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(54) **INLINE DOCUMENT COLLABORATION WORKFLOW**

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(73) Assignee: **Microsoft Corporation**, Redmond, WA (US)

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Publication Classification

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G06F 3/0484 (2006.01)

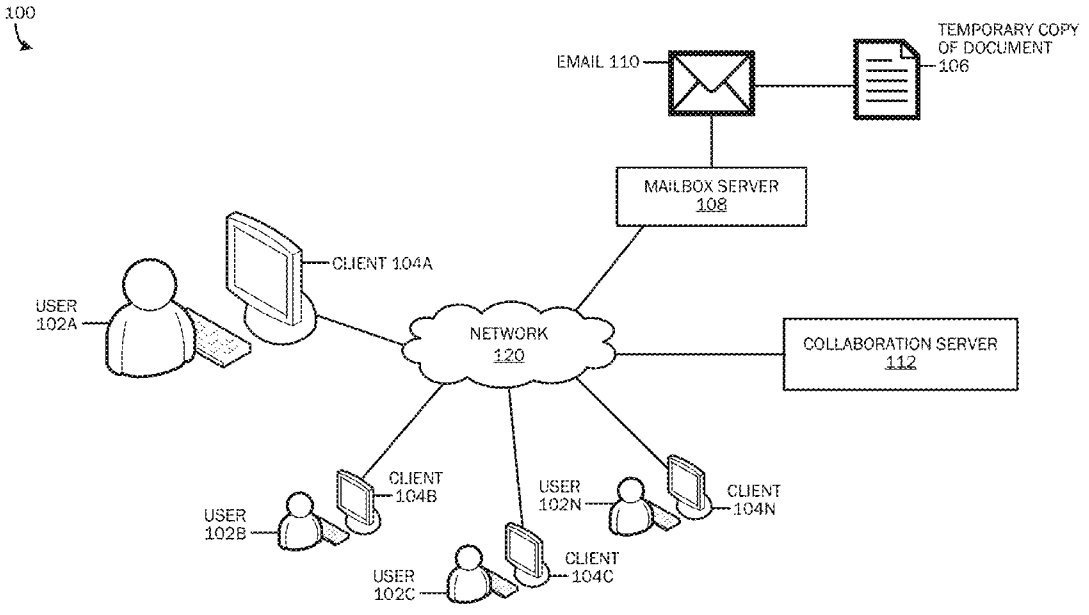
H04L 29/08 (2006.01)

(52) **U.S. Cl.**

CPC ***G06F 3/04847*** (2013.01); ***G06F 3/04842*** (2013.01); ***H04L 67/10*** (2013.01)

(57) **ABSTRACT**

Inline document collaboration workflows are provided. When a user receives an electronic communication that includes an attached content item, the receiving user may select the attached content item and cause the attached content item to be displayed in an immersive view in proximity to an electronic communication pane in which an electronic communication may be conducted about any topic including the content item that is displayed in proximity to the electronic communication pane. During editing of a content item, an electronic communication may be generated from a user interface in which the content item is being generated, or alternatively a new content item may be generated out of an electronic communications user interface.



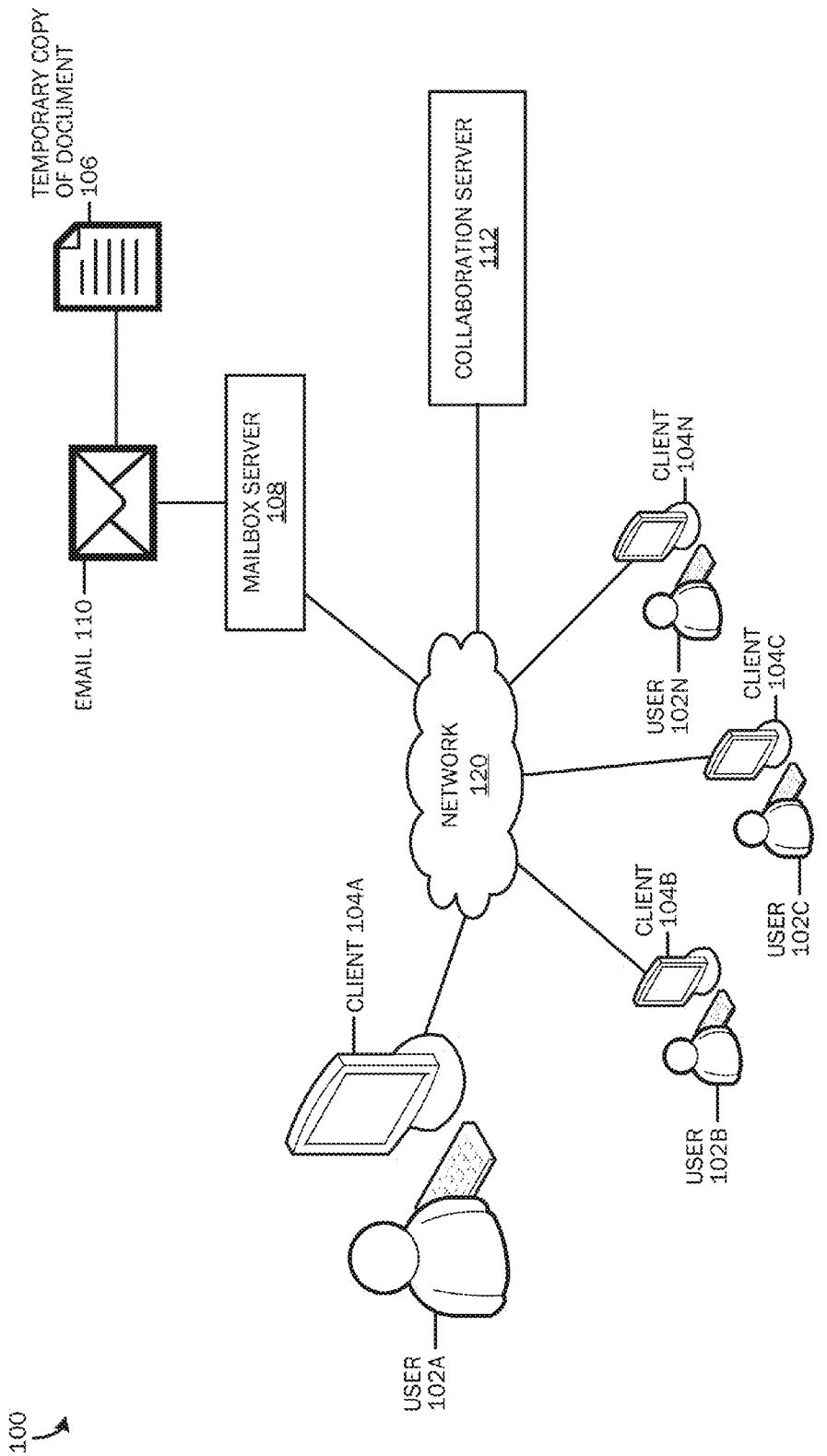

100
USER 102A
CLIENT 104A
USER 102B
CLIENT 104B
USER 102C
CLIENT 104C
USER 102N
CLIENT 104N
NETWORK 120
COLLABORATION SERVER 112
MAILBOX SERVER 108
EMAIL 110
TEMPORARY COPY OF DOCUMENT 106

FIG. 1

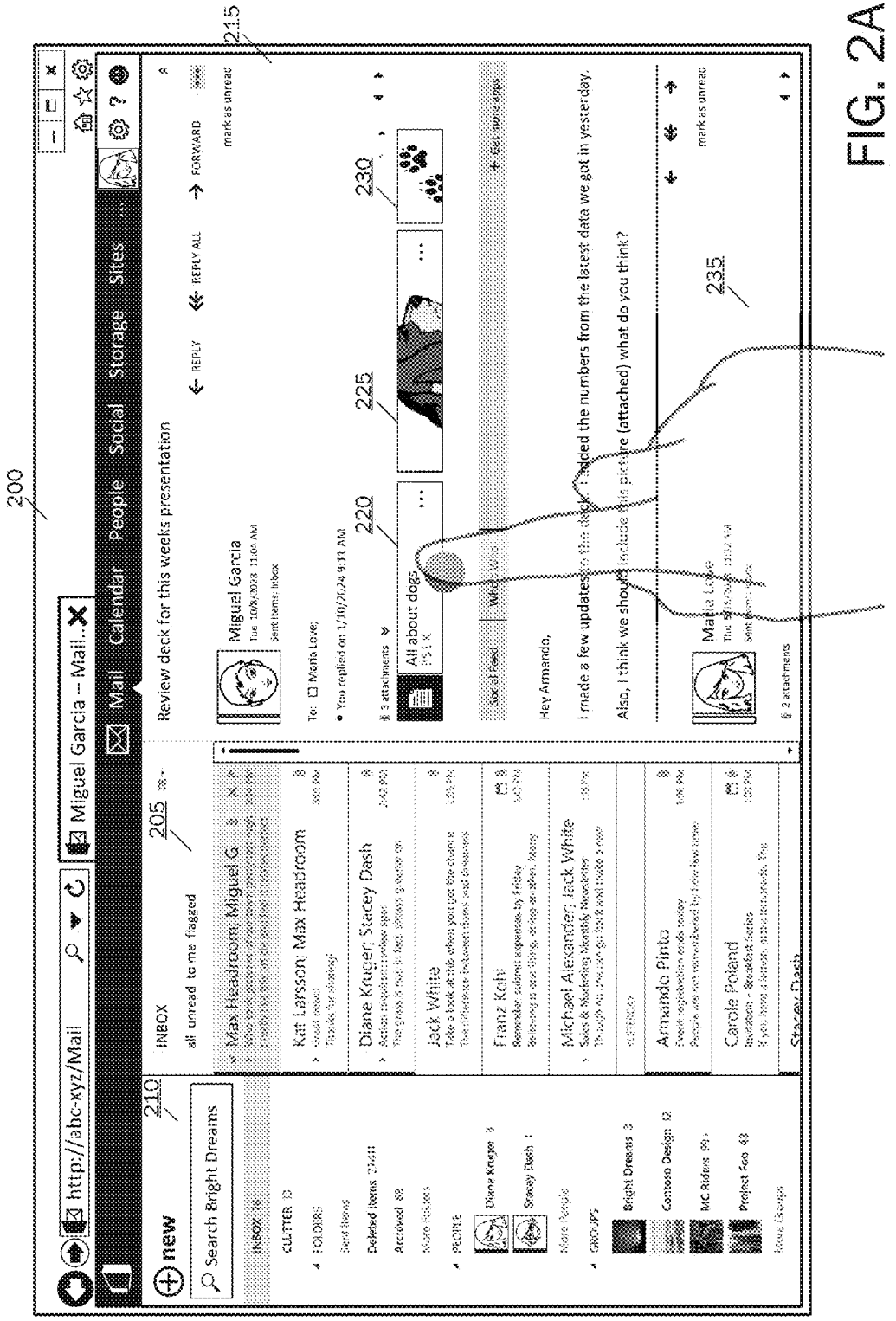

200
215
210
205
220
225
230
235
http://abc-xyz/Mail
Miguel Garcia – Mail..
Mail
Calendar
People
Social
Storage
Sites
new
Search Bright Dreams
INBOX
all unread to me flagged
Review deck for this weeks presentation
REPLY
REPLY ALL
FORWARD
mark as unread
Max Headroom; Miguel G
Kat Larsson; Max Headroom
Diane Kruger; Stacey Dash
Jack White
Franz Kohl
Michael Alexander; Jack White
Armando Pinto
Carole Poland
Miguel Garcia
All about dogs
Hey Armando,
I made a few updates to the deck. I added the numbers from the latest data we got in yesterday.
Also, I think we should include this picture (attached) what do you think?
Maria Love

FIG. 2A

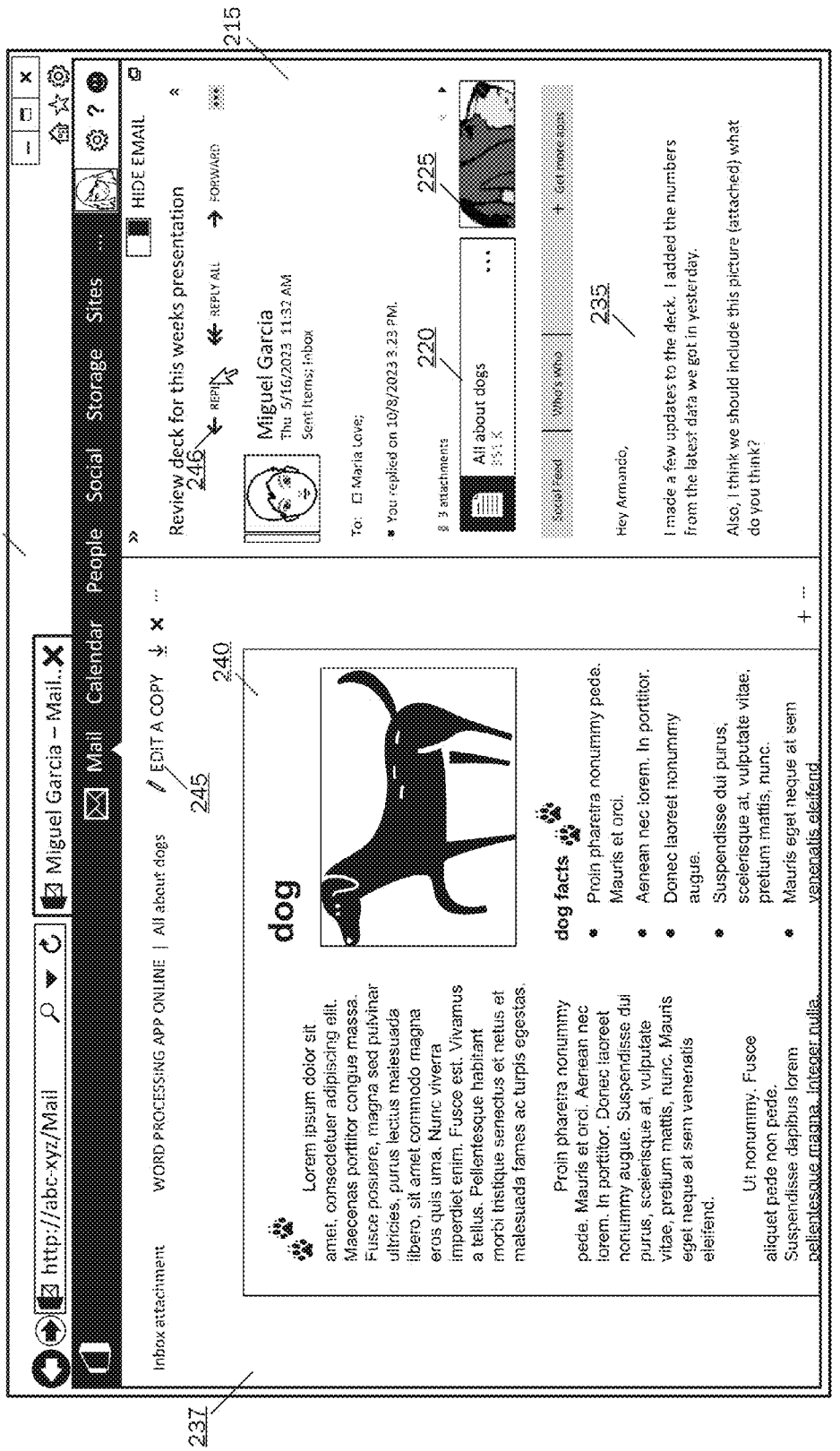

200
215
237
240
245
220
225
235
246
http://abc-xyz/Mail
Miguel Garcia – Mail..
Mail
Calendar
People
Social
Storage
Sites
Inbox attachment
WORD PROCESSING APP ONLINE | All about dogs
EDIT A COPY
HIDE EMAIL
Review deck for this weeks presentation
REPLY
REPLY ALL
FORWARD
Miguel Garcia
Thu 5/16/2023 11:32 AM
Sent Items; Inbox
To: Maria Love;
You replied on 10/8/2023 3:23 PM.
3 attachments
All about dogs
dog
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Maecenas porttitor congue massa. Fusce posuere, magna sed pulvinar ultricies, purus lectus malesuada libero, sit amet commodo magna eros quis urna. Nunc viverra imperdiet enim. Fusce est. Vivamus a tellus. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.
Proin pharetra nonummy pede. Mauris et orci. Aenean nec lorem. In porttitor. Donec laoreet nonummy augue. Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc. Mauris eget neque at sem venenatis eleifend.
Ut nonummy. Fusce aliquet pede non pede. Suspendisse dapibus lorem pellentesque magna. Integer nulla.
dog facts
Proin pharetra nonummy pede. Mauris et orci.
Aenean nec lorem. In porttitor.
Donec laoreet nonummy augue.
Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc.
Mauris eget neque at sem venenatis eleifend.
Social Feed
Who's Who
+ Get more apps
Hey Armando,
I made a few updates to the deck. I added the numbers from the latest data we got in yesterday.
Also, I think we should include this picture (attached) what do you think?

FIG. 2B

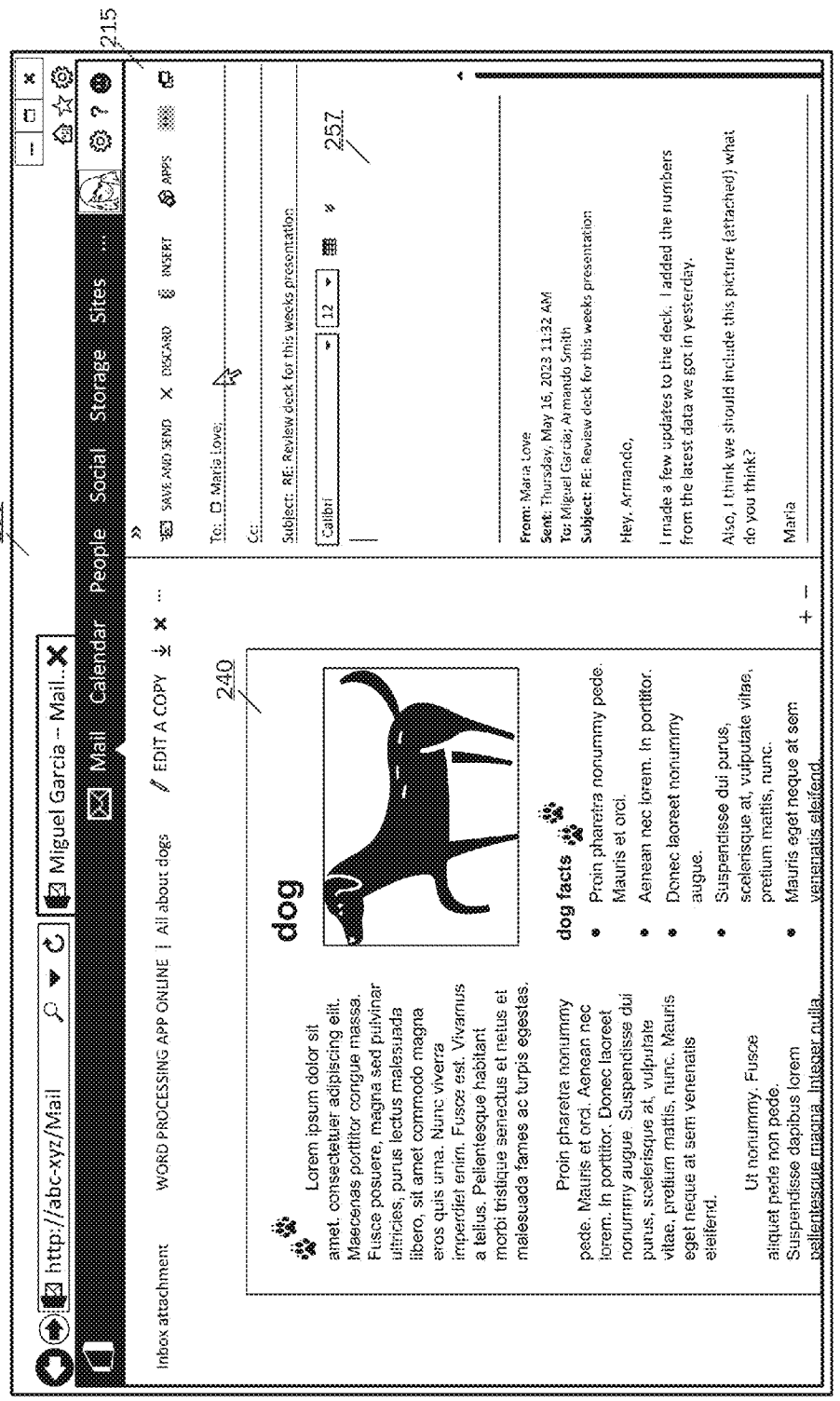

200
215
240
257
http://abc-xyz/Mail
Miguel Garcia – Mail..
Mail
Calendar
People
Social
Storage
Sites
Inbox attachment
WORD PROCESSING APP ONLINE | All about dogs
EDIT A COPY
SAVE AND SEND
DISCARD
INSERT
APPS
To:
Maria Love;
Cc:
Subject: RE: Review deck for this weeks presentation
Calibri
12
dog
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Maecenas porttitor congue massa. Fusce posuere, magna sed pulvinar ultricies, purus lectus malesuada libero, sit amet commodo magna eros quis urna. Nunc viverra imperdiet enim. Fusce est. Vivamus a tellus. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.
Proin pharetra nonummy pede. Mauris et orci. Aenean nec lorem. In porttitor. Donec laoreet nonummy augue. Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc. Mauris eget neque at sem venenatis eleifend.
Ut nonummy. Fusce aliquet pede non pede. Suspendisse dapibus lorem pellentesque magna. Integer nulla.
dog facts
Proin pharetra nonummy pede. Mauris et orci.
Aenean nec lorem. In porttitor.
Donec laoreet nonummy augue.
Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc.
Mauris eget neque at sem venenatis eleifend.
From: Maria Love
Sent: Thursday, May 16, 2013 11:32 AM
To: Miguel Garcia; Armando Smith
Subject: RE: Review deck for this weeks presentation
Hey, Armando,
I made a few updates to the deck. I added the numbers from the latest data we got in yesterday.
Also, I think we should include this picture (attached) what do you think?
Maria

FIG. 2C

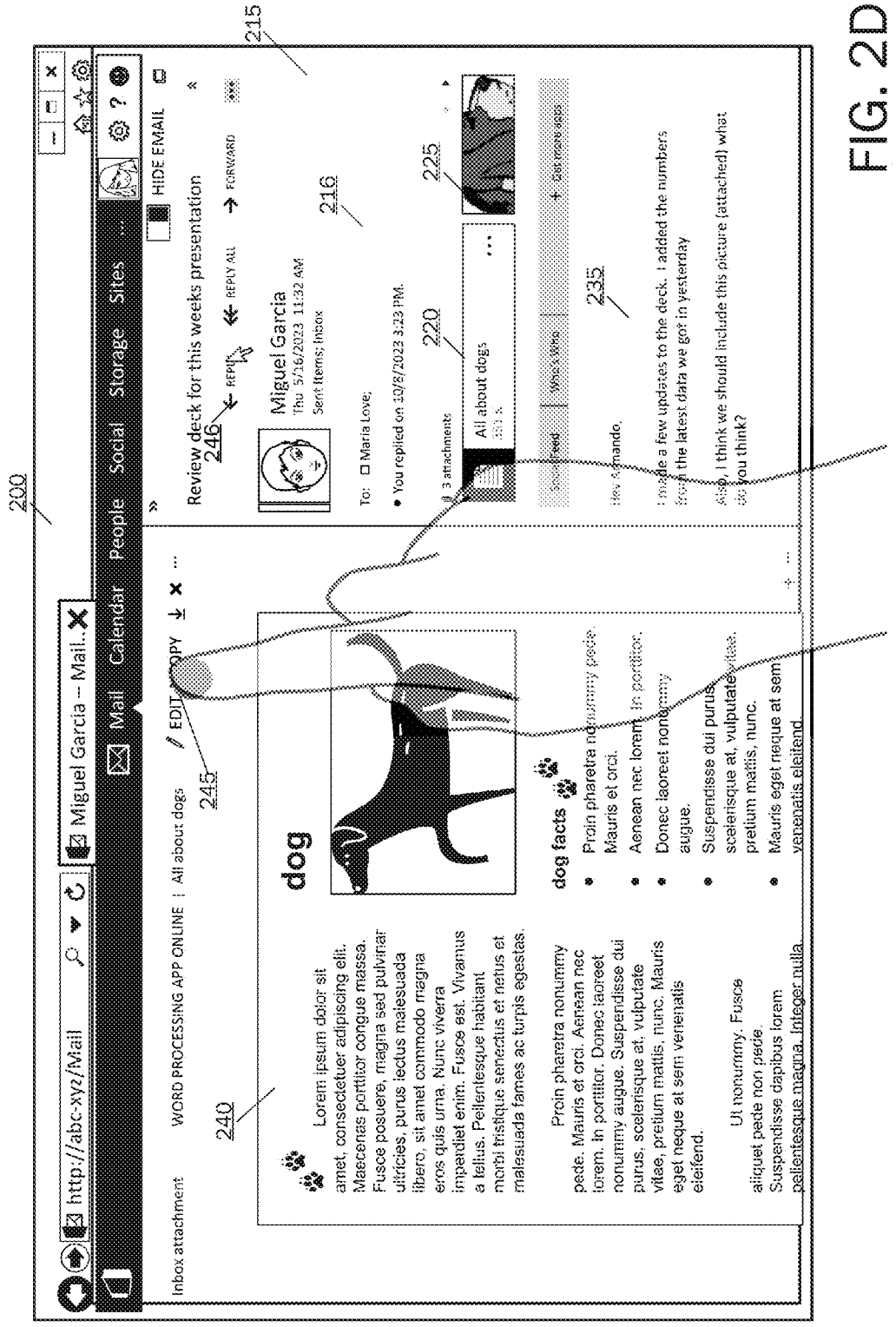

200
http://abc-xyz/Mail
Miguel Garcia – Mail..
Mail Calendar People Social Storage Sites
Inbox attachment
WORD PROCESSING APP ONLINE | All about dogs
EDIT COPY
240
245
dog
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Maecenas porttitor congue massa. Fusce posuere, magna sed pulvinar ultricies, purus lectus malesuada libero, sit amet commodo magna eros quis urna. Nunc viverra imperdiet enim. Fusce est. Vivamus a tellus. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.
Proin pharetra nonummy pede. Mauris et orci. Aenean nec lorem. In porttitor. Donec laoreet nonummy augue. Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc. Mauris eget neque at sem venenatis eleifend.
Ut nonummy. Fusce aliquet pede non pede. Suspendisse dapibus lorem pellentesque magna. Integer nulla.
dog facts
Proin pharetra nonummy pede
Mauris et orci.
Aenean nec lorem. In porttitor.
Donec laoreet nonummy augue.
Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc.
Mauris eget neque at sem venenatis eleifend.
HIDE EMAIL
215
Review deck for this weeks presentation
246
REPLY
REPLY ALL
FORWARD
Miguel Garcia
Thu 5/16/2023 11:32 AM
Sent Items; Inbox
216
To: Maria Love;
You replied on 10/8/2023 3:23 PM.
3 attachments
220
All about dogs
225
Feed
Who's Who
235
Hey Armando,
made a few updates to the deck. I added the numbers from the latest data we got in yesterday
Also, I think we should include this picture (attached) what do you think?

FIG. 2D

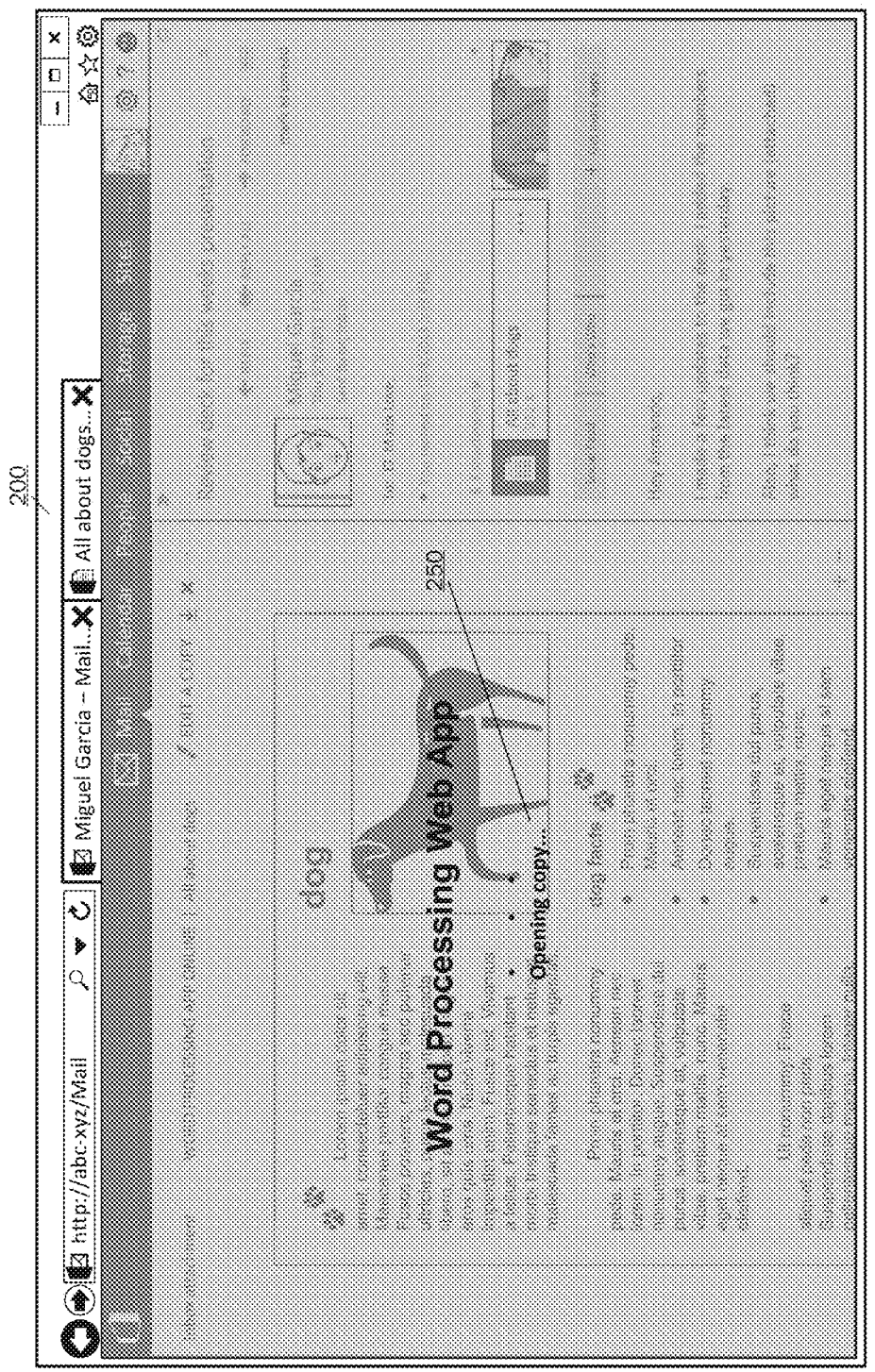

200
http://abc-xyz/Mail
Miguel Garcia – Mail...
All about dogs...
Word Processing Web App
250
Opening copy...

FIG. 2E

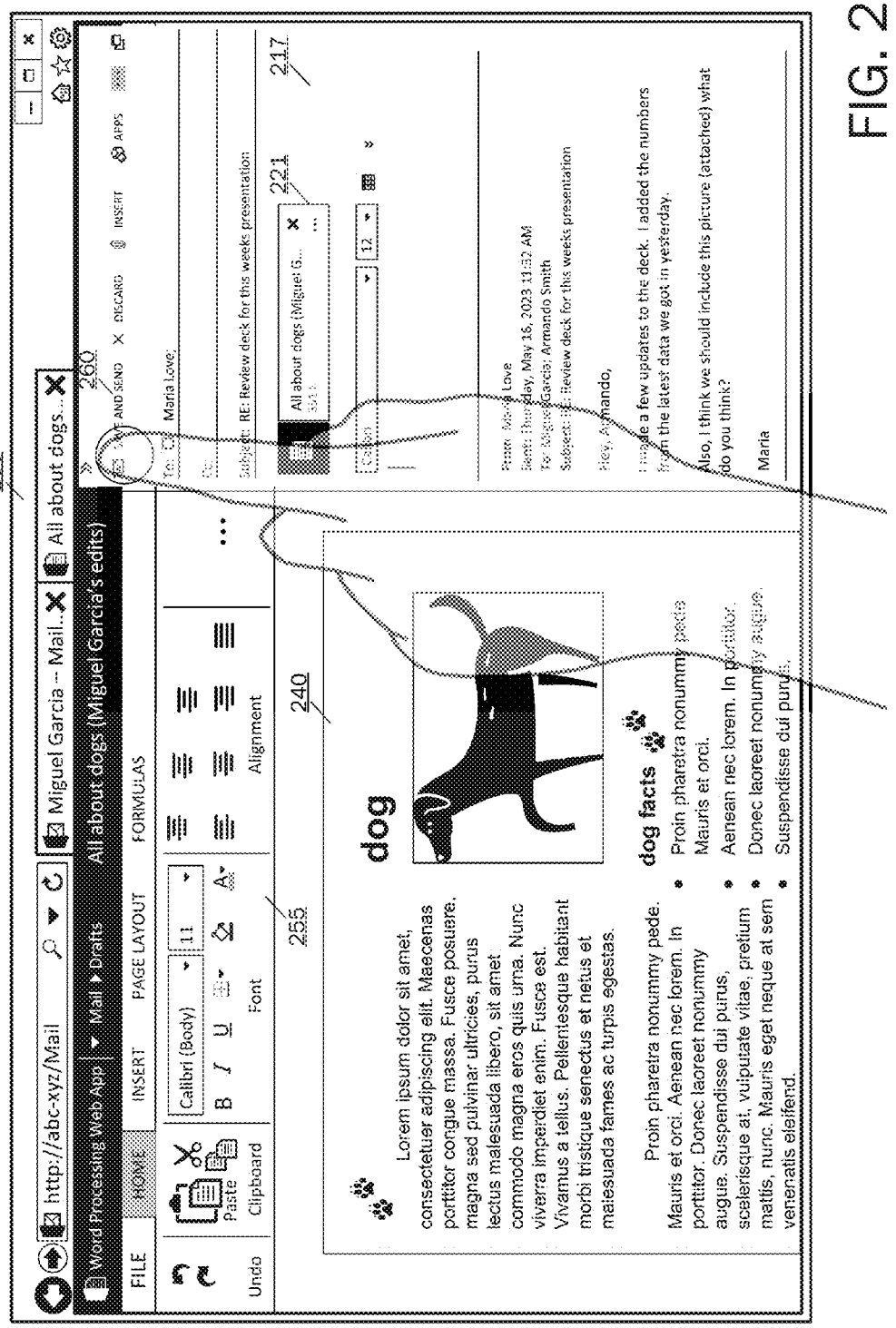

200
http://abc-xyz/Mail
Miguel Garcia – Mail...
All about dogs...
Word Processing Web App
Mail
Drafts
All about dogs (Miguel Garcia's edits)
FILE
HOME
INSERT
PAGE LAYOUT
FORMULAS
Undo
Paste
Clipboard
Calibri (Body)
11
Font
Alignment
255
240
dog
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Maecenas porttitor congue massa. Fusce posuere, magna sed pulvinar ultricies, purus lectus malesuada libero, sit amet commodo magna eros quis urna. Nunc viverra imperdiet enim. Fusce est. Vivamus a tellus. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.
Proin pharetra nonummy pede. Mauris et orci. Aenean nec lorem. In porttitor. Donec laoreet nonummy augue. Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc. Mauris eget neque at sem venenatis eleifend.
dog facts
Proin pharetra nonummy pede.
Mauris et orci.
Aenean nec lorem. In porttitor.
Donec laoreet nonummy augue.
Suspendisse dui purus.
260
DISCARD
INSERT
APPS
To:
Maria Love;
Cc:
Subject: RE: Review deck for this weeks presentation
All about dogs (Miguel G...
221
217
Calibri
12
From: Maria Love
Sent: Thursday, May 16, 2013 11:32 AM
To: Miguel Garcia; Armando Smith
Subject: RE: Review deck for this weeks presentation
Hey, Armando,
I made a few updates to the deck. I added the numbers from the latest data we got in yesterday.
Also, I think we should include this picture (attached) what do you think?
Maria

FIG. 2F

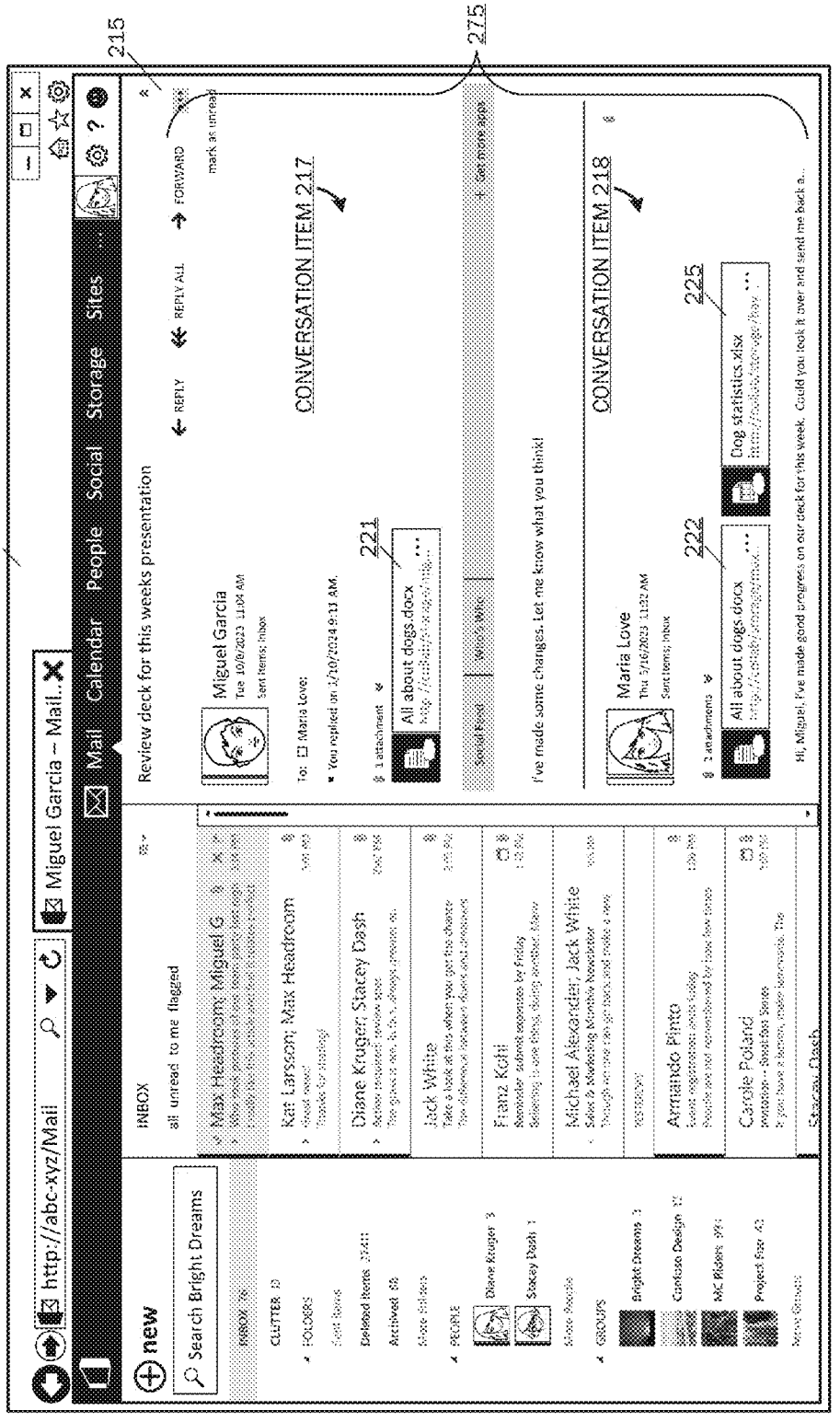
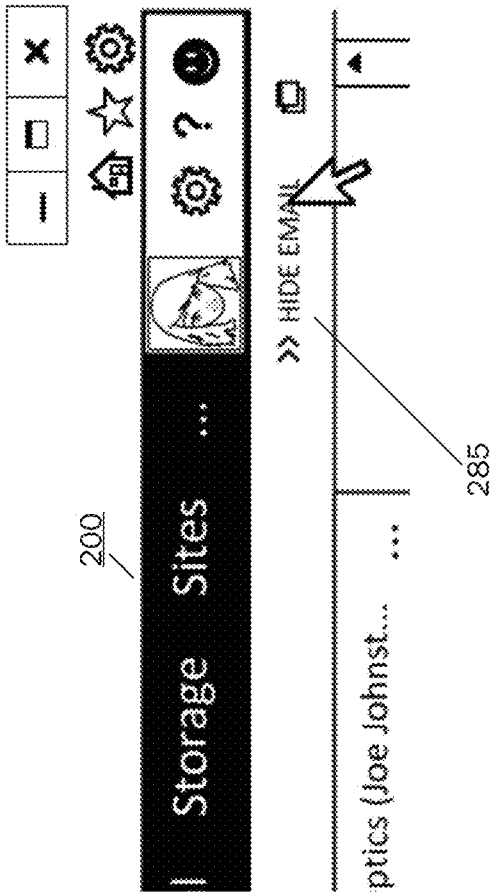

200
215
275
CONVERSATION ITEM 217
CONVERSATION ITEM 218
221
222
225
Review deck for this weeks presentation
Miguel Garcia
Maria Love
All about dogs.docx
Dog statistics.xlsx
I've made some changes. Let me know what you think!

FIG. 2G

FIG. 2H



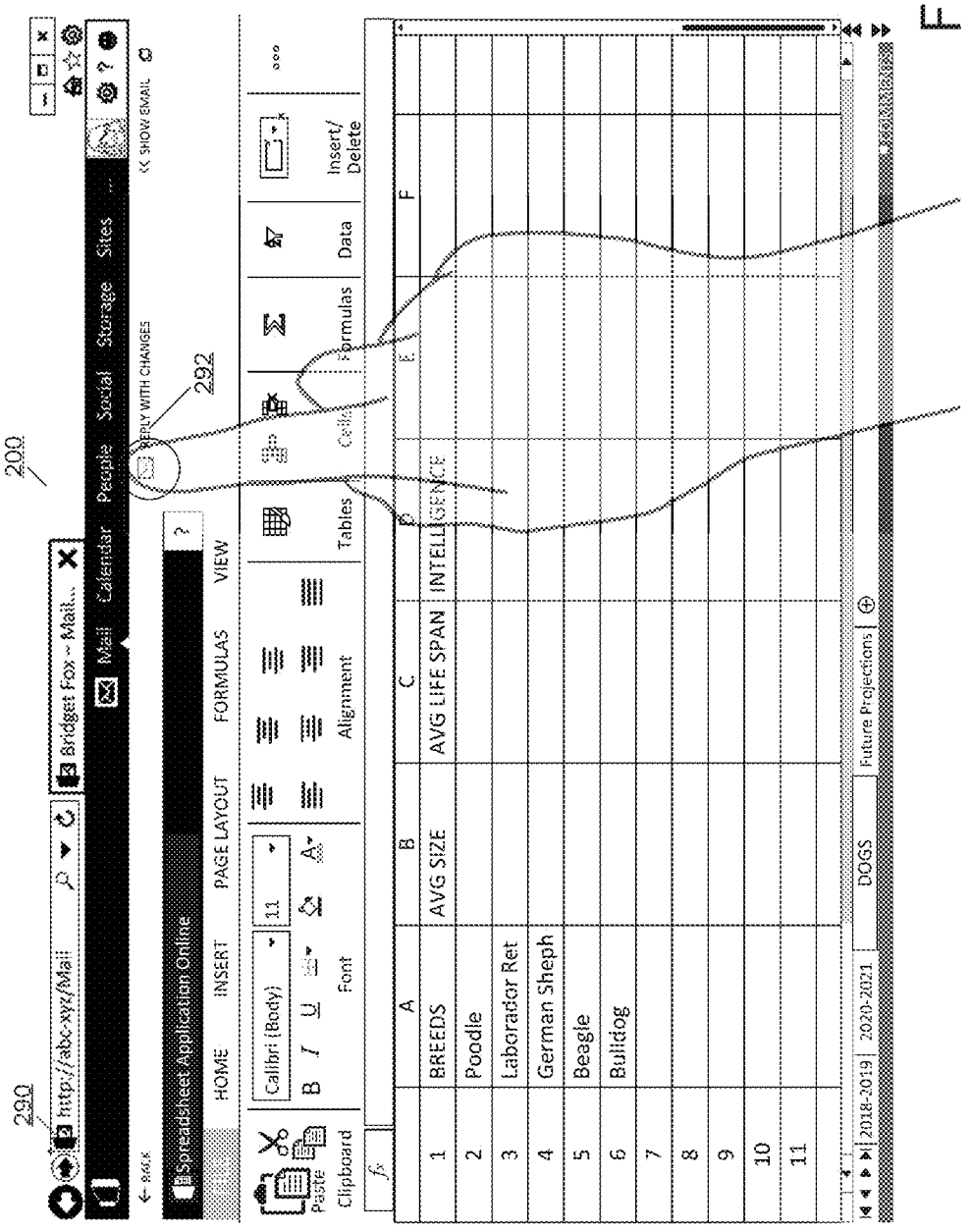

290
200
292
Spreadsheet Application Online
HOME
INSERT
PAGE LAYOUT
FORMULAS
VIEW
Paste
Clipboard
Font
Alignment
Tables
Formulas
Data
Insert/ Delete
BREEDS
AVG SIZE
AVG LIFE SPAN
Poodle
Laborator Ret
German Sheph
Beagle
Bulldog
2018-2019
2020-2021
DOGS
Future Projections

FIG. 2I

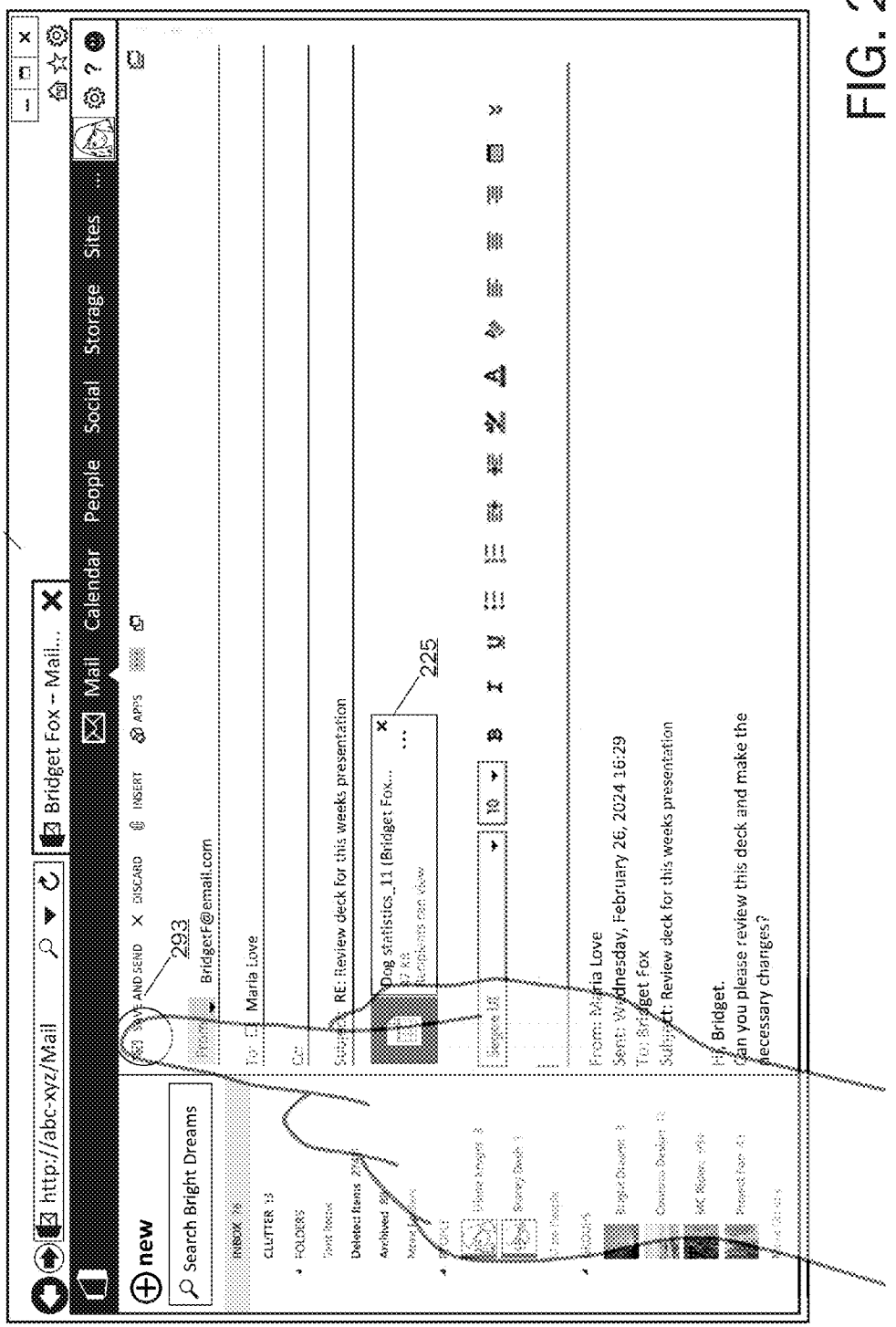

200
http://abc-xyz/Mail
Bridget Fox – Mail...
Mail
Calendar
People
Social
Storage
Sites
new
Search Bright Dreams
SAVE AND SEND
DISCARD
INSERT
APPS
293
BridgetF@email.com
Maria Love
RE: Review deck for this weeks presentation
Dog statistics_11 (Bridget Fox...
225
From: Maria Love
Sent: Wednesday, February 26, 2024 16:29
To: Bridget Fox
Subject: Review deck for this weeks presentation
Hi Bridget.
Can you please review this deck and make the necessary changes?

FIG. 2J

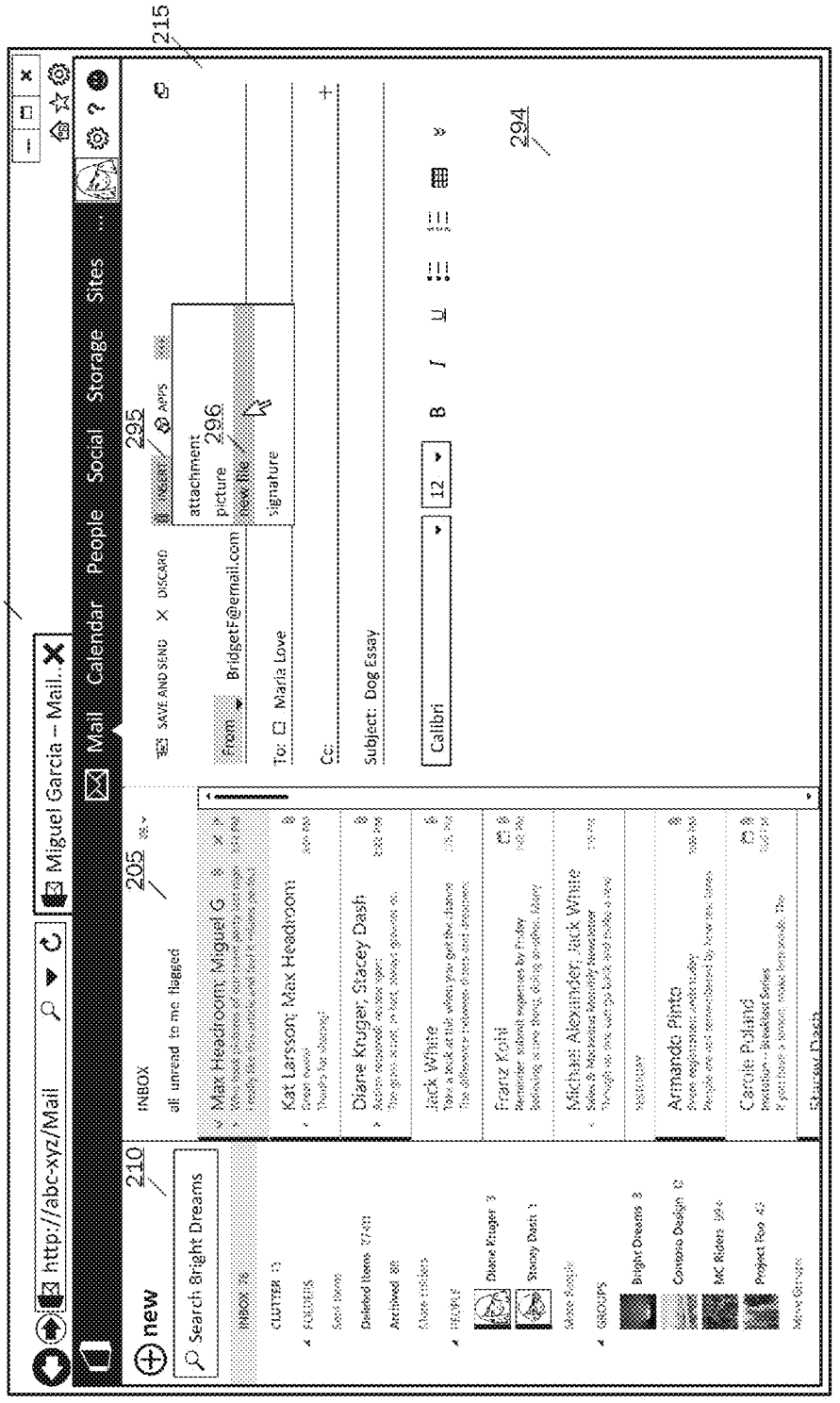

200
215
205
210
295
296
294
http://abc-xyz/Mail
Miguel Garcia – Mail...
Mail
Calendar
People
Social
Storage
Sites
new
Search Bright Dreams
INBOX
all unread to me flagged
SAVE AND SEND
DISCARD
APPS
attachment
picture
new file
signature
From:
BridgetF@email.com
To:
Maria Love
Cc:
Subject: Dog Essay
Calibri
12
Mat Headroom; Miguel G
Kat Larsson; Max Headroom
Diane Kruger; Stacey Dash
Jack White
Franz Kohl
Michael Alexander; Jack White
Armando Pinto
Carole Poland
Stacey Dash

FIG. 2K

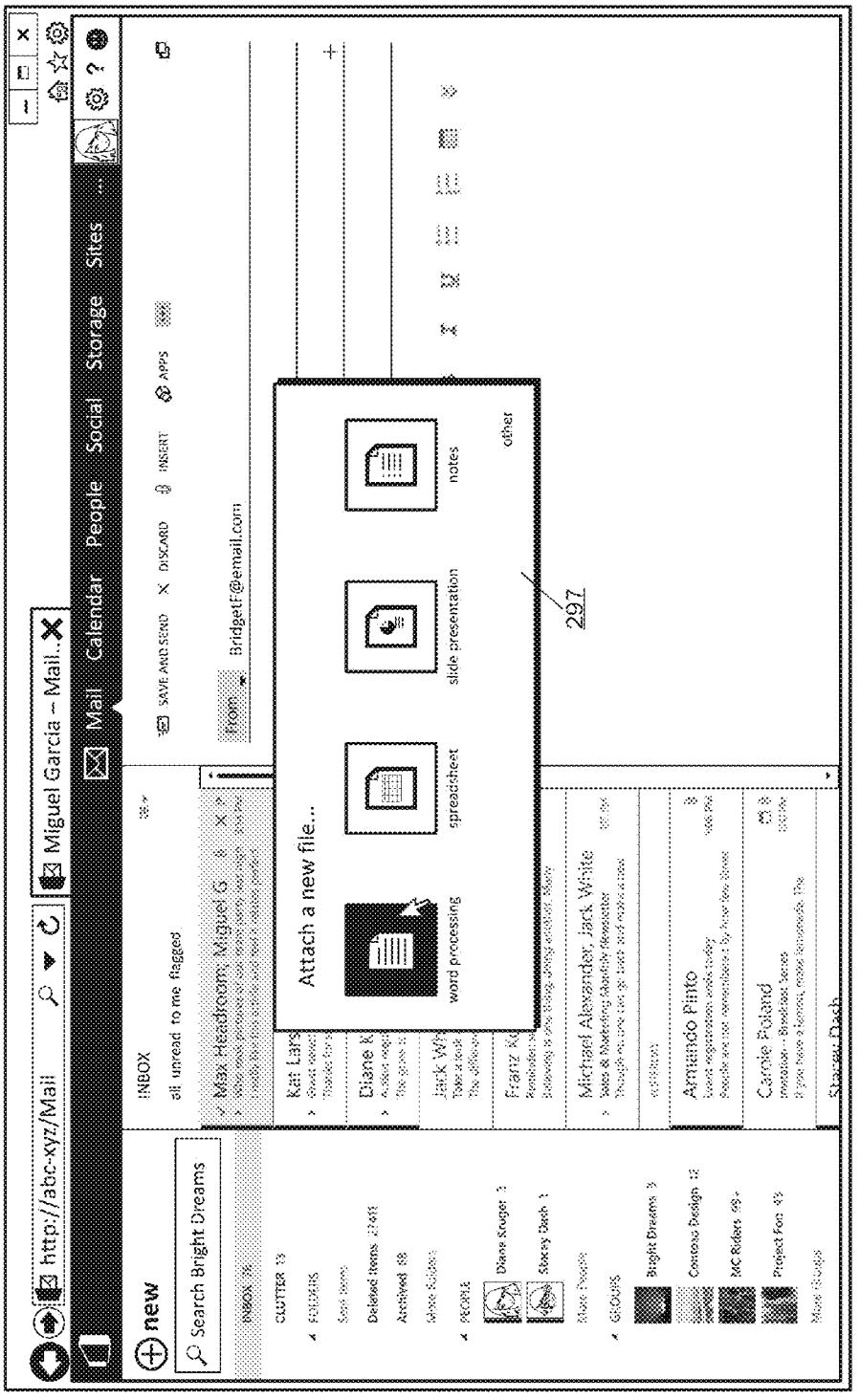

http://abc-xyz/Mail
Miguel Garcia – Mail...
Mail
Calendar
People
Social
Storage
Sites
new
Search Bright Dreams
INBOX
all unread to me flagged
SAVE AND SEND
DISCARD
INSERT
APPS
From
Bridgetf@email.com
Attach a new file...
word processing
spreadsheet
slide presentation
notes
other
297
Kat Lars
Diane K
Jack Wh
Franz K
Michael Alexander; Jack White
Armando Pinto
Carrie Poland
Stacey Dash
CLUTTER
FOLDERS
Deleted Items
Archived
PEOPLE
Diane Krueger
Stacey Dash
GROUPS
Bright Dreams
Contoso Design
MC Riders
Project Fox
More Groups

FIG. 2L

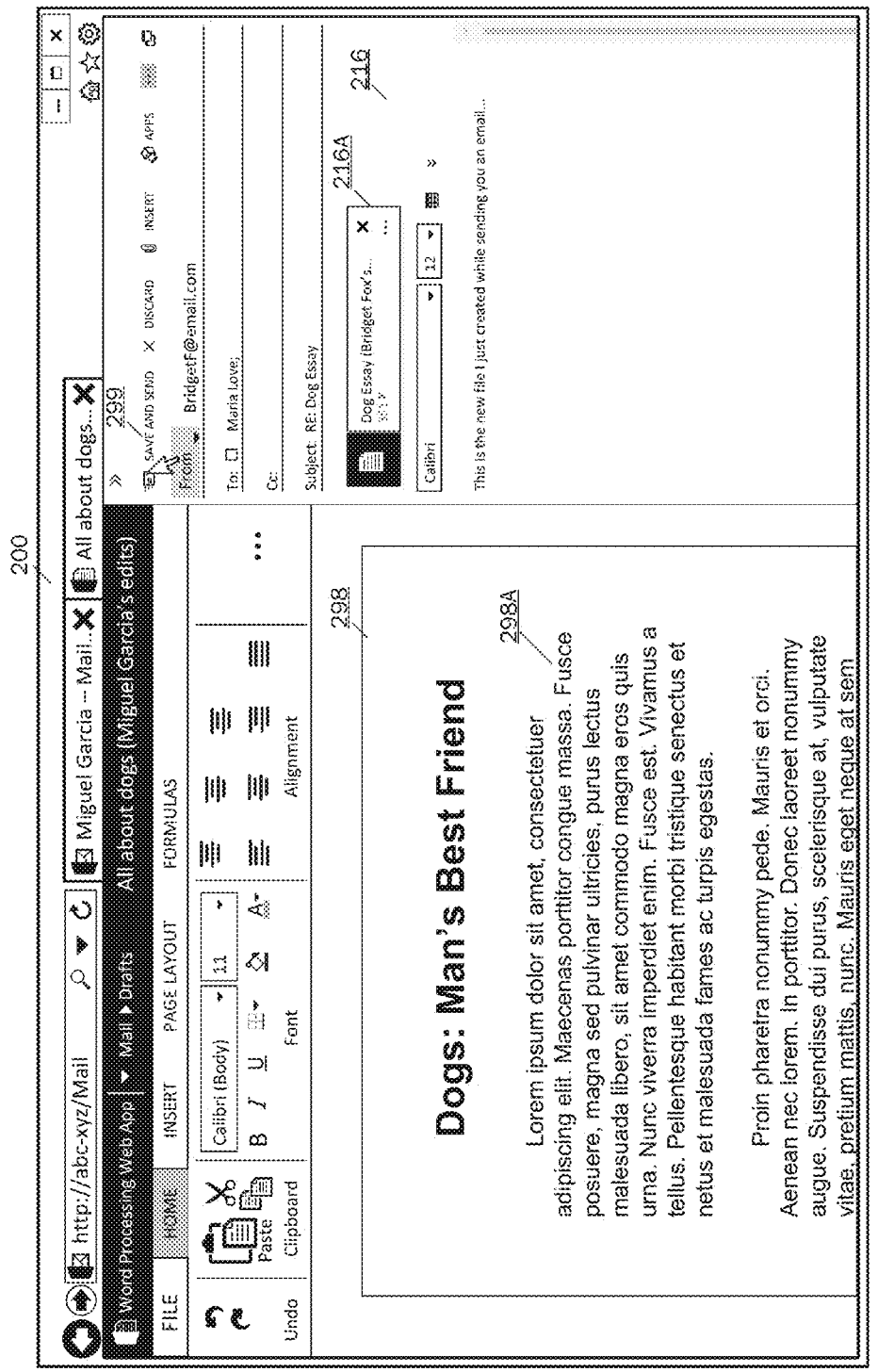

200
http://abc-xyz/Mail
Miguel Garcia – Mail...
All about dogs...
Word Processing Web App
Mail ▸ Drafts
All about dogs (Miguel Garcia's edits)
FILE
HOME
INSERT
PAGE LAYOUT
FORMULAS
Undo
Paste
Clipboard
Calibri (Body)
11
Font
Alignment
298
Dogs: Man's Best Friend
298A
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Maecenas porttitor congue massa. Fusce posuere, magna sed pulvinar ultricies, purus lectus malesuada libero, sit amet commodo magna eros quis urna. Nunc viverra imperdiet enim. Fusce est. Vivamus a tellus. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.
Proin pharetra nonummy pede. Mauris et orci. Aenean nec lorem. In porttitor. Donec laoreet nonummy augue. Suspendisse dui purus, scelerisque at, vulputate vitae, pretium mattis, nunc. Mauris eget neque at sem
299
SAVE AND SEND
DISCARD
INSERT
APPS
From
BridgetF@email.com
To:
Maria Love;
Cc:
Subject: RE: Dog Essay
216
216A
Dog Essay (Bridget Fox's...
Calibri
12
This is the new file I just created while sending you an email...

FIG. 2M

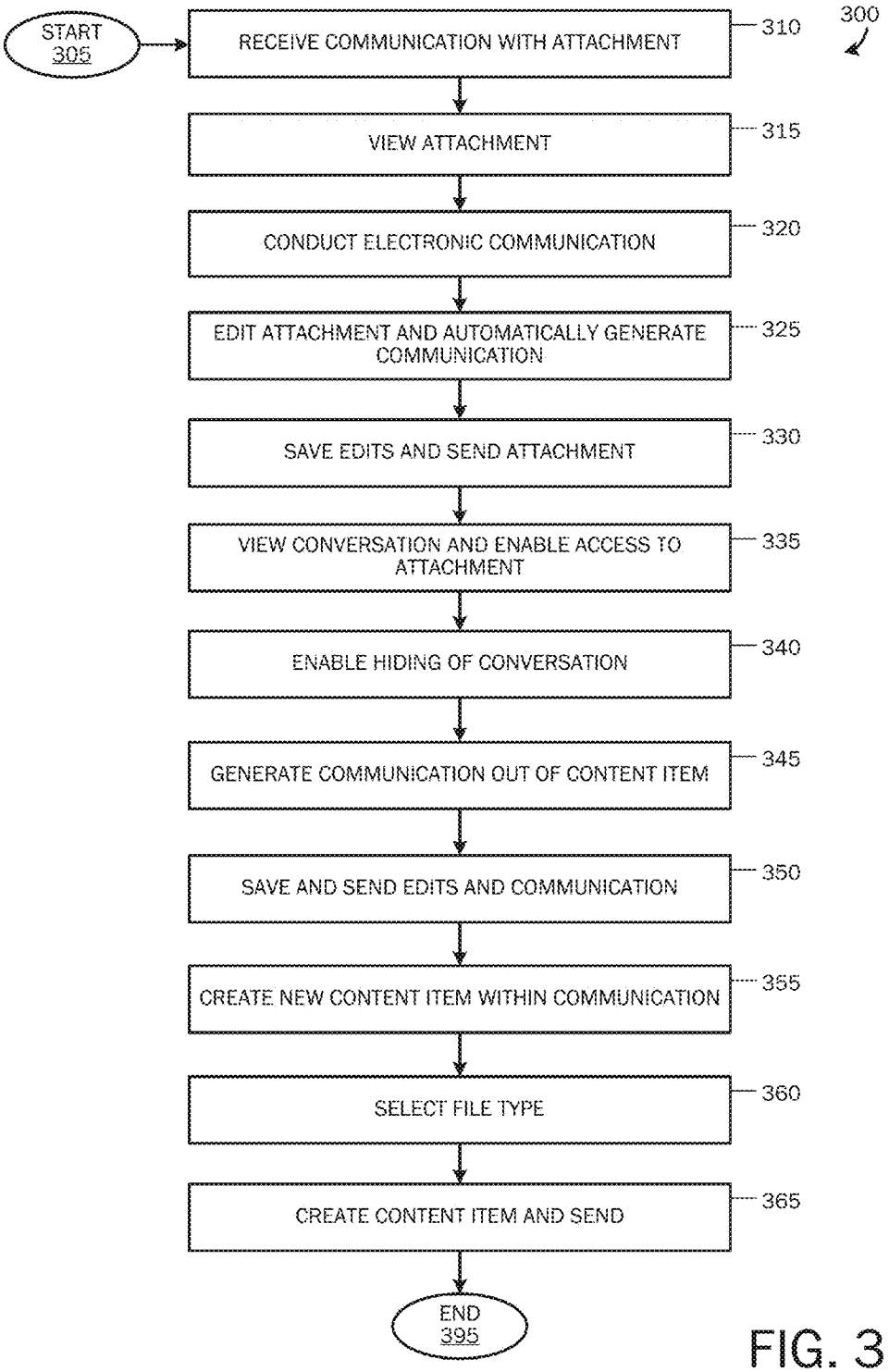

300
START
305
RECEIVE COMMUNICATION WITH ATTACHMENT
310
VIEW ATTACHMENT
315
CONDUCT ELECTRONIC COMMUNICATION
320
EDIT ATTACHMENT AND AUTOMATICALLY GENERATE COMMUNICATION
325
SAVE EDITS AND SEND ATTACHMENT
330
VIEW CONVERSATION AND ENABLE ACCESS TO ATTACHMENT
335
ENABLE HIDING OF CONVERSATION
340
GENERATE COMMUNICATION OUT OF CONTENT ITEM
345
SAVE AND SEND EDITS AND COMMUNICATION
350
CREATE NEW CONTENT ITEM WITHIN COMMUNICATION
355
SELECT FILE TYPE
360
CREATE CONTENT ITEM AND SEND
365
END
395

FIG. 3

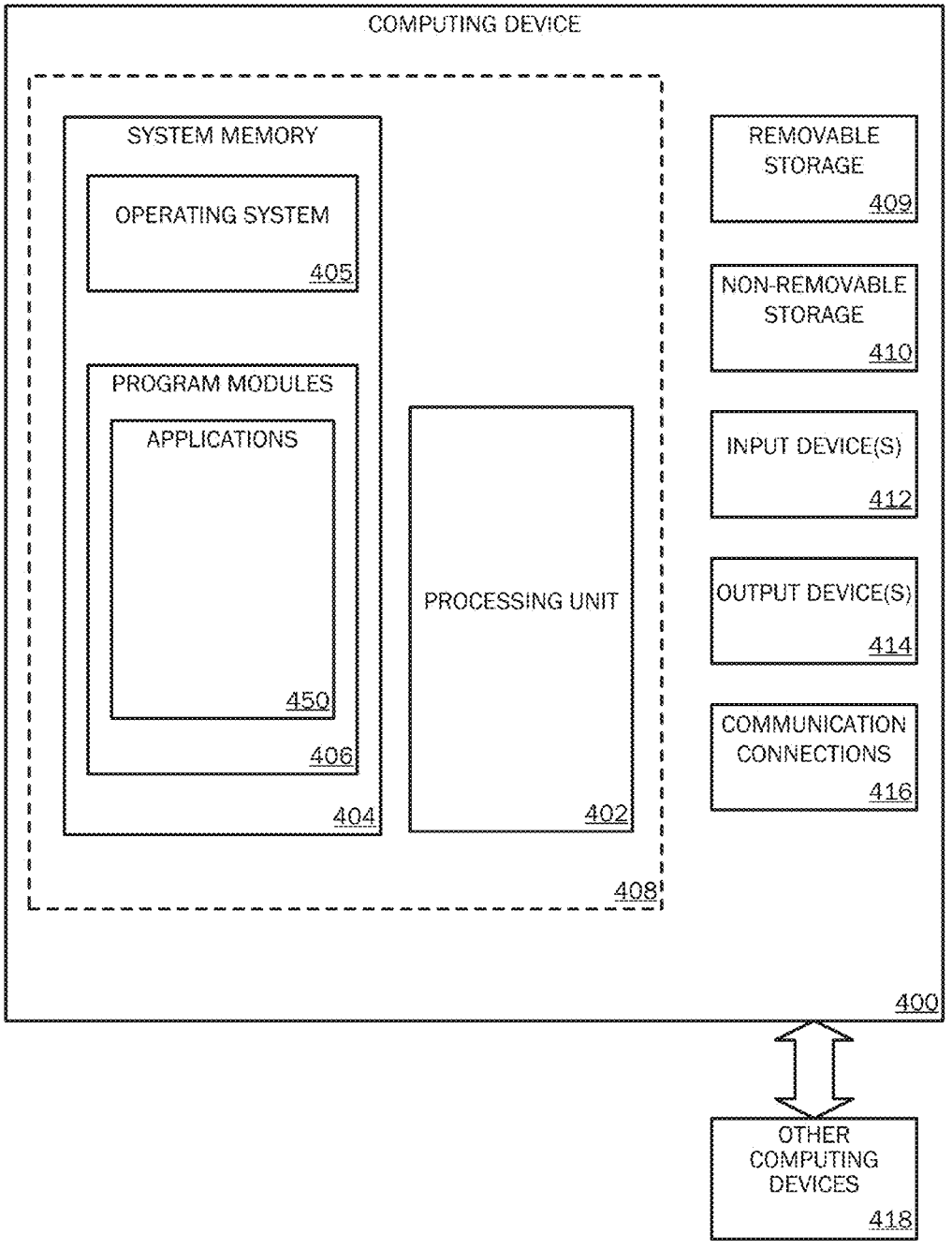

COMPUTING DEVICE
SYSTEM MEMORY
OPERATING SYSTEM
405
PROGRAM MODULES
APPLICATIONS
450
406
404
PROCESSING UNIT
402
408
REMOVABLE STORAGE
409
NON-REMOVABLE STORAGE
410
INPUT DEVICE(S)
412
OUTPUT DEVICE(S)
414
COMMUNICATION CONNECTIONS
416
400
OTHER COMPUTING DEVICES
418

FIG. 4

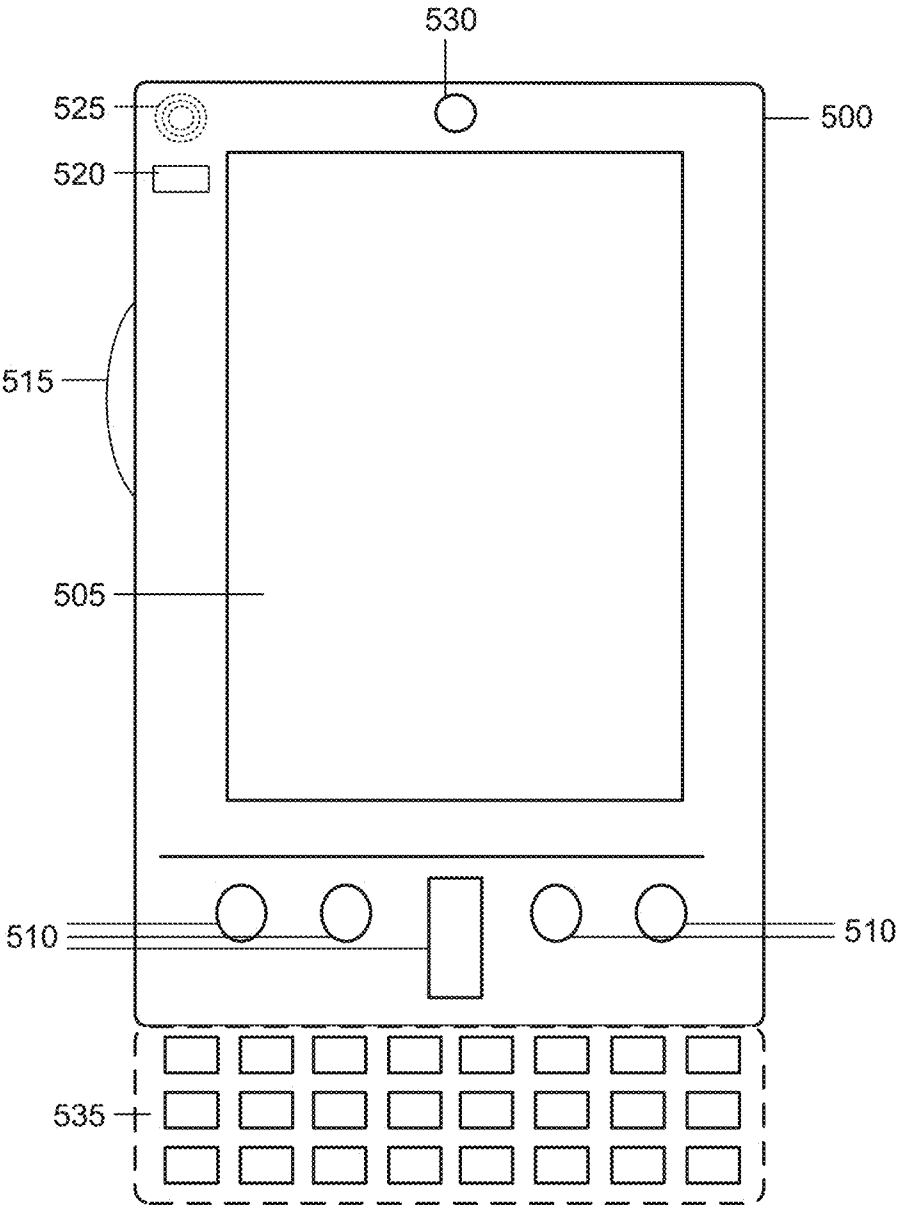


FIG. 5A

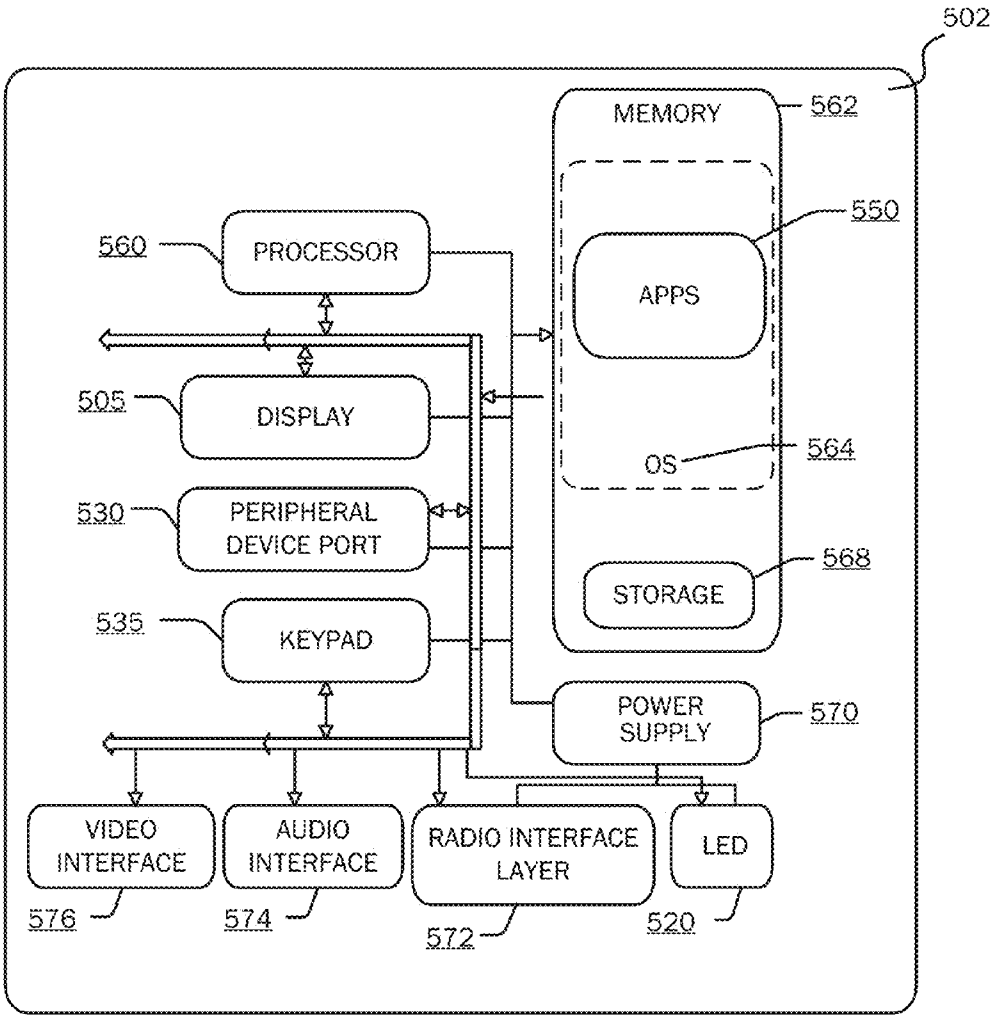

502
MEMORY
562
550
APPS
560
PROCESSOR
505
DISPLAY
OS
564
530
PERIPHERAL DEVICE PORT
568
STORAGE
535
KEYPAD
POWER SUPPLY
570
VIDEO INTERFACE
AUDIO INTERFACE
RADIO INTERFACE LAYER
LED
576
574
572
520

FIG. 5B

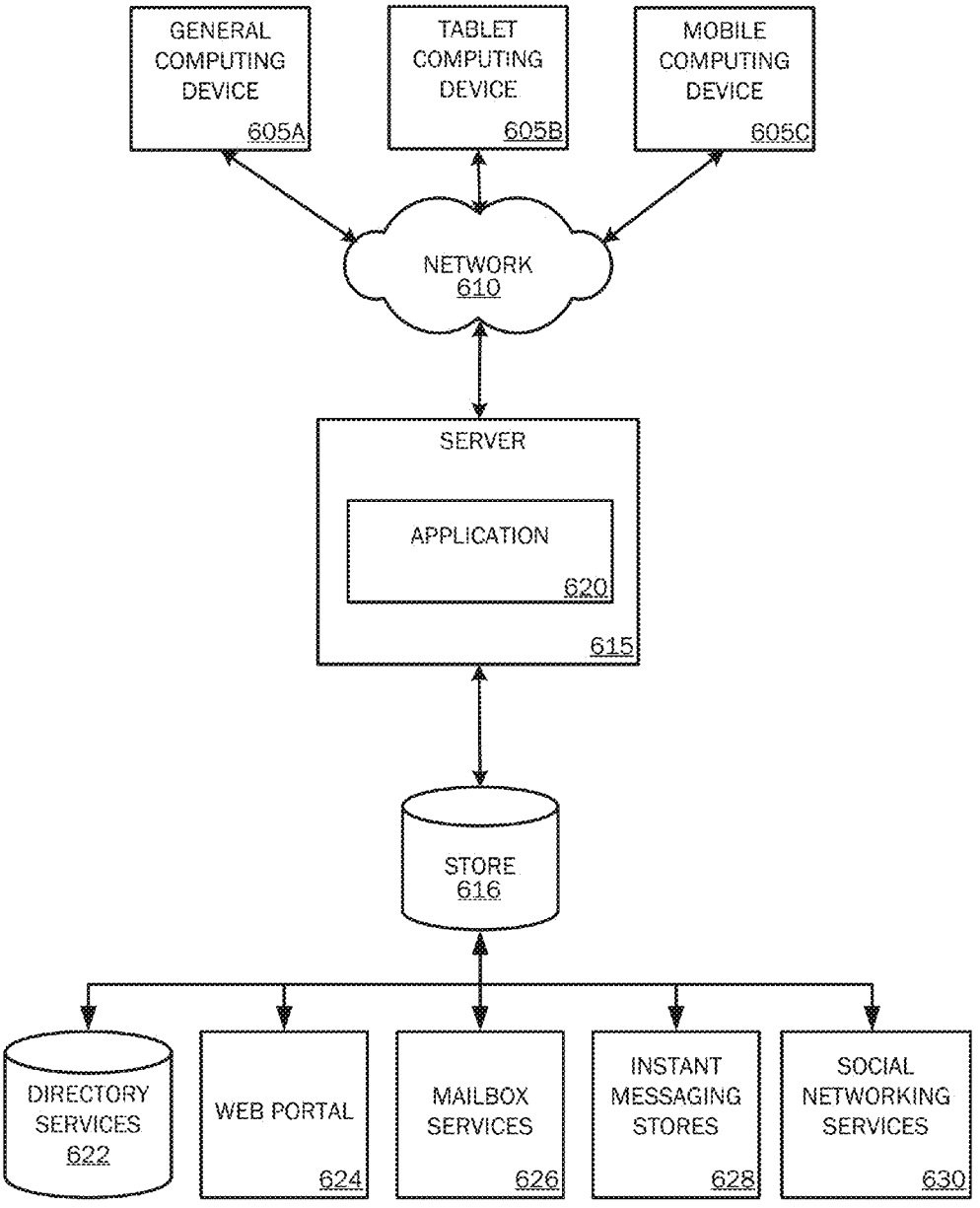

GENERAL COMPUTING DEVICE
605A
TABLET COMPUTING DEVICE
605B
MOBILE COMPUTING DEVICE
605C
NETWORK
610
SERVER
APPLICATION
620
615
STORE
616
DIRECTORY SERVICES
622
WEB PORTAL
624
MAILBOX SERVICES
626
INSTANT MESSAGING STORES
628
SOCIAL NETWORKING SERVICES
630

FIG. 6

INLINE DOCUMENT COLLABORATION WORKFLOW

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims benefit of U.S. Provisional Patent Application No. 61/973,139, filed Mar. 31, 2014.

BACKGROUND OF THE INVENTION

[0002] Computer and computer software users have become accustomed to generating, editing, receiving and sending many types of content items, for example, documents of different types, photographs, images, electronic mail items, calendaring items, notes items, and the like. In a typical electronic mail setting, a user often attaches a document or other content item (hereafter referred to as "attachment" or "content item") to an electronic mail item he/she then sends to a receiving user for review or editing. The receiving user then typically downloads the received attachment to her local computing device or to an enterprise (local or remote) storage depository, for example, a company or school file server or a remote server at which the receiving user has a storage location or at a collaborative file storage location at which the sending user and the receiving user store content items for receiving and editing as part of a collaborative work group of any of a number of types.

[0003] That is, many user tasks involve using both content items of various types and electronic communications (e.g., electronic mail) together in a general workflow that involves sending and receiving electronic communications and reviewing various content items. Current software solutions treat electronic communications and content items as two separate entities. Users must do a lot of manual work such as opening received attached content items, editing and saving attached content items, re-attaching edited content items to a subsequent electronic communication, and then sending the communication along with the edited and attached content item to a desired one or more recipients. There is a need for methods and systems for allowing relevant content items to be paired with relevant communications (electronic mail or other types of communications) so that a user may reduce the time-consuming and inefficient process of receiving, storing, editing, storing, retrieving, attaching, and disposing of content items in association with an electronic communications system. It is with respect to these and other considerations that the present invention has been made.

SUMMARY OF THE INVENTION

[0004] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the detailed description. This summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended as an aid in determining the scope of the claimed subject matter.

[0005] Embodiments of the present invention solve the above and other problems by providing inline document collaboration workflows. According to embodiments, when a user receives an electronic communication that includes an attached content item, the receiving user may select the attached content item and cause the attached content item to be displayed in an immersive view in proximity to an electronic communication pane in which an electronic communication may be conducted about any topic including the content item that is displayed in proximity to the electronic communication pane. Electronic communications may be conducted without edits to the selected and displayed content item. Alternatively, if the user desires to edit the selected and displayed content item, the user may enter an editing mode wherein functionality associated with a document type of the selected and displayed document may be displayed in the immersive view pane where the selected and displayed document is displayed. Using the provided functionality, the user may edit the displayed document, and according to one embodiment, upon editing the desired document, an instance of the edited document may be automatically saved for subsequent communication. According to one embodiment, upon initiating an editing function with respect to a selected and displayed content item, an electronic communication may be automatically generated in the electronic communication pane for attaching a copy of or pointer to the edited content item and for providing a communication to one or more recipients.

[0006] According to one embodiment, a "hide" function may be enabled for hiding temporarily or until subsequently "unhidden" the electronic communication thread to allow a greater display surface space for the selected and viewed or edited content item. In addition, a user may initiate and conduct an electronic communication about a content item by initiating the electronic communication from a client application associated with the content item.

[0007] According to another embodiment, a new content item may be generated out of an electronic communications user interface. For example, if a user is utilizing an electronic mail client application and an associated user interface, an insert function may be provided for allowing the user to insert a new content item of various types into the electronic communications user interface. If the user selects to enter a file of a given file type, an instance of a user interface for the selected document type that includes functionality of the associated application, for example, word processing functionality, may be displayed in the immersive view pane of the electronic communication user interface for allowing the user to create a content item of the desired document type.

[0008] The details of one or more embodiments are set forth in the accompanying drawings and description below. Other features and advantages will be apparent from a reading of the following detailed description and a review of the associated drawings. It is to be understood that the following detailed description is explanatory only and is not restrictive of the invention as claimed.

DESCRIPTION OF THE DRAWINGS

[0009] FIG. **1** is simplified block diagram illustrating a system for electronic communication-based storage and use of documents and other content items to support multiple workflows.

[0010] FIG. **2**A illustrates a computer-generated user interface of an electronic mail application with which embodiments the present invention practiced.

[0011] FIG. **2**B illustrates a computer-generated user interface of an electronic mail application with an immersive view pane in which a received content item may be displayed for viewing.

[0012] FIG. **2**C illustrates a computer-generated user interface of an electronic mail application with an immersive view pane in which a received content item may be displayed for viewing.

[0013] FIG. **2**D illustrates a computer-generated user interface of an electronic mail application with an immersive view pane in which a received content item may be displayed for viewing.

[0014] FIG. **2**E illustrates a computer-generated user interface of an electronic mail application with an immersive view pane and showing a launching of a software application associated with a received content item.

[0015] FIG. **2**F illustrates a computer-generated user interface of an electronic mail application with an immersive view pane and showing a display of software application functionality for allowing editing of a received content item.

[0016] FIG. **2**G illustrates a computer-generated user interface of an electronic mail application and showing attachment of an edited content item for disposition according to embodiments of the present invention.

[0017] FIG. **2**H illustrates a computer-generated user interface showing a "hide email" function.

[0018] FIG. **2**I illustrates a computer-generated software application user interface from which an electronic communication may be launched in association with a content item.

[0019] FIG. **2**J illustrates a computer-generated electronic mail user interface with which a content item may be sent to one or more desired recipients.

[0020] FIG. **2**K illustrates a computer-generated electronic communication user interface in which a content item may be created.

[0021] FIG. **2**L illustrates a computer-generated electronic communication user interface in which a content item may be created.

[0022] FIG. **2**M illustrates a computer-generated electronic communication user interface in which a content item may be created.

[0023] FIG. **3** is a flowchart illustrating a method for inline document collaboration through various workflows.

[0024] FIG. **4** is a block diagram illustrating example physical components of a computing device with which embodiments of the invention may be practiced.

[0025] FIGS. **5**A and **5**B are simplified block diagrams of a mobile computing device with which embodiments of the present invention may be practiced.

[0026] FIG. **6** is a simplified block diagram of a distributed computing system in which embodiments of the present invention may be practiced.

DETAILED DESCRIPTION

[0027] The following detailed description refers to the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the following description to refer to the same or similar elements. While embodiments of the invention may be described, modifications, adaptations, and other implementations are possible. For example, substitutions, additions, or modifications may be made to the elements illustrated in the drawings, and the methods described herein may be modified by substituting, reordering, or adding stages to the disclosed methods. Accordingly, the following detailed description does not limit the invention, but instead, the proper scope of the invention is defined by the appended claims.

[0028] As briefly described above, embodiments of the present invention are directed to providing inline document collaboration workflows. According to embodiments, when a user receives an electronic communication such as electronic mail, text message, instant message, chat message, or the like, where the electronic communication includes an attached content item, for example, a document, dataset, image, and the like, the receiving user may select the attached content item and cause the attached content item to be displayed in an immersive view in a user interface in a side-by-side or top/bottom orientation relative to an electronic communication pane in which an electronic communication may be conducted about any topic including the content item that is displayed in proximity to the electronic communication pane.

[0029] According to embodiments, electronic communications may be conducted without edits to the selected and displayed content item. Alternatively, if the user desires to edit the selected and displayed content item, the user may enter an editing mode wherein functionality associated with a document type of the selected and displayed document (for example, a word processing functionality, a spreadsheet functionality, slide presentation functionality, notes taking functionality, and the like) may be displayed in the immersive view pane where the selected and displayed document is displayed. Using the provided functionality, the user may edit the displayed document, and according to one embodiment, upon editing the desired document, an instance of the edited document may be automatically saved with the electronic communication message at an electronic communication server, or alternatively, the changes made to the edited document may be pushed to a corresponding instance of the document stored at another storage location.

[0030] Upon initiating an editing function with respect to a selected and displayed content item, an electronic communication may be automatically generated in the electronic communication pane for attaching a copy of or pointer to the edited content item and for providing a communication to one or more recipients to which the edited content item will be sent. Upon sending the automatically-generated communication and the attached edited content item, an electronic communication conversation may be displayed in the electronic communication pane showing a conversation thread associated with the edited content item.

[0031] A "hide" function may be enabled for hiding temporarily or until subsequently "unhidden" the electronic communication thread to allow a greater display surface space for the selected and viewed or edited content item.

[0032] A user may initiate and conduct an electronic communication about a content item by initiating the electronic communication from a client application associated with the content item. For example, if a user is currently editing a spreadsheet document in a user interface provided by a spreadsheet application, electronic communication functionality may be provided in the client application user interface, for example, "reply with changes" or "send document to recipients", or the like may be provided in the user interface of the client application. Thus, for example, if a user is editing an example spreadsheet document, the user may select a communications functionality, for example, "reply with changes" functionality, and an instance of electronic communications user interface, for example, an electronic mail user interface, may be provided in proximity to the being-edited document or overlaying the being-edited document, and an electronic communication may be automatically generated in the electronic communication user interface for sending the being-edited document to a desired recipient. According to this embodiment, an attachment of the being-edited document may be automatically placed into the automatically-generated electronic communication, so that a recipient of the

communication may select the attachment for view and/or editing the being-edited document.

[0033] A new content item may be generated out of an electronic communications user interface. For example, if a user is utilizing an electronic mail client application and an associated user interface, an insert function may be provided for allowing the user to insert a new content item of various types into the electronic communications user interface. If the user selects to enter a file of a given file type, for example, a word processing document, a spreadsheet document, a slide presentation document, a notes taking application document, or the like, an instance of a user interface for the selected document type that includes functionality of the associated application, for example, word processing functionality, may be displayed in the immersive view pane of the electronic communication user interface for allowing the user to create a content item of the desired document type. When the user completes creation of the content item of the desired document type, the newly created document may be stored with an electronic communication at a corresponding electronic communication server, or the document may be saved to a different storage location, as desired.

[0034] Upon entering edit mode for the document being created, an electronic communication, for example, an electronic mail, may be automatically generated in a corresponding electronic communication pane, and an attachment may be placed in the automatically-generated electronic communication for sending the being-created content item to a desired recipient. According to this embodiment, upon selection of a save and send function, the newly created document may be both saved to a desired location, and the electronic communication may be sent to a desired recipient along with an attachment of the newly created content item or along with a pointer to a storage location of the newly created content item to allow a recipient of the electronic communication to access the newly created content item.

[0035] FIG. **1** is simplified block diagram illustrating a system **100** for electronic communication-based storage and use of documents and other content items to support multiple workflows. As Illustrated in FIG. **1**, a variety of users **102***a*, **102***b*, **102***c*, **102***n* are illustrated in association with respective client devices **104***a*, **104***b*, **104***c*, **104***n*. The users and the associated client devices are illustrative of one or more users who may generate, edit, receive, send, or otherwise interact with content items of various types as described herein. The client devices **104***a*-**104***n* are illustrative of a variety of computing devices, for example, desktop computing devises, laptop computing devices, tablet computing devices, handheld computing devices (mobile phones), and the like. Each of the example computing devices may be interacted with according to a variety of input means, for example, keyboard input, mouse input, electronic pen and ink input, touch input, gesture input, voice input, eye tracking input, and the like. At each of the client devices **104***a*-**104***n*, a variety of software applications may be provided for allowing the one or more users to interact with a variety of content items. For example, software applications such as electronic mail applications, word processing applications, slide presentation applications, spreadsheet applications, notes taking applications, desktop publishing applications, calendaring applications, image processing and editing applications, and the like may be operated at the client devices by the one or more users **102***a*-**102***n*. The network **120** is illustrative of an enterprise-based network, for example, an intranet, or a distributed computing network, for example, the Intranet, over which the various users may communicate with each other and with other computing systems, as described herein.

[0036] The mailbox server **108** is illustrative of an electronic communication system that may be located local to one of the various users, or that may be located remotely from the various users for allowing electronic mail and other electronic communications between the various users. An example of a server **108** may be an EXCHANGE server from Microsoft Corporation. The electronic communication item **110** (e.g., email item) is illustrative of an electronic communication that may be communicated between one or more users for passing text-based communications, and a variety of attached files, for example, audio files, text files, image files, data files, and the like. The temporary copy of a document **106** is illustrative of a temporary storage of an edited attached content item that is edited in association with an electronic communication item and that is temporarily stored with an electronic communication at the electronic mail server **108** for disposition according to embodiments of the present invention. The collaboration server **112** is illustrative of a local or remote storage repository at which one or more content items may be stored. For example, the collaboration server **112** may be a shared resources server located at an enterprise accessible by the various users, or may be remotely located from the various users at which the various users may store and collaborate on various documents. An example of such a collaboration server **112** may include a SHAREPOINT server or ONEDRIVE server from Microsoft Corporation.

[0037] According to embodiments of the present invention, when an attached content item is received and edited by a given user, a temporary copy **106** of the edited content item is stored with the received electronic communication item **110** at the electronic communication server **108**. The content item is only stored at the collaboration server **112** if a given user desires to store the received content item apart from the electronic communication server **108** as described with respect to embodiments illustrated and described herein.

[0038] FIG. **2**A illustrates a computer-generated user interface of an electronic communication application with which embodiments the present invention practiced. An example electronic communication application suitable for embodiments described herein includes OUTLOOK from Microsoft Corporation. As illustrated in FIG. **2**A, a user interface **200** for an example electronic mail application with which a user may send and receive a variety of electronic messages, and with which a user may send and receive content item attachments according to embodiments of the present invention is illustrated. An electronic mail folder pane **210** is illustrated on the left side of the user interface **200** in which a variety of folders, contact items, group items, calendar items, and the like, may be provided to allow a user to select various folders, contacts, or other items associated with her electronic communication application functionality. An electronic communication items folder **205** is illustrated in which a variety of electronic communication items received by the receiving user are displayed that may be selectively reviewed and responded to according to the functionality of the associated electronic communication application. For example, the pane **205** may include an inbox for listing all received electronic mail items, a sent box for listing sent electronic mail items and/or the contents of a given folder of electronic communication items.

[0039] On the right side of the example user interface **200** is displayed an electronic communication viewing pane in which a given electronic communication message or electronic communication conversation thread of items may be displayed for allowing a user to read or otherwise interact with a given electronic communication message, for example, replying to the message, forwarding the message, and the like. That is, upon selection of a given communication item (e.g., an electronic mail item) listed in an inbox displayed in the pane **205**, the selected item may be opened in the pane **215** to allow the user to read or respond to the communication item. If the selected communication item contains a thread of multiple communication items comprising a communication conversation, then the entire thread of items may be displayed in the pane **215** to allow the user to navigate through the various items in the thread.

[0040] As illustrated in FIG. **2**A, an example electronic mail message **235** has been received by the receiving user and has been opened in the electronic communications pane or canvas **215**. The received electronic mail message includes three example attachments **220**, **225**, **230**. As should be appreciated, the attachments **220**, **225**, **230** are illustrative of any attached content item, for example, a word processing document, a spreadsheet document, a slide presentation document, a notes document, an image file, a photograph, and the like, that may be received by the receiving user from a sending user.

[0041] According to embodiments of the present invention, if a user selects one of the attached content items **220**, **225**, **230**, the selected content item may be displayed in an immersive view pane **237** for allowing a user to view and/or edit the selected content item. As illustrated in FIG. **2**A, an example user selects the example word processing document attachment icon **220** for viewing and interacting with the selected document **220**, as described herein.

[0042] Referring now to FIG. **2**B, in response to the receiving user's selection of the attachment item **220**, as illustrated in FIG. **2**A, the associated document **240** is automatically displayed in an immersive view pane **237** for allowing the user to review and interact with the associated document **240**. As illustrated in FIG. **2**B, the immersive view pane is positioned on the left side of the user interface **200**, and the electronic mail view pane **215** remains displayed on the right side of the user interface **200**. As should be appreciated, the respective viewing panes may be displayed in other orientations, for example in a right/left orientation where the immersive view pane is displayed on the right side of the user interface and the electronic mail pane is displayed on the left, a top/bottom orientation where the immersive view pane is displayed on the top of the interface **200** and the electronic communication pane is displayed on the bottom of the interface **200**, or a bottom/top orientation where the immersive view pane is displayed on the bottom of the interface **200** and the electronic communication view pane is displayed on a top of the interface **200**. Alternatively, if the computing device in use by the receiving user is a small form device, such as a tablet computing device or mobile phone, and display space is insufficient for displaying both the immersive view pane and the electronic communication view pane, then the immersive view pane **237** may be displayed over the entire display surface of the computing device, and a functionality button or control may be provided for selectively returning the electronic communication view pane to display, as desired. Alternatively, a truncated display of the electronic communication view pane may be provided and the remaining display space may be used for the immersive view pane.

[0043] Referring still to FIG. **2**B, according to one embodiment, a user of the electronic communication user interface **200** may begin an electronic communication in the electronic communication pane **215** without editing the content item **240** selected and displayed in the immersive view pane **237**. That is, by selecting one or more communication functions, for example, the reply function **246**, a reply to all function, a forward function, and the like, the user may conduct an electronic communication with a variety of users inside the electronic communication pane **215** without affecting a display of the content item **240** displayed in the immersive view pane **237**.

[0044] Referring to FIG. **2**C, after selection of an electronic mail conversation function, for example, the reply function **246**, a new electronic communication **257** is illustrated as being generated in the electronic communication pane **215** for allowing the user to enter an electronic communication. As should be appreciated, if desired, the user generating the electronic communication **257** may attach the content item **240** to the communication **257** for sending the communication and the attached content item to one or more other recipients, or the user may simply wish to reply back to the sending user that originally sent the communication having the attached content item **240**. In such a case, each user at two different locations may select and display the attached content item **240** in their respective immersive view panes, while simultaneously conducting an electronic communication in the electronic communication pane **215** about any topic, including the content item **240** that is displayed in the immersive view panes of each of their respective electronic communication user interfaces **200**.

[0045] Referring now to FIG. **2**D, an edit/copy function **245** is provided for allowing a user to selectively edit the document **240** displayed in the immersive view pane **237**. That is, as will be described below, selection of the edit/copy function **245** may cause a provision of functionality associated with the document **240** to allow the user to edit the document **240** in association with the provided functionality. As should be appreciated, the edit/copy function **245** is illustrative of one of a variety of functions that may be provided in the immersive view pane for allowing a user to operate on the document displayed in the immersive view pane. For example, other functions that may be provided may include a send function for allowing the user to send the document **240** to another user, a save function for allowing a user to save the document to a storage location such as the collaboration server **112**, described above, and the like.

[0046] Referring to FIG. **2**E, according to embodiments of the present invention, if a user selects the edit/copy function **245**, an application associated with the content item type for the content item displayed in the immersive view pane may be launched in the immersive view pane. In FIG. **2**E, a word processing web-based application **250** is launched in response to a selection of an edit/copy function for the document displayed in the immersive view pane, as illustrated in FIG. **2**C. That is, if the document **240** is a word processing application, then selection of an edit function associated with the document **240** may cause the launching and retrieval of word processing functionality for allowing a user to edit the document in association with application functionality with which the document was created. For example, if the document **240** is a spreadsheet document, then selection of an edit

function **245** may cause the launching of spreadsheet application functionality in the immersive view pane. Likewise, if the document **240** is a slide presentation, then selection of an edit function **245** may cause the launching and provision of slide presentation application functionality in the immersive view pane for use with the document displayed in the immersive view pane. As illustrated in FIG. **2**E, a web-based application **250** is launched in response to the selection of an edit/copy function **245**, but as appreciated, a local or remote word processing application may similarly be launched for providing functionality in association with the document **245**.

[0047] Referring now to FIG. **2**F, in response to a selection of an edit/copy function **245**, as illustrated in FIGS. **2**D, and in response to a launching of an associated example word processing application, as illustrated in FIG. **2**E, a variety of word processing functionalities **255** may be provided in the immersive view pane for allowing the receiving user to edit the document **240**. As should be appreciated, an instance of a word processing application may be launched and displayed in the immersive view pane, or selected functionalities, for example, formatting functionalities may be provided in the immersive view pane for allowing a user to operate certain word processing functions on the document **240**. Likewise, if the document **240** is a spreadsheet document, then an instance of a spreadsheet application may be launched in the immersive view pane, or certain functionalities of a spreadsheet application may be provided in the immersive view pane.

[0048] Referring still to FIG. **2**F, according to one embodiment, when the receiving user selects the document **240** for editing, a draft communication **217**, for example, a draft reply electronic mail item may be automatically generated and displayed in the electronic communication view pane to allow the user to communicate the edited document or other content item when the user completes the editing process. Referring to the draft communication **217**, according to one embodiment, an automatic reply message to the original sender of the electronic mail message that attached the document **240** that is being edited by the receiving user may be generated so that upon completion of edits to the document **240**, the editing user may select a save and send function **260** for automatically attaching the edited version of the document or content item **240** to the draft communication **217** for sending the communication to the original sending user. Thus, a communication from the sending user to the receiving user is enabled where the receiving user opens an attachment **221** received from the sending user, edits the attachment **221** and automatically sends the edited version of the attachment back to the original sending user without the need for saving the attachment to a hard drive or other storage repository at which edits are made and saved followed by a retrieval and re-attachment of the edited content item to a communication for transmitting to the original sending user.

[0049] As described above with reference to FIG. **1**, when the user begins the editing process for an attached content item, as illustrated in FIG. **2**D, a temporary copy of the content item being edited is saved along with the received electronic communication item **110** at the electronic communication server **108**. According to one embodiment, the edited attachment is renamed to provide information to an individual recipient of the edited document and to distinguish the edited document from a previous version of the edited document. For example, a document with a file name of "Document A" may be renamed to include a name or other identification for the editing user and a new name of "Document A.editing user" may be applied to the edited version of the attached content item, and the renamed and edited version of the content item may be stored as a temporary copy of the document **106** at the electronic communication server **108**, as illustrated in FIG. **1**. Thus, the edited version of the content item is not stored at a separate local or remote storage area, such as the collaboration server **112** from which the edited version of the content item must be retrieved for eventual communication to another user.

[0050] Referring still to FIGS. **1** through **2**F, sending of an edited version of an attached content item back to the original sending user is illustrated and described. According to embodiments, other functionality of the electronic communication application may be utilized for disposing of an edited version of the received attached content item. For example, instead of using a save/send function **260**, as illustrated in FIG. **2**D, another function such as "send as meeting request" may be provided which, when selected, causes an automatic generation of a meeting request and an automatic attachment of the edited content item to the meeting request. Likewise, another function, such as, "add to notes" may be provided, which when selected, causes an automatic presentation of a notes user interface component in the electronic communication view pane and automatically attaches an edited version of the attached content item to an electronic notes document. Another function, such as, "add to calendar entry" may be provided, which when selected, causes an automatic opening of a calendar function and an automatic attachment of the edited version of the content item to a calendar item in an associated electronic calendaring application. As should be appreciated, any number of functions may be provided similar to the save and send function **260** which when selected may cause the provision of a user interface component in the electronic communication view pane for automatically attaching the edited version of the attached content item to another content item associated with a selected functionality.

[0051] Referring now to FIG. **2**G, after the automatically-generated electronic communication is sent to the one or more desired recipients, the sending user may utilize the electronic communication user interface **200** for any electronic communication functionality, for example, electronic mail, text messaging, instant messaging, and the like. According to one embodiment, the sending user may review an electronic communication conversation or thread **275** in the electronic communication pane **215** concerning the recently-sent electronic communication **217** showing the attachment **221** with which the user attached an edited version of the content item **240**, and showing a subsequent conversation item **218** received back from the recipient of the user's electronic communication containing yet another version of the content item **240** illustrated as attachment **222**, and showing an additional attachment **225** that the sending user wishes to have the recipient review. Thus, an electronic conversation about a given topic including edits to the content item **240** may be conducted between various users.

[0052] As illustrated and described above with references to FIGS. **2**A through **2**G, a content item may be launched from an attachment received in an electronic communication, and launched content item may be displayed in an immersive view pane to allow a user to view the displayed content item and his/her electronic communications simultaneously. Referring now to FIG. **2**H, according to an embodiment, a "hide email" function **285** is illustrated which when selected may cause the electronic communications pane **215** to be

temporarily hidden from view so that the immersive view pane **237** may be expanded to consume all available display space to allow the user a larger view of the selected content item **240**. As should be appreciated, a similar function, for example, a "unhide email" function may be provided after hiding the electronic communications pane for allowing a user to selectively return the electronic communications pane back into view. Similarly, a function may be provided for allowing the user to selectively hide the immersive view pane for allowing a display of other electronic communications panes **210** and **205**, as illustrated with reference to FIG. **2**A. Similarly, a "unhide" function may be provided for un-hiding the immersive view pane and for bringing the immersive view pane back into display along side the electronic communications pane, as illustrated and described herein.

[0053] FIG. **2**I illustrates a computer-generated software application user interface from which an electronic communication may be launched in association with a content item. As illustrated and described above, a content item, for example, a document, may be launched by selecting an attachment associated with the content item from an electronic communication item which causes a display of the selected item in an immersive view pane. According to another embodiment, an electronic communication functionality and interface may be launched from a content item that is being provided by associated software application functionality. As illustrated in FIG. **2**I, a user interface **290** is illustrated as a spreadsheet functionality user interface that may be provided by a spreadsheet application for allowing a user to enter and manipulate various data items. According to this embodiment, one or more electronic communications functionalities **292** may be provided in the user interface of a given software application for initiating an electronic communication out of the user interface in association with a document or other content item being generated via the associated user interface. For example, as illustrated in FIG. **2**I, a "reply with changes" functionality **292** is provided in the example spreadsheet application user interface **290** for automatically initiating an electronic communication for communicating with one or more users about any topic, but likely for communicating with other users about the document contained in the user interface from which the communication is initiated.

[0054] As should be appreciated, the illustration of the spreadsheet application user interface and associated data is for purposes of example only. That is, electronic communication functionality may be enabled in accordance with the functionality of any software application, for example, a word processing application, a slide presentation application, a notes taking application, a database application, and the like. In addition, the "reply with changes" function **292** is for purposes of example, and is not limiting of other electronic communications functionalities, for example, "forwarding", "sending", "send as an attachment", "forward as an attachment", and the like. That is, any electronic communication functionality available to an associated electronic communications application, for example, an electronic mail application, may be provided as a selectable functionality in a given software application user interface.

[0055] Referring to FIG. **2**J, in response to a user selection of the electronic communications function **292** an instance of an associated electronic communications user interface may be automatically launched and provided, as illustrated in FIG. **2**J. As illustrated in FIG. **2**J, in response to selection of the electronic communication functionality **292** illustrated in FIG. **2**I, not only is an instance of the electronic mail user interface launched, but an electronic mail item may be automatically generated, and the document being edited in the example spreadsheet may be automatically attached to the electronic mail item as attachment **225**, such that when a user selects a function **293** for disposition of the communication (e.g., sending, forwarding, replying, replying to all, etc.), then the communication may be sent to a desired user along with an attachment of the edited document or along with a pointer to a location of the stored edited document.

[0056] As should be appreciated, while the spreadsheet user interface illustrated in FIG. **2**I and the electronic mail user interface illustrated in FIG. **2**J are illustrated as displayed apart from other displayed content, the example spreadsheet user interface may be displayed in an immersive view pane, as described above, and the launched electronic communications interface may be displayed in an electronic communications pane, as described above, so that the being-edited document and the launched electronic communications interface are displayed in a side-by-side or top/bottom orientation. Thus, according to this embodiment, a user may launch an electronic communications session out of a document generation/editing session for communicating a given content item to one or more other users.

[0057] Referring now to FIG. **2**K, according to another embodiment, in addition to displaying and enabling editing of a content item that is attached to an electronic communication, as described above, according to another embodiment, a new content item may be generated out of an electronic communication user interface. As illustrated in FIG. **2**K, the electronic mail user interface **200** with its folder pane **210** and electronic mail listing pane **205** and electronic communications pane **215** is illustrated. In addition, an insert function **295** is illustrated for allowing a user to selectively insert objects of various types into an electronic mail item for sending the electronic mail item along with the inserted object to one or more recipients. According to an embodiment, in addition to inserting a given object, for example, an attachment, a photograph, a content item, a document, a data object, and the like, a new file function **296** may be enabled which when selected may allow for the creation of a new content item **294** within the electronic communication user interface **200** that subsequently may be saved and passed to one or more other users via an electronic communication.

[0058] Referring now to FIG. **2**L, in response to selecting the "new file" function **296**, as illustrated in FIG. **2**K, a user interface object **297** may be presented for allowing the user to select a file type associated with the new content item the user desires to create. For example, the user may be allowed to select from a word processing file, a spreadsheet file, a slide presentation file, a notes taking file, a desktop publishing file, a database file, and the like. That is, as should be appreciated, any file type that may be called upon by the electronic communications application for functionality may be used for allowing the user to create a content item of that type.

[0059] Referring now to FIG. **2**M, in response to selecting the example word processing file type, an instance of a word processing application user interface may be provided in the immersive view pane of the electronic communications user interface **200** for allowing a user to create a document of that type in the immersive view pane. That is, functionality of the selected word processing file type is provided in the immersive view pane and a blank drafting surface **298** is provided

for allowing the user to enter content as illustrated in FIG. **2**M. According to one embodiment, after the user completes entry of the content, the user may save the generated content to a storage location of the user's choice, or the user may select a "save and send" function **299** for automatically saving the newly-entered content item to an electronic communication item, for example, an electronic mail item to allow the newly-generated content item to be transmitted with the communication item to a desired recipient. For example, as illustrated and described above with reference to FIG. **1**, the newly-generated content item may be automatically stored with an electronic mail item **216** at an electronic mail box **108** for subsequent transmission with the electronic mail item **216**.

[0060] According to one embodiment, when generation of the new content item is initiated, the electronic mail item **216** may be automatically generated to allow a user to send the newly-generated content item to a desired recipient upon completion of the content item. According to this embodiment, the automatically-generated electronic mail item **216** may be displayed in the electronic communication pane **215**, and attachment **216**A may be associated with the electronic mail item **216**. Upon selection of the "save and send" function **299**, the generated document **298**A may be automatically stored with the electronic mail item **216** at the electronic mail box **108**, and the attachment **216**A may be updated to point to the storage location of the stored document **298**A such that a subsequent recipient of the electronic mail item **216** may select the attachment for opening, viewing and editing, if desired the newly-generated document **298**A.

[0061] Having described the system architecture, various user interface components and various aspects and embodiments of the present invention with respect to FIGS. **1** through **2**M, FIG. **3** is a flowchart illustrating a method for inline document collaboration through various workflows. The routine **300** begins as operation **305** and then proceeds to operation **310** where a user receives an electronic communication with an attached content item. For example, the user may receive an electronic mail, instant message, text message, chat message, or the like, having an attached content item. At operation **315**, user may view the attached content item in an immersive view to allow the user to view the attached content item and his/her electronic communications pane showing various electronic communication items simultaneously. At operation **320**, the user may conduct an electronic communications conversation apart from the display of the selected content item, as illustrated and described above with reference to FIG. **2**C.

[0062] At operation **325**, if the user desires to edit the attached and displayed content item, the user may enter an edit mode wherein functionality associated with the content item will be provided. In response to entering the edit mode, an electronic communication may be automatically generated for allowing the user to subsequently send an edited version of the content item to one or more desired recipients. At operation **330**, in response to selection of a function for saving edits to the content item and for sending the edited content item to one or more desired recipients, the edited content item may be stored with the electronic mail item in an electronic mail server **108**, or the edited content item may be automatically stored in a separate storage location, for example, the collaboration server **112**.

[0063] When the electronic communication is sent to the desired recipients, the edited content item may be attached to the communication if it is been saved with the email, or a pointer to the saved content item may be attached to the communication to point the recipient of the communication to a storage location for the edited content item. At operation **335**, after the automatically-generated communication is sent, the user's electronic communications user interface **200** may return back to a starting configuration, and the user may view a communication conversation including a communication associated with the sent edited content item. At operation **340**, hiding an electronic communication may be enabled, if desired.

[0064] At operation **345**, if a user desires to generate an electronic communication out of a user interface associated with the generation of a given content item, the user may select an electronic communications function from a user interface provided by the associated software application, for example, a word processing application user interface, a spreadsheet application user interface, a slide presentation application user interface, and the like, and at operation **350**, a "save and send" function may be utilized for saving edits to an associated content item and for sending a generated and/or edit content item to one or more desired recipients, as illustrated and described above with reference to FIGS. **2**I and **2**J.

[0065] At operation **355**, if a user utilizing his/her electronic communications application and user interface **200** desires to create a new content item, the user may select to insert a new content item within an electronic communication, as illustrated above with reference to FIG. **2**K. At operation **360**, an appropriate file type may be selected, and an instance of an associated software application user interface, for example, a word processing application user interface, may be provided in the immersive view pane for allowing the user to generate a new content item of the desired file type.

[0066] At operation **365**, the content item of the selected file type may be generated. The generated content item may be saved a desired storage location, or if desired, the user may utilize a "save and send" function for saving the generated document with an automatically-generated electronic communication item and for sending the electronic communication item to a desired recipient by attaching the newly-generated content item to the automatically-generated electronic communication item. The routine ends at operation **395**.

[0067] While the invention has been described in the general context of program modules that execute in conjunction with an application program that runs on an operating system on a computer, those skilled in the art will recognize that the invention may also be implemented in combination with other program modules. Generally, program modules include routines, programs, components, data structures, and other types of structures that perform particular tasks or implement particular abstract data types.

[0068] The embodiments and functionalities described herein may operate via a multitude of computing systems including, without limitation, desktop computer systems, wired and wireless computing systems, mobile computing systems (e.g., mobile telephones, netbooks, tablet or slate type computers, notebook computers, and laptop computers), hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, and mainframe computers.

[0069] In addition, the embodiments and functionalities described herein may operate over distributed systems (e.g., cloud-based computing systems), where application functionality, memory, data storage and retrieval and various pro-

cessing functions may be operated remotely from each other over a distributed computing network, such as the Internet or an intranet. User interfaces and information of various types may be displayed via on-board computing device displays or via remote display units associated with one or more computing devices. For example user interfaces and information of various types may be displayed and interacted with on a wall surface onto which user interfaces and information of various types are projected. Interaction with the multitude of computing systems with which embodiments of the invention may be practiced include, keystroke entry, touch screen entry, voice or other audio entry, gesture entry where an associated computing device is equipped with detection (e.g., camera) functionality for capturing and interpreting user gestures for controlling the functionality of the computing device, and the like.

[0070] FIGS. **4-6** and the associated descriptions provide a discussion of a variety of operating environments in which embodiments of the invention may be practiced. However, the devices and systems illustrated and discussed with respect to FIGS. **4-6** are for purposes of example and illustration and are not limiting of a vast number of computing device configurations that may be utilized for practicing embodiments of the invention, described herein.

[0071] FIG. **4** is a block diagram illustrating physical components (i.e., hardware) of a computing device **400** with which embodiments of the invention may be practiced. The computing device components described below may be suitable for the client device **104***a-n* described above. In a basic configuration, the computing device **400** may include at least one processing unit **402** and a system memory **404**. Depending on the configuration and type of computing device, the system memory **404** may comprise, but is not limited to, volatile storage (e.g., random access memory), non-volatile storage (e.g., read-only memory), flash memory, or any combination of such memories. The system memory **404** may include an operating system **405** and one or more program modules **406** suitable for running software applications **450**. The operating system **405**, for example, may be suitable for controlling the operation of the computing device **400**. Furthermore, embodiments of the invention may be practiced in conjunction with a graphics library, other operating systems, or any other application program and is not limited to any particular application or system. This basic configuration is illustrated in FIG. **4** by those components within a dashed line **408**. The computing device **400** may have additional features or functionality. For example, the computing device **400** may also include additional data storage devices (removable and/or non-removable) such as, for example, magnetic disks, optical disks, or tape. Such additional storage is illustrated in FIG. **4** by a removable storage device **409** and a non-removable storage device **410**.

[0072] As stated above, a number of program modules and data files may be stored in the system memory **404**. While executing on the processing unit **402**, the program modules **406** may perform processes including, but not limited to, one or more of the stages of the method **300** illustrated in FIG. **3**. Other program modules that may be used in accordance with embodiments of the present invention and may include applications such as electronic mail and contacts applications, word processing applications, spreadsheet applications, database applications, slide presentation applications, drawing or computer-aided application programs, etc.

[0073] Furthermore, embodiments of the invention may be practiced in an electrical circuit comprising discrete electronic elements, packaged or integrated electronic chips containing logic gates, a circuit utilizing a microprocessor, or on a single chip containing electronic elements or microprocessors. For example, embodiments of the invention may be practiced via a system-on-a-chip (SOC) where each or many of the components illustrated in FIG. **4** may be integrated onto a single integrated circuit. Such an SOC device may include one or more processing units, graphics units, communications units, system virtualization units and various application functionality all of which are integrated (or "burned") onto the chip substrate as a single integrated circuit. When operating via an SOC, the functionality, described herein, with respect to providing an activity stream across multiple workloads may be operated via application-specific logic integrated with other components of the computing device **400** on the single integrated circuit (chip). Embodiments of the invention may also be practiced using other technologies capable of performing logical operations such as, for example, AND, OR, and NOT, including but not limited to mechanical, optical, fluidic, and quantum technologies. In addition, embodiments of the invention may be practiced within a general purpose computer or in any other circuits or systems.

[0074] The computing device **400** may also have one or more input device(s) **412** such as a keyboard, a mouse, a pen, a sound input device, a touch input device, etc. The output device(s) **414** such as a display, speakers, a printer, etc. may also be included. The aforementioned devices are examples and others may be used. The computing device **400** may include one or more communication connections **416** allowing communications with other computing devices **418**. Examples of suitable communication connections **416** include, but are not limited to, RF transmitter, receiver, and/or transceiver circuitry; universal serial bus (USB), parallel, and/or serial ports.

[0075] The term computer readable media as used herein may include computer storage media. Computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, or program modules. The system memory **404**, the removable storage device **409**, and the non-removable storage device **410** are all computer storage media examples (i.e., memory storage.) Computer storage media may include RAM, ROM, electrically erasable read-only memory (EEPROM), flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other article of manufacture which can be used to store information and which can be accessed by the computing device **400**. Any such computer storage media may be part of the computing device **400**. Computer storage media does not include a carrier wave or other propagated or modulated data signal.

[0076] Communication media may be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and includes any information delivery media. The term "modulated data signal" may describe a signal that has one or more characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communica-

tion media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), infrared, and other wireless media.

[0077] FIGS. **5**A and **5**B illustrate a mobile computing device **500**, for example, a mobile telephone, a smart phone, a tablet personal computer, a laptop computer, and the like, with which embodiments of the invention may be practiced. With reference to FIG. **5**A, one embodiment of a mobile computing device **500** for implementing the embodiments is illustrated. In a basic configuration, the mobile computing device **500** is a handheld computer having both input elements and output elements. The mobile computing device **500** typically includes a display **505** and one or more input buttons **510** that allow the user to enter information into the mobile computing device **500**. The display **505** of the mobile computing device **500** may also function as an input device (e.g., a touch screen display). If included, an optional side input element **515** allows further user input. The side input element **515** may be a rotary switch, a button, or any other type of manual input element. In alternative embodiments, mobile computing device **500** may incorporate more or less input elements. For example, the display **505** may not be a touch screen in some embodiments. In yet another alternative embodiment, the mobile computing device **500** is a portable phone system, such as a cellular phone. The mobile computing device **500** may also include an optional keypad **535**. Optional keypad **535** may be a physical keypad or a "soft" keypad generated on the touch screen display. In various embodiments, the output elements include the display **505** for showing a graphical user interface (GUI), a visual indicator **520** (e.g., a light emitting diode), and/or an audio transducer **525** (e.g., a speaker). In some embodiments, the mobile computing device **500** incorporates a vibration transducer for providing the user with tactile feedback. In yet another embodiment, the mobile computing device **500** incorporates input and/or output ports, such as an audio input (e.g., a microphone jack), an audio output (e.g., a headphone jack), and a video output (e.g., a HDMI port) for sending signals to or receiving signals from an external device.

[0078] FIG. **5**B is a block diagram illustrating the architecture of one embodiment of a mobile computing device. That is, the mobile computing device **500** can incorporate a system (i.e., an architecture) **502** to implement some embodiments. In one embodiment, the system **502** is implemented as a "smart phone" capable of running one or more applications (e.g., browser, e-mail, calendaring, contact managers, messaging clients, games, and media clients/players). In some embodiments, the system **502** is integrated as a computing device, such as an integrated personal digital assistant (PDA) and wireless phone.

[0079] One or more application programs **550** may be loaded into the memory **562** and run on or in association with the operating system **564**. Examples of the application programs include phone dialer programs, electronic communication applications, personal information management (PIM) programs, word processing programs, spreadsheet programs, Internet browser programs, messaging programs, and so forth. The system **502** also includes a non-volatile storage area **568** within the memory **562**. The non-volatile storage area **568** may be used to store persistent information that should not be lost if the system **502** is powered down. The application programs **550** may use and store information in the non-volatile storage area **568**, such as e-mail or other messages used by an e-mail application, and the like. A synchronization application (not shown) also resides on the system **502** and is programmed to interact with a corresponding synchronization application resident on a host computer to keep the information stored in the non-volatile storage area **568** synchronized with corresponding information stored at the host computer. As should be appreciated, other applications may be loaded into the memory **562** and run on the mobile computing device **500**.

[0080] The system **502** has a power supply **570**, which may be implemented as one or more batteries. The power supply **570** might further include an external power source, such as an AC adapter or a powered docking cradle that supplements or recharges the batteries.

[0081] The system **502** may also include a radio **572** that performs the function of transmitting and receiving radio frequency communications. The radio **572** facilitates wireless connectivity between the system **502** and the "outside world," via a communications carrier or service provider. Transmissions to and from the radio **572** are conducted under control of the operating system **564**. In other words, communications received by the radio **572** may be disseminated to the application programs **550** via the operating system **564**, and vice versa.

[0082] The visual indicator **520** may be used to provide visual notifications and/or an audio interface **574** may be used for producing audible notifications via the audio transducer **525**. In the illustrated embodiment, the visual indicator **520** is a light emitting diode (LED) and the audio transducer **525** is a speaker. These devices may be directly coupled to the power supply **570** so that when activated, they remain on for a duration dictated by the notification mechanism even though the processor **560** and other components might shut down for conserving battery power. The LED may be programmed to remain on indefinitely until the user takes action to indicate the powered-on status of the device. The audio interface **574** is used to provide audible signals to and receive audible signals from the user. For example, in addition to being coupled to the audio transducer **525**, the audio interface **574** may also be coupled to a microphone to receive audible input, such as to facilitate a telephone conversation. In accordance with embodiments of the present invention, the microphone may also serve as an audio sensor to facilitate control of notifications, as will be described below. The system **502** may further include a video interface **576** that enables an operation of an on-board camera **530** to record still images, video stream, and the like.

[0083] A mobile computing device **500** implementing the system **502** may have additional features or functionality. For example, the mobile computing device **500** may also include additional data storage devices (removable and/or non-removable) such as, magnetic disks, optical disks, or tape. Such additional storage is illustrated in FIG. **5**B by the non-volatile storage area **568**.

[0084] Data/information generated or captured by the mobile computing device **500** and stored via the system **502** may be stored locally on the mobile computing device **500**, as described above, or the data may be stored on any number of storage media that may be accessed by the device via the radio **572** or via a wired connection between the mobile computing device **500** and a separate computing device associated with the mobile computing device **500**, for example, a server computer in a distributed computing network, such as the Internet. As should be appreciated such data/information may be accessed via the mobile computing device **500** via the radio

572 or via a distributed computing network. Similarly, such data/information may be readily transferred between computing devices for storage and use according to well-known data/information transfer and storage means, including electronic mail and collaborative data/information sharing systems.

[0085] FIG. 6 illustrates one embodiment of the architecture of a system for providing the functionality described herein across components of a distributed computing environment. Content developed, interacted with, or edited in association with the applications described above may be stored in different communication channels or other storage types. For example, various documents may be stored using a directory service 622, a web portal 624, a mailbox service 626, an instant messaging store 628, or a social networking site 630. The application 620 (e.g., an electronic communication application) may use any of these types of systems or the like for providing the functionalities described herein across multiple workloads, as described herein. A server 615, 108 may provide the functionality to clients 605A-C and 104A-N. As one example, the server 615, 108 may be a web server providing the application functionality described herein over the web. The server 615, 108 may provide the application functionality over the web to clients 605A-C and 104A-N through a network 120, 610. By way of example, a client computing device 104A-N may be implemented and embodied in a personal computer 605A, a tablet computing device 605B and/or a mobile computing device 605C (e.g., a smart phone), or other computing device. Any of these embodiments of the client computing device may obtain content from the store 616.

[0086] Embodiments of the present invention, for example, are described above with reference to block diagrams and/or operational illustrations of methods, systems, and computer program products according to embodiments of the invention. The functions/acts noted in the blocks may occur out of the order as shown in any flowchart. For example, two blocks shown in succession may in fact be executed substantially concurrently or the blocks may sometimes be executed in the reverse order, depending upon the functionality/acts involved.

[0087] The description and illustration of one or more embodiments provided in this application are not intended to limit or restrict the scope of the invention as claimed in any way. The embodiments, examples, and details provided in this application are considered sufficient to convey possession and enable others to make and use the best mode of claimed invention. The claimed invention should not be construed as being limited to any embodiment, example, or detail provided in this application. Regardless of whether shown and described in combination or separately, the various features (both structural and methodological) are intended to be selectively included or omitted to produce an embodiment with a particular set of features. Having been provided with the description and illustration of the present application, one skilled in the art may envision variations, modifications, and alternate embodiments falling within the spirit of the broader aspects of the general inventive concept embodied in this application that do not depart from the broader scope of the claimed invention.

We claim:

1. A method of generating an electronic communication out of a content generation workflow, comprising:

providing an application user interface for generating, editing and/or displaying one or more content items;

providing one or more electronic communications functionalities in the application user interface;

receiving a content item in the application user interface;

in response to a selection of one of the one or more electronic communications functionalities, automatically generating an electronic communication for communicating the received content item to one or more desired recipients.

2. The method of claim 1, wherein providing an application user interface for generating, editing and/or displaying one or more content items includes providing an application user interface for one or more of a word processing application, a spreadsheet application, a slide presentation application, a database application, a notes taking application, a desktop publishing application, a calendar application, a tasks application and a reminders application.

3. The method of claim 1, wherein providing one or more electronic communications functionalities in the application user interface includes providing one or more of a reply function, a reply with changes function, a forward function, a send function, a send as an attachment function, and a forward as an attachment function.

4. The method of claim 1, wherein receiving a content item in the application user interface includes receiving the content item into the application user interface in response to selection of an attachment in an associated electronic communication.

5. The method of claim 1, in response to a selection of one of the one or more electronic communications functionalities and prior to automatically generating an electronic communication for communicating the received content item to one or more desired recipients, launching an electronic communications interface for generating the electronic communication and for sending the generated electronic communication to the one or more desired recipients.

6. The method of claim 5, prior to automatically generating an electronic communication for communicating the received content item to one or more desired recipients, storing an instance of the received content item for attachment to the automatically generated electronic communication.

7. The method of claim 6, further comprising:

in the electronic communications interface, automatically generating the electronic communication and automatically attaching the stored instance of the received content item to the generated electronic communication for sending the electronic communication and the attached stored instance of the received content item to the one or more desired recipients.

8. The method of claim 6, further comprising:

in the electronic communications interface, automatically generating the electronic communication and automatically attaching a pointer to the stored instance of the received content item to the generated electronic communication for sending the electronic communication and the pointer to the attached stored instance of the received content item to the one or more desired recipients.

9. The method of claim 7, wherein if the selected one of the one or more electronic communications functionalities is a reply functionality, automatically populating a receiving address for the generated electronic communication with an

address for an original sender of an electronic communication from which the received content item was received.

10. The method of claim **7**, wherein if the selected one of the one or more electronic communications functionalities is a reply to all functionality, automatically populating a receiving address for the generated electronic communication with an address for all addressees included in an electronic communication from which the received content item was received.

11. The method of claim **7**, wherein if a desired recipient of the generated electronic communication is not designated, providing a field in the generated electronic communication for receiving an address for the one or more desired recipients.

12. The method of claim **1**, wherein providing an application user interface for generating, editing and/or displaying one or more content items includes providing the application user interface in an immersive view pane in an electronic communications user interface, the electronic communications user interface having a communications pane in which the automatically generated electronic communication is generated for communicating the received content item to one or more desired recipients.

13. A method for providing immersive document view and use in an electronic communications user interface, comprising:

in a computer-generated electronic communications user interface, providing a communications pane in which is disposed one or more electronic communications where at least one of the one or more electronic communications includes a content item attachment;

in response to a selection of the content item attachment, displaying an associated content item in an immersive view pane in the electronic communications user interface for allowing a view of both the displayed content item and the one or more electronic communications in a single display of the electronic communications user interface; and

providing for removing the communications pane from display in the computer-generated electronic communications user interface for providing additional display space for the immersive view pane and providing for removing the immersive view pane from display in the computer-generated electronic communications user interface for providing additional display space for the communications pane.

14. The method of claim **13**, wherein providing for removing the communications pane from display includes providing a hide function for temporarily hiding the communications pane from display.

15. The method of claim **14**, further comprising providing an unhide function for returning the communications pane to display in the computer-generated electronic communications user interface.

16. The method of claim **13**, wherein providing for removing the immersive view pane from display includes providing a hide function for temporarily hiding the immersive view pane from display.

17. The method of claim **16**, further comprising providing an unhide function for returning the immersive view pane to display in the computer-generated electronic communications user interface.

18. A computer-readable medium containing computer executable instructions, which when executed by a computer perform a method of generating an electronic communication out of a content generation workflow, comprising:

providing an application user interface for generating, editing and/or displaying one or more content items;

providing one or more electronic communications functionalities in the application user interface;

receiving a content item in the application user interface;

in response to a selection of one of the one or more electronic communications functionalities, storing an instance of the received content item; and

launching an electronic communications user interface for automatically generating an electronic communication for sending the stored instance of the received content item to one or more desired recipients.

19. The computer-readable medium of claim **18**, wherein providing an application user interface for generating, editing and/or displaying one or more content items includes providing an application user interface for one or more of a word processing application, a spreadsheet application, a slide presentation application, a database application, a notes taking application, a desktop publishing application, a calendar application, a tasks application and a reminders application.

20. The computer-readable medium of claim **18**, wherein providing one or more electronic communications functionalities in the application user interface includes providing one or more of a reply function, a reply with changes function, a forward function, a send function, a send as an attachment function, and a forward as an attachment function.

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