



(19) **United States**

(12) **Patent Application Publication**  
**Ditzik**

(10) **Pub. No.: US 2005/0110780 A1**

(43) **Pub. Date: May 26, 2005**

(54) **DESKTOP COMPUTER CONFERENCING SYSTEM**

**Publication Classification**

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(51) **Int. Cl.**<sup>7</sup> ..... **H04N 7/14; H04M 11/00; G09G 5/00**

(52) **U.S. Cl.** ..... **345/179; 348/14.08; 379/93.01**

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(57) **ABSTRACT**

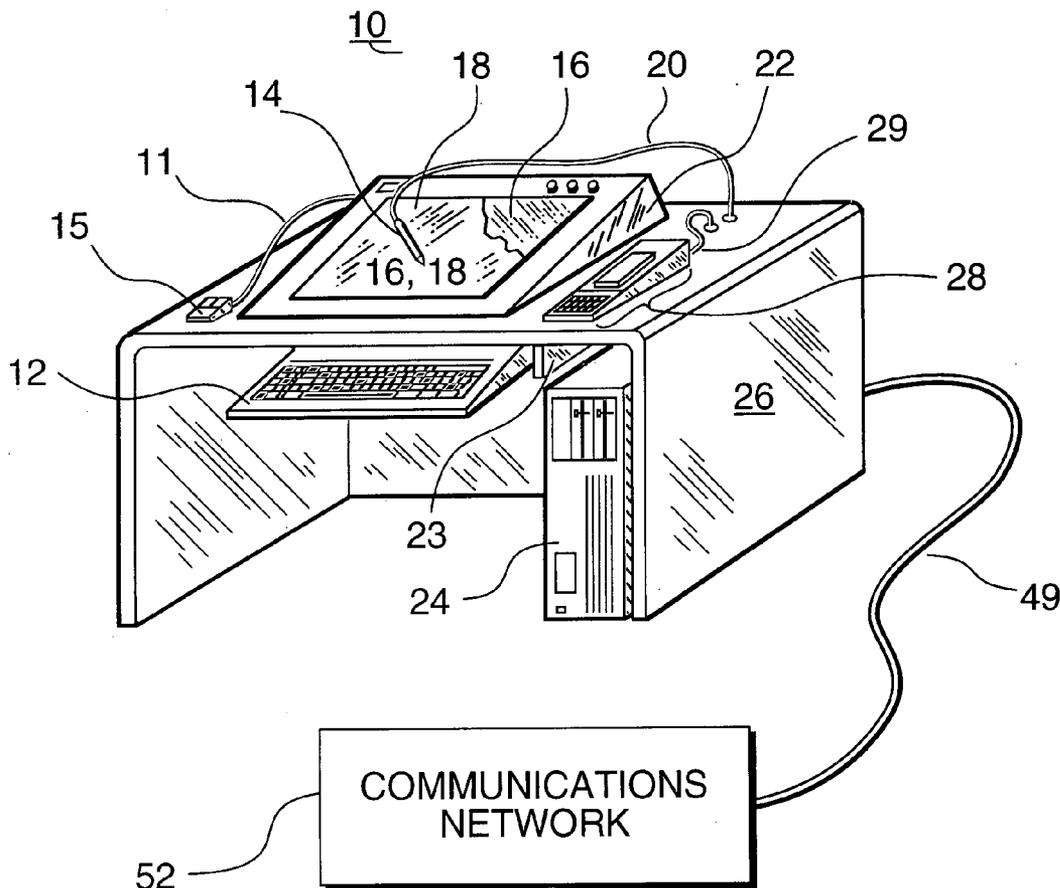
(21) Appl. No.: **11/023,361**

A man-computer-man communications system, including a computer workstation (10), which is comprised of a display device (22), graphic tablet (18), stylus (14), computer unit (24), and display device screen (16) located at convenient locations. The active area of the graphic tablet is a transparent surface area (18), which is coincident to the display screen and is approximately the same size as the display screen. The graphic tablet device may include active or passive stylus (14). A keyboard unit (12) and telephone unit (28) may be added to the workstation. An external communications system may be added to transmit and receive data to or from remote computers or other workstations. The computer unit (24) controls the operation of the workstation and external communications.

(22) Filed: **Dec. 29, 2004**

**Related U.S. Application Data**

(60) Continuation of application No. 08/487,778, filed on Jun. 7, 1995, which is a division of application No. 08/280,148, filed on Jul. 25, 1994, now Pat. No. 5,589,849, which is a continuation of application No. 07/771,856, filed on Oct. 7, 1991, now abandoned, which is a continuation-in-part of application No. 07/375,366, filed on Jul. 3, 1989, now abandoned.



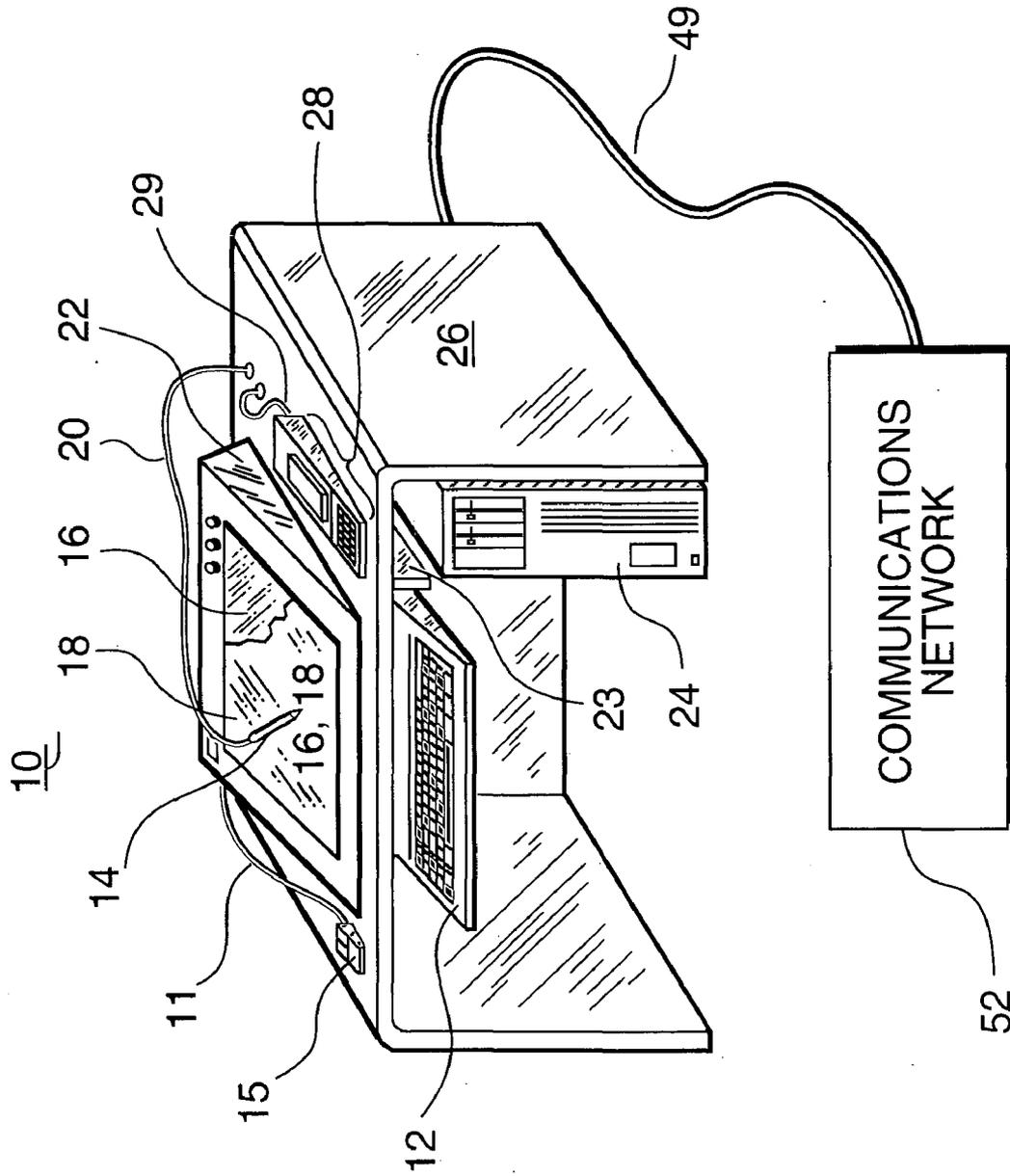


FIG. 1

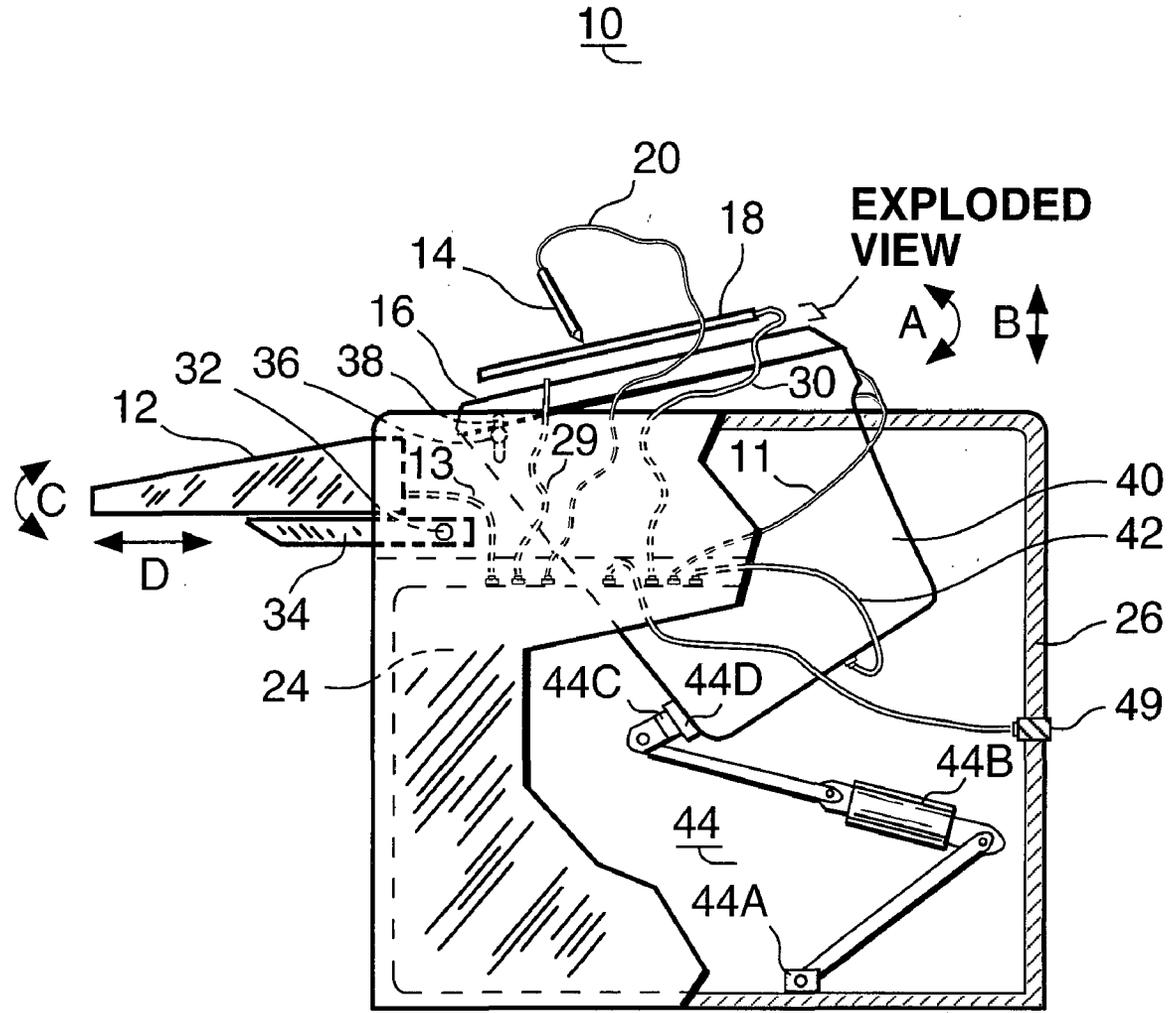


FIG. 2

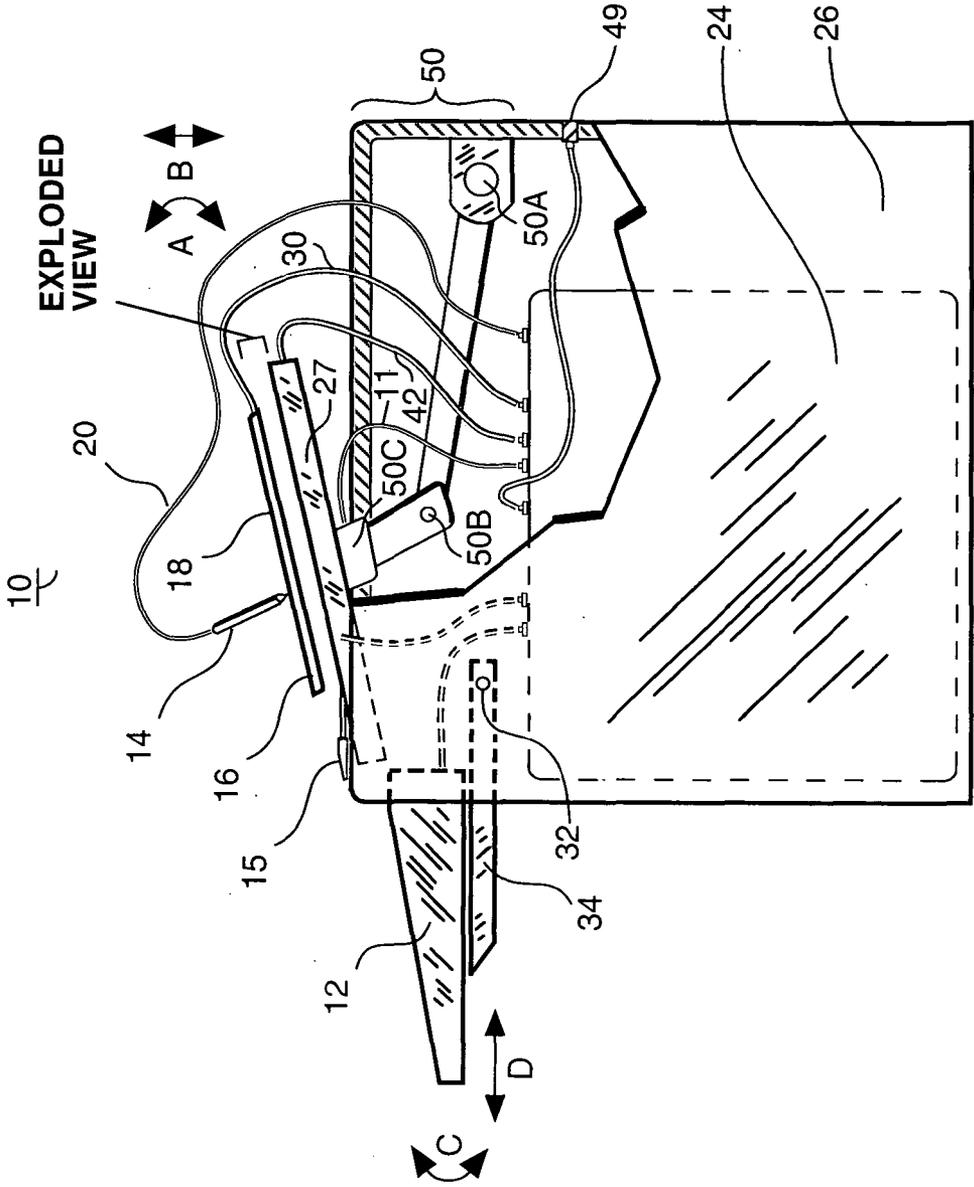


FIG. 3

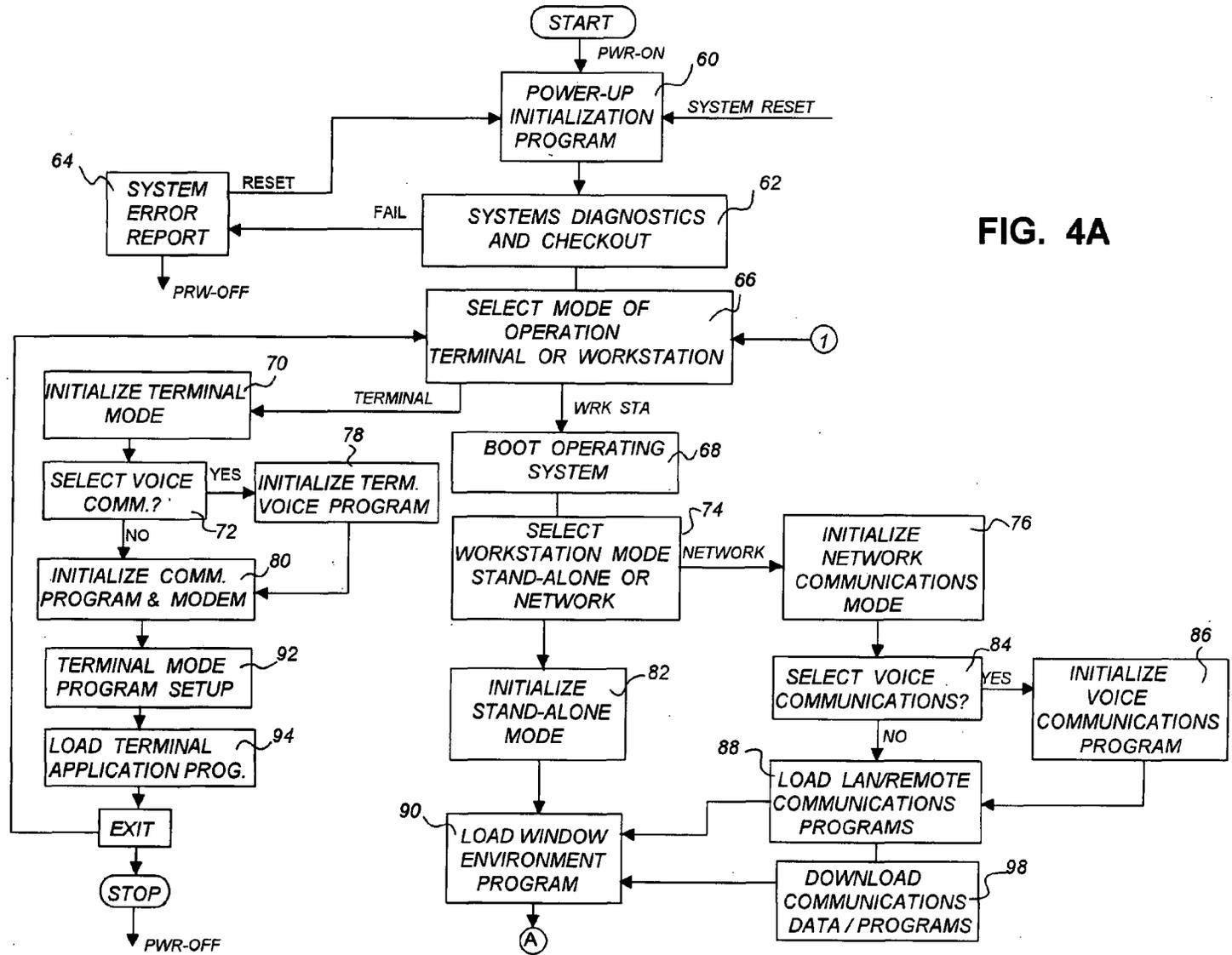


FIG. 4A

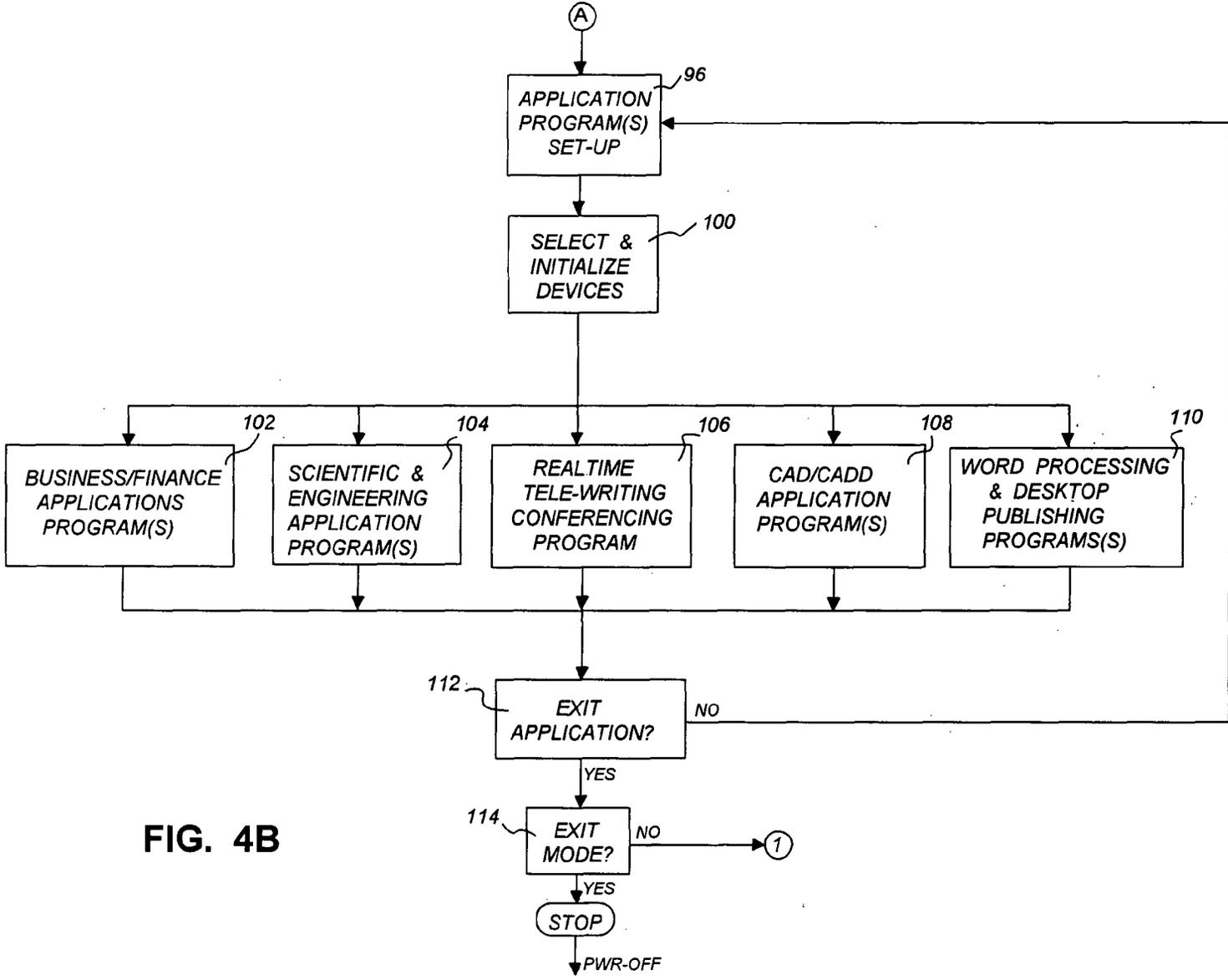


FIG. 4B

**DESKTOP COMPUTER CONFERENCING SYSTEM****RELATED APPLICATIONS**

[0001] This present application is a continuation application of Ser. No. 08/487,778 filed Jun. 7, 1995; which was divisional application of Ser. No. 08/280,148 filed Jul. 25, 1994, which was a continuation application of Ser. No. 07/771,856 filed Oct. 7, 1991, which was a Continuation in part application of Ser. No. 07/375,366 filed on Jul. 3, 1989. Each of the related applications is incorporated herein by reference in its entirety.

**BACKGROUND OF THE INVENTION****[0002] 1. Field of the Invention**

[0003] This invention relates to communication systems used by individuals for general tele-writing, sketching and drawing of hand written information, to be transmitted to other individuals via computer systems. In particular it relates to computer workstations comprised of electrical and mechanical devices for the input, computation, and output of data, resulting an integrated ergonomically designed human-computer interface system.

**[0004] 2. Description of the Prior Art**

[0005] In the following, a computer workstation is defined to be a combination of devices and apparatus, which may include computer hardware and software, that a person uses or operates during the performance various computing and communication tasks. These tasks includes, but is not limited to, technical calculations, business computations and local/remote communications. Prior art in this field includes many computer workstations and personal computers. Henceforth, a computer workstation will include personal computers, computer terminals, computer consoles, and like devices. The person operating the workstation will be referred to as the user. Display devices used in computer workstations can be classified into two broad categories. The first category is often referred to as direct-view display devices, in which the user, looks directly at the actual display screen, not projected light image from other components. Most of the display devices in the prior art belong to this category, examples include the Cathode Ray Tube (CRT), liquid crystal, and plasma panel displays. The other category is referred to as non-direct view or projected image displays, where examples include the optical CRT projector and some laser addressed liquid crystal projection devices.

[0006] There are presently many computer workstations on the market, many having similar components and physical arrangements. The available workstations are very well known to those skilled in the workstation art. The majority of computer workstations have a CRT display device placed on the table or desk, a mouse unit, a computer unit, and an alphanumeric keyboard. The prior art CRT or other direct-view displays usually have the display screen at near vertical or near 45 degree screen inclinations. A graphic tablet is defined to be an electrical device, which repeatedly measures the position of a stylus, pen or a user's finger over a defined area, encodes the positions into a digital signal, and transmits the data to a computer. A stylus is defined to be any elongated pen-like object that can be used for writing or sketching, including the user's finger. The writing stylus is typically used to point, write, sketch, or draw onto the graphic tablet's active area, referred to as the encoding area.

[0007] Prior art in computer workstations exist in various combinations of computers, display devices, and peripheral devices. However, the prior art fails to anticipate the importance of computer workstation with computer, graphic tablet, and display device, with inclined screen angle and its adjustability through large angles. U.S. Pat. No. 4,361,721 of Dagnelie discloses a teletext device having a graphic tablet and a CRT display at a screen inclination fixed near 45 degrees. However, the disclosure does not recognize display screen angle adjustability and does not teach a computing means of any type, which severely limits the usefulness of the device. U.S. Pat. No. 4,562,482 of Brown discloses a computerized executive workstation having a CRT display with a screen inclination angle of 50 degrees from the horizontal, during workstation operation. Although the CRT display can be retracted to a stored position below the work surface area, the teachings of Brown do not disclose a graphic tablet and do not disclose screen angle adjustability. These shortcomings restrict the workstation an operation without graphic input. The U.S. Pat. No. 4,668,026 of Lapeyre and Gundlach discloses a computer terminal cabinet for glare reduction, having a CRT display at an acute angle with the horizontal, a keyboard, and a printer. The reference teaches adjustable mounting only for glare reduction, and does not disclose a graphic tablet or a computer; thus also restricting the terminal to non-graphic input. U.S. Pat. No. 4,669,789 of Pemberton discloses a computer user's desk having a CRT monitor at about 60 degrees from the horizontal, a keyboard, and dual disk drives. This reference does not disclose a graphic tablet or screen angle adjustability to inclinations near the horizontal. Again, the prior art does not anticipate graphic input or screen angle adjustability for optimal stylus control.

[0008] All the prior art of computer workstations, terminals or cabinets, of which the above is representative, disclose either display screens near vertical orientation, disclose fixed acute inclinations, or limited screen angle adjustability for glare reduction. No prior art can be found that disclose screen angle adjustability from horizontal to vertical, with a graphic tablet and computer. The prior art workstations can be used in either the conventional manner or at a fixed acute screen angle, but not both. The prior art fails to recognize the importance of an ergonomically design graphic input workstation capable of adjusting between conventional orientation and graphic input mode of operation with stylus data entry and screen angle near the horizontal (about 30 degrees for horizontal).

[0009] Although several graphic tablet and stylus devices are available in the market, they usually have been combined with a display device by electrical means only. The typical display and graphic tablet combination has an opaque tablet laying horizontally on the desk or table next to the display device, connected by an electrical cable. Some graphic tablet prior art includes a transparent tablet placed over the display screen, but typically the screen orientation is near vertical. Although this arrangement works satisfactory for general purpose computer processing, it has some definite shortcomings when high resolution graphic processing is attempted. This is important because today software is becoming more graphic intensive than ever before.

[0010] An important problem exists if the screen angle is near vertical. The user's hand and wrist must bend to an uncomfortable position to write or sketch on the tablet-

display surface. In addition, if the screen is at eye level, as with most prior art, the user's arm must be raised and held at position that will become very tiresome to the user, if used for a significant amount of time. The above is not just a matter of convenience. These shortcomings have severely restricted the use of standard graphic tablet input devices in the marketplace. This is one reason that the mouse input device has found wide spread use as a graphic input device for computer workstations and personal computers. Specifically, the mouse unit slides over the work table or desk, providing a support for the user's hand and arm. However, the mouse graphic input devices also have several disadvantages. First, it is difficult for the user to write, sketch, or draw with a mouse, because the device is too large and bulky to act as a pen or stylus. Secondly, the device must have a clear area on the table or desk for the unit to slide. This is valuable work space that some workstations cannot afford to lose.

[0011] Prior art workstations are inherently limited in their graphic interaction capabilities. The use of mice, joysticks, trackballs, and touch panels all have limitations for entering positional and functional data. For example, Computer-Aid Design (CAD) and Computer-Aided Design and Drafting (CADD) applications require precise and natural drawing and pointing means. An engineer or draftsman must be able to work at their workstation all day without great mental or physical fatigue. The prior art also does a poor job at providing a fatigue free workstation. In the area of teleconferencing applications, the computer workstation must be capable of real-time graphic and voice communications. The prior art workstations do not provide the means to accomplish that type of communications. In addition, conventional prior art workstations do not provide the ergonomically designed hardware support necessary for real-time electronic mail communications, while connected to either in Local Area Network communication means or remote communication means.

#### SUMMARY OF THE INVENTION

[0012] The disclosed invention solves the shortcomings of the prior art by arranging the standard workstation components so that it results in an integrated ergonomically designed universal workstation. The primary feature of the workstation is that its display device is oriented so that its screen angle is inclined at an angle. A transparent graphic tablet or stylus encoding means is placed over the display screen such that tablet or encoding area is parallel to the screen and above with a minimum space between them. Thus the tablet and screen appear to be one surface to the user. The display and tablet combination can be made to be adjustable through a multiplicity of screen angles. When the user writes with the stylus onto the tablet-surface and the surface is oriented at an angle of about 30 degrees, a natural writing and display surface exists, which provides a surprisingly synergistic and natural man-computer interface. In addition, the same workstation can be used for standard personal computing.

[0013] Accordingly, the present invention has for its first object a computer workstation with a display device oriented at an inclined angle near the horizontal such that the user can write, sketch or draw on the display screen-tablet surface in a natural manner, where it results in a new and surprising tele-writing, tele-drawing, and voice-graphics conferencing system.

[0014] Another important object of this invention is to provide an ergonomically designed computer workstation integrating text, graphics, and voice means for the purpose of general purpose computing and communications.

[0015] A still another important object of this invention is to provide for a human-computer interface that results in a natural, easy to use, and useful computer workstation, personal computer, computer terminal, personal workstation, and/or computer console.

[0016] A further object of this invention is to allow precise hand controlled stylus pointing, sketching, writing, or drawing functions by a user for data entry into a computer means, computer network, distributed network, or communication system.

[0017] A still further object of this invention is to provide a workstation with graphic input and output means integrated with two way telephone voice means, such that real-time teleconferencing is made possible from the same workstation herein.

[0018] Another important object of this invention is to provide a computer based workstation capable of real-time electronic mail functions. This would involve communicating alphanumeric text, graphics, and images to remote locations, and having a capability of transmitting the user's hand writing, including his or hers personal signature, via electronic mail messages.

[0019] A further object of this invention is to provide an improved computer workstation for Computer-Aided Design and Computer-Aided Design and Drafting applications, as well as general purpose high resolution graphic image rendering systems.

[0020] Still further objects and advantages will become apparent from a consideration of the ensuing description and drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0021] FIG. 1 is a perspective view of the computer workstation in accordance with the present invention.

[0022] FIG. 2 is a right side view of a CRT monitor embodiment of the invention, showing a hidden view, an exploded view and a break away view.

[0023] FIG. 3 is a right side view of the flat panel display embodiment of the invention, showing hidden view, an exploded view and a break away view.

[0024] FIGS. 4A and 4B are a flow chart of one application of the invention showing the sequence of the stored program events during the operation of the computer workstation.

#### DETAILED DESCRIPTION

[0025] The disclosed invention can be described with reference to the perspective view of FIG. 1, which shows one possible embodiment. The components of the computer workstation may be arranged in several different embodiments. In FIG. 1, a table support 26 physically supports a display device 22, a transparent graphic tablet surface area 18, a stylus 14, a computer keyboard unit 12, a mouse unit 15 and a computing means 24. The table support 26 may be a standard desk or pedestal, modified to physically support

the above components, or it may be a specially design structure. All display devices define a display screen of a finite area. The display device 22 has a display screen 16, which is located under the graphic tablet surface 18 and is of equivalent size, as indicated in the figure. The display screen is inclined at an angle between the horizontal and 45 degrees. The angle of inclination is adjustable through a wide range of angles. The display device 22 has control circuitry which may internal to the screen housing or located some distance away. The control circuitry may have one or more microprocessors associated with it.

[0026] The graphic tablet surface 18 may consist of a thin layer of a transparent material such as indium tin oxide or other suitable material; thus it cannot be distinguished for the display screen 16 in FIG. 1, but can be seen in FIGS. 2 and 3 in exploded view. The stylus 14 has an electrical cable 20 connecting it to the computing means 24. The graphic tablet surface 18, the stylus 14 the stylus-computer cable 20 and its control electronics make up a stylus position encoding means. The control electronics is typically located on a printed circuit card inside the computing means. Stylus encoding means are well known to those skilled in the art. The mouse unit is comprised of a hand unit and electrical cable, which is connected to the computing mean's serial port or bus interface.

[0027] A telephone means 28 may be located on table support means near the display device and keyboard. The addition of the telephone means to the computer workstation provides for both voice and data communications, simultaneously. The telephone means may be connected to the computing means 24 via an electrical telephone-computer cable 29. Specific circuitry in the computing means may integrate the voice signals with text/graphic data, well known to those skilled in the art. The computing means may be connected to an external communication means for transmitting and receiving data to and from a communications network 52. The electrical connection to the communications network is via an external communications cable 49. The communications network 52 is defined to be any appropriate communication system or network, in which data is transmitted and/or received to and from local or remote devices. Examples of such a communication network include the conventional telephone system, private telephone exchanges, computer local area networks, wide area networks, RS-232 serial interface, and many other types of communication systems. The telephone means 28 may be a speaker-type telephone, where the hands of the user are free to type on the keyboard or to write with the hand-held stylus. In an alternative embodiment, the telephone means may be connected directly to the communications network without going through the computer means. In an alternative embodiment, the computing means' functions may be incorporated into the display control circuitry.

[0028] The computer keyboard unit 12 may be a standard alphanumeric type keyboard or a special application specific keyboard design. As shown in FIG. 1, the keyboard unit is mounted in front of the workstation for easy access by the user. The keyboard is electrically connected to the computer with a cable in the standard manner, well know to those skilled in the art. The computing means 24 may be located in several different positions, but a convenient position may be vertical mounted under the table support 26, as shown in the figure.

[0029] FIG. 2 shows a right side view of one embodiment of the computer workstation, embodied with a CRT display monitor 40, which is a specific type of display device. For clarity, this figure does not show the telephone means 28, but it does show the telephone-computer cable 29. Some elements of the figure are shown with hidden lines and other elements are shown in a break-a-way view.

[0030] The computer workstation 10 may be realized with several types of computers or processors, having a wide range of processing powers, capabilities and sizes. Typically, the computing means 24 will have a central processing unit, internal memory, arithmetic logic unit, internal data bus, memory bus, device controllers, and other component well known to those skilled in the art. The computing means 24 will also process stored programs, algorithms and software, including but not limited to machine language, operating system, assembly languages, high level computational languages, and application software. The software may include text and graphic primitive programs to assist in the generation and manipulation of text and graphic workstation functions. Such software is known to those skilled in the field.

[0031] The means to encode a stylus position over the tablet area into electrical signals can be accomplished by several techniques. Among the prior art of encoding means are (1) measurement of x and y time delays via surface acoustic wave, (2) surface resistive sheet, (3) membrane pressure, (4) magnetic field means and (5) air acoustic means. In some embodiments, the tablet surface maybe a thin film applied to the display screen. In other embodiments, the tablet or encoding area may represent an area on the display screen, without a physical embodiment; i.e., air space between sensors. There are many types of graphic tablets that are presently on the market, including the SummaSketch® from Summagraphics Corporation, E-Z Image™ from Ovonic Systems Inc., or Scriptel™ from Scriptel Corporation. Typically, the stylus position is measured at a rate of about 100-500 points/second in both the x and y directions over the tablet's active area. The tablet electronics, located near the tablet, in the stylus, or on the tablet-computer interface card, converts these measurements into a digital code (encoded) and arranged into digital words or bytes (typically, 8 or 16 bits long). The resolutions of these devices are in the 200-300 dots/inch range.

[0032] As presented in FIG. 2, the graphic tablet means is comprised of the graphic tablet surface 18 and the stylus 14 elements. They are presented in an exploded view, in order to show the reader the distinction between the tablet and the display screen 16. The space shown between elements 16 and 18 would not be apparent in the disclosed embodiment. The stylus 14 is shown with the cable 20 connecting it the computing means. The term graphic tablet and stylus encoding means are equivalent. Depending on the type of graphic tablet employed, the cable may not be necessary. The cable can be removed if the stylus contains small batteries for electrical power. Electrical cable 20 connects the graphic tablet to the computing means 24 for control. The electrical interface between the tablet and computing means can be a serial RS-232 interface, a parallel bus interface, or other standard computer-device interfaces. In FIG. 2, at least one electrical cable 42 connects the CRT monitor 40 to the computing means 24 for control of the display functions. The electrical interface is of the standard type well known to those skilled in the display terminal or workstation field.

Typically, either digital TTL signals (representing video) or analog RGB video signals are provided to the CRT monitor.

[0033] Many types of CRT display monitors could be used in the workstation, but it is preferred that a relatively high resolution (70 dots/inch or higher) flat screen type be used. One possible candidate CRT that is presently available is the Zenith™ Data System's Model ZCM-1490 Flat Screen CRT Monitor. This monitor is a color CRT display capable of displaying the IBM® V GA Standard 620×480 pixels at a center screen pitch of 0.28 millimeters. This resolution is sufficient for reasonable quality graphics. The main advantage of the monitor is its flat screen. For the invention disclosed here, the flat screen results in a natural writing surface, when combined with a graphic tablet. Other curved surface CRTs could be used, but a flat screen is a preferred embodiment. Although either monochrome or color display could be used, color displays are preferred, because they can produce a high brightness background color, for example white. A bright display background is important in order to reduce the perceived glare from the display-tablet screen. Of course, color displays are also preferred because of improved human information recognition, well known in the human factors field.

[0034] Instead of a CRT display monitor, the workstation may be embodied with a flat panel display device. One possible embodiment is shown in shown in FIG. 3 with flat panel display device 27. Flat panel displays devices include electroluminescent, liquid crystal, plasma, electrochromic, and electrophoretic display technologies. The primary characteristic of these type displays is the relatively thin structure with a lack of bulkiness. This lack of depth is an advantage since it reduces the mass and volume of the display device. This makes it easier to manufacture the computer workstation, resulting in a lower cost and an improved ergonomically designed workstation.

[0035] Since a relatively high resolution display device is required in this system, the active matrix liquid crystal display (LCD) panel is a preferred flat panel technology of choice. The advantages of LCD panels are their low power, light weight, VGA resolution, and the possibility of color. Presently, the disadvantages of LCDs are their high cost, low brightness, low contrast, and limited grey scale and color. The other display technologies have even greater limitations, making it difficult to realize a useful display device. This however, may change in the future when improvements in flat panel display technology will undoubtedly be made. The electrical signals between a flat panel display and the computing means, carried by cable 42 of FIG. 3, differ from that of the CRT. Flat panel displays are typically driven by matrix addressing techniques, requiring significant circuitry to be located at or near the panel. Data to be transferred between the display and the computing means will consist of digital words containing a number of bits for x and y addresses, write and erase data, color information, scan data, etc. Such interfaces are well known to those skilled in the art of display technology.

[0036] The other elements of FIG. 3, with like element numbers, are equivalent to those of FIG. 2. The preferred workstation embodiment is the one using flat panel display device 27 and display orientation adjustment means 50 as shown in FIG. 3. One reason for this preference is the ease of adjusting means and potentially better quality display.

However, the low cost of CRT monitors may be an advantage if the cost continues to be less than equivalent flat panel displays.

[0037] FIGS. 4A and 4B presents a flow chart of one possible implementation of the software that would be executed in the computing means, including central processor unit or control circuitry. If a computer is embodied in the invention, the software would reside in stored programs residing in memory of the computer. The memory may be semiconductor, magnetic, optical or other memory types. The sequence starts with the power-on switch selection, which starts the power-up initialization program 60. The term program, as used here, is equivalent to an algorithm or routine, implemented in computer software. The next program step is the systems diagnostics and checkout program 62 that has either of two outputs: PASS or FAIL. If any of the tested components FAIL the test, data is sent to the system error report 64 program. If the systems passes, the operator is asked to select the mode of operation 66, via the keyboard, mouse or graphic tablet. If a terminal emulation mode is selected, the mode is initialized 70. The terminal mode is defined to be an operational mode where the workstation acts as a conventional computer terminal or communications terminal. If it is to act as a communications terminal, voice data from the telephone means may be communicated as well as text and graphic data. The user is asked whether the voice communications 72 option is desired; if so, a program to control the voice communication is initiated. In either case, a terminal communication program and modem program 80 is initialized. Next, the terminal mode program is set up 92 and the terminal application program is loaded 94. Exit from the terminal mode is allowed, along with operation stop and power off.

[0038] If the workstation mode is selected in element 66 of FIG. 4A, the operating system is booted 68. The user is then asked to select either a stand-alone or a network mode 74. If a stand alone mode is chosen, that mode is initialized 82, a windowing environment program may be loaded 90, and setup for an application program is accomplished 96. If the network mode is selected, the network communication's programs are initialized 76, and the user is asked whether the voice communication option is selected 84. If so, the voice communication program is initialized, which notifies the program that simultaneous voice communications via the telephone means will take place, with both text and graphic data communications. The voice signals may be integrated with the digital text and graphics data, or it may be transmitted and received via a separate cable to the communications network. A Local Area Network (LAN) or a remote communications programs are then loaded 88. If necessary, certain data or programs may be downloaded 98 to the workstation from a remote host or workstation. Elements 88 and 98 both input into the load window environment program 90.

[0039] Following element 96 of FIG. 4B, the user is given the opportunity of selecting and initializing the memory and I/O devices 100, which are available to the workstation. The required application program or programs are then loaded into the workstation memory. A wide variety of application programs could be loaded, including, but not limited to, a realtime tele-writing conferencing program 106, CAD/CADD application programs 108, word processing and/or desktop publishing programs 110, business/finance applica-

tion programs **102**, and scientific and engineering application programs **104**. The user can exit from the application program or go to another application setup **112**. The user can also either exit the operating mode **114** or go to the mode of operation selection element **66**. If the exit from the operating mode is selected, the system stop and power-off switch can be selected.

**[0040]** The scope of the invention disclosed here should be determined by the appended claims and their legal equivalents, rather than by the examples given above.

**1.** A data conferencing system having a first and a second conferencing terminal, the data conferencing system comprising:

the first conferencing terminal including:

- a first integrated input and display device adapted to receive a first portion of information from a first stylus, the first portion of information including graphic data that is displayed on the first integrated input and display device;
- a first communication device integral with the first integrated input and display device and configured to connect the first conferencing terminal to the second conferencing terminal;
- a first interactive display interface portion configured to display both the graphic data entered by the first stylus and graphic data received from the second conferencing terminal simultaneously;
- a first stylus position determination device adapted to determine the position of the first stylus;
- a first keyboard in communication with the first integrated input and display device, input from the first keyboard being displayed on the first integrated input and display device; and
- a transmissive first tablet surface adapted to be contacted by the first stylus and integrated with the first integrated input and display device through which the first portion of information is displayed and through which stylus position is detected;

the second conferencing terminal including:

- a second integrated input and display device adapted to receive a second portion of information from a second stylus, the second portion of information including the graphic data that is displayed on the second integrated input and display device;
- a second communication device integral with the second integrated input and display device and configured to connect the second conferencing terminal to the first conferencing terminal;
- a second interactive display interface portion configured to display both the graphic data entered by the second stylus and the graphic data received from the first conferencing terminal simultaneously;
- a second stylus position determination device adapted to determine the position of the second stylus;
- a second keyboard in communication with the second integrated input and display device, input from the

second keyboard being displayed on the second integrated input and display device; and

- a transmissive second tablet surface adapted to be contacted by the second stylus and integrated with the second integrated input and display device through which the second portion of information is displayed and through which stylus position is detected;

wherein,

the first conferencing terminal has the same structure and configuration as the second conferencing terminal,

both conferencing terminals of the data conferencing system are capable of displaying the first and second portions of information simultaneously, and

at least one of the first and the second portions of information include handwriting entered by one of the first and second stylus.

**2.** A display-tablet device comprising:

- a) a microprocessor computer system running an personal computer-type operating system program;
- b) a flat panel display device defining a display screen controlled by the microprocessor computer system;
- c) a transmissive graphic tablet input device placed over the flat panel display screen, wherein the graphic tablet input device is controlled by the microprocessor computer system, and wherein a user has an option to enter data to the graphic tablet using a stylus;
- d) a control button on the front top surface of the portable display-tablet device for additional user control or data input to the portable display-tablet device;
- e) an enclosure in which the microprocessor system and other necessary support components are located.

**3.** A method for information sharing on a personal computer comprising the following steps in any order:

- a) executing a communication program in cooperation with a personal computer operating system;
- b) communicating data under control of the personal computer operating system to and from a second roughly equivalent personal computer at a remote location via an external communications network;
- c) conferring information between another personal computer system in a peer to peer manner in cooperation with the communicating data step using said computer program and an external communication function; and
- d) adapting said personal computer system for multiple data input devices.

**4.** A computer program residing on a computer readable medium, comprising instructions for causing one or more personal computer systems to:

- a) communicate information to and from another roughly same type personal computer system remotely located in cooperation with an operating system with a window graphical user interface capable of single window operation while communicating information,

- b) communication information via an external remote communications network in a roughly peer-to-peer process, such that a user has the option to execute programs separately and execute programs that do not correspond to each other;
  - c) control downloading of information from said roughly same type personal computer system via the external remote communication network, wherein said information is processed;
  - d) control uploading of information to said roughly same type personal computer via the external remote communication network, wherein said information is processed; and
  - e) process said information for communication to and from the remote personal computer, such that said communication of information is for a business purpose.
5. A computer program as recited in claim 4, in which the computer program is communicating information for the purpose of data conferencing and application sharing.
6. A computer program as recited in claim 4, in which the information communicated includes audio or voice information.
7. A computer program as recited in claim 4, in which the information communicated includes audio and video information.

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