PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) **International Patent Classification** 5 :
H04M 1/64, 11/00, G06F 15/00

A1

(11) **International Publication Number:** **WO 95/06993**

(43) **International Publication Date:** 9 March 1995 (09.03.95)

(21) **International Application Number:** PCT/US94/09247

(22) **International Filing Date:** 16 August 1994 (16.08.94)

(30) **Priority Data:**
08/112,955 30 August 1993 (30.08.93) US

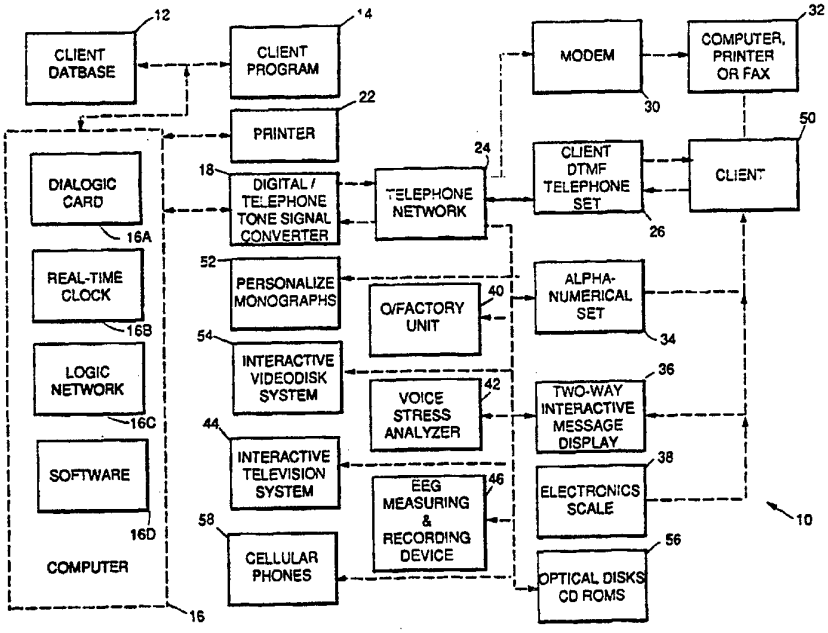
(71)(72) **Applicant and Inventor:** BRO, L., William [US/US]; 8939 S. Sepuleveda Boulevard, Los Angeles, CA 90045 (US).

(74) **Agents:** CISLO, Daniel, M. et al.; Cislo & Thomas, Suite 900, 233 Wilshire Boulevard, Santa Monica, CA 90401 (US).

(81) **Designated States:** AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) **Title:** METHOD AND APPARATUS FOR AN AUTOMATED AND INTERACTIVE BEHAVIORAL GUIDANCE SYSTEM



(57) **Abstract**

A system (10) that allows a user to send a series of motivational messages and/or questions to a client (50) to motivate a specific behavioral problem. The system (2) consists of a client database (12) that includes for each client the name, calling schedule and personal ID and a client program (14) that includes for each client unique motivational messages and/or questions which can be used alone or with such devices as an electronic weight scale (38), olfactory unit (40), and voice stress analyzer (42) that require a client response. The database and program are operated by a computer (16) that at preselected time periods sends the messages and/or questions to a client's telephone set (26) via a converter (18) and a network (24).

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**GB**	United Kingdom	**MR**	Mauritania
AU	Australia	**GE**	Georgia	**MW**	Malawi
BB	Barbados	**GN**	Guinea	**NE**	Niger
BE	Belgium	**GR**	Greece	**NL**	Netherlands
BF	Burkina Faso	**HU**	Hungary	**NO**	Norway
BG	Bulgaria	**IE**	Ireland	**NZ**	New Zealand
BJ	Benin	**IT**	Italy	**PL**	Poland
BR	Brazil	**JP**	Japan	**PT**	Portugal
BY	Belarus	**KE**	Kenya	**RO**	Romania
CA	Canada	**KG**	Kyrgystan	**RU**	Russian Federation
CF	Central African Republic	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CG	Congo			**SE**	Sweden
CH	Switzerland	**KR**	Republic of Korea	**SI**	Slovenia
CI	Côte d'Ivoire	**KZ**	Kazakhstan	**SK**	Slovakia
CM	Cameroon	**LI**	Liechtenstein	**SN**	Senegal
CN	China	**LK**	Sri Lanka	**TD**	Chad
CS	Czechoslovakia	**LU**	Luxembourg	**TG**	Togo
CZ	Czech Republic	**LV**	Latvia	**TJ**	Tajikistan
DE	Germany	**MC**	Monaco	**TT**	Trinidad and Tobago
DK	Denmark	**MD**	Republic of Moldova	**UA**	Ukraine
ES	Spain	**MG**	Madagascar	**US**	United States of America
FI	Finland	**ML**	Mali	**UZ**	Uzbekistan
FR	France	**MN**	Mongolia	**VN**	Viet Nam
GA	Gabon				

METHOD AND APPARATUS FOR AN AUTOMATED AND INTERACTIVE BEHAVIORAL GUIDANCE SYSTEM

TECHNICAL FIELD

The invention pertains to the general field of information exchange services, education and personal health care and more particularly to a computerized telephonic system that conveys health awareness messages and maintains surveillance over clients by periodically sending behavioral motivation reinforcement messages and/or questions that require a client interaction.

BACKGROUND ART

One of the major advances of present-day society is in the field of computerized telecommunications. Today, in the growing field of behavioral medicine, formal verbal interchange is essential to provide modification of behavior and reinforcement. By using computerized telecommunications coupled with voice recognition technology, a client's behavior can be modified and reinforced at the site where behavior occurs and wherever the client goes. It has been found that as the frequency of reinforcing feedback increases, the client shows more rapid progress towards a particular goal. By utilizing a system of continuous computerized reinforcement, a client can be provided with more opportunity and greater frequency of therapeutic contact or feedback than through treatment in person. Additionally, the use of an interactive system vastly increases the therapeutic effect of this method of behavioral modification and reinforcement.

Learning is enhanced through interactive feedback, and feedback in some form heightens the learning experience. The number of times in school a teacher asks any one child for an

answer is fairly limited. Most of the time, children raise their hands and respond, and get back a "right" or "wrong." If they are wrong, they have lost their chance, and someone else is called upon for the answer. In traditional adult education and behavioral modification, the amount of continuing feedback is limited to the time actually spent with a counselor or in a seminar. Here, too, the feedback is limited to the actual time the counselor or trainer spends providing interaction with any one client. By contrast, the addition of a computer and telecommunications or broadcast transmission allows "narrowcast" interaction and feedback on a continuous 24-hour basis to the client wherever he goes, allowing for far greater frequency of interaction. Most importantly, in the case of adult behavior modification, this feedback becomes available for the first time at the site where the behavior occurs.

Learning by playing and doing is fundamental to all mammals. While audio broadcast or telecommunications are media based upon hearing, and video broadcast is a medium based upon seeing, interactive feedback utilizing these architectures is a medium based upon doing or responding to the stimulus of feedback. Recent studies have revealed that the single best way to increase mammalian intelligence is through interactive stimulation. The frequency of feedback that we receive generally is the single greatest factor affecting learning and modifying behavior. Further, learning by receiving immediate feedback is preferable to receiving a delayed response. Children prefer interactive television games to merely watching a television program. They become impatient with long strings of dialogue, and the focus of their attention is diverted by devices providing rapid feedback.

Adults display the same behavior throughout their lives. For example, when purchasing an appliance, they rarely read the instructions before trying to use it. The need to receive continuing feedback, at all levels of life, is a human characteristic, thus providing a basic survival mechanism which fosters learning and continuing growth.

Research indicates that learning is enhanced by interactive feedback. Where the quantity of interacting feedback is increased, focus is sustained or increased, thereby stimulating keen responsiveness, as is the case with video games. The active involvement required to respond by answering provocative questions stimulates conscious awareness of and focus on the issue at hand. Learning and behavioral modification systems that incorporate rapid feedback foster problem-solving abilities, pattern recognition, management and allocation of resources, logical thinking patterns, memory, quick thinking, and reasoned judgment. Most importantly, when these skills are practiced at the site where the desired behavior is to occur, learning is more vivid and is quickly integrated into real life.

A sense of control is perceived with the provision of feedback. By engaging the client to direct his focus and asking provoking questions, involvement is increased and stimulation results. When the individual learner achieves success and immediately receives positive feedback, self-esteem is rapidly built. When success is rewarded, confidence and resilience are enhanced and knowledge is created.

Historically, individuals have sought self-improvement through self-help books, seminar workshops and programs of aperiodic or short duration. With the best of intentions relapse usually

occurs within several days after reading a book or attending a seminar, or several months after the conclusion of a behavioral modification program.

In contrast, computer-derived, self-adjusting motivational guidance, which interactively polls the client and comments on his performance as he goes about his daily life throughout the year, has a more lasting effect. It differs importantly from seminars and visits to counselors in that it modifies behavior at the site where the behavior occurs, with personal or customized intervention. The more frequent interactive dialogue between the counselor-controlled computer and the client enhances the feedback and therapeutic simulation in much the same way as has been experienced in other interactive communication structures, such as education and entertainment. For instance, consumers accord a higher value to interactive entertainment software than to passive software, due to the greater stimulation afforded by this mode. In entertainment software, an example would be some of the new video games that present a mode which runs like an animated cartoon until one elects to interact. As an animated cartoon, the video usually becomes boring within minutes. But as an interactive video game, the software stimulates the user with hours of entertainment.

In summary, a computerized interactive system increases the client's ability to resolve problems at the site where behavior occurs, and adjusts him within the framework of a preset goal. By including, within the context of the personalized message, challenges in the form of questions, an entertaining and stimulating process can be added due to the increased feedback or interactive nature of new telecommunication technology.

With regard to the prior art, many types of systems have been used in endeavoring to provide an effective means for providing surveillance over a behavioral modification client by using a telecommunication link. However, these prior art systems have not disclosed an adequate and cost-effective telecommunication network that uses a computer in combination with a telephone to provide positive motivational messages and/or questions that are answered by a client by means of a dual tone multifrequency telephone set.

Further, the prior art systems have not disclosed utilization with such hardware as voice stress analyzers, olfactory units, CD-ROM platforms, interactive television in connection with a telecommunication link as a further behavioral modification means in use with the client.

A search of the prior art discloses patents that show different types of feedback mechanisms:

PATENT NO.	INVENTOR	ISSUED
3,742,938	T. J. Stern	3 July 1973
3,808,694	W. Y. Hutchinson et al.	7 May 1974
4,112,425	G. J. Zobrist et al.	5 September 1978
4,237,344	Moore	2 December 1980
4,328,494	R. Goodall	4 May 1982
4,377,214	G. G. Hansen et al.	22 March 1983
4,396,976	G. P. Hyatt	2 August 1983
4,602,127	J. F. Neely et al.	22 July 1986
4,773,492	E. Ruzumna	27 September 1988
4,831,242	W. H. Englehardt et al.	16 May 1989
4,835,372	Gombrich et al.	30 May 1989
4,916,435	Fuller	10 April 1990

4,922,514	Bergeron et al.	1 May 1990
4,912,552	Allison III et al.	27 March 1990
4,933,873	Kaufman et al.	12 June 1990
4,952,928	G. T. Carroll et al.	28 August 1990
5,008,835	Jackmann et al.	16 April 1991
5,014,298	Katz	7 May 1991
5,018,736	Person et al.	28 May 1991
5,023,901	Sloan et al.	11 June 1991
5,036,462	Kaufman et al.	30 July 1991
5,068,080	Impink Jr. et al.	26 November 1991
5,085,527	P. A. Gilbert	4 February 1992

The Sloan et al., patent discloses a surveillance system which integrates voice identification with passive monitoring mechanisms. The system comprises a central station located at a supervisory authority and a plurality of remote voice verification units. Each unit is located at a designated locality for an individual under surveillance and is connected to the central station via telephone lines. The central station consists of a control computer system and a violation computer system. The central station maintains and analyzes all relevant data for each individual, and initializes and retrieves information from each voice verification unit. Each voice verification unit conducts a voice verification test of a respective individual according to test schedules outlined by the central station. Test and monitoring results obtained during a defined surveillance period are transmitted to the central station on a periodic or exigent basis. Each remote station has a modem input, test means input connected to a microphone, and a third input to receive passive monitoring signals. The active

and passive signals are analyzed according to an algorithm and command signals received from the central station. The test means also has an output to prod the individual to speak a preselected series of words. The test schedule in each remote is randomly created for each period and individual.

The Fuller patent discloses a remote confinement monitoring station and system with a central office that provides means for automatic selection of a specific confinee. The central office selects scheduled or semi-random monitoring calls, to avoid a high degree of predictability by the confinee, auto dialing means for transmission of a prerecorded or synthesized audio instruction message to the confinee, and recording of information received in response to the acts of the selected confinee preformed in response to the communicated message. The central office has a computer with a telephone line modem, a voice synthesizer, and other accessories in displays for automatic recording of data received including a visual camera image and breath analyzer results, and can include automatic image comparison and violation signal alarming.

The Moore patent discloses a rapid response hospital health care communications system. The system includes an auto dialer telephone system to allow patients to communicate from outside the hospital to receive advice and health care as indicated by the patient's medical profile. The communications system includes a health care console with an information storing computer connected through various communication paths to in-hospital patients, and by telephone means to out-of-hospital patient locations. Each out-of-hospital location includes a communication interface with a telephone, a console, and a hand-

held remote control comprising a plurality of sensors, indicators and features. The interface includes an auto dialer and auto identifier that dials the health care console and identifies the patient by a computer recognizable code.

The Kaufman et al., patent discloses an interactive patient assisting device that has both preselected doses of medicine and a physical testing device that can communicate with a remote medical center over the telephone system. The system includes a clock/ calendar unit that can be programmed to establish a schedule of a variety of activities, a pharmaceutical dispenser, a voice synthesizer and recognitions unit, a computer, displays, and monitor means for blood pressure, oxygen and temperature. For communicating to a remote location, an automatic dialer, modem and telephone are included.

The Bergeron et al., patent discloses a method and system for the dispatch of resources to remote sites in response to alarm signals. A processor accesses the database of, for instance, a field service engineer designated to provide services to particular remote sites in response to the alarm signals received from those sites. The processor then attempts to establish a telephone connection with the field service engineer and provide the engineer with information by means of synthesized voice messages. The system may execute remote diagnostic programs and determine the results and attempt to communicate with selected resources. The system has a conventional processor with a database, voice synthesizer, voice system and auto dialer. When the system dials and the telephone is answered, the system requests an identification code by means of the touchtone buttons before it communicates.

The Hutchinson patent discloses a weighing and height measuring device. It is especially adapted for use with a remote digital read-out system. The device comprises a weight responsive moving platform connected by cable to a remote digital read-out unit. One of the objects of the invention is to provide a weight measuring device adapted for use with a remote read-out and/or computer input device.

The Stern patent discloses a cardiac pacer and heart pulse monitor for remote diagnosis wherein information from a pair of sensors is transmitted by means of a telephone handset and transmitter, over a commercial telephone system to a remote receiver. Information received at the receiver may then be processed by means of an appropriate computer and program system.

The Carroll patent discloses an adaptable electronic monitoring system. The system is configured to fit the needs of a particular monitoring or identification application by selecting appropriate modules. The system provides for monitoring at a central location and communication between the location of the sensed information to the processing site by means of a normal telephone communications system.

The other cited patents are for background purposes and are indicative of the art to which the invention relates.

It will be noted that the above mechanisms and systems do not allow the utilization of various well known elements used in a unique random calling manner with a client database and client program of prescribed messages and/or questions for particular persons. More particularly, the instant apparatus and method provides a uniquely reinforcing approach of allowing the use of prescribed messages and/or questions for particular persons.

More particularly, the instant apparatus and method provides a uniquely reinforcing approach of allowing the use of random calls at random locations from a list of possible locations where a client may be located. Furthermore, this system utilizes existing telephone technology unlike many of the devices described in the above referenced patents.

DISCLOSURE OF THE INVENTION

The automated and interactive positive motivational system is designed to be used by doctors, psychologists, counselors or other trainers to provide motivational messages and/or questions to clients having behavioral, weight, volitional or motivation problems. Its basic configuration comprises:

(a) means for recording and accessing a client's database that includes for each client the name, schedule of telephone numbers where the client may be reached during each 24-hour period, personal identification number, and previous history of messages and the client's responses;

(b) means for measuring and recording a client's weight without revealing their weight to them and transmitting said weight information telephonically for use in a weight reduction program;

(c) first means for recording and accessing a client's program that includes for each client specific motivational messages, personal and unique metaphoric references, and/or questions that are to be responded to by the client through either the telephone interactive beeper, personal communicator, or interactive television;

(d) a computer having means for accessing the client database and said client program. If a match is found between a

client's database and client program, the computer produces a sequence, a digital telephone signal and corresponds to a client's telephone number or beeper or personal communicator number, a digital client validation request signal and a digital motivational message(s) and/or questions. The messages and/or questions are only then sent if the client's validation request signal is responded to by the client with a valid personal identification number (PIN) in the telephone mode, or broadcast without a PIN with a beeper or personal communicator;

(e) means for converting the digital signals produced by the computer to telephone tone signals that are sent to a client's dual tone multifrequency telephone set via a telephone network. The telephone set is used to respond to the client's validation request, hear the motivational message(s) and/or to respond to the questions;

(f) means for converting the telephone tone signals originating at the client's telephone set to digital signals for application to and processing by the computer; and

(g) second means for permanently recording all the outgoing and incoming client communications.

An important object of the invention is that the system manipulates speech messages that are stored, not in an analog format common to audio tape storage systems, but in digital format that is stored on a read-only compact disc, a computer hard drive or the like. The use of compact discs allows the system to access files quickly and accurately. Therefore, it is

possible for the computer to access more than one speech file at a time. Each telephone line that the system is servicing is actually a small "slice" of computer time during which speech files are being played from or recorded. The more lines that are active, the more slices of time that must be managed. The system provides the functions to operate with more than one telephone line simultaneously, thereby allowing a counselor, at all times over a 24-hour period, to process and supervise many more clients than otherwise. In addition, the system allows for a client to receive more doses of intervention over any time period than in any other manner.

Another object of the invention is directed to accomplishing most tasks in a voice response application by accepting, recognizing and making decisions based on a keypad input from the caller's dual tone multifrequency telephone. The keypad generally sends dual tone multifrequency (DTMF) tone signals but occasionally multifrequency (MF) tones are used by certain types of telephone switching equipment. While these two signalling methods are not compatible, the system will work with either one equally well.

Still another object of the invention is the use of digitized voice signals for the transmission of messages to the client. Digitized voice signals are typically made by sampling the voice wave form 6000 to 8000 times per second in order to accurately reconstruct good speech quality. Each sample takes 8 to 12 bits, this results in 48,000 to 96,000 bits of information per second that must be stored. It is common in telephonic applications for a digitized voice to be compressed by storing only the differences between samples. Therefore, the speech card that the

system supports uses a compression technique known as Adaptive Differential Pulse Code Modulation (ADPCM) which recognizes that there is only a small difference between the speech samples and stores a logarithmic function of the difference between speech samples. The result is good speech quality at only 3000 bytes per second of data throughput.

Yet, another object of the invention is that the client program may be directed to any subject matter such as motivational training, teaching, psychological behavior modification, religious training, indoctrination and reinforcement by sales managers, psychologists, ministers, counselors, wherever motivations would be facilitated by daily or periodic intervention. The following is a partial list of some of the component areas that the client program may be directed to:

1. nutrition
2. creativity
3. exercise
4. weight loss (diet/weight management)
5. optimism (and hope)
6. life-long learning
7. time management
8. stress management
9. happiness (and purpose)
10. optimal health
11. relationships
12. thrift/financial freedom (reduction of consumption)
13. risk/courage
14. new, balanced image, enhanced self-esteem (beauty)

15. immune system enhancement
16. midlife transformation/emergence
17. women and men in aging and transition (heart disease, menopause, etc.)
18. control or self-discipline
19. intuition enhancement
20. high energy
21. spiritual insight

Accordingly, it is an object of the present invention to record the daily activity schedule of each client enabling contact with the client on a scheduled or random basis by telephone or by other means such as an alpha-numeric pager or modem that is used to contact clients wherever the client may be during the day or night. If the client misses a call, they may call in to the computer and get their message by using a specific password.

The rationale of the system is that man is in a continuous state of growth and development. The system provides the motivation through continuous daily monitoring of each client as he works towards their basic goals for optimal health, personal success, longevity and happiness. By this daily reinforcement and guidance utilizing stimulating feedback, the system is able to maintain the organization and intervention between the client and his goals.

These and other objects and advantages of the present invention will become apparent from the subsequent detailed description of the preferred embodiment and the appended claims taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a block diagram showing the interactive activity between the system and a client;

FIGURE 2A is an application flowchart of the computer software program. **FIGURE 2B** is a continuation of the application flowchart of **FIGURE 2A**; and

FIGURE 3 is an illustration of the invention described in **FIGURES 1 and 2.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

The best mode for carrying out the invention is presented in terms of a preferred embodiment that is designed to allow doctors, psychologists, counselors and other trainers to maintain surveillance over their clients by utilizing a telecommunication link to perform automated information exchange. The preferred embodiment of the automated and interactive positive motivation system **10**, as shown in **FIGURE 1**, comprises a means for recording and accessing a client's database **12** and a client's program **14**, by using a computer **16**, having a digital signal/telephone tone converter **18** and a printer **22**, wherein access means comprise a telephone network **24** and a client dual tone multifrequency telephone set **26**. A client **50** uses the system **10** which can also be enhanced by the incorporation of the following elements that are operated by the telephone network **26**: a modem **30** that operates a computer printer of facsimile machine **32**, an alpha-numeric pager **34**, a two-way interactive message display **36**, an electronics scale **38**, an olfactory unit **40**, a voice stress analyzer **42**, an interactive television system **44**, an EEG measuring and recording device **46**, personalized monographs, Level

III interactive video, optical discs, i.e., CD-ROMs, and cellular phones.

The client database **12** in the preferred embodiment consists of a compact disc (CD) recording that is played back on a CD player that interfaces with the computer **16** as shown in **FIGURE 1.** However, other database recording and playback units can also be used. These units include but are not limited to a tape cartridge that is played back to the computer by means of a tape cartridge player or an optical disc and optical disc playback unit. The client database includes for each client **50**, the client's name, their calling schedule by week, day and time, each client's personal identification number (PIN), and previous history of messages.

The client program **14** in the preferred embodiment, is also recorded and played back by a CD player or other recording and playback units, as described above for the client database **12**, and is connected to the computer and to the telephone network **24** as shown in **FIGURE 1.** The client program **14** is especially designed to serve a plurality of specific clients. The program **14** can include as many motivational and reinforcement messages as are necessary to help with a specific behavioral problem. The motivational and reinforcement messages are designed to provide therapeutic intervention at specific or random times and more particularly to provide therapeutic intervention at the site where the behavior to be corrected occurs. In the field of behavioral reinforcement it has been found that even with the best of intentions, relapses usually occur within several days following the reading of a book or attending a seminar to several months after the conclusion of a behavioral modification program.

Thus, by transmitting behavioral motivation and reinforcement messages on a periodic or random basis, the behavioral modification program can continue on course to a curable conclusion.

In addition to or in combination with the messages, the system **10** is also designed to send a client behavioral modification questions. These questions are answered by the client by pressing on a specific key on the keypad of the dual tone multifrequency telephone set **26**. The answers to the questions are analyzed by the client's doctor or trainer to find root problems and to determine the next series of messages and/or questions that are to be transmitted to the client **50** at the next transmittal period. All messages, questions and the client's response to the questions as well as the time, date, duration of each call and touch tones entered by the client **50** are retained in a permanent log or record by means of the printer **22** which is directly connected to the computer **16** as shown in **FIGURE 1.**

The telephone by its very nature, has always been interactive on a two-way basis and because of its wide usage it lies within the comfort zone by nearly all clients. The telephone is also cost effective and is convenient for both the caller and the client. Additionally, social learning theories suggest that education carried out in the setting in which the behavior is taking place will have the greatest impact. Thus, telephone counseling at home or in the work place may have greater behavioral impact than direct clinic. For clients who cannot come to a clinic because of their physical condition, distance or the presence of a psychiatric disorder that makes the intimacy of face-to-face contact intolerable, the telephone is the sole

means for counseling. By calling clients on their transportable or cellular telephones **58**, behavioral reinforcement can also be provided for clients on the go and increase the instances wherein motivation can be provided in the place where the behavior occurs.

The client database **12** and client program **14** interface with the computer **16** that in the preferred embodiment consists of an IBM-AT compatible computer **16** having at least an 80386 coprocessor. The client database **12** and client program **14** as described above, are externally stored as shown in **FIGURE 1.** However, these elements may also be stored on a hard disc located within the computer **16** or on other mass media storage devices such as CD-ROM or removable mass media cartridges. The computer **16** is configured in part to include a Dialogic D41 4-line speech card **16A**, having a real-time clock **16B** and a logic network **16C**, operated by the system software **16D.**

The Dialogic card **16A** allows a speech compression technique to be used that samples a small difference between speech samples and stores a logarithmic function of the difference between the speech samples. This technique results in good speech quality at only 3000 bytes per second. The real-time clock **16B** sets and selects the appropriate time for a particular client to be accessed from the client database **12** and the client program **14.** The logic network **16C** provides the logic necessary to determine if a match between the client stored in the database **12** and in the client program **14** is available. The system software **16D** provides the algorithms to operate the system **10** in combination with the logic network **16C.** The operating steps of the software

2 and listed in source code format in **Appendix 1** of U.S. Application No. 08/112,955 filed on August 30, 1993 entitled METHOD AND APPARATUS FOR AN AUTOMATED AND INTERACTIVE BEHAVIORAL GUIDANCE SYSTEM now allowed.

As shown in **FIGURE 2**, the computer program builds a client database and sets the database to a computer clock time. In a typical operating sequence, the computer **16** at a preselected week and time, accesses the client database **12** and the client program **14**. If a match is found between the client's database **12** and program **14**, the computer **16** via the logic network **16C**, produces in sequence, a digital telephone number and a digital client validation request signal.

Both of these signals are applied to the digital signal/telephone tone signal converter **18**. The converter **18** includes circuit means to accept and convert the digital signals from the computer **16** to telephone tone signals that correspond to the client's telephone number and a personal identification number. The converter **18** can also be designed to include a telephone number redial circuit and a random telephone number dialer circuit. The redial circuit allows a client's busy telephone number to be automatically re-dialed at selectable time intervals. The random number dialer allows client telephone numbers stored in the client database **12** to be randomly selected and called.

From the digital signal/telephone tone signal converter **18**, the telephone tone signals are applied as shown in **FIGURE 1** to a telephone network **24**. The network **24** relays the tone signals to the client's dual tone multifrequency telephone set **26** from where the client **50** can answer the telephone **26** and respond to

the request to provide a personal identification number. The client **50** responds by pressing on specific keys on the keypad of the telephone set **26**. If the client **50** responds with a valid number it is routed via the telephone network **24**, back through the converter **18** to the logic network **16C** in the computer **16**. Upon the receipt of a valid number, the logic network **16C** enables the client program **14** to allow the audio signals carrying the messages and/or questions to be transmitted via the telephone network **24** to the client's telephone **26** from where the client **50** can receive the message and respond to the questions.

The telephone network **24** used in the preferred embodiment is serviced by the local telephone public utility company. However, if a closed circuit operation is desired, such as within the confines of an enclosed area or building, a private telephone network may be employed. In either of the above scenarios the clients dual tone multifrequency telephone set **26** may be hardwired to the telephone network **24** or, a transportable cellular **58** that uses RF or satellite communication links may be used. By calling a client **50** on their transportable cellular telephone **58**, the motivation message can in many instances be sent to the place when the behavior is occurring when the message carries its greatest effect. As also shown in **FIGURE 1** by dotted lines, in lieu of making the initial client contact by using the telephone set **26**, the contact can be made by means of a modem **30**, an alpha-numeric pager **34**, a two-way, interactive, computer activated message display **36** or other such devices. If a modem **30** is used, it can be connected directly to a computer printer or facsimile machine (FAX) **32**. In this client alerting medium, after the client **50** receives a motivational message or a

question, the client **50** response can be made by calling the computer **16** on the dual tone multifrequency telephone **26** by use of a special computer access telephone number. Likewise, if an alpha-numeric pager **34** is used the client response would be made as previously described. The use of a two-way interactive message display **36** further provides an enhanced client interface in that graphics can be included with the messages and questions. The display **36** is connected directly to the computer **16** via the telephone network **24** and digital/telephone tone signal converter **18**. Likewise, an interactive television system **44** can be used wherein customized broadcasts can be responded to by individual clients or whole classes of subscribers, providing a low cost alternative to individual customized instruction. In addition to or in lieu of an interactive television system **44**, an interactive videodisc system **54** comprising a videodisc player and monitor interfaced with a microcomputer may be used.

With the use of optical discs or CD-ROMs **56**, a computer-based information metering system is envisioned wherein a client **50** will be billed through the use of an encryption-metering device only for amount of therapy the client **50** wishes to access.

The motivation and behavioral messages and client questions can also be used in combination with auxiliary devices to fortify the client's messages or questions. For example, in the field of weight loss, an electronics scale **38** can be utilized to supply the timely weight of the client to determine if a weight loss or gain has occurred during the reporting period. As shown in **FIGURE 1**, the electronic weight scale is connected to an ordinary telephone line which automatically dials the telephone number

associated with the operating system and transmits the weight of a client **50** standing on the scale **38** digitally to the client's program **14** and database **12** for later analysis in accordance with a weight reduction program.

The scale **38** prevents the client **50** from becoming aware of their day-to-day weight fluctuations. This is consistent with new insights in behavior theory with respect to human motivation which allow an observer or instructor using the computer to review the client's weight periodically through the use of the computer **16** which is at a remote location and can guide the client **50** from time to time based upon the trend or average of their weight, and other devices such as glucose monitoring, blood pressure, heart rate, and cholesterol monitoring.

Research reported by Mori and Morey in 1991 shows that individuals with depression or lower levels of self-esteem are more likely to have a vulnerable or negatively distorted body image (The vulnerable body image of females with feelings of depression, Journal of Research in Personality, Vol. 25, 343-354). Furthermore, Nelson and Craighead's 1977 study (Selective recall of positive and negative feedback, self-control behaviors, and depression, Journal of Abnormal Psychology, Vol. 86, 379-388), suggests that depressives distort environmental input in such a way that they consistently reach a negative conclusion. Since the depressed person "filters out" a certain amount of positive feedback and is particularly sensitive to negative feedback, it is important to control or limit the frequency of negative feedback (i.e., weight readings).

The scale **38** does not have any visible measurement display on its exterior and may be fabricated in the shape of a flat mat by

use of strain gauge technology or the like for placement in various rooms within a client's dwelling. While not shown in the drawings, it may be envisioned that the scale **38** may be placed in front of a refrigerator door wherein the clients weight is measured at a period of time before the client intakes food.

Another preferred embodiment, shown in **Figure 1**, is the use of an olfactory unit **40** which provides a variety of different smells to the client **50** to be used in memory association with the daily telephone interaction. Researchers have successfully trained animals to recognize several different scents and to behave in particular ways when they did -- for instance, to lick or chew in expectation of food or water as reported by W.J. Freeman , The physiology of perception, Scientific American, 78-85 (February, 1991). A more recent study entitled Olfactory stimuli as context cues in human memory, by A. Cann and D.A. Ross and reported in American Journal of Psychology, 91-102 (1989), indicates that an olfactory context cue, when paired with a learning experience, might later be used to produce more efficient performance of the learned behaviors. In fact, the client **50** could carry the proper olfactory stimulus **40** for release at the critical time when performance is finished, thus enhancing the motivational training by providing accessing cues in a way not previously taught in the prior art.

A 1990 study by Frank R. Schab at Yale University ("Odors and the remembrance of things past" reported in Journal of Experimental Psychology: Learning, Memory and Cognition, Vol. 16, 648-655), further builds upon the evidence that odors can effectively be used as memory retrieval cues to enhance learning and performance. This is consistent with the "encoding

specificity hypothesis" of Tulving & Thompson ("Encoding specificity and retrieval processes in episodic memory," Psychological Review, Vol. 80, 352-372 (1973), which states that contextual stimuli (i.e., olfactory cues) are encoded along with target information on learning and serve as memory cues to the target information at retrieval.

Yet another preferred embodiment shown in **FIGURE 1** incorporates the use of a voice stress analyzer **42**, which offers a digital numerical evaluation of the speaker's voice stress level to monitor a client's response during a behavioral motivation reinforcement question. Research by D. O'Hair and M.J. Cody entitled "Gender and vocal stress differences during truthful and deception information sequences," in Human Relations, Vol. 40, 1-14 (1987), indicates that voice stress analyzers can be objectively and unobtrusively used to detect vocal stress indicative of deception. If a client **50** knows that his veracity is being tested and that his responses are being analyzed for deception, then there is greater motivation on his part to adhere to the program **14** and hence more rapidly progress towards a particular goal. In addition, commonly encountered self-deception is reduced using this mode.

Another preferred embodiment incorporates the use of an EEG measuring and recording device **46** which can be used to assess hypnotic susceptibility either in the presence of the client **50** or at some distance by use of a modem for transmitting signals which indicate various brainwave states. Behavior research indicates that there is an increase in alpha activity in the EEG when subjects are exposed to behavioral intervention techniques such as hypnosis, relaxation and meditation. In addition,

studies with psychotropic drugs have demonstrated that increased and synchronized alpha activity is a characteristic of all the major tranquilizers. A 1972 study by G.A. Ulett, S. Akpinar and T.M. Itil ("Quantative EEG analysis during hypnosis," Electroencephalography and Clinical Neurophysiology, Vol. 33, 361-368) reported significant EEG differences between the hypnotic and awake states, with all subjects experiencing increased alpha activity in the hypnotic state. The computer **16** in this mode, receiving and analyzing the signals, can then adjust the intervention to correspond to the client's **50** brainwave state.

Another preferred embodiment shown in **FIGURE 1**, is a computer-driven system for motivational reinforcement and guidance which can be applied to various modes of interactive television **44**. Its feature of providing customized instruction, learning, and motivational prompts and cues, often where the behavior occurs, provides a unique approach toward directed interactive learning and behavior modification. Using interactive television **44**, the computer-driven system converts the traditional broadcast format to a customized "narrowcast," where either classes of learners or individual subscribers are addressed according to their individual issues without specific categories, and each in turn returns individual specific responses to questions or polling, which are then recorded in the client database **12**. This application becomes possible because of the larger number of channels available with fiber optic cable facilitating two-way interaction.

It is envisioned that three separate modes of transmission from a computer can be utilized:

(1) fiber optic cable for two-way communication -- the computer transmission would appear on the subscriber's screen and he would in turn reply either through a remote control unit or telephone back over the fiber optic cable. The computer would receive his return transmission or reply and note it accordingly in its memory. Periodic and finer tuned follow-up reinforcement could occur via telephone based upon the client's responses over specific time periods.

(2) coaxial cable -- inasmuch as existing coaxial cable systems can transmit hundreds of times more data than a conventional telephone line, the subject computer driven system can transmit learning, motivational guidance and reinforcement to classes of subscribers over existing coaxial cable systems and the subscribers can reply using a remote unit containing computer hardware for reply back over the cable. Alternatively, the remote unit can contain a modem for reply back over a telephone line.

(3) wireless cable -- subscribers without cable would receive the signal via antenna in the case of localized transmission or dish in the case of satellite transmission. The transmission would contain the computer driven learning, motivation and reinforcement. The subscriber would reply via telephone.

In each mode of transmission, subscribers can be reminded of an upcoming transmission via telephone **26** or wireless radio beeper **34** as described herein. Additionally, explanatory brochures can be used with any of the above described interaction as a method of further reinforcing a client **50** toward a particular goal. With today's technology and regulatory infrastructure, programming for interactive television would

remain in its current analog form and a special unit, usually a controller box plus remote positioned atop the TV set, would allow the viewer to dip into the data stream and manipulate what appears on the TV screen. With digital and compression technology (compression six or more digital channels into the same bandwidth as one analog channel), a settop box would be used to decode and decompress video and audio signals in real time.

Another preferred embodiment is the use of a computer-based information metering system that uses optical discs **56** as transport and storage media, encrypting to protect data and metering to permit usage by clients on a pay-per-view or pay per bit of information basis. The encryption-metering device would use digital technology and would be made available through cellular phones, wireless cable transmission, interactive television and CD-ROM. Information would be distributed in encrypted form to users. After the user browses through the menu or index at no charge and selects the item needed, the encryption-metering device will decrypt the information required, record which data was used, by whom and for what issues or subjects, and will permit the user to be billed only for the data used. This information would be unreadable or unlistenable until decrypted and users would be charged based on the number of bits of information selected. A metering chip or computer board would be used to gauge data use just as an electric meter tracks power demand. Information may be retrieved in either full-text audio or image form. A decryption program keeps track of how much data is decoded and can subtract its costs from a prepaid credit stored on a chip as a form of payment. The encryption-metering technology may use a Microsoft Windows® based application, with

familiar graphical interfaces and menuing systems to which users are accustomed, and would be available on a variety of computer platforms.

Another preferred embodiment is the use of CD-ROM **56** (Compact Disc with Read Only Memory), a high-density storage and delivery medium similar to digital audio compact discs, which stores vast amounts of data in a digital form. Each CD-ROM **56** will hold about 600 megabytes of data, equivalent to a shelf of books almost 100 feet long, with a full text index. CD-ROMs **56** offer the fastest and most convenient way to access material from large data bases. However, most present CD-ROM systems require the user to purchase an entire data base on CD-ROMs. By contrast, the use of encryption technology and metering allows the applicant to distribute each CD-ROM for little or no cost and then charge the user only for the information actually used. The CD-ROMs **56** would be used with standard as well as portable CD-ROM players, allowing users instant access to the material virtually anywhere.

Still another preferred embodiment shown in **FIGURE 1**, is the use of monographs or "bibliotherapy" **52** as an adjunct to audio, video and in-person feedback. In a study of women in a weight reduction program, the use of written handouts was found to improve levels of self-esteem, assertiveness, attitudes to body size, and self efficacy about weight control. (A.J. Blair, V.J. Lewis, and D.A. Booth, "Response to leaflets about eating and shape by women concerned about their weight," Behavioural Psychotherapy, Vol. 20, 279-296 (1992)).

Another preferred embodiment is the use of interactive video system **54** to accelerate the learning process. An interactive

videodisc **54** system implies that a videodisc player and monitor are interfaced with a microcomputer, thus allowing control of the progression of the program **14**. Prior art systems have decreasing capabilities essentially consistent with reduced computer memory. These prior art systems allow proportionally less user control and interactivity. Research shows that with interactive video systems **54**, effective learning tends to occur in one-third to one-half of the time required for the same content presented through more traditional approaches (G. Kearsley and J. Frost, March, 1985, "Design factors for successful videodisc-based instruction; Educational Technology, 7-13). Positive student responses to the use of interactive video technology (IVT) are reported in the literature (L. Jones and S.G. Smith, March, 1989, "Lights, camera, reaction! The interactive videodisc: A tool for teaching chemistry," T.H.E. Journal, 16(7), 78-85) and IVT appears to be particularly well-suited for learning and behavior modification: learning occurs in an environment free from observation and evaluation, users have the freedom to err and to observe the consequences of their decisions, and to use problem-solving strategies to bring about corrected action. Dr. Marion Diamond, at University of California Berkeley, has reported, based on extensive experimentation on rats, that the structure and abilities of the cerebral cortex can be changed throughout life by enriching sensory environments; she concludes that we can actually become smarter as we grow older if we provide our brains with the right encouragement and environment. Indeed, newer learning theories and recent brain research emphasize the importance of an active, empowered learner participating and interacting fully in the creation of his or her own learning.

Although not shown it may be envisioned that another preferred embodiment is the application of the spiral or staged model of change in a multifaceted behavioral modification program. Researchers James Prochaska, Carlo DiClemente and John Norcross have created a spiral model of change which conceptualizes the process of change in a non-linear framework. Their research revealed that relapse is the rule rather than the exception among individuals with addictive behavior patterns. Therefore, by reframing relapse as a normal stage in the process, their model suggests that relapse is merely a temporary setback and that most relapsers do not regress all the way back to where they began. Instead, they use relapse as a learning experience from which to attain newer heights and move forward, in a spiral process change. The spiral model of change depicts the cycle of change as consisting of 5 or more distinct stages. Prochaska, et al., have found that each of these stages is characterized by a set of specific behavior patterns. The likelihood of successful change appears to be directly linked to an individual's position on the spiral (i.e., the particular stage within the model). Indeed, the progress made by patients as a result of professional interventions tends to be a function of the stage they are in at the start of treatment.

By integrating the processes and stages of change as outlined by Prochaska et al., to create a multifaceted and multidimensional treatment system, this system tailors particular behavioral interventions accompanied by facts of the subject invention and its embodiments to clients in a customized manner consistent with the location they are in within each cycle and stage within the aforesaid spiral process. For example, during

the contemplation stage, individuals are most open to consciousness-raising techniques and are more likely to use bibliotherapy and other feedback and reinforcement educational techniques. During the "action stage," clients need help with behavioral processes such as counter-conditioning and stimulus control to prevent relapse. And, during the "maintenance stage," there is a continued emphasis on coping skills as well as a focus on improving self-efficacy levels. In some cases, the same intervention or technique may be used across several different stages of change, but with varying degrees of intensity and/or frequency. There are numerous research studies which support the notion that matching therapy programs and processes to the client's stage of change, as conceptualized by Prochaska et al., will better serve the majority of clients.

An online and/or CD-ROM multimedia or video game with an ascending spiral interaction or script would be used as part of the program **14**. Clients **50** would be consciously or unconsciously imprinting the spiral image in their minds each time they played the game, acting out or visualizing the process of contemplation, action, maintenance and relapse, and then starting again over the same cycle, thereby providing themselves with a strong sense of dramatic victory without personal or physical danger. The lessons learned, such as problem solving, pattern recognition, quick thinking, resource management and reasoned judgment, could then be gradually adopted with the client's life. For online users it may be envisioned that a settop box would be used to render interactive 3D graphics in real time.

Additionally, the use, separately or in combination, of multiple media such as audio, motion video, still images,

graphics, animation, and text may be used to enhance the ability of the user to absorb and learn new information and make corresponding behavioral modifications.

It is also envisioned that the above described devices may be used in conjunction with personalized monographs **52** by one-on-one interviews to develop a client database to improve and enhance the audio, video and in-person aforementioned behavior modification techniques.

While the invention has been described in complete detail and pictorially shown in the accompanying drawings it is not to be limited to such details, since many changes and modifications may be made in the invention without departing from the spirit and scope thereof. For example, a variety of emerging telecommunication technologies provide varied platforms to transmit behavioral motivation and reinforcement. Some of these devices include: enhanced telephones containing LCD display screens for the representation of data and graphs; personal communication networks which use low power digital radio; palm-top calculators which received satellite transmissions as part of a nationwide network; wireless radio networks which exchange data on a national basis; digital cellular phones which signal their whereabouts on a continuous basis in order that their owner may be located anywhere in the world through linage to a satellite network; and personal digital assistants (PDA) which can receive data, organize it, monitor the client's activities, give reminders and then communicate via an internal modem as to the client's compliance with a central mainframe computer. Also, the application of the spiral or staged model of change may be applied to all of the behavioral modification programs heretofore

discussed. Hence, the invention is described to cover any and all modifications and from which may come within the language and scope of the appended claims.

CLAIMS

1. An automated and interactive positive motivation comprising:

a) means for recording and accessing a client's database that includes a client program which incorporates for each client, a calling schedule and personal identification number,

b) means for reinforcing predetermined client behavior based upon said means for recording and accessing said client's database which includes for each client one of either specific motivational messages, stimuli or questions which are to be responded to by the client,

(c) a computer having means for accessing said client database and said client program, said computer producing in sequence, a digital telephone signal that corresponds to a client's telephone number, a digital client validation request signal and one of either said motivational messages, stimuli or questions of said means for reinforcing predetermined client behavior that are only sent if said client's validation request signal is responded to by the client with a valid personal identification number,

(d) means for converting the digital signals produced by said computer to telephone tone signals that are sent to a client's dual tone multifrequency telephone set via a telephone network where said telephone set is queued to respond to the client's

validation request, hear said motivational messages and to respond to said questions,

(e) means for converting telephone tone signals originating at said client's telephone set to digital signals for application to and processing by said computer, and

(f) means for permanently recording all outgoing and incoming client communications.

2. The system as specified in claim 1 wherein said means for recording and accessing a client's database comprising a compact disc and a compact disc player interfacing with said computer.

3. The system as specified in claim 1 wherein said means for recording and accessing a client's program comprising a compact disc and a compact disc player that interfaces with said computer.

4. The system as specified in claim 1 wherein said computer comprising an IBM-AT compatible computer having an 80386 processor including a Dialogic D41 4-line speech card or equivalent.

5. The system as specified in claim 1 wherein said means for converting said digital signals from said computer to telephone tone signals comprising a digital/telephone tone signal converter having circuit means for performing the conversion in either direction.

6. The system as specified in claim 1 wherein said means for reinforcing a client's program comprising an electronic weight scale that does not allow the client to view his weight.

7. The system specified in claim 1 wherein said means for reinforcing a client's program comprising an olfactory unit to provide smells in association with said client database.

8. The system specified in claim 1 wherein said means for reinforcing a client's program comprising a voice stress analyzer.

9. The system specified in claim 1 wherein said means for reinforcing a client's program comprising using an interactive television system.

10. The system specified in claim 1 wherein said means for reinforcing a client's program comprising an EEG measuring and recording device.

11. The system specified in claim 1 wherein said means for reinforcing a client's program comprising an interactive video system.

12. The system specified in claim 1 wherein said means for reinforcing a client's program addresses stored information from an optical disc.

13. A positive reinforcement and feedback system comprising:

a) a client database that includes for each client the name, calling schedule and personal identification number,

b) a reinforcing means for reinforcing client behavior by selecting information from said client database including a client program that for each client has specific motivational messages, stimuli or questions that are to be responded to by the client,

c) a digital/telephone tone signal converter having circuit means for converting digital signals from

said means to corresponding telephone tone signals and telephone tone signals to corresponding digital signals,

(d) a telephone network having circuit means for receiving said telephone tone signals from said converter and to transmit said tone signals to a client's dual tone multifrequency telephone set from where the client can receive and respond to one of either said specific motivational messages, stimuli or questions of said reinforcing means, and

(e) a computer comprising in part a software program, a real-time clock and a logic network and integrated into said reinforcing means and said digital/telephone tone signal converter, wherein at preselected dates and times said computer program in combination with said logic network accesses said client database and said client program, whereupon if a match is found between said client's database in combination with said digital/telephone tone signal converter and program, said computer produces in sequence, a digital telephone signal that corresponds to the client's telephone number and a digital client validation request digital telephone signal and said digital client validation signals are applied to said converter from where said digital telephone signal and said digital client validation signal are converted to telephone tone signals corresponding to the client's telephone number and personal identification number, wherein

the signals are then transmitted via said telephone network to said client's telephone set where the client can respond to the personal identification request, whereupon if the client responds back to said computer via said telephone network and said converter with a valid personal identification number by pressing on specific keys on a keypad of said dual tone multifrequency telephone set, said computer in combination with said software program and said logic network enables said client program to deliver one of either said messages stimuli questions or of said reinforcing means to be transmitted via said telephone network to said client's telephone set where the client can receive one of either said messages, stimuli or questions of said reinforcing means, and respond to said messages, stimuli or questions of said reinforcing means.

14. The system as specified in claim **13** wherein said computer is comprised of an IBM-AT compact computer having an 80386 processor including a Dialogic D41 4-line speech card or equivalent.

15. The system as specified in claim **13** wherein said client's database is recorded on a compact disc (CD) recording that is played back to said computer by means of a CD player.

16. The system as specified in claim **13** wherein said client's database is recorded on a tape cartridge that is played back to said computer by means of a tape cartridge player.

17. The system as specified in claim 13 wherein said client's program is recorded on a compatible disc recording that is played back to said computer by means of a CD player.

18. The system as specified in claim 13 wherein said client's program is recorded on a tape cartridge that is played back to said computer by means of a tape cartridge player.

19. The system as specified in claim 13 wherein said telephone network consists of a private telephone network that operates within the confines of an enclosed area.

20. The system as specified in claim 13 wherein said client's dual tone multifrequency telephone set consists of a standard telephone set hardwired to said telephone network.

21. The system as specified in claim 13 wherein said client's dual tone multifrequency telephone set comprising a transportable/ cellular telephone.

22. The system specified in claim 13 wherein said means for reinforcing a client's program comprising an EEG measuring and recording device.

23. The system specified in claim 13 wherein said means for reinforcing a client's program comprising an interactive video system.

24. The system specified in claim 13 wherein said means for reinforcing a client's program addressing stored information from an optical disc.

25. The system as specified in claim 13 wherein said means for reinforcing a client's program comprising an electronic weight scale having an enclosure which prevents the client from viewing his weight.

26. The system as specified in claim 13 wherein said means for reinforcing a client's program comprise an olfactory unit to providing smells indexed to said client data base.

27. The system as specified in claim 13 wherein said means for reinforcing a client's program comprising a voice stress analyzer.

28. The system as specified in claim 13 wherein said means for reinforcing a client's program comprising an interactive television system.

29. The system as specified in claim 13 further comprising:

a) a modem that is activated by a telephone signal produced by said digital/telephone tone converter via said telephone network, and

b) means for receiving and recording the output of said modem, where the received data is subsequently received by the client for his or her review or response via said client's dual tone multifrequency telephone set.

30. The system as specified in claim 29 wherein said modem receiving and recording means includes a personal computer.

31. The system as specified in claim 29 wherein said modem receiving and recording means includes a printer.

32. The system as specified in claim 29 wherein said modem receiving and recording means includes a facsimile machine.

33. The system as specified in claim 29 further comprising a client-assigned alpha-numeric pager activated by a telephone signal produced by said telephone network, wherein the message received comprising a message requiring a response via the client's dual tone multifrequency telephone set.

34. The system as specified in claim 13 further comprising a two-way, interactive, computer-activated message display unit connected directly to said computer via said telephone network and said digital/telephone tone signal converter.

35. The system as specified in claim 13 further comprising an electronics scale having means for measuring the client's weight and reporting that weight to said computer via said telephone network and said digital/telephone tone signal converter.

36. The system as specified in claim 13 wherein said client database and client program are stored on a hard disc located within said computer.

37. The system as specified in claim 13 wherein said reinforcing means further comprises:

a) a telephone number redial circuit that allows a client's busy telephone number to be automatically redialed at selectable time intervals, and

b) a random telephone number dialer circuit that allows client telephone numbers stored in said client's database to be randomly selected and called.

38. The system as specified in claim 13 further comprising a printer connected to said computer where said printer records all outgoing and incoming client communications.

39. A method for an automated and interactive positive motivation system comprising the steps of:

a) recording a client calling schedule and personal identification number for a client;

b) storing said recording of said client calling schedule and said personal identification number in a client database;

c) reinforcing client behavior by selecting information from said client database including a client program that for each client has a specific motivational messages, stimuli, or questions that are to be responded to by the client;

d) producing a digital telephone signal that corresponds to said recording and said storing of said personal identification number in accordance with said client calling schedule in said client database;

e) converting said produced signal telephone signal to telephone tone signals in correspondence to said recording and said storing of said personal identification number in accordance with said client calling schedule in said client database;

f) sending said telephone tone signals from said converting of said digital telephone signal in accordance to said recording and said storing of said client calling schedule in said client database to a client's dual tone multifrequency telephone set;

g) comparing said telephone tone signals from said converting of said digital telephone signal corresponding to said personal identification number in said client database to a client's telephone tone signal input wherein if a match is found, a program means delivers one of either motivational messages, stimuli or questions to said client; and

h) processing said client's response to said motivational messages, stimuli or questions by said program means and permanently recording said client's response in said client database, whereby said client calling schedule in said client database is updated by said program means for producing and converting said digital telephone signal in accordance with said

client calling schedule to deliver another set of said motivational messages, stimuli or questions to said client.

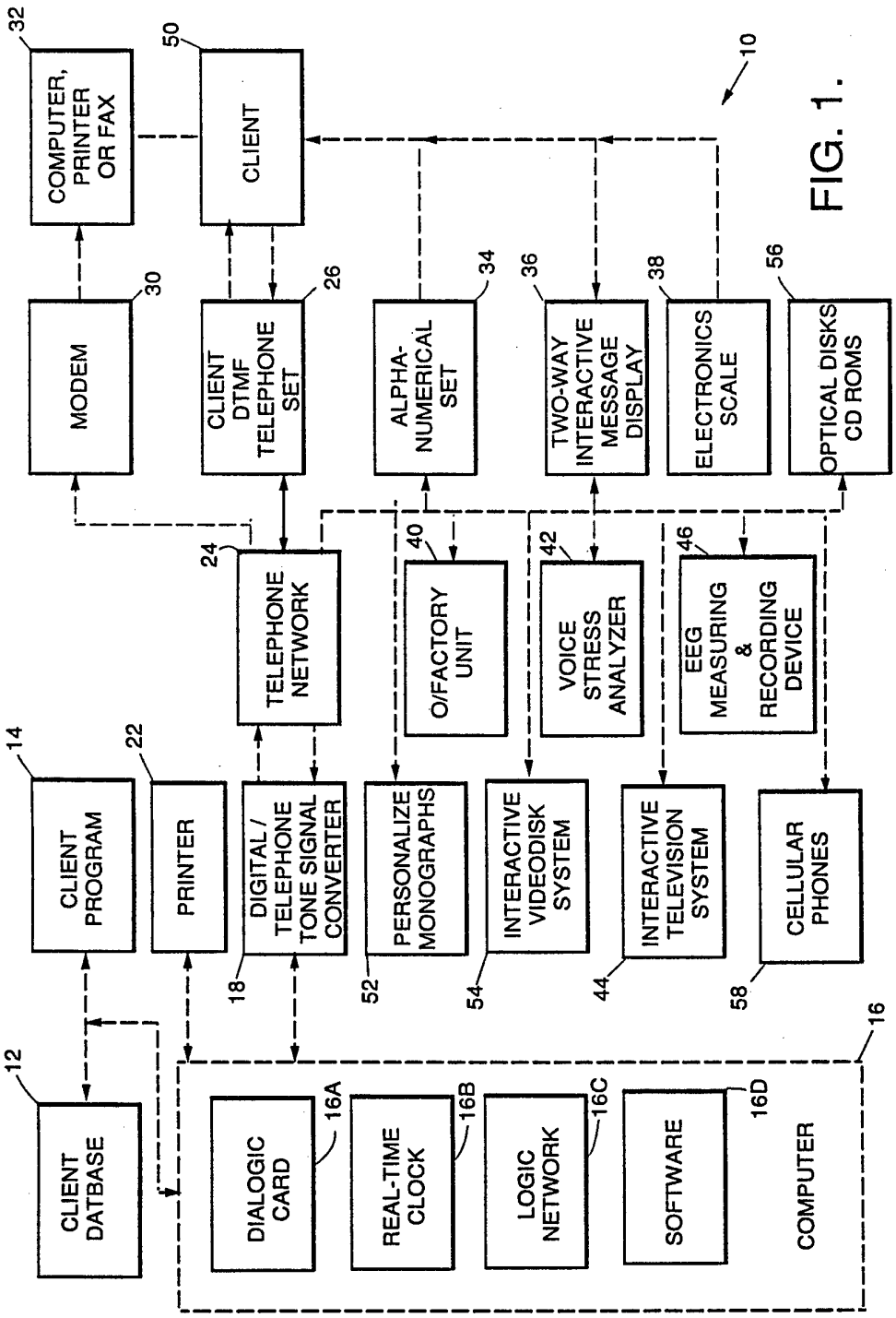

10
12
CLIENT DATBASE
14
CLIENT PROGRAM
16
COMPUTER
16A
DIALOGIC CARD
16B
REAL-TIME CLOCK
16C
LOGIC NETWORK
16D
SOFTWARE
18
DIGITAL / TELEPHONE TONE SIGNAL CONVERTER
22
PRINTER
24
TELEPHONE NETWORK
26
CLIENT DTMF TELEPHONE SET
30
MODEM
32
COMPUTER, PRINTER OR FAX
34
ALPHA-NUMERICAL SET
36
TWO-WAY INTERACTIVE MESSAGE DISPLAY
38
ELECTRONICS SCALE
40
O/FACTORY UNIT
42
VOICE STRESS ANALYZER
44
INTERACTIVE TELEVISION SYSTEM
46
EEG MEASURING & RECORDING DEVICE
50
CLIENT
52
PERSONALIZE MONOGRAPHS
54
INTERACTIVE VIDEODISK SYSTEM
56
OPTICAL DISKS CD ROMS
58
CELLULAR PHONES

FIG. 1.

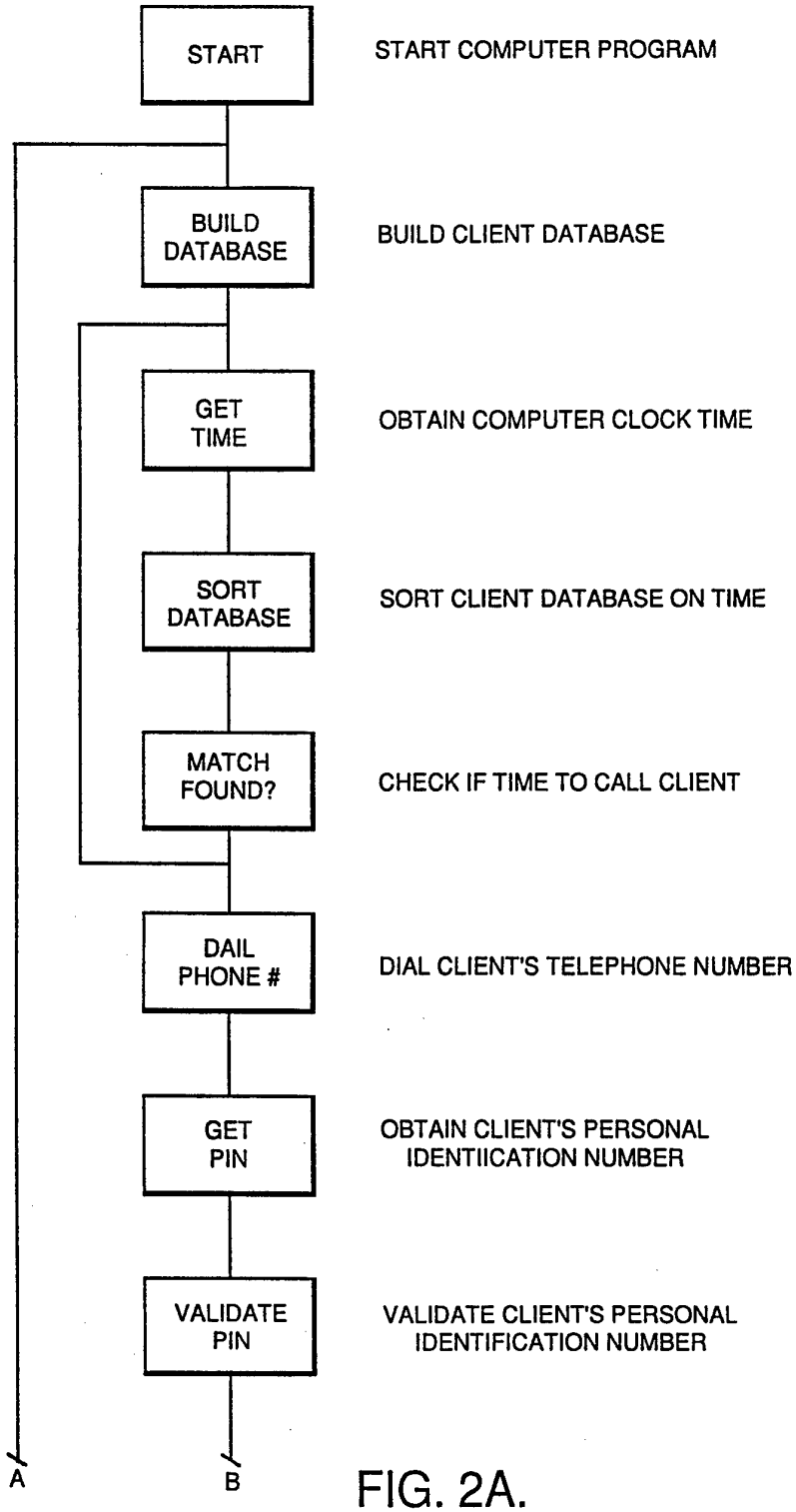

START
START COMPUTER PROGRAM
BUILD DATABASE
BUILD CLIENT DATABASE
GET TIME
OBTAIN COMPUTER CLOCK TIME
SORT DATABASE
SORT CLIENT DATABASE ON TIME
MATCH FOUND?
CHECK IF TIME TO CALL CLIENT
DAIL PHONE #
DIAL CLIENT'S TELEPHONE NUMBER
GET PIN
OBTAIN CLIENT'S PERSONAL IDENTIICATION NUMBER
VALIDATE PIN
VALIDATE CLIENT'S PERSONAL IDENTIFICATION NUMBER
A
B

FIG. 2A.

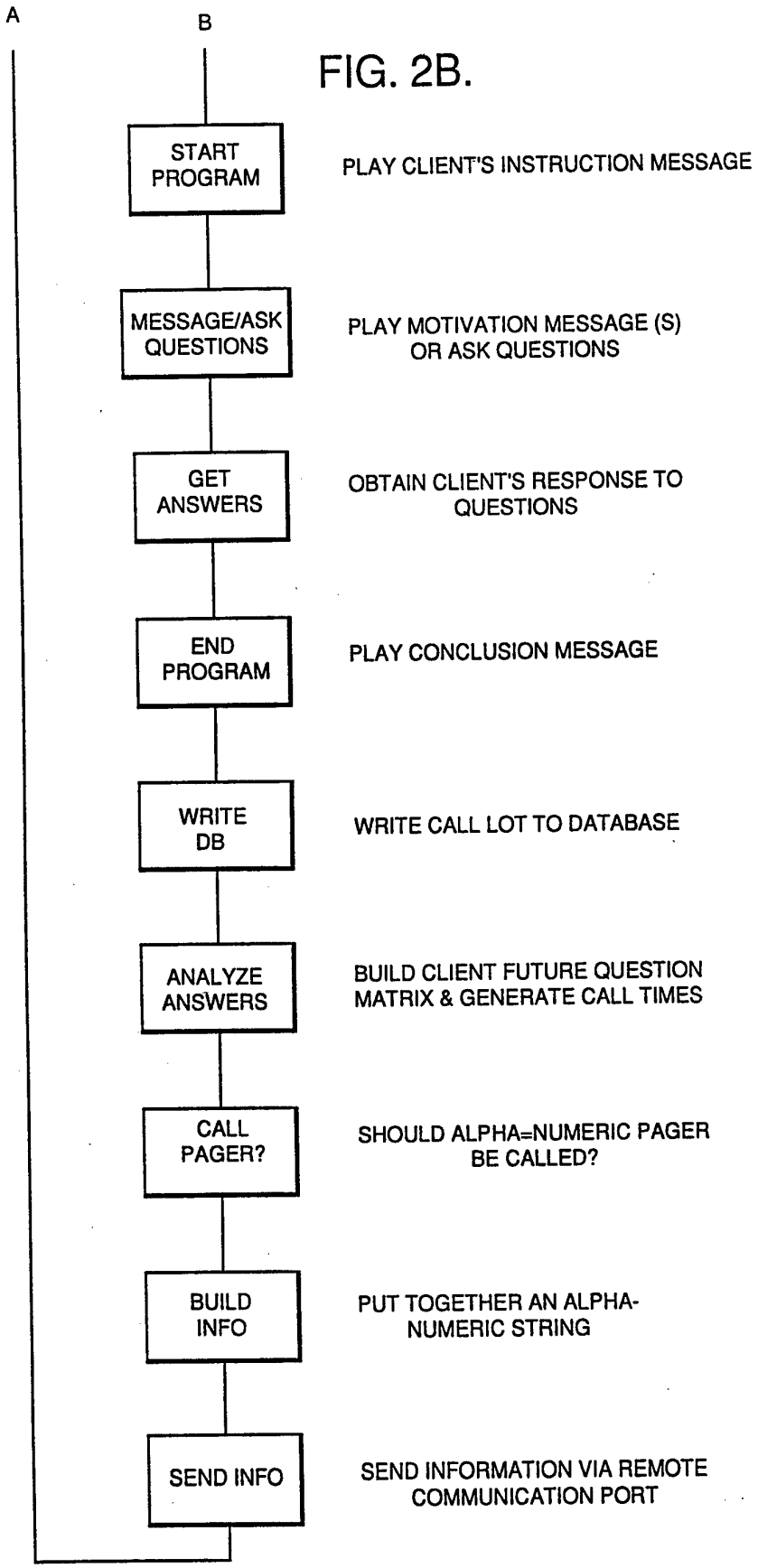

A
B
START PROGRAM
PLAY CLIENT'S INSTRUCTION MESSAGE
MESSAGE/ASK QUESTIONS
PLAY MOTIVATION MESSAGE (S) OR ASK QUESTIONS
GET ANSWERS
OBTAIN CLIENT'S RESPONSE TO QUESTIONS
END PROGRAM
PLAY CONCLUSION MESSAGE
WRITE DB
WRITE CALL LOT TO DATABASE
ANALYZE ANSWERS
BUILD CLIENT FUTURE QUESTION MATRIX & GENERATE CALL TIMES
CALL PAGER?
SHOULD ALPHA=NUMERIC PAGER BE CALLED?
BUILD INFO
PUT TOGETHER AN ALPHA-NUMERIC STRING
SEND INFO
SEND INFORMATION VIA REMOTE COMMUNICATION PORT

FIG. 2B.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/09247

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :H04M 01/64, 11/00; G06F 15/00

US CL :Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 379/67, 68, 69, 88, 89, 90, 92, 93, 94, 96, 97, 98; 364/413.01, 413.02, 413.03, 413.04; 128/903, 904

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

none

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

none

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4,922,520 (BERNARD ET AL) 01 May 1990, col. 3, line 38 through col. 5, line 60.	1-39
A	US, A, 5,014,298 (KATZ) 07 May 1991, col. 6, line 33 throuth col. 12, line 26.	1-39
A	US, A, 4,773,492 (RUZUMNA) 27 September 1988, col. 3, lines 4-9.	6, 25, 35
A	US, A, 5,023,901 (SLOAN ET AL) 11 June 1991, col. 4, lines 58-64.	8, 27,
A	US, A, 4,916,435 (FULLER) 10 April 1990, col. 7, line 53 through col. 9, line 18.	4, 8, 11, 14, 19, 20, 23, 27, 30, 31, 34, 38

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be part of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 04 OCTOBER 1994	Date of mailing of the international search report JAN 19 1995
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer JASON CHAN Telephone No. (703) 305-4700

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/09247

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4,531,527 (REINHOLD, JR. ET AL) 30 July 1985, col. 9, lines 24-41.	10, 22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/09247

A. CLASSIFICATION OF SUBJECT MATTER:
US CL :

379/67, 68, 69, 88, 89, 90, 92, 93, 94, 96, 97, 98; 364/413.01, 413.02, 413.03, 413.04; 128/903, 904