxes for the desired addressee(s).

[0256] Yet another way to simplify addressing of correspondence for users of digital mailbox appliances is to provide preprinted forms that are recognized by the communication service provider as being destined to a specific member of the caregroup or a specific subgroup. Again, identification marks may be used, such as barcodes and the like to communicate the information regarding the intended addressee(s), but in this case the identification marks would be part of the routing form rather than supplied as preprinted labels. According to another embodiment, the digital mailbox appliance user uses any previously received message or digital gift from a caregroup member as a routing form to identify that caregroup member as the intended addressee, jots a note (or not) and then sends the optionally annotated previously received message or digital gift optionally followed by photos, clippings, or any number of additional pages. All the scans are gathered up by the communication service provider and delivered to the original sender of the message or digital gift. Thus, an elder can send off a quick thank you note on any digital gift (or even items from the communication service provider).

[0257] In one embodiment, in order to send an electronic communication to the indicated addressee(s), the digital mailbox appliance user places the completed routing form on the flatbed scanner of the digital mailbox appliance and presses the “Send” button. In the present example, the result of the user sending the routing form **1100** is delivery of message **1150** to June. Upon receiving the scanned image of the routing form **1100**, the communication service provider’s infrastructure takes care of the rest, as described below, for example, by extracting the handwriting sector **1120** from the scanned image of the routing form **1100** and including the extracted image of the handwriting sector **1120** as an inline image within a standard email message. Alternatively, the extracted image may be sent as an attachment or a URL to the extracted image may be sent.

[0258] FIG. 12 illustrates a sample completed return-reply requested form **1200** that may be created and delivered to a digital mailbox appliance responsive to a caregroup member request according to one embodiment of the present invention. According to the present example, a caregroup member may provide a photo journal form **1200** to an elder and/or other members of the caregroup to allow reprints to be ordered of one or more photos or allow the recipient(s) to vote for a favorite.

[0259] In this example, the photo journal form **1200** includes a form identification barcode **1210** to allow the communication service provider to identify and parse the form, a photo sector **1220** depicting a photo and a corresponding selection sector **1230**. In alternative embodiments, one or more pairs of photo sectors **1220** and selection sectors **1230** may be included on a single form. In any event, the originator of the completed photo journal form **1200** has marked a “Hard Copy Please” selection from the check-off list to request a hard copy of the photo depicted in the photo sector **1220**. Various alternative selections are contemplated. For example, the digital mailbox appliance user, may be provided with the

option of having a digital version of the photo stored as an eCard image and/or in his/her photo shoebox for future use.

[0260] FIG. 13 illustrates another sample completed return-reply requested form **1300** that may be created and delivered to a digital mailbox appliance responsive to a caregroup member request according to one embodiment of the present invention. According to the present example, a caregroup member may send a life harvest album form **1300** to an elder to solicit input regarding one or more photos as part of a family or caregroup project. The life harvest form **1300** includes a form identification barcode **1310** in one or more locations to allow the communication service provider to identify and parse the form, a photo query sector **1320** which may include one or more photos for discussion and corresponding handwritten response sectors **1330** for elder feedback.

[0261] FIG. 14 illustrates another sample completed routing form **1400** that may be provided by the communication service provider to a digital mailbox appliance user and customized for the user according to one embodiment of the present invention. According to the present example, the routing form **1400** includes a form identification barcode **1410** in one or more locations to allow the communication service provider to identify and parse the form, an addressing sector **1420**, a handwriting sector **1430**, and a check-box **1440** to indicate additional pages will follow.

[0262] In the example depicted, the user of the digital mailbox appliance has specified broadcast distribution of the written message in the handwriting sector **1430** message by marking check-box **1421** in the addressing sector **1420** corresponding to distribution to “everybody” listed in the addressing sector **1420**. According to the present example, if the user of the digital mailbox appliance intended to scan additional pages to be included as part of the distribution, then her/she would simply mark check-box **1440**. As described further below, multiple page or continuous communications may be recognized in various other ways.

[0263] FIG. 15 illustrates a sample coaching message **1500** and associated form **1510** that may be directed to a digital mailbox appliance user according to one embodiment of the present invention. In the present example, a caregroup member, Mike, has sent coaching message **1500** containing a sample Halloween eCard and directions to encouraging an elder, Gertrude, to send a Halloween card to the elder’s nephews. The caregroup member has also provided the elder with an eCard selection form **1510** to further simplify the task.

[0264] FIG. 16 illustrates a sample completed eCard form **1600** originated at a digital mailbox appliance and a resulting eCard **1650** generated responsive thereto according to one embodiment of the present invention. In the present example, an elder, Gramps Ted, has completed eCard form **1600** by marking a desired image **1621** in the selection sector **1620** and providing a personalized message in the handwriting sector **1630**. As will be described further below, by simply checking boxes a user of a digital mailbox is able to specify the composition of a customized eCard, such as the resulting eCard **1650**. In the present example, responsive to receipt and processing of eCard form **1600** by the communication service provider, the resulting eCard **1650** may be composed by retrieving the desired image **1621** from the central service database and combining the retrieved image with handwritten materials extracted from handwriting sector **1630** of eCard form **1600**.

[0265] While the examples of FIGS. 15 and 16 are explained with reference to a manually initiated coaching message and a specific holiday, similar coaching messages may be automatically generated for various other holidays or family “days of note,” such as birthdays, anniversaries, or the like, such as any condition when a traditional greeting card would be appropriate.

[0266] FIG. 17 is a flow diagram illustrating a method of performing automated dispatch according to one embodiment of the present invention. In the present example, responsive to a set of scans uploaded from a digital mailbox appliance, the distribution server of the communication service provider initiates image processing at block 1710 to identify the type of predefined form employed for this particular missive. Typically, the first page of an elder missive will include form identification marks that allows a determination to be made regarding which of a predefined set of forms is represented by the first page of the elder missive. For example, in one embodiment, the form identification marks are a barcode that is included on each form in the upper right-hand corner of the form and the lower left-hand corner of the form. Various other identification marks and locations may be employed. For example, barcodes (code 128, code 39, Interleaved, EAN, . . . etc), data matrix, MaxiCode, OCR (A or B) and other machine readable codes. Depending upon the particular implementation, there are certain tradeoffs among identification mark density, resolution, transmission time, software availability/price/programmability, etc. that would typically be evaluated.

[0267] Certain simplifying assumptions made in the automated dispatch techniques described below include an assumption that blank page, empty scanner and backside-down page errors are resolved local to the digital mailbox appliance or at least prior to execution of this automated dispatch processing. Additionally, it is assumed that certain physical page placement restrictions are implemented at the digital mailbox appliance resulting in only three possible orientations of a scanned version of a form (i.e., rightside-up, upside-down and backside-down). Finally, it is assumed that the item or form identification marks are included at one or more predetermined locations on each type of form of the set of predetermined forms. According to one embodiment, the communication service provider may supply special paper for use with the digital mailbox appliance to force a specific orientation in the flatbed scanner. For example, the bottom right hand corner of the supplied paper may be clipped off to match a feature of the flatbed scanner and/or the input tray to require a specific orientation of the paper at scan time.

[0268] Given the above simplifying assumptions, the form recognition and identification processing need only examine one or two general locations of the scan (one assuming the form is rightside-up and one assuming the form is upside-down) for purposes of locating form identification marks. If a form identification mark, such as a MaxiCode barcode, is located, then the information conveyed thereby may then be used to retrieve information regarding the corresponding form type. For example, the characters of information represented by a barcode (e.g., the barcode value) may be used as part of a query to retrieve information from the central service database of the communication service provider.

[0269] If, at block 1710, no form identification marks are located, the form type identification process has failed and further analysis is performed to determine if the current scan is a second or subsequent page of a multipage message. If

form identification marks are located, however, then as a result of each value defining a specific form of a set of predefined forms, information regarding the characteristics of the form now identified may be retrieved. As described above, each form type may have a set of defined form segments, such as zero or more address sectors or areas, selection sectors or areas, and/or handwriting sectors or areas. After having failed in determining the type of form or having succeeded in determining the type of form represented by the current scan and retrieving information regarding the form’s characteristics (e.g., the number, type and locations of the various included segments), automated dispatch processing continues with decision block 1720.

[0270] At decision block 1720, a determination is made regarding the successful identification of a form type associated with the current scan. If a form type was successfully identified in block 1710, then processing continues with block 1730; otherwise processing branches to decision block 1725.

[0271] At decision block 1725, it is known that no form identification marks were located within the current scan. In view of the simplifying assumptions summarized above, it can be appropriately deduced that either (1) the current scan “page” was intended by the originator to be part of a continuing correspondence and should therefore should be dispatched in accordance with the prior scan page; or (2) the page of correspondence represented by the current scan page did not employ a recognized form.

[0272] A determination is made at decision block 1725 whether the current scan is intended to be part of a continuing communication. According to one embodiment of the invention, if additional scanned images are received within a predefined period of time of a prior scan, those images are assumed to be included with the previous image and are sent to the recipients identified in or associated with the previous image. The communication service provider may infer that received scans are 2nd or subsequent pages of a continuing communication (collectively or individually “follow-on” pages) based on the timing of the scans and a lack of identification markings, barcode. In one embodiment, scans are considered follow-on pages only if they are originally scanned within a short duration, e.g., seconds to minutes, after the 1st page form (e.g., a routing form). The duration may be a configurable parameter set by the communication service provider and/or an administering caregiver. If subsequent scans have different recipient information, however, then the automated dispatch process will treat such subsequent scans as a new message to be sent to a new set of recipients identifiable by information contained within such subsequent scans. In this manner, the elder is able to send multiple pages to a set of recipients without having to identify the set of recipients on each page.

[0273] As described earlier, in alternative embodiments, the elder may check a box on the first page of a correspondence to indicate whether one or more pages follow. Alternatively, a check box may be included on follow-on form pages to allow them to be marked by the user of the digital mailbox appliance as being associated with an earlier scanned “address” or routing page. Regardless of the mechanism or algorithm use to make the determination, if, at decision block 1725, it is determined the current scan is part of a continuing communication, then processing continues with block 1726. Otherwise, processing continues with block 1755.

[0274] At block 1726, the current scan is marked as a follow-on page (e.g., a 2nd or subsequent page of a continuing communication). According to one embodiment, this marking process includes modifying information stored in the corresponding scan data structure in the central service database. As discussed further below, the composition process notes the existence of follow-on pages and appends them to the basic missive to be emailed to the addressee(s).

[0275] At block 1755, the current scan is forwarded to a dispatcher for manual resolution, e.g., determination of missing information, such as addressee(s) and/or choices, and/or determination regarding the current scan's association with earlier scanned pages.

[0276] At block 1730, the form represented by the current scan is parsed in accordance with the type of form previously identified and the characteristics thereof. Information typically sought, identified and/or extracted during form parsing includes one or more of addressee(s), choices, images spaces, such as handwritten material, drawings, photos, clippings, etc., and 2nd or following pages. According to one embodiment, addressee(s) and choices may be determined using various image processing techniques, such as XORing the original sector of the form with the marked version. In this manner, checked boxes, filled-in boxes and boxes marked in other ways may be interpreted as a selection of the addressee or choice associated with the marked box.

[0277] Some information is optionally defaulted within the scan data structure based upon the barcode value. For example, in the case of an eCard resulting from a coaching message, the communication service provider may know a priori the addressee(s) and need only determine one or more choices and an image region containing a handwritten message to complete composition of the missive.

[0278] In one embodiment, information extracted from a form filled in by the elder may be used to build a digital gift for one or more addressees. For example, a one-page form, such as eCard form 1600 of FIG. 16, may be used by an elder to select a type of Halloween eCard for delivery to one or more members of the elder's caregroup. The form may include an area for selecting one or more addressees (or the addressees may be determined based on the form identification barcode 1610), an area for the elder to provide a hand-written note (e.g., handwriting sector 1630), and a selection area to indicate choices made, such as a check-off list for selection of a desired image to be used for the Halloween eCard (e.g., selection sector 1620). Continuing with the present Halloween eCard example of FIG. 16, upon receipt of the scanned image of the eCard form, the form type is determined from the form identification barcode 1610, the originator may be determined based upon the form identification barcode 1610 or the unique ID associated with the digital mailbox appliance, and the addressees (e.g., the two nephews and an appropriate email address (or addresses) for delivery, such as their mother's email account) may be determined based upon information marked by the elder in an address segment of the form or based upon the form identification barcode 1610, which may associated the form with a particular coaching message concerning the nephews. Additionally, a determination can be made regarding the image the elder has selected to send (e.g., from a marking in a check box associated with the desired image 1621). Finally, an image of writing and/or any additional drawings may be extracted from the handwriting sector 1630 to form the inside of the eCard being sent.

[0279] According to one embodiment, instructions for composition of the elder missive based upon the particular form employed are retrieved from the central service database. The instructions from the central service database may then be used to compose a completed missive from the parsed components. This includes appending follow-on page images to the core document (for example an embedded handwritten note appended to a birthday card).

[0280] At decision block 1745, a determination is made regarding the completeness of the missive. If insufficient data is available to construct the missive (e.g., no marking in a selection section of the form), then composition cannot be completed, the processing state is marked in the central service database, a notification is sent to the dispatcher and processing continues with block 1755. If sufficient data is available to construct the missive, then processing continues with block 1750.

[0281] At block 1750, the missive is sent (e.g., emailed) to the appropriate addressee(s) by the methods specified in their respective personal information stored in the central service database. Typically, the specified method is defaulted to the primary email address.

[0282] FIG. 18 is a flow diagram illustrating a method of performing coaching and monitoring analysis according to one embodiment of the present invention. While making the interfaces to the communication service provider for both the caregroup members and the target of the caregroup exceptionally easy is one mechanism to influence the quality, quantity, effect and timeliness of communications; a variety of monitoring and assessment techniques are also provided according to various embodiments to allow the administering caregiver(s) and other authorized family members to influence communications to and from the elder.

[0283] According to various embodiments, the communication service provider may be provided limited access to communications exchanged between members of caregroups and corresponding caregroup targets for the purpose of facilitating the monitoring of usage of various technologies and features provided by the communication service platform and then taking or suggesting actions to administering caregivers in response to various observed usage patterns. In one embodiment, such actions suggested or taken by the communication service platform are designed to seek to enhance the effectiveness of the communication system platform in supporting elders, for example, by stimulating increased communication with the elder if a drop in communication rate is detected.

[0284] In one embodiment, the communication service provider may be provided limited access to data that spans multiple caregroups. For example, while the communication service provider and/or affiliated researchers may derive statistical baseline data that can be used to analyze behavior of an elder within a single caregroup, it is anticipated that data collection and analysis may be performed across a type of community of caregroups where the associated elders are demographically or psychologically similar.

[0285] The coaching features may employ a supporting technology referred to as project templates. An example of a project template is a user tool that (1) makes it easy for a family member to initiate a project, such as building a family recipe collection, or creating a cryptogram puzzle with text of interest to the elder, or providing a Health Tip of the Week, while (2) allowing the communication service platform to recognize and track that the activity is taking place. By moni-

toring the use of such project templates, the communication service platform can determine which system features are being used and which are not, and suggest new projects and/or activities, if appropriate, in response to a drop in communication with the elder. Additionally, the communication service platform may provide guidance and/or direction regarding potentially useful features of the system that are not being used spontaneously by members. For example, coaching messages may be delivered to caregroup members regarding content types they have not yet used (e.g., eCards, crossword puzzles, family recipes, carousels for supplying commercial and/or family data streams, health advice, amusing news, entertainment topics, such as celebrity gossip and TV and/or movie reviews, special interest etc.). According to various embodiments of the present invention, each content type is supported by a corresponding project template that may act both as a tool to make it easier for caregroup members to use the associated feature, and as a marker, enabling the communication system platform to recognize and track the features being utilized.

[0286] According to one embodiment, administering caregiver(s), other authorized family members and personnel associated with the communication service provider (if desired and authorized by the caregroup) may be provided with access to a communications dashboard that presents communication history (under a variety of novel analyses) and a wide variety of coaching tools that can be used to influence communications to and from the elder. These coaching tools may be coupled with subtle (often indirect) coaching techniques to encourage the creation of digital gifts and other communications to and/or from the elder.

[0287] At block 1810, various information is measured regarding the communications exchanged between members of a caregroup and the target of the caregroup. In one embodiment, information measured and/or tracked includes number of digital gifts exchanged, time, date, sources and types of digital gifts and the content employed (e.g., component images embedded in the digital gifts), the level of personalization of digital gifts, and key words indicative of affectiveness of the communication.

[0288] At block 1820, various analyses are performed based upon the information measured. For example, analysis may be performed to produce one or more of an affectiveness rating, a rating regarding intellectual stimulus, and a rating regarding activity inducement. Digital gifts often include family annotated images. These annotations allow metrics to be generated regarding the emotional content of the digital gifts. For example, a digital gift including an annotated photo that refers to the name or nickname of grandchildren and/or includes affective terms (e.g., smiling, happy, . . . etc.) may have a higher affective value rating than a digital gift including a stock photo. Lexical Semantic Indexing (LSI) and Lexical Semantic Analysis (LSA) may also be used as one measure of the similarity between images. Other specific information available for analysis includes names, nicknames, kinship, elder ratings of information received (from, for example, best-of ratings that may occasionally be requested from the elder), family events from the schedule (birthdays, valentine's day, . . . etc.).

[0289] Simplistic analysis may involve a count of digital gifts delivered by member, by type, by time. More complex analysis may involve rating various parameters, such as affective-emotional value (A) of communications, intellectual stimulus value (IS) of communications, and activity induced

value (AI) of communications, based on the content of the communications, e.g., digital gifts and associated images and text.

[0290] According to one embodiment, digital gifts may be scored based on the sum of items plus an individual weighting for various digital gift types. For example, digital gifts may have associated base rating value tuples (A, IS, AI) with enhanced points available for specific content analysis (e.g., use of a family photo of the grand-daughter over a stock photo, a new stock image was selected as opposed to using the system supplied first guess, whether personalized text was added, . . . etc.).

[0291] Scoring a crossword puzzle might proceed as follows. If delivered as a personalized digital gift from a member of the caregroup, base gift value of (5, 10, 5). If delivered in stock form (not personalized), base gift value of (1, 3, 2). Puzzles also might include associated rating value tuples (A, IS, AI) based on difficulty, complexity, number of words, length, subject matter, etc. Puzzles might have IS ratings of 1 to 10 and AI ratings of 1 to 10. A particular puzzle might have a rating value tuple of (0, 5, 5). According to the present example, when this particular puzzle is delivered as a personalized digital gift the total score would be $(5+0, 10+5, 5+5)=(5, 15, 10)$. In contrast, when this particular puzzle is delivered without personalization, the total score would be $(1+0, 3+5, 2+5)=(1, 8, 7)$.

[0292] Scoring a photo essay might proceed as follows. Base gift value of (5, 2, 0), plus an author bonus of 1 to 10 points (A) depending on age and kinship, plus a per item bonus of 1 to 10 point (A) for each image included in the photo essay depending upon the subject matter depicted.

[0293] According to one embodiment, intellectual stimulus of content from various information feeds and from the central service database of the communication service provider that are delivered to elders, such as crossword puzzles, interest based items, . . . etc., may be rated by the communication service provider based on the content source or by explicit ratings stored within the central service database by a content management team associated with the communication service provider.

[0294] At block 1830, responsive to a selection of a coaching tool from the dashboard of the communication service provider website interface by an appropriate caregroup member, the corresponding coaching editor is displayed. The dashboard may support a number of coaching and reminding tools and editors available both to the appropriate family member(s) and the communication service provider (human-driven and/or automated). Various forms of indirect coaching and prompting have been found to have a significant impact on the quantity and quality of communications. According to various embodiments, authorized family members may use coaching tools/editors to perform one or more of the following:

[0295] annotate a weekly summary of digital gifts (and in particular their family photos) sent widely throughout the family,

[0296] launch reminders of upcoming family events (birthdays, father's day, . . . etc.) with embedded digital gifts ready for immediate sending or editing (to the elder or other family members),

[0297] follow up to doctor's appointments or physical therapy sessions (could triangulate with message from doctor or therapist),

[0298] send projects of varying sizes to the elder (e.g., a return-reply requested form, such as a photo journal (see FIG. 12), a life harvest album (see FIG. 13), or an eCard form for sending a birthday card or holiday card to a specific family member (see FIG. 15 and FIG. 16)). Furthermore, these items can be directed through other family members to broaden the base of communications.

[0299] welcome new members to the caregroup,

[0300] notify members of the availability of new digital gift editors or new content enhancing existing digital gift editors,

[0301] create best-of selections,

[0302] remind members of digital gifts that they have not tried, or not tried for a significant length of time (this function is typically automated based upon parameters set by the dashboard operator),

[0303] request additional personal information from members for the directory and the family schedule (such as birthday information),

[0304] Examples of various coaching editors are described below. At block 1840, the coaching editor composes the coaching message responsive to user input. At block 1850, the coaching editor receives a list of one or more addressees to which the coaching message is to be distributed. At block 1860, the coaching message is distributed to the addressees.

[0305] The dashboard may also enable the user to specify notifications and/or reminders to be sent to him/herself on specific conditions (e.g., low levels on specified content carousels, lack of personalized communications to the elder, lack of intellectual stimulus items, . . . etc.).

[0306] Similar and/or additional dashboard capabilities may also be made available to communication service provider operated services. Thus, the communication service provider may automate various coaching methodologies for a newly formed caregroup until one or more family members take responsibility for various services (e.g., providing a weekly update of elder deliveries to the caregroup, notification of new editors of content, event reminders, . . . etc.).

[0307] Simple coaching (automated and/or manual) is based on use or nonuse of specific features, or on overall usage levels. But, more sophisticated coaching may also encourage particular categories of use as described further below. For example, by examining the assessed value of communications between caregroup members and the target of the caregroup and/or usage of various project templates across a family, the communication service platform may detect that the family is making little use of features that emphasize affective content (for example, family photos), or features that promote cognitive stimulation (for example, puzzles or projects), and suggest features in these categories. Similarly, if a family is not using any features that direct health or lifestyle information to the elders, coaching messages may be used to encourage doing so.

[0308] According to an alternative embodiment, digital gifts can be gathered into a daily delivery or "Daily Edition", rather like a family newsletter. Typically, a cover photo and a table of contents are used as a cover page. The Digital Edition also plays a useful role in encouraging communication among family members: when family members know what the elder is seeing in the Digital Edition, it stimulates them to communicate more with the elder, and with one another. That is, one family member's communication prompts communication by others. According to one embodiment, the commu-

nication service supports this implicit coaching effect by making Digital Edition contents available to family members on the Web via the family VPN website, for example.

[0309] FIG. 19 illustrates a user interface screen 1900 depicting a coaching message editor for a weekly summary according to one embodiment of the present invention. According to the present example, the administrating caregiver(s) may periodically, e.g., weekly, provide an update or summary to the caregroup regarding communications among the caregroup members and the user of the digital mailbox appliance corresponding to the caregroup.

[0310] If the administrating caregiver(s) participate in more than one caregroup, they initially select the caregroup via a user interface input object, such as a caregroup dropdown list 1910. The administrating caregiver may also select the caregroup members to which this coaching message is to be sent by using user interface input objects, such as the "Send To" radio buttons 1920 and/or corresponding dropdown Caregroup member email list.

[0311] According to various embodiments, some types of coaching message pre-filter (or at least suggest a filtering) of member addressees. For example: ex-officio members may be filtered from certain types of coaching messages as appropriate. A welcome coaching message suggests inclusion of only caregroup members who have not been introduced to the communication service or website, or who have not responded to an earlier welcome coaching message. The weekly summary email newsletter coaching message may filter caregroup members who have opt-ed out. A coaching message relating to encouraging the use of a particular digital gift type would presumably filters any caregroup members who have tried the particular digital gift type within a specified time period. Coaching messages requesting personal information may filter caregroup members who are current with regard to their personal data.

[0312] Returning to the present example, an "Editions Count" numeric display field 1930 may provide an indication of the number of daily deliveries that were sent to the digital mailbox appliance user during the corresponding period being summarized. The administrating caregiver may provide text commentary in an "Initial Text" text input field 1940 explaining the newsletter or pointing out items of particular interest. Finally, before distributing the newsletter, the administrating caregiver may preview the newsletter by selecting the "Preview Newsletter" button 1950. Responsive to selection of the "Preview Newsletter" button 1950 a user interface screen may be presented to the administrating caregiver to allow the newsletter to be viewed in the form in which it will be distributed according to currently selected parameters, such as timeframe, recipients, etc.

[0313] FIG. 20 illustrates a review coaching message user interface screen 2000 according to one embodiment of the present invention. In the present example, the administrating caregiver is provided an opportunity to review the newsletter prior to distribution to the list of recipients. The text message entered within the "Initial Text" text input field 1940 is displayed as introductory text 2020. A link 2015 is provided to facilitate easy access to the caregroup's website and encourage caregroup members to visit the website. The preview also includes a set of thumbnail image links 2030 to the various daily deliveries sent to the digital mailbox appliance user during the period at issue.

[0314] FIG. 21 illustrates a member activity user interface screen 2100 summarizing information regarding communi-

cations by members of a particular caregroup according to one embodiment of the present invention. In the present example, if the administrating caregiver participates in more than one caregroup, he/she may select one of the caregroups via a user interface input object, such as a caregroup drop-down list **2110**.

[0315] Responsive to selection of the caregroup of interest, a member activity report **2120** may be displayed. In the present example, the member activity report **2120** includes a name column **2121**, a last login column **2122**, a number of articles column **2123**, a last article column **2124**, a number of items column **2125**, and a last item column **2126**. More or fewer columns may be provided depending upon predetermined or configurable settings associated with the member activity report **2120**. For example, columns may be included for the individual rating values described above, e.g., affectiveness rating, intellectual stimulus rating, and activity inducement rating.

[0316] The member activity report **2120** may be used by administrating caregivers and/or customer service representatives of the communication service provider to make decisions regarding the types of coaching messages they would like to send and the targets of such coaching messages. In one embodiment, the administrating caregiver may sort the various columns **2121-2126** in ascending or descending order to assist processing of the information presented in the member activity report **2120**. The administrating caregiver may also select an individual caregroup member from the member activity report **2120** to obtain detailed information concerning the selected caregroup member's communications and activities within the communication system. As described further below various other charts, meters, tables, and reports may be provided to the administrating caregiver(s) and/or customer service operators of the communication service provider. Such tools may be used to analyze the communications being exchanged among the caregroup members and the digital mailbox appliance user corresponding to the caregroup.

[0317] After having used various communications analysis tools, the administrating caregiver may select a coaching messages tab from his/her dashboard to choose from a collection of prompt editors. The administrating caregiver may create special coaching messages or edit the configurations of automated prompts (e.g. weekly summary, new gifts, . . . etc.).

[0318] Returning to the present example, the name column **2121** of the member activity report **2120** lists the members of the selected caregroup and the digital mailbox appliance user associated with the selected caregroup. The last login column **2122** indicates the time and date of the last caregroup website login by the corresponding caregroup member. The number of articles column **2123** indicates the number of articles that have been contributed to the daily delivery by the corresponding caregroup member allowing the administrating caregiver to evaluate the relative participation of the caregroup members. The last article column **2124** provides information regarding the date and time of the last article contributed to the daily delivery by the corresponding caregroup member allowing the administrating caregiver to see how current the particular caregroup members' participation in the daily delivery is. The number of items column **2125** provides information regarding the number of digital gifts delivered to the user of the digital mailbox appliance by the corresponding caregroup member. The last item column **2126** provides

information regarding the date and time of the last digital gift sent by the corresponding caregroup member.

[0319] FIG. 22 illustrates a drill down member activity user interface screen **2200** listing communications by a specific member of a caregroup according to one embodiment of the present invention. In the present example, the drill down member activity user interface screen **2200** is presented responsive to selection of a particular caregroup member by the administrating caregiver from the member activity report **2120**. According to one embodiment the drill down member activity user interface screen **2200** may display a drill down member activity report **2210** including a title column **2211**, a last updated column **2212** and a view column **2213**. As above, more or fewer columns may be provided depending upon predetermined or configurable settings associated with the drill down member activity report **2220**. For example, columns may be included for one or more of individual affectiveness, intellectual stimulus and activity inducement rating values. Additionally, a column may be included relating to the various digital gifts sent by the caregroup member. Alternatively, a separate drill down member activity report relating to digital gifts may be included among the communication analysis tools provided to administrating caregivers.

[0320] In the present example, the title column **2211** of the drill down member activity report **2210** lists the titles of the various articles contributed by the selected caregroup member. The last updated column **2212** indicates the date and time the corresponding article was last updated. Finally, the view column **2213** provides a link to the corresponding article to allow the administrating caregiver to quickly review contributions by the selected caregroup member.

[0321] FIG. 23 illustrates an exemplary chart or dashboard monitor **2300** for effects of communications delivered to a particular elder that may be displayed within a user interface screen according to one embodiment of the present invention. According to the example illustrated, the effects chart **2300** visually depicts cumulative assessed rating values in the form of a bar chart for three exemplary categories of effects, i.e., activity induced **2310**, intellectual stimulus **2320**, and affectiveness **2330**, by month. Various other charting formats may be used, e.g., histogram, pie chart, etc., and differing aggregation timeframes may be used, e.g., day, week, year, etc. Charting and/or timeframe parameters may be predefined and user selectable or configurable by the administrating caregiver.

[0322] FIG. 24 illustrates an exemplary chart or dashboard monitor **2400** of communications delivered to a particular elder by caregroup member that may be displayed within a user interface screen according to one embodiment of the present invention. According to the example illustrated, the communications chart **2300** visually depicts the cumulative number of communications delivered to the particular elder in the form of a bar chart by caregroup member **2410-2490** and by month. Various other charting formats may be used, e.g., histogram, pie chart, etc., and differing aggregation timeframes may be used, e.g., day, week, year, etc. Charting and/or timeframe parameters may be predefined and user selectable or configurable by the administrating caregiver.

[0323] FIG. 25 illustrates an exemplary chart or dashboard monitor **2500** of digital gifts by category delivered to a particular elder that may be displayed within a user interface screen according to one embodiment of the present invention. According to the example illustrated, the gift categories chart **2500** visually depicts the cumulative number of digital gifts

delivered to the particular elder in the form of a bar chart by digital gift category **2510-2560** and by month. Various other charting formats may be used, e.g., histogram, pie chart, etc., and differing aggregation timeframes may be used, e.g., day, week, year, etc. Charting and/or timeframe parameters may be predefined and user selectable or configurable by the administering caregiver.

[0324] FIG. 26 is a flow diagram illustrating a method of performing good guessing according to one embodiment of the present invention. According to various embodiments of the present invention, the communication system platform, via caregroup websites, for example, may provide distinct editors for each digital gift type. In one embodiment, in order to facilitate the creation of digital gifts and encourage caregroup members to participate in digital gift giving to the digital mailbox appliance user associated with the caregroup, techniques are employed to establish intelligent defaults for content fields of digital gifts. These techniques are referred to herein as “good guessing.”

[0325] Examples of content fields include an eCard image, the greeting title text, and the ‘interior’ sentiment and signature text. According to one embodiment, good guessing is predicated on data collected by the communication service provider about the family or caregroup and/or context of the communication or the type of communication. For example, various information that may be used during good guessing processing includes one or more of the following: the caregroup member’s biographic information; information regarding communications history between one or more members of the caregroup and the focus of the caregroup, such as the caregroup’s specific communications activities, the specific communication history between the caregroup member and the user of the digital mailbox appliance; ascertained preferences of the target of the caregroup, the content created by the caregroup and/or the particular caregroup member, the type of the digital gift, and/or any survey data collected regarding their “out of band communications” (e.g., phone calls, emails between caregroup members that are not through the communication service provider, physical visits, etc.). Additionally, images and text included in digital gifts have associated keywords that may be used in categorization schemes for specific editors, such as a birthday card editor. Content supplied by the communication service provider and used by caregroup members may also have value in a search for a good guess.

[0326] According to the present example, each content-containing component of a digital gift has an associated query that is used to select from content items. Content items have fields for the image URL, subtitle text, commenting text, source (e.g., caregroup member, communication service provider staff), date, key-words (used for categories, etc.), seen (date) over which the queries are run. At block **2610**, the data collected and maintained in the communication service provider’s central service data base is queried to retrieve potential datum for use in filling the current content containing digital gift field. For example, the query may be against the caregroup member’s information and communications history with the user of the digital mailbox appliance and/or with others. Various other examples of specific data that may be collected for use in good guessing are described further below.

[0327] At block **2620**, a sorting methodology is applied to the retrieved datum to select a specific retrieved datum for inclusion in the current content-containing component of the

digital gift. Various sorting techniques may be employed, such as goodness of fit to various numerical assessments, least recently used, randomization, etc.

[0328] At decision block **2630**, a determination is made whether more content-containing components remain that have not been assigned a good guessing default. If so, then processing continues with block **2610**; otherwise, processing proceeds to block **2640**.

[0329] At block **2640**, the selected digital gift is displayed within the corresponding digital gift editor and each content-containing field of the digital gift is filled-in with the previously guessed content.

[0330] As indicated above, good guessing relies upon data collected and maintained by the communications service provider. Examples of specific data collected includes information about caregroup members (such as that entered into a member personal information user interface screen **2700** like that depicted in FIG. 27), about the elder/family schedule (such as that entered into an elder’s schedule user interface screen **2800** like that depicted in FIG. 28), about specific communications (such as a photo essay **2900** like that depicted in FIG. 29), from occasional surveys that might be conducted. Data from such surveys might include recollection of phone calls, recollection of member-member emailing outside of the communication system platform and recent visits to the elder, including, duration, topics discussed, . . . etc.

[0331] FIG. 27 illustrates a member personal information user interface screen **2700** according to one embodiment of the present invention. Caregroup members or administering caregivers may enter various information, such as name, address, phone numbers, email addresses (including camera phone addresses), birthdate (the year is recorded but may not be posted), ID photo(s), opt-in coaching permissions, editing privileges, . . . etc.), nick names, . . . etc., via a pop-up editor (or pop-ups) as shown **2710** and as described further below.

[0332] FIG. 28 illustrates an elder’s schedule user interface screen **2800** according to one embodiment of the present invention. In one embodiment, information regarding the elder’s and/or the family’s schedule may be provided via user interface screen **2800**. Examples of information that might be entered and maintained on behalf of a family caregroup include family recognized holidays, birthdays (from the core member data), events (e.g., a Thanksgiving reunion), doctor’s appointments, . . . etc. Information here can be used to drive various coaching opportunities to both the elder and caregroup members.

[0333] FIG. 29 illustrates an example of a user interface screen **2900** depicting a photo essay type digital gift according to one embodiment of the present invention. According to one embodiment, the communication service provider collects and maintains information about specific communications in order to facilitate charting and reporting to the administering caregiver(s) and to support good guessing.

[0334] Such information collection is simplified by the fact that all digital gifts delivered are generated from a database record created by the caregroup member’s interactions with a specific digital gift editor, or parsing of a traditional email. The more precise the records, the more helpful the coaching and good guessing will be.

[0335] Information that may be collected regarding a particular digital gift includes the type of message (e.g., digital gift), header information (such as source, recipient(s), date, title, etc.), gift type (e.g., photo essay), creation date, delivery

date, images used (both family content and content supplied by the communication service provider), various categories of text (such as that associated with specific images), . . . etc. Images typically have subtitle and body text associated with them. This text often contains information that can be correlated and used in good guessing.

[0336] FIG. 30 illustrates a user interface screen 3000 depicting an initial (blank) photo essay 3010 (or photo journal) type of digital gift with embedded edit stimulus markers 3011-3115 according to one embodiment of the present invention. Using the popup editor mechanism, each field presents (one or more) presentation components. Thus, responsive to selection of an editable field, such as 3014, by the end user, an image editor 3016 might present a light table with image content supplied by the communication service provider, or family images or an image uploading tool.

[0337] FIG. 31 illustrates a user interface screen depicting a personalizable ready made eCard type of digital gift resulting from good guessing according to one embodiment of the present invention. Within the basic eCard editor 3100 the system has guessed that a Halloween card is what is likely to be appropriate and in particular a colorful image of Halloween gourds has been guessed. It is highlighted yellow because the user has passed the mouse over the image. Selecting the image brings up a light table of likely alternative images 3110. Selecting an image from the light table of likely alternative images 3110 would replace the current eCard image.

[0338] FIG. 32 illustrates various user interface screen shots, selection from a collection of digital gifts and good guessing defaults according to one embodiment of the present invention. According to the present example, a caregiver has logged into a caregroup VPN and is taken to a home page 3200 for the caregroup website, e.g., the "What's new?" page. Here the caregroup member may be presented with cover photo thumbnails 3211 from the last week's daily deliveries that have already been delivered to the elder. Selecting one of the thumbnails 3211 retrieves and presents an electronic rendering of the corresponding daily delivery. Selecting a digital gifts button 3210 (2nd from the left on the navigation bar) the caregroup member is presented with a list of possible digital gifts 3220 to send the elder (or another member of the caregroup).

[0339] Upon selecting a digital gift type, a custom editor for the selected digital gift type is opened. For example, if the caregroup member indicates he/she would like to send a thank you note by selecting the "Thank you note" hyper link 3221, then a thank you note editor 3230 is presented with a thank you note 3240 containing good guessing defaults for the title 3241, picture 3242, and sentiment 3243 as described earlier. The good guessing defaults may be changed by the caregroup member by selecting the particular content containing element and replacing it with personalized content. Alternatively, if the caregroup member indicates he/she would like to send a photo collage by selecting the "Photo collage" hyper-text link 3222, then a photo collage editor 3250 is presented with recently uploaded photos from the caregroup member's camera phone. Again, the caregroup member may edit the digital gift before sending it by adding, deleting and/or replacing photos, for example.

[0340] FIG. 33 is a flow diagram illustrating a method of interacting with pop-up forms according to one embodiment of the present invention. In the example depicted, pop-up form processing begins at block 3310 responsive to selection of a field or group of fields by a caregroup member from

within an editor, such as a digital gift editor. At block 3310, an indication of the selected field or group of fields is received. At block 3320, a pop-up form corresponding to the selected field or group of fields is presented to the caregroup member. After the caregroup member has made the appropriate choices and/or provided the requested information and submitted the pop-up form, at block 3330, an indication is received by the originating editor that the pop-up form has been completed. Then, at block 3340, the originating editor is re-rendered based upon the information submitted via the pop-up editor thereby giving the caregroup member real-time feedback regarding the effects his/her decisions/selections have on a digital gift being created, for example.

[0341] FIG. 34 illustrates customization and re-rendering of a pop-up in the context of a note editor according to one embodiment of the present invention. Continuing with the example discussed with reference to FIG. 32, upon receiving an indication by a caregroup member that he/she would like to create a thank you note, the "thank you note" editor 3230 is presented with "good guesses" regarding appropriate content for fields, such as a likely image for picture field 3232, within the thank you note 3240. Note the "Send it!" button 3270 in the lower right hand corner of the thank you note editor 3230. The thank you note 3240 is ready to go if the caregroup member is satisfied with the defaults selected by the good guessing process. If the caregroup member likes what they see they can send the thank you note 3240 immediately.

[0342] As described earlier, the thank you note editor 3230 employs good guessing to supply the likely image, text for the title, and even a draft sentiment (derived from the message type, communications histories of both the caregiver and the elder, and numbers of other parameters). If the caregroup member would like to revise one of the editable components, such as the image for picture field 3232, they are highlighted in some manner to indicate their editability, for example, by being bordered with a dashed red outline. In the present example, the caregroup member has selected the picture field 3232 to choose a different image. Selecting the picture field 3232 brings up a pop-up window 3400 providing a table of options 3410. Choosing a personal picture of the grand daughter 3415 from the table of options 3410 causes the thank you note editor 3230 to re-render the revised thank you note 3260 (which now includes the selected image 3415 in the picture field 3232) to send or modify further.

[0343] FIG. 35 illustrates examples of various pop-ups 3510-3560 according to one embodiment of the present invention. Pop-up 3510 is an example of a pop-up window that may be used to change the title and text associated with a picture in the caregroup member's shoebox. Pop-up 3520 is an example of a pop-up window that may be used to change the delivery date of an article submitted by a caregroup member for publication in a daily delivery. Pop-up 3530 is an example of a pop-up window that may be used to allow a caregroup member to select a picture from the caregroup member's shoebox. Pop-up 3540 is an example of a pop-up window that may be used to provide an administrative caregiver with mutually exclusive options from which to select for configuring various parameters within the caregroup VPN. Pop-up 3550 is an example of a pop-up window that may be used to edit groups of related fields, such as biographic information and contact information. Pop-up 3560 is an example of a pop-up window that may be used to change text associated with a picture in the context of a photo essay or photo journal digital gift, for example.

[0344] FIG. 36 illustrates examples of various digital gifts according to one embodiment of the present invention in the form of a collage including a personalized weekly calendar digital gift 3610, an astronomy picture of the day digital gift 3615, a daily delivery publication digital gift 3620, an orchid of the day digital gift 3625, an annotated cartoon digital gift 3630, a personalized (eCard) birthday card digital gift 3635, a crossword puzzle digital gift 3640, a daily jokes digital gift 3645, a kid art digital gift 3650, a photo essay digital gift 3655, a photo collage digital gift 3660, a family weather digital gift 3665, a web clipping digital gift 3670.

[0345] As should be appreciated, various art and projects from the elder's grand children or other relatives serve as particularly valued contributions to the daily delivery. In pilot studies, both the elder and all the adult caregroup members remarked in surveys on their particular pleasure in these occasional contributions.

[0346] A favorite family photo with the next week's schedule of events, maintained as part of the Discussion site, for example, may serve as the raw material. Any family member can use the calendar Digital Gift to provide a calendar that the elder can print out and post. The weekly calendar is of particular interest because it may serve as a mechanism for family members to coach the elder for upcoming events such as doctor's appointments, family visits, the monthly hair appointment, physical therapy, . . . etc.

[0347] FIG. 38 illustrates a specific example of a Halloween card 3800 sent during a field test implemented by the assignee of the present invention. In this specific example, the family "knew he was back to his old self" when the elder decorated the Halloween card 3800 he was sending with his old "mustachioed Portuguese guy" logo humorously adapted as a pumpkin face 3810.

[0348] FIG. 39 illustrates examples of various samples of coaching or therapeutic digital gifts according to one embodiment of the present invention in the form of a collage. Family members may find a myriad of ways to exploit digital mailbox communications to encourage, to coach, to stimulate, to facilitate, to remind, to test, to strengthen the spirit of their loved ones. According to the present example, the coaching or therapeutic digital gifts include, a typical cheerful get well card 3900, a weekly schedule 3910: reminders of appointments, therapy, . . . coupled with a favorite family picture encouraging putting the schedule on the refrigerator door, Information on an AARP safe driver program—a web clipping that a niece gathered upon request 3920, a crossword puzzle sent to provide intellectual stimulus, or to help pass the time while convalescing 3930, Just a quick sharing-life pick-me-up of a CameraPhone collage 3950, an actual clinical screening test for depression (clipped from the web) 3940. There are similar tests for Addictive behaviors, anxiety, chronic fatigue, abuse, alcohol assessment, nutrition assessments, geriatric depression, stress, . . . etc.

EXAMPLES

[0349] As a result of the flexibility provided by the various embodiments of the communication system and methods described herein, it should be appreciated that it is not feasible to comprehensively describe all possible usage scenarios and interactions between or among the participants. Consequently, while various treatment and diagnosis examples are provided below in order to facilitate understanding of the flexible nature of the described communication system, the

examples should not be considered to be all-inclusive or static. Furthermore, the examples should not be considered mutually exclusive.

Example #1

Coaching Physical Therapy

[0350] The assignee of the present invention observed during a field trial that one of Elder A's daughters was sending him bawdy barroom style jokes. This had not been a previous characteristic of their interactions so it was investigated. It turns out that she was sending the jokes for Elder A to use with his fellow 'senior guys' at Physical Therapy sessions. Elder A had become 'mister joke man.' Interviewing the daughter, it turns out she was doing this to remotely encourage (and monitor) Elder A's attendance at physical therapy. The jokes not only gave Elder A a kind of social currency and status at physical therapy but also gave his daughter an excuse to find out how the 'boys' liked it thereby checking in on Elder A's attendance at an activity that heretofore he had eschewed. The daughter was both enabling and coaching Elder A's attendance in a socially acceptable manner without appearing to nag. The precursor communication system made the finding and delivery of the jokes a minimal task for the daughter. In this case, the monitoring was typically done during weekly or bi-weekly phone calls in which the jokes were a regular source of conversation.

Example #2

Alertment

[0351] FIG. 37 is a graph illustrating a sample plot of an elder's response rate over time. Within one embodiment of the closed communication system, family members are provided with the ability to observe both the frequency of elder responses to various types of inquires as well as the quality of the responses (both the handwriting as well as the substance of the missive—humor, with, . . . etc.). Because the missives are archived, they are easy to count over time as well as permitting specific examination. So, observations regarding increases in the micrographic nature of the elder's handwriting might be indicative of onset or worsening of Parkinson's disease. Decreases in the number of responses as shown in the response rate graph 3800 or a "flattening" of the content might warn family members of the approach of a depressive state or cycle. Consequently, a drop off in responses (quantity and quality) with respect to one individual or in the aggregate may indicate the onset or worsening of a particular physical or mental condition, disorder, disability or illness, injury, or chronic condition of the elder.

Example #3

Engendering a Purpose

[0352] Imagine a mother and daughters having a joint project to collect, present, and publish to the family mom's recipes. Various embodiments of the communication system platform described herein support and amplify such an effort even though it might involve multiple members of a caregroup spread across the continent. Imagine the daughters doing test preparations of each of the recipes with their children and taking pictures of the activity as well as the results. These materials can then be gathered into a publication (online or in book form) to be shared throughout the family. This

kind of activity not only provides a shared activity between a mother and her distant daughters but it actually can define a purpose for the elder. These kinds of purposeful activities are known to extend the health and well-being of participating elders.

Example #4

Putting Granny in-the-Flow of Complex Family Life

[0353] In days gone by multi-generation living meant that as Granny aged she sat on a rocker by the hearth. From here she watched the kids running in and out, gave occasional advice, and told stories. GrannySnap seeks to reintroduce a significant part of that activity. In one embodiment, GrannySnap is a CameraPhone application that caregroup members can configure online and download from the family's website. In turns the CameraPhone into a direct pipeline from camera to a digital gift scheduled for the next delivery to grandma. In alternative embodiments, GrannySnap functionality may be configured on the CameraPhone too, plus it may be loaded from places other than the family's website. In a preferred embodiment, GrannySnap allows "one button" routing of content from a CameraPhone to a predefined online area.

[0354] Say the kids are going to the zoo (in St. Louis, Granny is in San Diego). Turning on GrannySnap, dad takes pictures of the kids watching the elephant, mocking the apes, and petting the llama. The pictures are automatically sent to a collage for 8 AM delivery to Granny. This provokes a response from Granny commenting on her experiences with her favorite horse when she was growing up. This provokes a phone call from the granddaughter, Maria, because she is writing a report on rural living for her social studies class. These kinds of interactions give Granny her place across the generations, give her specific activities, and stimulate her memory and social interaction skills. These are exactly they types of social and productive activities that Thomas Glass and the MacArthur Foundation have show to improve the quality and extend the life of the elderly. This example not only shows putting the elder into the flow of the family, it shows how digital gifts provoke both return gifts but also engender positive activity on the part of the elder.

Example #5

Reawakening Thoughts

[0355] Fifteen years ago, one of the elders involved in a field test administered by the assignee of the present invention was an active orchid fancier. He owned a greenhouse, bought, sold, collected and traded specimens, and actively attended orchid shows. This interest was moribund. An orchid of the day digital gift stimulated this dormant interest. Orchids are once again a subject of interest for the elder, and a positive topic of communication between the elder and family members. The elder explains to family members (who can share the daily content over the web) his personal knowledge of particularly interesting specimens and reminisces of the days when he collected specimens in Costa Rica.

Example #6

Intellectual Stimulus I

[0356] Verghese, et al. (2003). Asserts "... elderly persons who did crossword puzzles four days a week had a risk of dementia that was 47 percent lower than among subjects who

did puzzles once a week." Different elders have different preferences: for example crosswords, jumbles, chess, brain teasers, ... etc. Caregroups are encouraged to pick and choose intellectual stimulus that the elder is interested in. Various embodiments of the communication service described herein may automate, monitor, and notify interested members in the stimuli provided. The communication service may also provide answer tools and monitor elder performance. The sociology of what degree of monitoring and notification is desirable varies from caregroup to caregroup depending on family sociology, elder preferences and the specific circumstances of the elder. The communication system may leave these issues as configurable parameters by the caregroup.

[0357] Doug's father, Jack (age 90), used to be a crossword puzzle fiend, but has stopped doing puzzles in the last few years. Jack and Doug have always enjoyed father-son friendly competitions: golf, fishing, etc. but due to Jack's age and Doug now living several hours away, these outings have stopped. Using the a communication service in accordance with an embodiment of the present invention, Doug arranges to send Jack a crossword puzzle 3 times per week. It's just a digital gift that he sets for automatic delivery Monday, Wednesday, and Saturday. Saturday is "challenge day" since Doug just doesn't have the time to do the challenge during the work week. Jack and Doug compare answers by phone on Saturday afternoon. Jack tells his physician that he "feels great getting his brained exercised, and loves having a weekly challenge with his son, now that they can't play golf or fish anymore."

Example #7

Intellectual Stimulus II

[0358] A variety of games, such as family turn taking games, can be integrated into the communication service platform. For example, Scrabble can be played with 0 to 3 other family members. Note that the communication service platform may automate one or more players, thus filling in for a family member who misses a day. Some will prefer to play a day-a-move chess game with a favorite grand-niece. These activities provide several purposes. They provide: 1) significant intellectual stimulus, 2) daily connection with family members, 3) a tool for the other gamers to monitor the elder's behaviors, 4) an anticipated activity for the elder to fill an otherwise lonely day.

Example #8

Affective Communications I (Kid Art)

[0359] One of the strongest effects in sustaining or recovering well-being is interest and love being expressed by the youngest members of an elder's social network. In a large percentage of Alzheimer's cases the primary caregiver is an aging spouse. The incidence of high stress and depression in such cases is high. Attendant with the ever accelerating responsibilities to the resident caregiver is a sense of isolation and a feeling of caring the burden alone. Various embodiments of the communication system platform described herein permit family members from across the country to not only send items to the ailing elder but also the burdened spouse. Everyday family members are checking in, buoying the spirits with news of grandchildren, just showing that they are thinking of the caregiver. Family members may also monitor the spirit of the elder on an almost everyday basis. All

of the observations made about being able to have earlier recognition of depressive behaviors hold for the caregiver as well as the Alzheimer's patient.

Example #9

Coaching II

[0360] There are several barriers to increasing the amount and effectiveness of communications with the elderly.

[0361] Lack of Awareness: With our busy lives even our dearest family members drop off our day-to-day radar. Various embodiments of the present invention address that in several ways:

[0362] Receipt of weekly updates regarding various digital gifts to and from the elder. Seeing the photos or greeting cards or other missives going to grandma reminds each of the members in the caregroup of their impulse to tell her they care.

[0363] Receipt of simple direct hand-written messages from Grandma directly to the members of her caregroup delivered to their electronic world (e.g., email or cell phone).

[0364] Automated and/or member-to-member coaching messages and/or self notifications providing regular reminders of easy, fun and novel digital gifts to send.

[0365] Lack of Time: None of us has a lot of time in our busy lives. Embodiments of the present invention, respects the caregroup members' time by:

[0366] Providing a large number of specialized editors designed to suggest and speedily compose a wide variety of evocative and stimulating digital gifts that can be created and sent in as little as 10 seconds.

Example #10

Diagnosis I

[0367] In June, Elder A is able to complete a reasonably complex crossword puzzle and is proud of the accomplishment. In September, Elder A is unable to complete a similar level of crossword puzzle and expresses frustration to caregiver who sent puzzle. The communication system flags this and also has monitored other signs of decline (use of the digital mailbox appliance), level of communications, handwriting, etc. To support this use, the family caregiver could use the communication system to administer periodic checks/tests to monitor the status of the elder. The communication system prompts the administrator to check to see if there has been any change in treatment, such as new medications, with any of the primary caregiver, the elder, or the ex officio healthcare professional.

Example #11

Diagnosis II

[0368] Based on significant experience with widely disseminated supported communications networks, it is determined that, once a network has been established, a level of elder activity sending at least 5 messages a week and completing one puzzle or game per week indicates a healthy status for a certain user demographic (e.g., female, widowed, age 75-78). When variations from this level of usage occur, a caregiver is notified. Patterns of communication are determined, so that it is possible to have a better prognosis of the progression of a condition, such as Alzheimer's disease. For

instance, if the number of messages, length of message or number of network members contacted decline over a period of time, it may be possible, based on studying large numbers of elders, to predict when certain stages of disease may be reached. This may be useful to provide additional time to caregivers to determine additional health care requirements (for instance, arrange for long term care facility, move elder to a different place). Another potential measure might be the rate of elder response to explicit coached replies, such as return-reply requested forms, eCard order forms, . . . etc.

Example #12

Diagnosis III

[0369] Various embodiments of the communication system monitor usage by primary caregiver(s) to see if data or communication pattern changes could signal stress, depression or decline for this person. As an example, over time the system may establish that as communication by an elder declines, communication from a resident relative caregiver increases. In the event of Elder Y, as communication decreases, the communication from Elder Y's spouse, X, decreases at an even faster rate. The system could notify other caregivers, which might suggest a visit by another family member, or that the spouse see their physician or generate health tip coaching for the caregiver.

Example #13

Recovery from an Injury

[0370] Gertrude, age 84, breaks her hip in a fall in her home. Over the next months she is taken to the emergency room, has hip replacement surgery, goes from the hospital to a convalescence facility for several weeks and for a final recovery two months with her daughter who lives 5 miles from her home. All during this time from the hospital until she is back at home her digital mailbox is moved along with her: anywhere she has a phone line she remains connected. Better still her mailbox only requires paper and pencil. Her support group uses it not only to send her messages of concern and pleasant missives but also:

[0371] Digital gifts keeping her up to date on the Halloween season with the kids she missed and the Thanksgiving with her son John's family in North Carolina she had to forgo,

[0372] Sally, her daughter, notified all the family (including the cousins in Newark) ("It's so nice that they all either called or send a get well card").

[0373] Puzzles and entertainment to keep her occupied and her mind alert ("that TV can be so deadening if you look at it all day"),

[0374] Information from web clippings on typical recovery processes for her age group,

[0375] Resumed the running scrabble game she was playing on a daily basis with the kids in Omaha,

[0376] Continued gathering of her comments on the compilation of family recipes that her daughter Mary has been conducting with her over the previous 6 months,

[0377] Reconnected with her niece in Wisconsin ("isn't it nice how even a disaster can bring us all back together again"),

[0378] Coordinating her various moves (e.g. to the convalescence home) with her daughter,

[0379] Getting encouragement from several members in her support group on the 6 day a week physical therapy sessions (“including those weird Ballard Street cartoons from Jenny—what is that about anyway?”),

[0380] Arranging for regular delivery of the prescription medications that her doctors want her to use during recovery (Sally sent her that data showing her the benefits of this new pain medication and assuring her that it has no addictive effects. “Who trusts doctors anyway?”),

[0381] Letting the room therapist in the hospital keep the family up to date on Gertrude’s early progress,

[0382] This example extends to virtually any long term care, recovery or convalescence—cancer, heart operation, back surgery, diabetes, . . . etc. It also shows the richness of purpose and effect that the many members of Gertrude’s social support network can have, each helping just a little to accumulate to a great effect on Gertrude. Speeding her recovery, keeping her on track with her therapy regimens, keeping her spirits up in a situation that threatens isolation, loneliness and depression, helping with life’s minor problems made impossible by being immobile, monitoring her progress without being pests.

Example #14

Injury (Memory) and Physical Therapy Compliance

[0383] John, age 36, is recovering from brain surgery which occurred after he was injured when a rock came through his windshield. He has had difficulty recalling events prior to the accident and has twice weekly physical therapy sessions as well as daily exercises he is supposed to do. By using the a communication system in accordance with an embodiment of the present invention, John’s family support network is able to send him pictures of past events, along with descriptions of the event. For example, his sister Beth sent him pictures from a camping trip they had taken several years earlier and this triggered memories of fly-fishing for John. In addition, John’s digital mailbox appliance prints out a daily schedule, including physical therapy appointments and reminders to perform his exercises. In time, John recovered most of his memories and completes his physical therapy. John’s physician felt that there had been noticeable improvement in John after the communication system was put in use, and that the communication system had assisted John’s recovery in several aspects: a) assisting memory recall; b) noticeable improvement in physical therapy compliance and c) general feeling of well-being due to the feelings of support and affection he received from his family.

Example #15

Reducing the Risk of Substance Abuse

[0384] Rex, age 70, is a caregiver for Ethel, who is suffering from Alzheimer’s disease. Their closest family members live several hundred miles away. Rex has a history of alcohol abuse, although he has been sober for 2 years, and the family is concerned that with the additional stresses of caring for Ethel, Rex may start drinking again. By using a communication system in accordance with an embodiment of the present invention to communicate with Rex and Ethel, the family is able to reduce caregiving stress and associated likelihood of depression for Rex by supporting Ethel and reducing Rex’s sense of isolation. In addition, by targeting specific coaching and support messages for Rex, such as encouragement to

attend church, exercise and play cards with some friends who don’t drink, the likelihood of Rex abusing alcohol is reduced. Finally, the family is able to monitor Rex’s behavior and can intervene if they detect he has started drinking again.

Example #16

Drug Therapy Compliance

[0385] Jane is a widow, age 79, who suffered from diabetes, high cholesterol and early stage Alzheimer’s disease. Jane, like many elderly patients, was taking 4 different prescription drugs, which had different pills, different doses (number of pills) and different dosing schedules. As Jane aged, she found it increasingly difficult to properly comply with her various drug regimens and her physician was concerned that this would compromise her health and ability to live independently. Using a communication system in accordance with an embodiment of the present invention, Jane’s physician and daughter customized a Digital Gift that provided Jane with a simple daily schedule and checklist for her prescriptions, which she used to check off and send back to the daughter and the physician’s office each day. The problem was resolved for almost 18 months and Jane was able to continue to live independently until she was involved in a car accident, at which time she was placed in a resident care facility.

Example #17

System Generated Healthcare Provider Alert

[0386] Using the drug therapy compliance example above, during the 18 month period of system use, during month 7, the physician prescribed a drug to help Jane sleep better. In the following week, Jane’s communications with family members dropped significantly, and she failed to return 1 of her daily prescription checklists. The system alerted the administering caregiver (daughter) and physician, who had earlier set up the system to alert them to changes in communication volume and for missed daily reports. The daughter phoned Jane, who complained that she was feeling “tired and drowsy” and the physician adjusted the dose to resolve the problem. Jane’s system usage then returned to prior levels.

Example #18

Reduced Stress, Depression and Risk of Disease in Elder and Primary Caregiver

[0387] A controlled study comparing 30 families with elders suffering from Alzheimer’s disease who used a prototype communication system to 30 families with elders suffering from Alzheimer’s disease who did not use such a system is being conducted. After the first year of this five-year study, researchers have concluded:

[0388] i) that the amount of family communication with the elder has increased by 35%;

[0389] ii) that in the communication system using families, the elder is twice as likely to receive a daily communication from a family member than the non-user elders;

[0390] iii) that elders in the communication system group reported a higher level of well being, lower levels of depression and stress, and fewer new health problems than the control group;

[0391] iv) that compliance with drug and physical therapy regimens was significantly higher in the communication system using group of elders;

[0392] v) that primary caregivers in the communication system using group reported significantly lower levels of stress, depression and new health problems than the control group.

[0393] vi) that participating family members of the communication system using group reported a higher level of well being and involvement and lower levels of stress and depression over elder care than family members in the control group.

[0394] While embodiments of the invention have been illustrated and described, it will be clear that the invention is not limited to these embodiments only. Numerous modifications, changes, variations, substitutions, and equivalents will be apparent to those skilled in the art, without departing from the spirit and scope of the invention, as described in the claims.

What is claimed is:

1. A method comprising:

providing a closed communication service configured to facilitate and encourage communications among a plurality of members of a caregroup and a target of the caregroup, the target of the caregroup using a hardcopy-based communication appliance associated with the caregroup to transmit and receive electronic communications via the closed communication service to and from the plurality of members of the caregroup;

one or more coaching tool routines facilitating identification, creation and delivery of appropriate member-to-member and member-to-target coaching messages by allowing one or more administering caregivers of the plurality of members of the caregroup to view metrics relating to electronic communications exchanged via the closed communication service; and

wherein the one or more coaching tool routines are implemented in one or more processors and one or more computer-readable media of one or more server computer systems that are part of the closed communication service, the one or more computer-readable media having instructions tangibly embodied therein representing the one or more coaching tool routines that are executable by the one or more processors.

2. The method of claim 1, further comprising providing within the closed communication service one or more digital gift suggestion routines operable to allow the one or more administering caregivers to include within the coaching messages suggestions regarding appropriate types of digital gifts that may be sent via the closed communication service.

3. The method of claim 1, further comprising providing within the closed communication service one or more tools that provide information to healthcare providing caregivers to assess and diagnose the condition of the target and to make prognoses regarding the condition of the target and to deliver and receive private communications with a patient, primary caregiver, or administering caregiver.

4. The method of claim 1, wherein the metrics include one or more of:

a rating regarding an affective-emotional value of electronic communications received by the target of the caregroup;

a rating regarding an intellectual stimulus value of the electronic communications received by the target of the caregroup;

a rating regarding activity induced value of the electronic communications received by the target of the caregroup; information provided by caregivers or target to the closed communication service or healthcare providing caregivers;

information interpreted by healthcare providing caregivers;

information regarding historical norms of electronic communications frequencies with the target of the caregroup by individual members of the plurality of members of the caregroup.

5. The method of claim 1, further comprising ameliorating or slowing progression of Alzheimer's disease or symptoms associated with Alzheimer's disease in a subject with Alzheimer's disease as a result of enrolling the subject and a family support network associated with the subject in the closed communication service and participation in the closed communication service by the subject and members of the family support network.

6. The method of claim 1, further comprising decreasing an at risk subject's risk of developing a condition including one or more of Alzheimer's disease, depression, stress, physical illness, cancer, a geriatric cognitive disorder, and heart disease as a result of enrolling the at risk subject and a family support network associated with the at risk subject and participation in the closed communication service by the at risk subject and members of the family support network.

7. The method of claim 6, wherein participation in the closed communication service decreases the subject's risk of developing the condition, reduces the severity of the condition or delays the onset of the condition.

8. The method of claim 1, further comprising slowing progression of a chronic condition of an elder subject as a result of enrolling the elder subject and a family support network associated with the elder subject in the closed communication service and participation by the elder subject and members of the family support network in the closed communication service.

9. The method of claim 1, further comprising improving health and well-being of an elder subject or improving the elder subject's compliance with one or more of a drug therapy regimen and a physical therapy regimen as a result of enrolling the elder subject and a family support network associated with the elder subject in the closed communication service and participation in the closed communication service by the elder subject and members of the family support network.

10. The method of claim 9, further comprising improving health and well-being of one or more members of the family support network as a result of participation in the closed communication service.

11. The method of claim 1, further comprising ameliorating symptoms associated with dementia for a subject with dementia as a result of enrolling the subject and a family support network associated with the subject in the closed communication service and participation by the subject and members of the family support network in the closed communication service.

12. The method of claim 1, wherein the hard-copy based communication appliance comprises a digital mailbox appliance.

13. A method comprising:
 providing a closed communication service configured to facilitate and encourage communications among a plurality of members of a caregroup and a subject that is a target of the caregroup, the subject using a hard-copy based communication appliance associated with the caregroup to transmit and receive electronic communications via the closed communication service to and from the plurality of members of the caregroup;
 one or more metric tracking routines capturing information regarding communications among the plurality of members of the caregroup and the subject via the closed communication service;
 one or more metric communication routines providing information to healthcare providing caregivers to assess and diagnose the condition of the subject and to make prognoses regarding the condition of the subject; and
 wherein the one or more metric tracking routines and the one or more metric communication routines are implemented in one or more processors and one or more computer-readable media of one or more server computer systems that are part of the closed communication service, the one or more computer-readable media having instructions tangibly embodied therein representing the one or more metric tracking routines and the one or more metric communication routines that are executable by the one or more processors.

14. The method of claim **13**, wherein the hard-copy based communication appliance comprises a digital mailbox appliance.

15. A method comprising:
 providing a closed communication service configured to facilitate and encourage communications among a plurality of members of a caregroup and a subject that is a target of the caregroup, the subject using a hardcopy-based communication appliance associated with the caregroup to transmit and receive electronic communications via the closed communication service to or from the plurality of members of the caregroup;
 one or more metric tracking routines, capturing information regarding communications exchanged among the plurality of members of the caregroup and the subject via the closed communication service;
 the one or more metric tracking routines calculating one or more metrics based on the captured information;

one or more coaching message generation routines, based on the one or more metrics, the closed communication service automatically generating and delivering coaching messages in an effort to encourage a set of goals, including one or more of (i) frequent communications among the plurality of members of the caregroup and the subject, (ii) affective communications, (iii) stimulating or activity inducing communications; and (iv) communications with ex officio caregivers who are professional healthcare providers; and

wherein the one or more metric tracking routines and the one or more coaching message generation routines are implemented in one or more processors and one or more computer-readable media of one or more server computer systems that are part of the closed communication service, the one or more computer-readable media having instructions tangibly embodied therein representing the one or more metric tracking routines and the one or more coaching message generation routines that are executable by the one or more processors.

16. The method of claim **15**, wherein the coaching messages include suggestions regarding use of appropriate digital gifts consistent with the set of goals.

17. The method of claim **15**, wherein the metrics include one or more of:

- a rating regarding an affective-emotional value of communications received by the subject;
- a rating regarding an intellectual stimulus value of communications received by the subject;
- a rating regarding activity induced value of the communications received by the subject;
- information provided by caregivers or the subject to the closed communication service or healthcare providing caregivers;
- information interpreted by healthcare providing caregivers;
- information regarding historical norms of communications frequencies with the subject by individual members of the plurality of members of the caregroup.

18. The method of claim **15**, wherein the hard-copy based communication appliance comprises a digital mailbox appliance.

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