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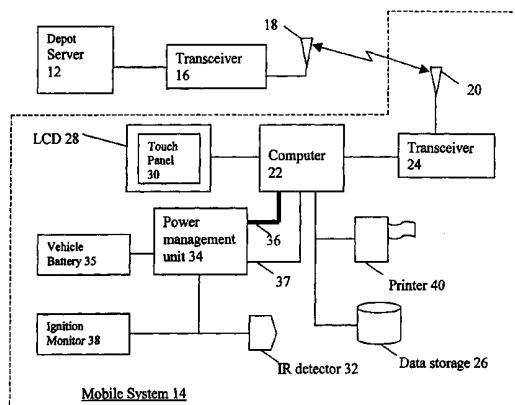
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(54) Title: INTERACTIVE ADVERTISING AND MULTI-MEDIA SYSTEM WITH A PLURALITY OF MOBILE PLATFORMS



(57) Abstract: The present invention relates to a system that distributes and displays entertainment and advertising content in a mobile electronic display. The mobile system of the present invention includes a computer system that drives an electronic display mounted on the backside of a vehicle seat. A wireless radio connection to a depot server enables the transfer of information between the mobile system and the server. The transferred information includes advertisements, entertainment, news and other information for display on the electronic display as well as statistical information relating to the advertisements. Each depot server is coupled to a main server from which the entertainment and advertising content is developed and where the statistical information is analyzed. Since battery management is of concern, the computer system also contains means for determining whether a user is present in a viewing position and for determining whether they are viewing the display. If the viewer is inactive for an extended period of time, a power management control unit deactivates or minimizes power consumption. The mobile system of the present invention is housed in an aesthetically pleasing enclosure that includes means for mounting the device on a seatback or other flat surface.



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FIELD OF THE INVENTION

The present invention relates to a mobile system for displaying advertising and multi-media content in an electronic form. More specifically, the present invention relates to an interactive advertisement and entertainment system with wireless transfer update capability for commercial public transportation vehicles and the like, mounted on a seat back capable of displaying electronic multi-media content.

BACKGROUND OF THE INVENTION

Advertising channels are the means by which products and services are communicated to the consumers. Traditional advertising channels include, by way of example, billboards, printed publications, radio, and television advertisements but now must also include the Internet as a distinct advertising channel. One familiar with the Internet will appreciate that it has transformed the desktop computer into an advertising outlet with banner advertisements displayed to individuals whenever they access a web site. Additional details regarding the advertised product or service may be associated with the banner so that once the viewer "clicks" on the banner these details are displayed. Many advertisers have found Internet banner advertising to be a cost effective method for reaching consumers interested in their product or services and many companies have allocated an increasing portion of their advertising dollars for Internet advertising. However, the Internet is an inherently poor medium for reaching many consumers who do not have Internet access or the mobile consumer. This problem is further exacerbated because wireless Internet access is bandwidth limited and few users are willing to view advertisements over a wireless link because such data is viewed as slowing down the retrieval of desired information. Further still, although wireless Internet connectivity is envisioned in the near future as being widely available, very few consumers currently have such access. As such, advertisers are unable to reach the mobile consumer via the Internet.

In contrast to the Internet, some traditional advertising channels are often readily accessible by mobile individuals. For example, billboards and signage provide generally static displays visible to any passerby. However, a significant problem with billboards and signage arises from the fact that there is no mechanism to encourage the viewer to view the advertisement content. For this reason, billboards positioned on a busy street are more valuable than billboards positioned at a location with relatively low volume of passerby traffic simply because only a small proportion of potential viewers are expected to view the advertisement. Another problem with billboard arises from the limited amount of information that may be conveyed on a billboard because many viewers rapidly pass by the billboard or sign in a vehicle. Since, the available time for viewing is very limited and the information that the viewer may retain for later reference is very limited, such advertising channels are often less effective than other advertising channels. Yet another problem arises from the fact that billboards and signage are

stationary so the population that could potentially view the billboard lacks diversity. What is needed is a billboard or signage that may be viewed by large numbers of consumers from a widely diverse population. What is further needed is the ability for the consumer to obtain detailed information about the product or service being advertised for later reference.

5 Many of the problems associated with billboards and signage are overcome by printed publication such as newspapers or magazines. For example, printed publications are readily accessible to the mobile consumer who may peruse the publication at a pace conducive to retaining information regarding the advertised product or service. However, since publications lure readers with the promise of news and entertainment in the form of printed articles, the
10 reader's attention may not be focused on the advertisements and the printed article may only be read once and discarded. Thus, while many readers will encounter advertisements, they may focus instead on the articles. Notwithstanding the limitations, many people believe that periodical advertising is highly effective because they may be readily acquired by a diverse population. Periodicals have a further advantage in that they are relatively mobile. Thus, an individual may
15 pick up a newspaper and read it, even while traveling. For this reason, newspapers are relatively inexpensive and effective advertising media. One problem that arises with newspapers, however, is that the distribution costs are substantial as can paper and ink costs. Also, periodicals contribute to problems associated with disposal. Clearly, what is needed is a mobile advertising media that is inexpensive and environmentally friendly.

20 In the effort to reach a diverse, mobile audience of consumers, advertisements have been placed on the exterior of vehicles, such as cars, buses and vans. This advertising channel originally took the form of billboards attached to the exterior of the vehicle. More recently, the advertisers have taken to wrapping vehicle in a Mylar mesh. Since this type of advertising is mobile, it may be viewed by a high number of potential viewers. While highly visible, the length of
25 time the advertisement may be viewed is limited especially if the vehicle is traveling at a rapid rate of speed. Unfortunately, there is no effective means for distributing advertising collateral such as brochures or coupons to viewers of the mobile advertisement. Another problem arises from the time and expense associated with printing and distributing and updating a plurality of vehicles with new advertisements.

30 Radio has long been used as a mechanism for providing advertisement and entertainment content in the interior of a vehicle. Again, however, there is no effective means for distributing advertising collateral such as brochures or coupons to viewers of the advertisement. More recently, vehicles have included video monitors to display audio-visual content but such systems have not been popular because there are many problems associated with providing
35 multi-media advertising content in a mobile vehicle. For example, a monitor or display device must be provided. Display devices have inherently high-power consumption so most battery

operated devices are precluded from long term use in such applications. Further, providing multi-media advertising content requires a high bandwidth radio connection and the infrastructure to support such transfers is not widely available. Further still, due to inherent environmental vibration associated with mobile vehicles, the multi-media content has traditionally been stored on video tape or CD-ROM disks. Unfortunately, this type of media requires a dedicated player and it is difficult to distribute the media to large numbers of vehicles in a timely manner. Another problem arises from the fact that most vehicles are not designed to include audio-visual systems. Thus, mounting the device has typically been dictated by the interior configuration of the vehicle. By way of example, passenger vehicles recently have started to include built-in display monitors that project downward from the ceiling. Such monitors are often inadequate for most viewing applications because they are relatively small, difficult to view, and positioned in a manner that requires the viewer to look upward at an awkward angle. What is needed is a system that may be mounted in the vehicle such that it is unobtrusive yet positioned for convenient viewing.

Notebook computers are yet another mechanism for providing multi-media content in vehicles. Notebook computers advantageously provide a display unit and include mechanisms such as a DVD drive so it is possible to display pre-recorded multi-media content. However, one significant problem with using notebook computers for providing multi-media content in a vehicle arises from design constraints associated with notebook computers – namely, the display's size and poor visibility and contrast in high ambient light conditions. More specifically, due to the requirement that such devices remain portable, the displays have historically been significantly smaller than a common desktop computer display screen. For this reason, portable computers, while adequate for many purposes, are generally perceived as inadequate for viewing in a mobile vehicle. Also since there is rarely a desk top or similar surface on which to place the notebook computer during use in most vehicles, the viewer must position the system on the lap or between seats on the floor, both positions of which result in a viewing angle that is less than desirable. What is required is a display system that is easy to attach to the interior of most vehicles so that viewers may comfortably view multimedia content while the vehicle is in motion.

Notwithstanding the advantages of the above-described advertising systems, yet another problem arises from the inefficient mechanism by which such systems may be upgraded. More specifically, the pre-recorded content contained on the typical VCR tape or the DVD disk is fixed and may not be changed over time. Unfortunately, once the pre-recorded content is selected, it is unchangeable for the duration of the trip unless a new tape or disk is subsequently purchased. Clearly what is needed is a system and method that enables the multi-media content to be updated in a timely fashion without requiring the user to maintain an inventory of tapes or disks which must be returned or stored until their desired re-use. Further, what is needed is a mechanism for distributing multi-media content that includes both local and national advertising in

a manner that is updateable over time and that is geared to a specific location within which the vehicle is traveling. More specifically, what is needed is a system that readily adapts the content displayed to the user that relates to the location. This location-specific content must be changeable in an inexpensive and timely manner.

SUMMARY OF THE INVENTION

The present invention relates to a mobile system that distributes entertainment and advertising content in a vehicle such as an automobile or bus. Entertainment content is initially displayed in a portion of an electronic display. Advertisements are initially presented in a frame surrounding the entertainment portion. By selecting one of the displayed advertisements, additional features are made available to the viewer. Specifically, when the selected advertisement includes extended information, the viewer is provided with additional information such as details regarding the advertisements, address or telephone number of the advertiser. This information may be printed in tangible form for the viewer to retain and refer to a later time. Alternatively, the extended information may comprise a promotional coupon or other incentive offered by the advertiser. This incentive is also printed in a tangible form and provided to the viewer for redemption. In addition to the tangible output, the extended information may also include a multi-media digitized material that promotes the advertiser's product or service.

By way of example, a movie may be advertised by a local theater on the system in the form a banner advertisement. When a viewer selects the banner, the viewer is provided extended information that includes the performance schedule, pricing information, the address of the theater as well as a coupon redeemable for a discount applied toward the purchase of ticket. In addition, the extended information may include a short segment often referred to as a movie trailer consisting of several minutes of scenes from the movie. Advantageously, the present invention permits the advertiser to customize the advertisement to reflect location specific information.

The mobile system of the present invention includes a computer system that drives the electronic display mounted on the backside of a vehicle seat. A wireless radio connection to a depot server enables the transfer of content information between the mobile system and the server. The transferred information includes advertisements, entertainment, news and other information for display on the electronic display. Additionally, the transferred information may include statistical information such as the number of viewers during a selected time period, the number of advertisements selected by viewers to obtain access to the extended information, the number of coupons or information slips printed during the selected time period as well as the actual time of the viewing. The depot server is coupled to a main server from which the entertainment and advertising content is developed and where the statistical information is

analyzed.

In operation, the present invention includes at least one server located at a depot where it may send and receive information via a wireless connection to a plurality of mobile systems. Information is transferred to and from the mobile system whenever it enters transmission range. The entire update process can be accomplished in a matter of seconds, so that by the time the vehicle is, for example, re-fueled, new content is available.

The depot server's primary task is manage the transfer of information to and from each mobile system as it enters the depot area. A depot may be a service center, service station, bus station, train station or similar locations where vehicles equipped with the mobile system will periodically visit. To illustrate, if the vehicle is a taxi, the depot is the taxi service center where each taxi will return at the end of each shift for re-fueling and for a change of drivers. In other applications, a fuel distributor may include the depot server at each service station. The depots are strategically positioned throughout the transportation network so that the information may be downloaded to individual mobile systems. Thus, a plurality of depots could be positioned along the interstate highway system to provide continuously updated information that is customized with local content. This local content may be specific to locations within about a 500 mile radius of the depot which is a typical driving range between fuel stops. When the vehicle is in the depot area, statistical information may be uploaded to the depot server. The depot server is coupled to a central server by a network such as the telephone network or the Internet this statistical information may be uploaded to the central server for analysis by the advertisers.

To further illustrate the operation of the present system, the following description refers to a mobile system positioned in a taxicab or other commercial vehicle. To support the mobile systems, the depot server is positioned at a taxi depot so that each time a taxi enters the yard, typically at the beginning and end of each shift, new content is transferred from the server to the mobile system associated with that taxicab. Whenever a taxi is within the proximity of the depot server, the mobile system establishes a wireless link with the depot server to download new content which may include news, entertainment and advertising.

If the mobile system is positioned in a private vehicle, the wireless Internet may be used to link the mobile unit to the server. For example, an Internet service provider may distribute information via the local cellular network to mobile systems that dial in to acquire new content. By knowing the location of the cellular tower that initiates the telephone call, the ISP can the determine the location and provide content that is targeted to the specific geographic location..

In one preferred embodiment, the mobile system of the present invention comprises a computer system having a large format LCD display screen with a sensor adjusts the contrast in response to changes in ambient lighting. Preferably, the display includes an integrated touch panel so that a keyboard or other input device is not necessary. One skilled in the art will

5 appreciate that a joystick or other known control device may, however, be desirable and readily implemented with the present system for specific applications. The computer system has sufficient random access memory (RAM) to store several minutes of audio-video content in digital form together with the banner advertisement. Additional information that, by way of
10 example, relates to advertisement, entertainment, and location-specific information such as maps, local restaurants, telephone directories, and yellow pages is stored on a hard disk or other re-writeable storage device. This content is transferred from the hard disk storage device to RAM by the computer and displayed in response to a viewer's selection. Also associated with the computer system is a printing device that prints extended information for retention by the viewer. The printer is also useful for printing maps, directions, and coupons associated with local
15 advertisers.

The computer system further includes a power management control unit coupled to the vehicle's battery. Since battery management is of concern, the computer system also contains means for determining whether a user is present in a viewing position and for determining
20 whether they are viewing the device. Thus, if the viewer is inactive for an extended period of time, the power management control unit deactivates or minimizes power consumption until such time as a request is entered. The power management control unit also monitors vehicle parameters such as the ignition state and whether the vehicle is moving. Thus, if the vehicle is left idling for a period without a viewer present, the power management control unit will initially deactivate the display and then subsequently after a second period of time deactivate the entire
25 computer system. Similarly, if the ignition is turned off, power will be removed from the mobile unit in an orderly manner even if a viewer is present. In this manner, power management is maximized to insure that the vehicle's battery is not unduly drained. However, even if a viewer is not present when the vehicle enters the proximity of the depot, the power management control unit ensures that the computer system is awoken and able to exchange information with the depot server.

The computer system of the present invention is housed in an aesthetically pleasing enclosure. This enclosure includes a mechanism for mounting the device on the back of a seat in the typical car, van, bus, train, or airplane or other mobile vehicle. The enclosure positions the
30 display portion of the mobile system such that it is properly positioned for convenient viewing by one or more passengers seated in a facing seat. Advantageously, the enclosure of the present invention positions the display device such that it is slightly angled upward so that the primary viewer views the screen without introducing viewing angle distortion. In another preferred embodiment, the printer is removed and replaced with a peripheral device such as a floppy disk drive, a CD-ROM drive or a backup device, such as the SuperDisk™ drive available from Imation Corporation. Media is introduced to the peripheral device through the slot. In this embodiment,
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the enclosure is mounted on a wall or on a desk surface to provide, with the addition of a keyboard and a mouse, a thin profile computer system. This embodiment is particularly useful as an electronic window or billboard, as a zero-footprint data entry device or as a desk top personal computer.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram of one embodiment of the display system of the present invention.

Figures 2A and 2B illustrate the operational sequence executed by the computer processor associated with the mobile platform component of the display system of the present invention.

Figures 3A and 3B illustrate preferred display configuration for the concurrent display of advertisement and entertainment content.

Figure 4 illustrates the operational sequence associated with generating the display area illustrated in Figures 3A and 3B.

Figure 5 illustrates the process flow associated with a depot server.

Figure 6 shows one preferred embodiment of a low-profile enclosure for housing the present invention.

Figure 7 shows a perspective view of a peripheral mounting bracket.

Figure 8 shows a support structure for minimizing vibration-induced errors from a hard disk drive associated with the mobile platform component of the present invention.

Figure 9 illustrates an embodiment of a suspension frame associated with the support structure of Figure 8.

Figure 10 illustrates a means for coupling the suspension frame to a hard disk drive.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

In the following description of a preferred embodiment, reference is made to the accompanying drawings, which form a part hereof, in which is shown by way of illustration specific embodiment in which the invention may be practiced. In the following description, numerous specific details are set forth in order to provide a complete understanding of the present invention. It will be apparent to one skilled in the art that the present invention may be practiced without the specific details. In the development of the actual implementation, numerous implementation-specific decisions must be made to achieve the design goals which will vary for each implementation. Accordingly, in order not to obscure the present invention, well-known

structures and techniques are not shown or discussed in detail. Further, it should also be noted that elements shown in the drawings herein are not necessarily to scale, the intent being to illustrate the relationships of the elements.

Referring now to Figure 1, a block diagram of a representative embodiment of the present invention is illustrated. System 10 includes a server 12 and a mobile system 14 coupled by wireless transceivers 16 and 24. Transceiver 16 includes a broadcast and receive antenna 18 and is coupled to server 12. Transceiver 24 includes a broadcast and receive antenna 20 coupled to mobile system 14. Antenna 20 is physically attached to the vehicle (not shown) in which the mobile system is positioned. Antenna 20 is coupled to a single board computer 22 via wireless LAN transceiver 24. When mobile system 14 is in the proximity of transceiver 16, content is transferred or downloaded over a dedicated high bandwidth channel from server 12 to mobile system 14 for subsequent playback without establishing a physical connection. Similarly, mobile system 14 transmits or uploads data via transceiver 24 to server 12.

Mobile system 14 comprises a computer 22 and a power management unit 36. Computer 22 includes data storage device 26 for accumulating data received from server 12 or that is to be uploaded at a later time. In one preferred embodiment, data storage device 26 is a high-capacity magnetic storage device such as a hard disk drive.

When a passenger is seated in front of mobile system 14, the computer activates an LCD display 28. The LCD display incorporates two additional lighting tubes to increase the contrast and brightness. These additional lightening tubes are necessary to ensure that the display will have sufficient contrast for bright ambient light conditions. Display 28 has a viewing angle of about 160° and receives content data from computer 22 for display to the viewer. To receive viewer input, display 28 includes an integrated touch panel 30 so that viewer responses may be entered to control the operational sequence executed by computer 22. One preferred touch screen is available from Dynapro, now a part of the Optical Systems Division of Minnesota Mining and Manufacturing Company (3M).

Mobile system 14 further includes a light sensor 38 that generates a signal coupled to computer 22. The signal produced by light sensor 38 is processed by computer 22 to automatically adjust the brightness of display 28. Specifically, additional light tubes associated with display 28 are switched on when the ambient light condition is bright sunlight. This sensor allows the contrast to be varied in accordance with ambient light conditions so that display 28 is visible in ambient light conditions ranging from dim to bright sunlight. Mobile system 14 also includes a thermal printer 40 for generating a hard copy or tangible output. Thermal printer 40 is particularly useful for printing instructions or promotional coupons for use by the viewer.

Power management unit 34 is responsible for generating the voltages required to operate mobile system 14. Power management unit 34 includes multiple DC converters each of which

supplies various voltages, such as ± 12 volts, ± 5 volts and $+3.3$ volts, to specific component of computer 22. Each converter 42 supplies current independent of other converters. These voltages are supplied to computer 22 and the other components of mobile system 14 by power bus 37. In another preferred embodiment, one dedicated converter supplies power to the LCD display, another dedicated converter supplies power to the printer and another dedicated converter supplies power to the computer 22. Additional converters would be included as required by specific applications.

Power management unit 34 also includes a microcontroller that monitors signals from passive infrared detector 32 and an ignition switch monitor 38. If the vehicle's ignition switch is in the "off" position, the signal from monitor 38 causes power management unit 14 to ignore the signal from the infrared detector 32 and keep the mobile system 14 in either a power-down or sleep condition. When the vehicle ignition switch is initially activated, power management unit 34 begins the process to initiate the power-up and the boot process necessary to bring computer 22 and its peripherals to an active state by passing a reset/power-on signal on line 37 to computer 22. One skilled in the art will appreciate that computer 22 may be thereafter placed in a suspended or sleep mode from time to time to minimize the time required to boot-up sequence while minimizing the power requirements of mobile system 14.

When power management unit 34 determines when a viewer (i.e., a human) is present in a viewing position by monitoring passive infrared detector 32. When infrared detector 32 indicates the presence of a viewer, power is applied to display 28 and computer 22 is signaled to initiate a display sequence on LCD display 28. When power manager unit 34 determines that the viewer has vacated the vehicle, power is removed from LCD display 28 because it is a high power-consuming component.

Referring now to Figure 2, the operation of mobile system 14 is described in more detail. Initially, power management unit 34 monitors the ignition switch of a vehicle in which mobile system 14 is located as indicated at step 44. If the ignition switch is in the "off" position, the output of power management unit 34 is in a low power state at bus 36. Power management unit 34 continuously monitors the ignition state until it is appropriate to boot computer 22. In other embodiments the power management unit is only powered up when the ignition switch is in the "on" or "accessory" positions.

In either embodiment, power management unit 34 begins the boot process when the ignition switch is turned "on." The initial step in the boot process requires the power management unit 34 to verify that system voltages to computer 22 and the peripherals are at the appropriate voltage level, as indicated at step 46, at the output of the DC to DC converters. When the voltages are all verified as being in the proper range, the boot process proceeds to step 48. However, if one or more voltages are determined to be outside of specification, operation

proceeds to step 50 where the error condition is noted. The operational sequence end at step 52. However, since vehicle voltages may fluctuate depending on the temperature and battery loading, power management unit 34 may wait a selected period of time to enable voltages to stabilize after the ignition switch is switched "on" before proceeding. If the voltages are out of specification, power management unit 34 records the source of the problem and saves this information for transmission to server 12 when mobile system 14 is next within range of server 12. After the identifying the voltage problem, power management unit 34 terminates its activity, as indicated at step 52, and the mobile system 14 remains in a quiescent state. When mobile system 14 next returns to the vicinity of server 12, the wireless LAN transceiver 24 is activated to indicate the problem associated with the voltages to server 12. Server 12 then activates an alert indicating the problem so that service personnel can be routed to fix the problem associated with mobile system 14 or its vehicle.

When voltages are tested correctly, power management unit 34 begins the bootstrap process for activating computer 22, step 48. The bootstrap process associated with booting a computer system requires accessing code stored in a non-volatile memory and using that code to initialize system components. Once system components are initialized, operating systems and application programs are transferred from disk storage or other non-volatile storage device to random access memory (RAM) (not shown) associated with computer 22. It is interesting to note that while the display 28 is initialized by loading appropriate drivers and providing diagnostic information related to the boot process at step 48, it is immediately put in a sleep mode with no power applied. To eliminate start-up time when a viewer initially occupies a viewing position, the content for display may be moved from data storage device 26 to RAM.

Once computer 22 is active, computer system interrogates/monitors a signal from the passive infrared detector 32 and waits until a passenger is seated in the viewing area. This process is indicated at steps 56 through 60. If no passenger is present, computer 22 continues to monitor the passive infrared signal, as indicated at step 54. This monitoring process can be based on an interrupt or by running a program to check the signal output. When a passenger is present, the signal change from passive infrared detector 32 is detected by computer 22 and process flow proceeds to step 56.

At step 56, the power is applied to the LCD display 28. Once the LCD display 28 is powered up, the screen content is displayed. At step 58, computer 22 must determine if the screen is too bright. If it is the display intensity must be reduced as indicated at step 60. Display intensity is lowered by either the voltage is adjusted to run the light generating means of LCD display 28 at a lower level or one of the plurality of light bulbs are turned to the "off" state.

If the LCD display screen 28 is too dim, step 62, computer 22 increases the intensity of the LCD display, as indicated by step 64. Computer 22 can increase intensity by either

increasing the voltage applied to the light generating means or turn on additional light bulbs associated with the LCD display 28.

When computer 22 determines LCD display is neither too dim nor too bright, operation proceeds from step 62 to step 66. At step 66, computer system begins the process of displaying a plurality of advertisements and interactive games or other entertainment. Computer 22 monitors the viewer's interaction based on input received from touch panel 30. At this point in the operational sequence, the viewer may be viewing advertisements, accessing other information or participating in the entertainment provided by computer 22.

If the viewer presses a portion of display 28 that indicates the viewer desires a print-out of information contained in the data storage device 26, the information is transferred by computer 22 to printer 40 for printing as indicated at step 68. The printer is then provided with information for printing and the coupon or other information is printed for the viewer to acquire as indicated in step 70. Statistical information is then stored for later upload to the depot server, as indicated at step 72. Operation then proceeds back to step 54 where computer 22 verifies that a viewer is still present.

If, however, it is determined in step 66 that the viewer is not interacting with the information presented on LCD display 28, operation proceeds from step 66 to step 74 where it is noted that the viewer was non-responsive to both the advertisement content and the entertainment content. This information is stored on data storage device 26 until it is uploaded to the server the next time mobile system 14 is in proximity to the depot server. Lack of the viewer interacting with the displayed information may be caused by several reasons. For example, it could be that the viewer is unable to determine how to operate or to control display 28. Thus, if a viewer is present for a period of time a series of instructions may be presented on display 28 in a plurality of languages. It will be appreciated that the appropriate period of time selected will be based on an engineering determination as to the appropriate amount of time for the specific viewing environment. If a first-time viewer is not familiar with the operation of mobile system 14, instructions may be displayed indicating that certain portions of the display are touch sensitive and that the viewer may modify or control the content of display by pressing those areas where information of interest is displayed. In other situations, it may be determined, based on the length of inactivity, that the viewer is uninterested in the currently displayed content. Thus it is possible for computer 22 to reconfigure the display so as to encourage viewer participation. In this manner, mobile system 14 is interactive and adaptive, based on the presence of the viewer seated in front of mobile system 14. Similarly, computer 22 may determine that viewer participation or interaction may be encouraged by offering promotional coupons or other incentives.

By way of example, a portion of display 28 may be dedicated to a video game, any

number of which are well-known in the art. To encourage the viewer to participate and play in the game, promotional coupons may be awarded to the viewer. One such game may be a video representation of a slot machine, such as commonly found in Las Vegas. By instructing the user/viewer to touch the arm of the slot machine, the slot machine may be activated. As the viewer becomes captivated by the game, their attention is focused on display 28 for an extended period of time. Thus, by playing the game, the viewer's attention is focused on display 28 so that the advertisements in the frame area are also inherently observed. The viewer may be rewarded for their participation by printing coupons or promotional discounts for products or services advertised in the displayed advertisements. This sequence of operation continues for as long as the viewer is present in the viewing area proximate to mobile display unit 14.

From time to time, the process illustrated in Figures 2A and 2B will drop out of the passenger interaction sequence of steps, that is, steps 54 through 74, and proceed to step 76. This process flow will occur when the viewer's activity decreases below a selected threshold of activity so that computer 22 can determine if a viewer is still present. If the determination that the viewer remains in the vicinity of the viewing area, operation proceeds from step 76 back to step 54 so that display contrast can be adjusted. It is necessary to re-adjust the display intensity due to mobile nature or mobile system and the changing nature of the ambient light. In this manner, computer system 28 is able to determine whether the viewer is present and whether display is appropriately adjusted consistent with the ambient light environment on a timely and repetitive basis. Operation then proceeds to step 66 where the display of advertisements in the frame area of the LCD display 28 and entertainment continues.

If, however, computer 22 determines that the viewer is no longer in the viewing area at step 76, operation proceeds to step 78. At step 78, computer 22 minimizes power supplied to LCD display 28 by adjusting the voltage from DC to DC converter associated with display 28. LCD display may have power completely removed or it may be adjusted until it is in a low-power light state.

Following execution of step 78, computer 22 operation proceeds to step 80 where a determination is made as to whether the ignition switch remains in the "on" position. If computer 22 determines the ignition switch is in the "on" position in step 80, operation proceeds to step 54 for monitoring for a arrival of the next to arrive viewer.

If, however, computer 22 determines that the ignition switch is no longer in the "on" state, operation proceeds from step 80 to step 82. At step 82, computer 22 initiates a five-minute wait state during which it periodically monitors the ignition switch as indicated at step 84. The purpose of wait state step is to minimize power drain on the battery if the vehicle is sitting for an extended period of time with the vehicle in the "off" state. The assumption being made at this point is that both the viewer and the driver have vacated the vehicle. Accordingly, there is no

reason for computer 22 to remain in the powered-on state, even if power management functions are activated. Accordingly, at the end of the five-minute wait state in step 82, operation of computer 22 proceeds to step 84 where the ignition state is again checked. If in step 84 it is determined that the ignition switch is in the "on" state, operation proceeds back to step 54, where operation of computer system proceeds in the manner as described above. If however it is determined in step 84 that the ignition switch has remained in the "off" state for at least 5 minutes, operation proceeds from step 84 to step 86 and computer 22 begins the process of closing application programs and operating system and shutting down computer 22. Process flow ends at step 88. Once computer 22 is shut down, operation of mobile system 14 proceeds back to step 44 where power management unit 34 again begins the process of monitoring the ignition switch to be switched to the on-state.

When computer 22 is operational, mobile system 14 provides an interactive advertising platform installed on the back seat of a vehicle, such as an automobile, bus, train, airplane, or other vehicle. The present invention combines features of inexpensive electronic broadcast with the benefits of print advertising, such as billboards, handbills, newspapers, or magazines where the viewer can interact with the advertisement over an extended time period.

Figures 3A and 3B illustrate one preferred configuration of a display format for the concurrent display of both advertisements and entertainment on the LCD display. More specifically as illustrated in Figure 3A, the display area of display 28 is divided in two primary regions, a frame region and an entertainment region 99. In one preferred arrangement, region 99 is initially dedicated to display of entertainment or informational content. The frame region is further divided into a plurality of screen region 91-98. Each region is individually addressable and may display a banner advertisement, information or video. The remaining regions 91 through 98 are dedicated to display of banner advertisements. Banner advertisements may be either a static scanned image or include animation script. When the viewer observes an advertisement of interest, the viewer generates a signal by touching the integrated touch panel 30. When computer 22 senses an input from touch panel 30, the region 99 is re-drawn with an expanded version of the advertisement selected by the viewer. Alternatively, additional or extended information may be displayed. Extended information may include animation or digitized video, such as would be the case if the extended information comprises a movie trailer. In this manner, a banner advertisement in region 91 through 98 can be selected, expanded and displayed in region 99.

Advantageously, advertisement of various sizes may be displayed in the frame region of display 28. For example, each region 91-98 can be further sub-divided as indicated in Figure 3B. As illustrated, regions 92 and 93 can be treated as a single region 100 to display a large and attention grabbing advertisement. Similarly, region 95 can be divided into sub-regions 101 and

102 each of which may display a different advertisement. Similarly still, region 98 may be divided into sub-regions 103 and 104. In other embodiments, all regions may be combined as a single regions for the display of a single advertisement or selected entertainment. Regardless of the size of the regions in the frame regions, each will be referred to as an "ad cell" hereinafter.

5 The advertisements are obtained from the data storage device 26 and moved to RAM before display. As the number of advertisements will typically exceed the amount of regions, the advertisements are displayed in random position and order.

10 When a viewer touches the screen region corresponding to a displayed advertisement, the mobile system 14 provides in display region 99 extended information consisting of additional information relating to the advertisement or promotional coupons. This extended information is provided at an increased cost to the advertiser. The ability to up-sell such services is available to generate additional income. The extended information is displayed in region 99 of display 28. When the extended information is displayed, the game will disappear from the screen for selected periods of time, or until the viewer requests the game to be returned to display region 99.

15 The present invention further includes promotional prizes which may be distributed in the taxicab by software which selects the distribution rate based on a random lottery method. For example, to encourage viewer participation and interaction with mobile system 14, it may be possible to distribute gifts or entry forms to be returned for payment of prizes or promotional discounts on products and services.

20 The operation of display manager of mobile system 14 is now described. When mobile system 14 detects the presence of a viewer (Figure 2), the operational sequence illustrated in Figure 4 is initiated. Process flow begins by presenting a game or other image sequence designed to capture the attention of the viewer in region 99 of display 28. For the sake of illustration, the following description relates to the display of a game that preferably requires user-
25 interaction such that it attracts the viewer's attention to display 28. In one preferred embodiment, games of chance, such as a slot machine, roulette, or other card games, are presented as indicated at step 110 because such games are widely known and easily played by a single viewer. However, it will be appreciated that the displayed entertainment will be determined by
30 each specific application or targeted audience. Using touch screen 30, a viewer enters commands or interacts with the images displayed in region 99.

35 As indicated in step 112 In the frame region of display 28, a plurality of advertisements are displayed, specifically in regions 91 through 98 (Figure 3). These advertisements are downloaded from depot server and stored on the data storage device 26. Computer 22 selects from available advertisements in a randomized manner prior to display. The advertisements are displayed in random manner in regions 91 through 98. Advertisements are typically moved from

data storage 26 to local memory for rapid retrieval by computer 22 when it is time to change the display. While the game is running in display region 99 and advertisements are being randomly displayed in display regions 91 through 98, computer 22 continuously performs a check for user input. If the user input relates to the region 99, the game play continues. If, however, the user-selected region corresponds to regions 91 through 98, an indication is provided that a specific advertisement currently being displayed in an ad cell has been selected by the viewer. This process of monitoring the regions 91 through 98 is indicated at step 114.

When an advertisement is selected by a viewer, process flow proceeds to step 116 where computer 22 determines if the selected advertisement has corresponding extended information associated therewith. If the advertisement does not have extended information, process flow proceeds back to step 112 so that on the next iteration of advertisement refresh, new ads are displayed in random order in regions 91-98. If, however, the selected advertisement has extended information associated therewith, process flow proceeds to step 118.

At step 118, region 99 of display 28 is cleared. Subsequently, the extended information associated with the selected advertisement is displayed in region 99.

As indicated in step 120, computer 22 next determines whether the extended information associated with the selected advertisement includes a printed item. The printed item may correspond to a promotional prize or a coupon for a discount on goods or services. Alternatively, the printed item may include instructions, telephone numbers, directions, or other such information of use to the viewer. If a printed item is associated with the selected advertisement, computer 22 provides printer 40 with the information for printing. As indicated in step 122, a print-out of the printed item is provided at the output of the printer and made available to the viewer. Subsequently, operation then proceeds back to step 110, where the game is again displayed in region 99.

If the extended information associated with the selected advertisement does not include a printed item, operation proceeds from step 120 to step 124. At step 124, computer 22 determines whether the advertising information currently being displayed in step 118 has been displayed for an allotted period of time. The allotted period of time may vary, depending on several factors. For example, an advertiser may request that the advertisement be displayed for up to 30 seconds to allow the viewer to completely assimilate the information displayed therein. Alternatively, the advertiser may simply require that the advertisement be displayed for a shorter period of time to simply enable the impression to be made upon the viewer. Thus, various periods of time, such as 6 seconds, 15 seconds, and 30 seconds, may be sufficient to convey the information and in this manner the advertiser may limit the cost associated with the display of the information by selecting the most appropriate display period. Alternatively, in step 124, if computer 22

determines that the viewer has selected a region or has activated the touch panel 30 to provide input directing the next sequence of operations desired by the viewer, operation may terminate the display of extended information and return to step 110 to run the game if the viewer has selected the game. One skilled in the art will appreciate that a software button may be displayed at the bottom of display 28 to enable such input.

The viewer may also direct the process flow to two alternative process flows, specifically, step 126 or step 128, by activating one of a plurality of corresponding software buttons. Process step 126 relates to a software button (not shown) displayed on display 28 that enables a viewer to select from a directory of information. This directory of information is similar to a telephone directory listing or other business listing of goods or services. When this software button selected, process flow proceeds from step 126 to step 130 where the directory listing is displayed in region 99. As will be appreciated, the information provided in the directory may be rather extensive. Accordingly, the viewer may scroll upward, downward to select a subject of interest in a manner that rapidly enables information to be acquired. As the display region changes, computer 22 monitors the touch panel 30 in order to detect when the viewer has selected a menu item. This process is indicated in process step 132.

When computer 22 determines that a viewer has selected a particular information unit, process flow proceeds to step 134, where the information associated with the selected information unit is displayed in region 99. After the selected information has been displayed for a period of time, computer 22 returns process flow to step 110. If, however, the viewer has selected additional information, such as "return to game area", "return back to directory information", or "adult information", the corresponding information is displayed in region 99 of display 28.

If the viewer selects the software button on display 28 corresponding to the adult information content, operation proceeds from step 128 to step 138. At step 138, the viewer is requested to verify that they are of legal age to view adult content information. After age verification, the viewer is provided with a directory information of products and services of adult nature. This information is displayed in region 99 of display 28. As indicated at step 140 a directory is displayed. If the viewer selects an item from the displayed directory listing of adult information content, process proceeds to step 144, where the specific advertising content associated with the selected item is displayed. If, however, the viewer does not select a specific information item, operation returns to step 140 where the viewer is provided the opportunity to scroll or select from an index describing the subject matter.

In step 144, the extended information corresponding to a selected item is displayed in region 99. When the information has been displayed for a selected period of time without further

input from the viewer, the process flow returns to step 90, where the game is displayed in region 99. Alternatively, if the viewer selects a different software button, process flow returns to either step 90 or step 126.

One skilled in the art will appreciate that, in the event that the viewer does not select any of the information units displayed in accordance with steps 132 or 142, the system may automatically impose a time-out and return to step 90 for display of the game.

Operation of the computer 22 continues as described in steps 110 through 146 until such time as terminated by power management unit 34.

Referring again to Figure 1, mobile system 14 includes a single board computer 22 mounted on the back seat of a vehicle, such as a car, bus, train, or airplane. Since each mobile system 14 is mounted in a vehicle, the present invention further includes means for coupling mobile systems to the server 12. In one preferred embodiment, the coupling means consists of an externally mounted antenna coupled to the server by a wireless LAN transceiver 16. Each mobile system 14 is designed for the primary use of a single viewer. However, viewers seated at either side of mobile system 14 may participate in both playing games and viewing the display content of the frame areas. Additional viewer input devices, such as joysticks, may be coupled to mobile system 14 to allow multiple viewers to participate in games displayed in region 99 of display 28. Operation of mobile system 14 must be viewer friendly and intuitive since it is to be used primarily by non-computer literate viewers. Alternatively, instead of mounting the mobile system 14 in a vehicle, it may be wall-mounted and used as an electronic billboard or as a desk top computer.

The system shown in Figure 1 further includes server 12, as noted above. Server 12 comprises a server computer with a sufficient processing capability to handle multiple threads simultaneously and at least one GB of random access memory (RAM). Server 12 also includes data storage device comprising a hard disk storage unit with at least 20GB of storage space.

Server 12 is typically located at a fixed central depot location. Examples of depot locations include service stations, vehicle terminals, or other locations where vehicles tend to pass in the normal course of transit. For example, in the event the vehicle in which mobile system 14 is mounted is a taxicab, a typical depot location would consist of a taxi yard where the taxis return at the end of each shift to refuel, change drivers and perform light maintenance. If the vehicles are long distance buses, the server may be located at the bus station where buses are refueled. In the case of passenger vehicles, the central depot may be located either at the home or, preferably, at service stations located throughout the country. Then, as mobile systems 14 move from one location to another throughout the country and the vehicle enters the central vehicle location (i.e., service station) for refueling, the contents of data storage device 26 may be updated to reflect geographic-specific information correlating to the location of the mobile system

at that time as well as updated news or other entertainment information. In this manner, as mobile system 14 is transported from one location to another, the contents may be readily updated without relying on wireless public Internet connection. Alternatively, each depot server could be accessed through the Internet and the geographic-specific, news and entertainment information can be downloaded. In this manner, a viewer may start a cross-country trip and continuously upgrade information as the vehicle approaches each city along the route merely to refuel their vehicle. Once having refueled, a viewer may be able to select location-specific hotels, restaurants, and entertainment options available within a short driving radius. In this manner, service stations may provide additional service and increase customer loyalty by providing such service. The present invention provides an economical method for distribution of location (geographic-specific) information to the traveling public. This is similar to passing out printed material but without the cost associated with the printing and distribution of such printed material.

Depot server 12 is coupled to an externally mounted antenna dedicated to the data transfer as vehicles approach the central depot location. Transfer of information incorporates wireless technology so that when a vehicle is in close proximity (such as within 150 feet) of the server, information transfer takes place. A wireless LAN-adaptor card coupled to an external antenna handles the transfer to a plurality of mobile systems under control of the server.

Server software executed by the server contains operational and control software for managing advertising content for each of the mobile systems 14. This management software is broken down into two software components, specifically, the advertising manager and the download manager.

The advertising manager is a relational database for tracking and managing all of the advertisements that will be downloaded to the mobile systems 14. This database has the capacity to track approximately 250 advertisements with a maximum capacity of about 1,000 different advertisements slated for each vehicle. It should be readily apparent for one skilled in the art that with 100,000 cabs and other livery vehicles engaged in transporting fare-paying passengers in the United States alone, the relational database of the advertisements manager can be substantial. Accordingly, the relational database may be distributed throughout the geographical region in which the system is operating. The relational database associated with each depot server may be kept relatively small, although there may be some duplication of advertisements in each of the databases, such as may be the case where a portion of the advertisements in the database are for national distribution and another portion of the advertisements are for regional distribution.

In one preferred embodiment, the advertising manager database has the following fields as a minimum configuration. The first field comprises the advertiser's name. This field is linked

to an advertiser information table. The advertiser information table consists of a contact name, the name of the advertiser, the address, phone number, fax, and electronic mail address. Additional information may include product type, service type, and other important information that may be required to properly service each individual advertiser.

5 The second field contains the name of the file that contains the name of the advertisement information, that is the banner that will be displayed in the frame area. In one preferred embodiment, a thumbnail picture of the advertisement is included in the database for easy reference. By selecting this field, a service representative may access the file and display the advertisement on a computer (not shown) coupled to server 12. Accordingly, account
10 representatives can monitor, manage, and maintain the advertising manager database in real time.

 A third field provides the starting date for which the advertisement is to be displayed on mobile units 14 in system 10. If this field is left blank, a default start date for display of the advertisement is the date the file is generated.

15 The next field provides the duration for which the advertisement is to be displayed. The unit of measure is the number of weeks purchased by the advertiser for which the advertisement will be displayed. It is possible to modify or change the file containing the advertisement thumbnail without modifying the duration for which the advertisement is to run. In this manner, an advertiser may select an annual contract and then periodically update their advertisement to
20 reflect topical events. By way of example, if a convention is being held at a local hotel or convention center, an advertiser may substitute an advertisement directed to a particular convention. When the convention is over, the advertiser may go back to their standard advertisement simply by designating the original file name to be placed into the third field as noted above.

25 The fourth field comprises the stop date. This field is accessed to determine when an advertiser's allotted space will be available to others. More specifically, the date contained in the stop date field determines when the advertisement will no longer be distributed by system 10 to mobile system 14. In one preferred embodiment, the date contained in this field is automatically calculated by the server based on the date contained in the start date field and the duration for
30 which the advertisement is to run. When the stop date is reached, the advertisement will no longer be distributed to mobile systems 14 when the current date extends the stop date. The stop date is calculated by adding the duration (in weeks) to the start date.

 The fifth field determines the number of mobile systems that the advertisement will be distributed to. More specifically, the present invention envisions a situation where an
35 advertisement will be distributed in multiples of 100 mobile systems. This means that if a taxicab fleet is configured to contain 1,000 mobile systems (1,000 taxicabs), an advertiser may select that

their advertisement be placed in either 100, 200, ... 1,000 cabs on a weekly, monthly, or annual basis. In accordance with the present invention, the advertiser is charged a price based on how many advertisements will be distributed on a weekly basis and the size of the advertisement to be displayed in the ad cell..

5 The sixth field associated with a relational database of the advertisements manager reflects the price paid for the advertisement by the advertiser. This field is used primarily for statistical purposes, specifically to calculate revenue for a given time period.

Each of the above fields may be populated with data obtained from a web page. As is well known in the art, advertisers log into the web page to access their account, upload the
10 advertisement collateral that will be displayed in the ad cell and forward payment information.

The seventh field permits the advertiser to designate a geographical region for purposes of distribution. Thus, an advertiser can select to run the advertisement worldwide so that the advertisement is distributed from each and every depot server. Alternatively, the advertiser may select a single depot server or a group of depot server to limit distribution to specific geographical
15 locations. Data for this field may be collected by providing a web page with check boxes (sometimes referred to as radio buttons) where the geographical location of each depot server is listed together with the number of associated mobile units 14. By selecting one or more of the check boxes, distribution of the advertisement can be tailored for one city or worldwide. One
20 skilled in the art will appreciate that selection of a wider distribution is selected, the price paid, as reflected in the seventh field, may change to reflect volume discounts or pricing premiums for selected markets. For example, in Las Vegas the months of September, October and November bring a substantial amount of conventions to the city and advertisers could be charged a premium to reflect the higher volume of viewers that will view the advertisements. In July and August, as
25 the number of visitors typically decline due to the high heat, price discounts can be implemented.

30 In addition to the advertising manager, the operational software executed by server 12 also includes a download manager. The download manager manages the transfer of advertisements from the relational database associated with the advertisement manager into blocks of commercial vehicles in accordance with the number of blocks purchased by the advertiser. Commercial vehicles may be taxicabs, buses, vans or other public vehicles.

Each and every day the advertisement files and associated configuration files are downloaded from the server to the mobile systems whenever a mobile system enters the central depot location. The download manager is responsible for the process of updating the data storage unit 26 associated with each mobile system 14.

35 Because advertisement distribution is purchased for blocks of 100 mobile systems, or multiple blocks of 100 mobile systems, any given mobile system may carry a different combination of advertisements relative to other mobile systems. However, the advertisement

must be evenly distributed throughout the entire number of mobile systems comprising the system. This means that the number of advertisements carried in each of the cabs/vehicles must be approximately the same. Each time a mobile system is available for downloading, the download manager calculates which advertisements must be downloaded to that mobile system. In addition, download manager accesses selected graphic advertisement files and the associated configuration files. These files are sent to the mobile system via the wireless LAN network.

To make sure that the number of advertisements are uniformly distributed to mobile systems 14, download manager employs a distribution algorithm. In one preferred embodiment, the distribution algorithm is implemented as follows. First, Bmax is the maximum number of blocks of one hundred mobile units 14 in the system. For example, if there are 440 mobile units 14 in a system, then $B_{max} = 5$. Although partial blocks could be counted the same as a full block, the distribution algorithm of the preferred embodiment truncates Bmax to four so that it is more advantageous to the advertisers. When this occurs, the additional commercial vehicles that are not in the full block are provided as a free advertisement platform.

Once Bmax is determined, the download manager keeps a running counter, starting with one. Each time a mobile system is downloaded, the counter increments by one. When the counter reaches Bmax, it is again reset to one.

If an advertiser purchases a single block for their advertisement to be run in, it will be downloaded once for every Bmax mobile units/vehicles that enter the depot location. If an advertiser purchases three blocks, the advertisement will be downloaded three times for every Bmax commercial vehicle entering the depot location. Naturally, if an advertisement is purchased for all blocks of the mobile units 14, then the advertisement will be downloaded each and every time a mobile unit is in the central depot location. With this algorithm, it is not necessary to count the total number of commercial vehicles each day while providing uniform distribution of advertisement throughout the fleet.

Refer now to Figure 5 where the process flow associated with the depot server software is illustrated. At step 150, the process flow begins by displaying the advertising database organized on a "per advertisers" manner. Thus, if a single advertiser has more than one advertisement each of the advertisements are shown organized in a chronological manner with the oldest advertisement appearing first. The typical viewer at this point in time will be the advertising service representative or the actual advertiser who wishes to submit advertising copy for distribution by system 10.

Once the process flow is initiated, the advertisements may be modified or updated. To modify or update one or more of the advertisements, process flow proceeds from step 150 to step 152. At step 152, the viewer is given the opportunity to determine whether the advertising database needs to be updated. If the database is not up to date, process flow proceeds to step

154. At step 154, an initial determination is made to find out if the advertiser is already in the database. If the advertiser is not in the database, process flow proceeds to step 156 where the advertising service representative or the advertiser is provided the opportunity for entering information. This information will be linked to the advertiser's name field of the advertisement manager relational database. The present invention may be readily implemented such that the advertiser may access the relational database associated with server 12 via the Internet. In this manner, advertising copy may be downloaded from the advertiser directly into the database for distribution through system 10. This method provides the advertiser with complete control over their advertisements distributed by system 10. In order to insure the integrity of the advertisements, the present system contemplates that advertisers will be given appropriate security levels in order to restrict access to their account information. This security may restrict access to the database to viewers having the password.

The advantage of the present system resides in the ability of the advertisers to access and manipulate advertising copy on an on-going basis such that the advertisements are always up-to-date and current. Thus, the advertiser may be able to adjust their advertisements reflect market reaction to the advertisements.

Further, to the extent that the advertiser wishes to associate additional information advertisement in addition to a banner advertisement displayed in regions 91-98, this additional information can be updated on a periodic basis by the advertiser without intervention by the account service representative. For example, a movie distributor may place a movie poster banner in region 91-98. Since mobile system 14 provides the capability of displaying video information, movie trailers may be developed and downloaded by the advertisers on a periodic basis. When a viewer selects the banner, the movie trailer is displayed in region 99. With appropriate monitoring of uploaded statistical information, the advertiser may determine the most effective trailer for advertising the movie. In this manner, the advertiser is provided real-time control and near real-time feedback as to the results of their advertising copy.

If the advertiser has been previously entered into the database at process step 1354, flow proceeds directly to step 158 where the advertiser's current advertisements are displayed for review and manipulation. At this point, process flow enables the advertiser to add new advertisements to the database or modify existing advertisements. If no advertisements are to be added, process flow proceeds back to step 130 and then subsequently to the download region of the process flow. However, if advertisements are to be added (or modified) to the database, information regarding the advertising file name, the advertising type, the number of blocks of mobile systems to which the advertisement is to be distributed, as well as the start date, the stop date, the duration, and the price charged for the advertisement are added in the database. One skilled in the art will recognize that if the advertiser is using a self-service function, many of the

features are pre-selected. For instance, the price will be a set price based on whether the advertisement includes just a simple banner or whether the advertisement includes additional information, such as promotional literature or coupons, which will be distributed to the viewer. In this manner, if an advertiser wishes to display merely a banner advertisement a first price may be displayed at step 162. However, if the advertiser wishes to engage the viewer and encourage a pro-active interaction with the viewer, additional levels of advertisement information may be provided in each mobile system 14. When this occurs, different prices will be charged to the advertiser. This information may be determined based on a checklist provided to the advertiser over the Internet on a web page. Although the Internet and the process of conducting business to business software applications is relatively new, the present disclosure does not discuss the implementation of the website because implementation web-page programming skills are well known. The present invention enables advertisers to access the relational database via the Internet in a manner that promotes cost savings and timeliness.

Server 12 also includes a display screen that is either coupled to server 12 directly or via a local area network, the Internet or other communication network to a personal computer. Information contained in the database is displayed on the screen when requested by the viewer. One side of the screen shows information associated with a particular advertiser and advertisement. The other side of the display screen shows a graphic presentation in thumbnail form of each advertisement associated with the advertiser. Each thumbnail comprises a small but recognizable replica of the graphic content. Displayed with each thumbnail is the file name of the file in which the thumbnail is stored on server 12. Double-clicking on a displayed thumbnail causes server 12 to access the file and show a full-screen picture of the graphics. The response time is less than 250 milliseconds because the server does not use a dedicated application program for displaying graphics files. The advertisement manager is capable of directly displaying both alphanumeric and graphical images simultaneously. Double-clicking on a thumbnail allows the viewer to accept or cancel the actual image. The file name is displayed but not updated into the database until the viewer clicks an "update" software button. If the viewer accepts the image, the file name is automatically transferred into the corresponding field of the database without requiring the viewer to type in the file name. In this manner, typographical errors are minimized because there is no need to physically transfer the file name to the database.

Once the database is updated, it becomes available for downloading to mobile systems 14. However, the process flow first performs a determination step at step 164 to verify that the database is available for download. In a typical environment, the database will only be downloaded or updated on an occasional or periodic basis. If it is not yet time to download the information, the server software process flow terminates until such time. In this manner, the

database may be updated in an off-line fashion and held for subsequent download to mobile systems. If, however, it is time to begin the download operation, server software begins distributing files identified by the database from server 12 to mobile systems 14. Accordingly, at step 168, the server begins the process of distributing advertisements to vehicles that are in the depot location and within range of antenna 18. When a vehicle equipped with a mobile unit 14 is in the vicinity, process proceeds to step 170 and the download of files to the mobile system begins via the wireless connection. The download process will continue until the appropriate number of advertisements have been downloaded into mobile systems. Accordingly, this download process may continue on a continuous basis throughout the day. However, once the appropriate number of downloads have been completed, process flow proceeds from step 172 back to step 170.

It will be appreciated that download process of steps 170 and 172 may continue indefinitely if there is no requirement to minimize the number of advertisements being distributed. In this embodiment, server software may include a counter (not shown) that counts the number of downloads provided during any time period, for example, each day or each week. Accordingly, the present system envisions the process of billing advertisers based not on the number of viewers, but rather on the number of times the advertisement is downloaded by server 12 to mobile systems 14. Once the process flow proceeds from step 172 to step 168 and it is determined that there are no vehicles equipped with mobile systems 14 within the proximity of the transmitting antenna, process flow proceeds from step 168 to step 174.

At step 174, process flow determines whether a sufficient number of downloads have been completed in order to comply with the obligation to the advertiser. Thus, if all the mobile systems in the vicinity have received the update, process flow proceeds from step 176 to step 178. If, however, the downloading process remains unfinished, process flow proceeds from step 152 to step 156 where the process flow causes server 12 to monitor for vehicles within the proximity of the transmitting antenna 18. In one preferred embodiment, server 12 checks for proximate vehicles equipped with mobile units every five (5) seconds.

Each time a vehicle carrying a mobile system 14 approaches for downloading, the download manager calculates the advertisements that are to be downloaded to mobile system 14. In addition to the advertisements, the download manager must also download corresponding graphic files and configuration files to mobile system's 14 hard disk drive. All of these files are sent to the mobile system by wireless LAN connection. The download manager also insures that the number of advertisements are uniformly distributed among mobile systems 14.

Referring now to Figure 6, attention is again directed to mobile system 14. Mobile system 14 comprises an enclosure 180, which provides an aesthetically pleasing appearance to

the viewer. The ornamental features of this enclosure is shown in co-pending United States Design Patent Application Serial No. 29/124,375 filed June 5, 2000 and assigned to the present assignee, Captivads, Inc. Enclosure 180 further includes an opening 186 which provides visual access to LCD display 28. Enclosure 180 further includes a housing 160, which covers the
5 printer. Housing 182 includes a slot 184 from which paper may be dispensed from. The upper edge of slot 184 may include a sharp edge to facilitate the tearing of the paper in a clean manner. Alternatively, slot 184 may be provided with a paper slicing device that cleanly separates each coupon from the next-to-follow coupon or promotional printed item.

In another preferred embodiment, the printer is replaced by a peripheral storage device
10 such as a floppy disk drive, a CD-ROM or other disk-based removable media backup drives. Instead of ejecting paper through slot 184, the removable media is inserted into or removed from the drive. Due to the orientation of the peripheral device within enclosure 180, the media enters and exits at an angle, relative to the horizontal plane. More specifically, the peripheral device is vertically positioned at an angle of between about 70° and 85° and preferably about 80° relative to
15 a horizontal reference plane. This configuration enables the enclosure to minimize its foot-print by positioning the peripheral substantially in-line with the display screen.

Frame 188 facilitates mounting of mobile 14 to the back of a seat such as is found in typical automobile or similar airplane. It is a sheet metal or aluminum pan having a lower lip for engaging the lower edge of enclosure 180 and a mounting bracket at the upper end. The primary
20 functions of frame 188 are to affix display 28 in close proximity to a single board computer 22 and position display 28 such that it is appropriately angled for viewing by a viewer of average height. Accordingly, when mounted in frame 188, display 28 is angled upward at approximately a five degree (5°) angle such that the bottom of display 28 is positioned slightly toward the viewer and the top of display 28 is slightly further away from the average viewer.

Frame 188 also provides mounting support for printer 40. Printer 40 is positioned such that paper, maintained on a roller mechanism 190, is fed by printer out through slot 184. To facilitate replacement of paper rolls on roller 190, enclosure 180 is pivotally mounted to frame 188 along the top edge 172. Along the bottom edge 174, enclosure 180 is held shut with either a
25 molded plastic snap fit or a spring loaded screw (not shown) to provide secure retention of enclosure 180. A locking mechanism may also be included to prevent unauthorized opening of enclosure 180.

Single board computer 22 is positioned behind display 28 and attached to frame 188. This combination provides a compact and efficient utilization of the space such that the display overlaps the computer board itself. Unlike notebook computers where the screen is positioned at
35 a right angle to the computer/keyboard, the present invention eliminates the requirements for a keyboard and provides the display on top of the computer board. Printer 40 and disk drive (not

shown) are positioned on frame 188 below display 28. Speakers 192 may be attached to frame 188 below the display 28 so that audio information may be provided to the viewer in conjunction with the video or other visual information on display 28. In order to permit sound to be provided without muffling, slots 194 are provided in enclosure 180 such that when enclosure 180 is
5 attached to frame 188, the slots overlie the speakers 192.

Referring now to Figure 7 perspective view of printer 40 mounted on bracket 194 is shown. In the preferred embodiment, bracket 194 is secured to frame 188 by a plurality of screws. In one arrangement, four screws are used with two screws 196 securing the bottom portion of bracket 194 to the frame 188 and two screws (not shown) proximate to the top portion
10 (i.e., the portion closest to single board computer) securing the top portion of bracket 194.

The primary purpose of bracket 194 is to support the printer or other peripheral device at an angle relative to frame 188. If bracket 194 supports a peripheral device with removable media, the angle must be sufficient to enable the media to be accessed and removed. While bracket 194 is more fully described below for supporting thermal printer 40, one skilled in the art
15 will appreciate that the same principles will apply when positioning other peripheral devices at an angle relative to frame 188.

When the mobile unit 14 is used primarily as an advertising platform, bracket 194 supports printer 40 such that paper will feed out through slot 184 so that coupons or other promotional information may be acquired by the viewer. To secure printer 40 in bracket 194, a
20 pair of spring tabs 198 engage a lower edge of the printer. To secure the upper portion of printer 40 a pair of outwardly extending support tabs 200 on either side of bracket 194 engage a corresponding mounting hole on printer 40. Each tab 200 provides a boss that engages hold-down screws 202. Tabs 200 may be cantilevered or extended downward to engage frame 188.

Bracket 194 also includes a paper roll support structure 204 at the upper end of the
25 bracket. Structure 204 includes a pair of support arms 206. Support arms 206 are adapted to engage a rod on which the paper is supplied relative to the printer. At least one arm is substantially rigid and the other arm is preferably flexible to facilitate the insertion and subsequent retention of the rod. An alternative support structure (not shown) is also envisioned the paper positioned in a shallow depressed receptacle so that it is possible to feed paper into printer 40.
30 This receptacle may be appropriate where the paper is supplied in a fan-fold arrangement or without a rod. A sensor (not shown), coupled to computer 22, is mounted on bracket 194 to detect the end of roll. The sensor may be an optical or other sensor adapted to detect an end-of-roll condition. The information detected by the sensor is included in the upload report sent to the depot server so that maintenance personnel can replace the paper while the vehicle is located at
35 the depot. The report may also include information regarding coupon printout rate (i.e., the rate at which customers are requesting information, etc.). Since the typical commercially available

thermal printers have a paper input at the top of the device and a paper exit path proximate thereto, bracket 194 positions the paper exit path from the printer so that the paper feeds through slot 184.

Bracket 194 is elevated at the end toward the display 28 relative to the other. Two side wall extensions 208 are integrally joined along opposite edges of the bracket and extend out from the bracket 194. Extensions 208 restrict movement of the lower end of the printer 40. As such, extensions 208 are substantially rigid and preferably engage the side of the printer forming a friction bond there-between. At least one side wall has a cable cut-out for routing cables from the single board computer to the thermal printer. A plurality of top openings 194 in the support surface are provided to enable access to the under-side of printer 40. These openings are useful for routing cables to connectors on the printer.

Referring now to Figure 8, a support structure for minimizing vibration imparted to the hard disk drive during operation of the vehicle is illustrated. The present invention employs a two-part strategy to protect the hard disk drive. The goal is to enable the hard disk drive 210 to float, relative to frame 188, with minimum resistance so that shock and vibration will not affect data integrity during operation of the vehicle. In one preferred embodiment, hard disk drive 210 is encased in a cocoon to minimize any jarring or sudden de-accelerations. More specifically, the hard disk drive 210 is surrounded with a low durometer (low resistance) open cell urethane foam tape 212 that compresses to dissipate shock in the vertical (up/down) direction. This type of tape has a thickness of about 1.25 cm and is available from 3M Corp. in Minneapolis, Minnesota. A low-friction material layer 214 is applied beneath the drive to facilitate the vertical movement. This low-friction layer is preferably a layer of ultrahigh molecular density (UHMD) polypropylene foam tape, also available from 3M. An additional layer (not shown) may be positioned under layer 214 to absorb the shock that would occur if hard disk drive were to impact frame 188.

Although the cocoon is effective in minimizing the rate at which the drive will de-accelerate when the vehicle imparts high vibration to the mobile system, it is not expected to fully absorb all shock and vibration. For this reason, the drive 210 is supported by a suspension fixture to further dampen vibration. In one preferred embodiment, the suspension fixture comprises four posts 216 (only three of which are shown in Figure) symmetrically positioned around drive 210. Posts 216 are either an integral part of frame 188 or coupled thereto by rivets, screws or adhesives, by way of example. Typical hard disk drive enclosures have a width of about 6.35 cm so the posts are spaced to allow about 1.25 cm wire segment on each side of the hard disk drive enclosure. This spacing allows sufficient length of the motion arm to decouple the hard disk drive from the frame 188. Each post 216 is tapped to receive a hold-down screw 218. Four wire segments 220, each of which terminates in a circular loop that is smaller in diameter than the head of screw 218 and is held in place between screw 218 and post 216. The

other end of wire segment 220 is attached to a mounting point on the hard disk drive enclosure. It will be appreciated that the means for attaching the wire to the drive enclosure depends on the specific mounting points on the hard disk drive enclosure. Accordingly, details relating to the attachment of the wire segment at the enclosure is not further discussed.

5

Figure 9 illustrates another preferred embodiment for coupling the hard disk drive to the suspension frame. In this embodiment, a single wire segment 220 spans from one post to a corresponding post on the other side of the hard disk drive. At each post, the wire is clamped between screw 218 and post 216 in the manner described above. The wire is coupled to the bottom of hard disk drive by at least a pair of screws 222 and washer 224. Washer 224 has an offset slot in which the wire passes. The hard disk drive enclosure, of course, must include threaded mounting holes or sufficient space that allows a screw to be tapped into the enclosure.

10

Wire segments 220 act as a deflection beam. The flexing moment of the wire segment is sufficient to significantly minimize the shock that is coupled by the frame to the hard disk drive. One skilled in the art will appreciate that a standard beam deflection equation may be used to determine the modulus of elasticity of the wire relative to the weight of the hard disk drive and to the distance the hard disk drive is allowed to move. Advantageously, the suspension fixture of may be tuned to the weight of the hard disk drive merely by changing the diameter of the wire. If the weight of the hard drive is reduced, a smaller wire dimension may be selected. By way of example, the typical hard disk drive is rated to be able to withstand about 300G/2msecond during operation. This rating may be improved by using a 10-thousandth of an inch diameter piano wire as the suspension beam but if this wire is too soft for the weight of the drive, a 12-thousandth of an inch diameter piano wire may be selected.

15

20

Referring now to Figure 9, the attachment of display 28 to frame 188 is shown. Specifically, the LCD display has an angle bracket 230 attached along each side. The extended portion of bracket 230 terminates at one end in an extended tab 230. Frame 188 has a slot 234 that accepts tab 230. The other end of the extended portion of bracket 230 has a hole through which accepts a screw for attachment to frame 188 at flange 236. The relationship between slot 234 and flange 236 sets the angle of display 28 so that it is angled slightly upward for the viewer.

25

30

Also shown in Figure 9 is the curved frame extension 238 that engages the headrest on the seat to which it is attached. Extension 238 has a pair of notches 240 through which the headrest supports pass. In other embodiments of enclosure 180, frame 188 is merely bolted to the seat frame.

35

While certain exemplary preferred embodiments have been described and shown in the accompanying drawings, it is to be understood that such embodiments are merely illustrative of and not restrictive on the broad invention. Further, it is to be understood that this invention shall

not be limited to the specific construction and arrangements shown and described since various modifications or changes may occur to those of ordinary skill in the art without departing from the spirit and scope of the invention as claimed.

CLAIMS:

We claim:

1. A system for distributing electronic information comprising:
A server computer for managing the collection and arrangement of said electronic
5 information;
A mobile system for displaying said electronic information, said mobile system having a display screen, an input device for receiving viewer commands, and means for storing said electronic information; and
Means for transferring information from said server to said mobile system, and for
10 transferring statistical information from said mobile system to said server.
2. The system of Claim 1 wherein said mobile system further comprises a printer.
3. The system of Claim 1 wherein said electronic information comprises graphical
15 images of the advertisements.
4. The system of Claim 1 wherein said electronic information comprises graphical advertisements and a linked source of information comprising audiovisual information for display upon selection of said advertisements.
20
5. The system of Claim 1 wherein said electronic information comprises graphical information.
6. The system of Claim 1 where said display includes a plurality of defined screen
25 portions wherein in each screen portion a graphical banner advertisement is displayed in a random sequential manner.
7. The system of Claim 1 wherein said display includes a plurality of portions for displaying graphical information and at least one portion for displaying interactive audiovisual
30 graphical information and for displaying information in response to viewer request.
8. The system of Claim 1 wherein said at least one portion comprises an area that is larger than said plurality of portions for displaying interactive audiovisual graphical information.
- 35 9. In a system for distributing electronic information where at least one server is adapted to store electronic information for distribution and a distribution system for distributing

said electronic information from said server to a plurality of mobile systems, said mobile systems adapted for displaying said electronic information, said mobile systems comprising:

A computer processor system adapted to receive said electronic information from said server said computer processing system having random access memory and a permanent storage device for retaining said electronic information; said computer processor system adapted to prepare said electronic information for display in a random sequence;

A display device, coupled to said computer system, for displaying said electronic information in said random sequence as determined by said computer processor system; said display device including means for adjusting display contrast in response to changes in ambient lighting conditions;

An input device for receiving viewer instructions and generating a signal indicative of said instruction, said input device coupled to said computer processor system; and

A peripheral device for distributing information related to said electronic information displayed on said display device.

10. The system for distributing electronic information of Claim 9 wherein said mobile system further comprises a frame on which is mounted said computer system, display device, input device and said peripheral device.

11. The system for distributing electronic information of Claim 10 wherein said mobile system further comprises a bracket for mounting said peripheral device on said frame.

12. The system for distributing electronic information of Claim 11 wherein said bracket comprises means for retaining said peripheral device at an angle relative to said frame.

13. The system for distributing electronic information of Claim 10 wherein said frame further comprises means for securing said display device, said means comprising a slot for receiving a tab and a flange for receiving a screw.

14. The system for distributing electronic information of Claim 13 wherein said display device comprises a liquid crystal display device having an L-shaped bracket along at least two sides of said display device, said L-shaped bracket having an outward extending tab at one end and a hole, said tab adapted for insertion in said slot and said hole, aligning with said flange and adapted to receive a screw to couple said L-shaped bracket to said flange.

15. The system for distributing electronic information of Claim 10 wherein said

permanent storage device comprises a storage device electrically coupled to said computer processor system, said storage device including a suspension frame for coupling said magnetic storage device to said frame.

5 16. The system for distributing electronic information of Claim 15 wherein said suspension frame comprises:

 a low durometer foam barrier, surrounding said storage device, for limiting motion of said storage device and for absorbing mechanical energy;

 means, between said storage device and said frame, for minimizing friction; and

10 at least two suspension beams, coupled to said frame, for supporting said storage device, said suspension beams further coupled to said storage device.

 17. The system for distributing electronic information of Claim 16 wherein said suspension frame further comprises a plurality of receptacles associated with said storage device and each adapted to receive a screw; and a coupling washer, aligned with each of said
15 receptacles, having a slot for engaging said suspension beams.

 18. The system for distributing electronic information of Claim 15 wherein said frame positions said computer processor system between said frame and said display device.
20

 19. The system for distributing electronic information of Claim 18 wherein said frame positions said peripheral device and said storage device adjacent to said computer processor system and said display device.

25 20. The system for distributing electronic information of Claim 10 wherein said frame positions said computer processor system between said frame and said display device.

 21. The system for distributing electronic information of Claim 20 wherein said frame positions said peripheral device and said storage device adjacent to said computer processor
30 system and said display device.

 22. The system for distributing electronic information of Claim 21 further comprising an enclosure, coupled to said frame, having an opening for said display device and a slot for accessing said peripheral device.
35

 23. In a distributed system for distributing electronic information:

At least one server is adapted to store electronic information for distribution;

A plurality of mobile systems adapted for displaying said electronic information, said mobile system having a display screen, an input device for receiving viewer commands, and means for storing said electronic information and;

5 A distribution system for distributing said electronic information from said server to said mobile systems.

24. The system of Claim 23 wherein said mobile system further comprises a peripheral device for distributing information related to said electronic information displayed on
10 said display device.

25. The system of Claim 24 wherein said electronic information comprises graphical images.

15 26. The system of Claim 23 wherein said electronic information comprises graphical advertisements and a linked source of information comprising audiovisual information for display upon selection of one of said advertisements.

20 27. The system of Claim 23 where said display includes a plurality of defined screen portions wherein in each screen portion said graphical advertisements are displayed in a random sequential manner.

25 28. The system of Claim 23 wherein said display includes a plurality of portions for displaying graphical information and at least one portion for displaying interactive audiovisual graphical information and for displaying information in response to viewer request.

29. The system of Claim 28 wherein said at least one portion comprises an area that is larger than said plurality of portions for displaying interactive audiovisual graphical information.

30 30. The system of Claim 23 wherein said mobile system further comprises a frame for mounting a computer system, said display screen, said input device for receiving viewer commands, and said means for storing said electronic information, said computer system adapted to control operation of said mobile system.

35 31. The system for distributing electronic information of Claim 30 wherein said mobile system further comprises a bracket for mounting a peripheral device on said frame at an angle

relative to said frame.

32. The system for distributing electronic information of Claim 30 wherein said frame further comprises means for securing said display device, said means comprising a slot for receiving a tab and a flange for receiving a screw.

33. The system for distributing electronic information of Claim 30 further comprising a suspension frame coupling said means for storing said electronic information to said frame; said suspension frame, including a motion limiting low durometer barrier surrounding said means for storing; and at least two suspension beams, coupled to said frame, for supporting said means for storing, said suspension beams further coupled to said storage device.

34. The system of Claim 32 wherein said frame positions said computer processor system between said frame and said display device.

35. The system of Claim 34 further comprising an enclosure, coupled to said frame, having an opening for said display device.

36. The system of Claim 30 wherein said mobile system further comprises means for detecting a viewer proximate to a position for viewing said mobile system, said means for detecting coupled to said computer system.

37. The system of claim 36 wherein said mobile system further comprises means for minimizing power dissipation of said mobile system, said power minimizing mean adapted to removing power from said display when the absence of a viewer is detected by said detecting means.

38. A business method for distributing advertising content to a plurality of mobile platforms comprising the steps of:

Collecting advertising collateral in electronic form;

Associating said advertising collateral with identifying information regarding ownership of said advertising collateral;

Determining a charge, associated with said advertising collateral, said charge based on selected duration and geographical location indicators;

Distributing said advertising collateral to a plurality of mobile display units for the selected duration and in the selected geographical location as provided by said duration and geographical

location indicators, respectively; and

Collecting statistical information regarding viewer responses associated with said advertising collateral.

5 39. The business method of claim 38 wherein said collecting and associating steps comprise the steps of:

accessing a web site;

entering user identification information to access user-specific advertising collateral stored on a storage device associated with said web site;

10 up-loading graphical information to said web site for storage device, said graphical information comprising advertising collateral;

selecting parameters associated with the distribution of said advertising collateral; said parameters including a start date for beginning the distribution of said advertising collateral and the number of mobile units to receive the advertisements; and

15 analyzing statistical information regarding the distribution of said advertising collateral, said statistical information including the number of times said advertising collateral is selected by a viewer.

20 40. The business method of claim 39 wherein said distributing step further comprises the steps of:

transferring said advertising collateral to at least one depot server;

transferring said advertising collateral from said at least one depot server to said plurality of mobile units in the proximity of said at least one depot server.

25 41. The business method of claim 40 wherein said step of transferring advertising collateral to said plurality of mobile display units comprises the steps of:

determining the selected number of mobile display units to receive each of said advertising collateral;

determining the selected geographical location; and

30 distributing the advertising collateral to a selected portion of said plurality of mobile display units.

42. The business method of claim 41 further including the step of displaying entertainment content together with said advertising collateral on said mobile display units.

43. The business method of claim 42 further including the steps of:
linking additional information to a selected display of advertising collateral displayed on
said mobile display unit;
detecting a request for said additional information from a viewer; and
distributing said additional information to a viewer.

44. The business method of claim 43 further including the steps of:
detecting a viewer request for advertisement linked to a selected display of advertising
collateral;
removing from the display of said mobile display unit the advertising collateral and said
entertainment content; and
displaying advertising content linked to said selected display of advertising collateral.

45. The business method of claim 44 further including the steps of collecting
statistical information regarding the number of viewers viewing each of said plurality of mobile
display units, the number of distributed items requested by said viewers and the number of times
said linked advertising content is selected by said viewer associated with each of said mobile
display units.

46. A method for distributing advertising content to a plurality of mobile platforms
comprising the steps of:
Collecting advertising collateral in electronic form;
Distributing said advertising collateral to a plurality of mobile display units for the selected
duration and in the selected geographical location as provided by said duration and geographical
location indicators, respectively; and
Collecting statistical information regarding viewer responses associated with said
advertising collateral.

47. The method of claim 46 wherein said distributing step further comprises the steps
of:
transferring said advertising collateral to at least one depot server;
transferring said advertising collateral from said at least one depot server to said plurality
of mobile units in the proximity of said at least one depot server.

48. The method of claim 47 wherein said step of transferring advertising collateral to
said plurality of mobile display units comprises the steps of:

determining the selected number of mobile display units to receive each of said
advertising collateral;
determining the selected geographical location; and
distributing the advertising collateral to a selected portion of said plurality of mobile
display units.

49. The method of claim 48 further including the step of displaying entertainment
content together with said advertising collateral on said mobile display units.

50. The method of claim 49 further including the steps of:
determining whether a viewer is proximate to said mobile display unit;
applying power to a display device associated with said mobile display unit;
determining ambient light level; and
adjusting the display device intensity for viewing in the ambient light level.

51. The method of claim 50 further including the steps of:
determining whether said viewer is interacting with said mobile display unit;
determining when said viewer is no longer proximate to said mobile display unit; and
removing power from said display device associated with said mobile display unit.

52. The business method of claim 51 wherein said viewer interacting determining
step further including the steps of:

linking additional information to a selected display of advertising collateral displayed on
said mobile display unit;

detecting a request for said additional information from a viewer; and
distributing said additional information to a viewer.

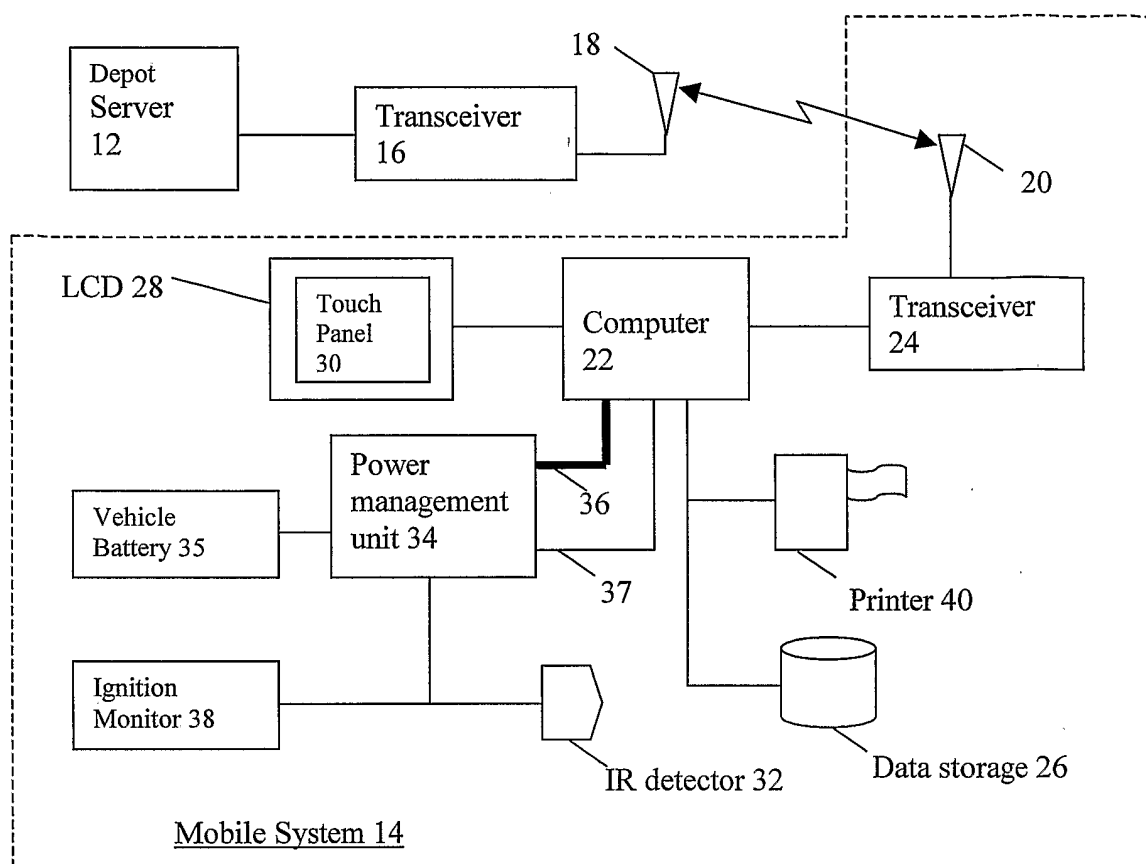


FIGURE 1

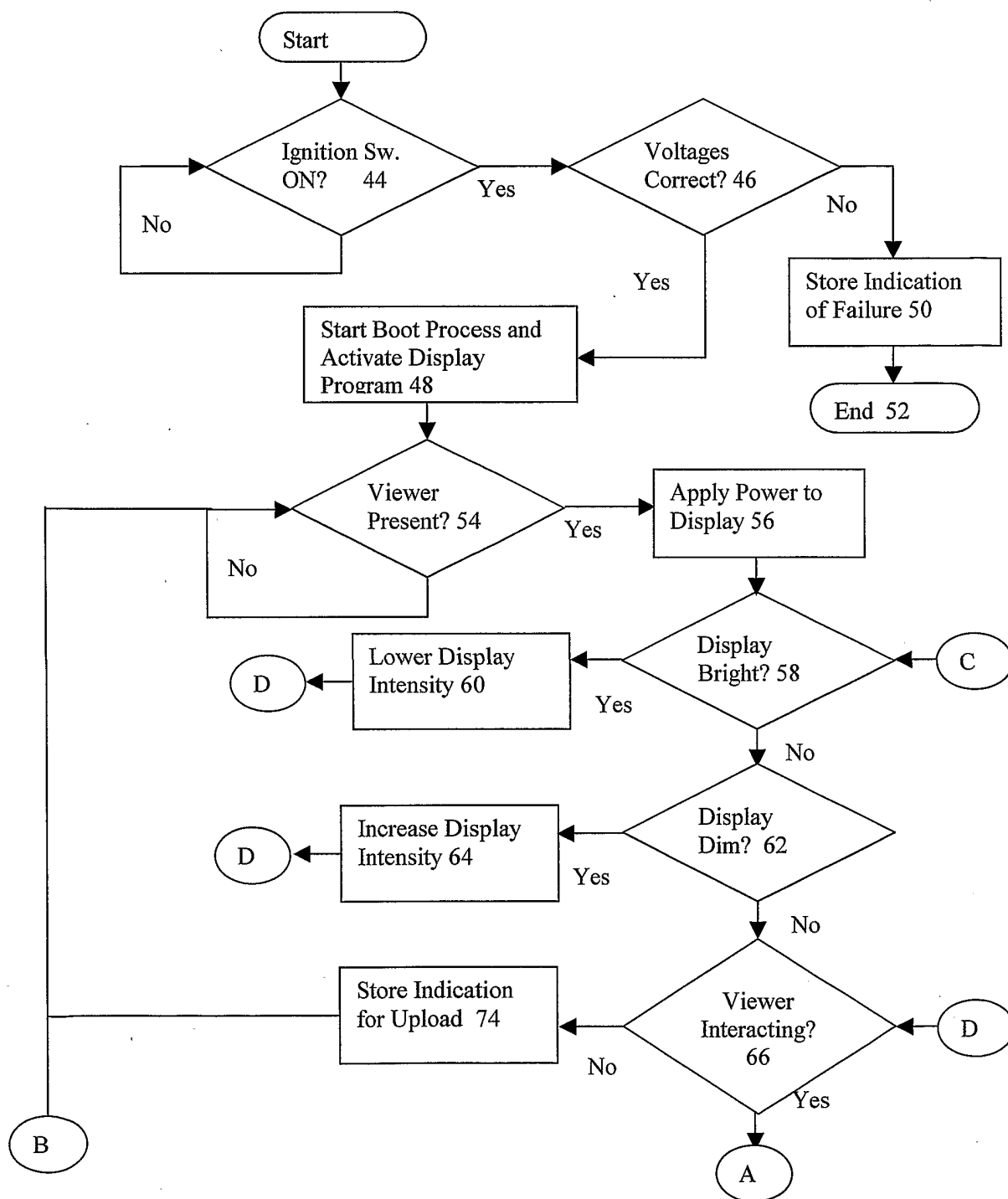


FIGURE 2A

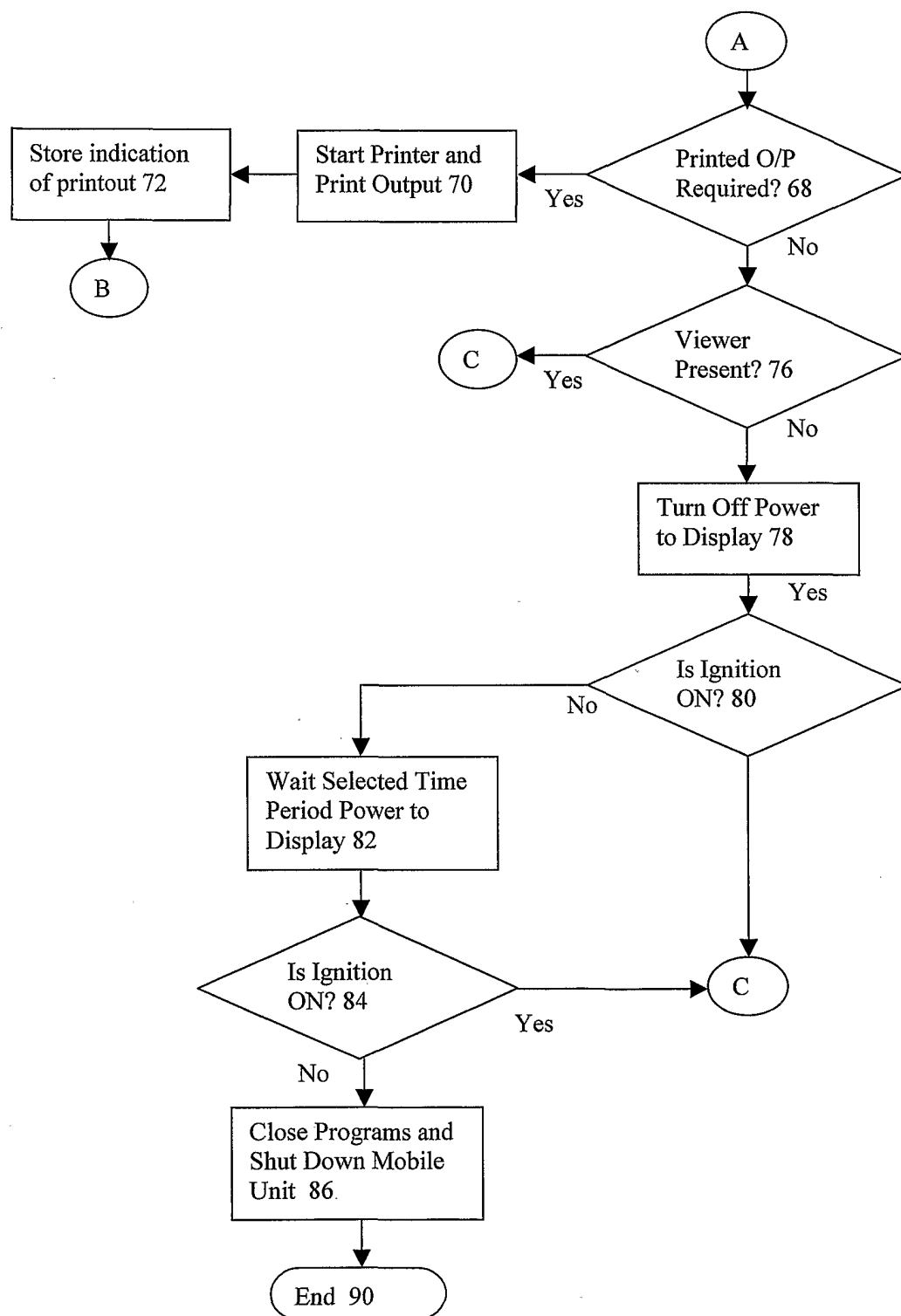


FIGURE 2B

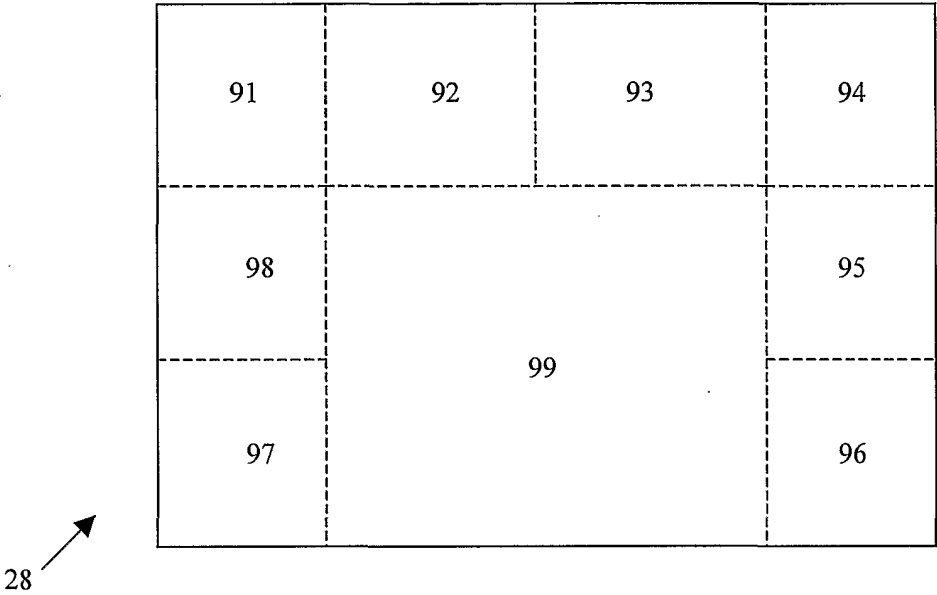


FIGURE 3A

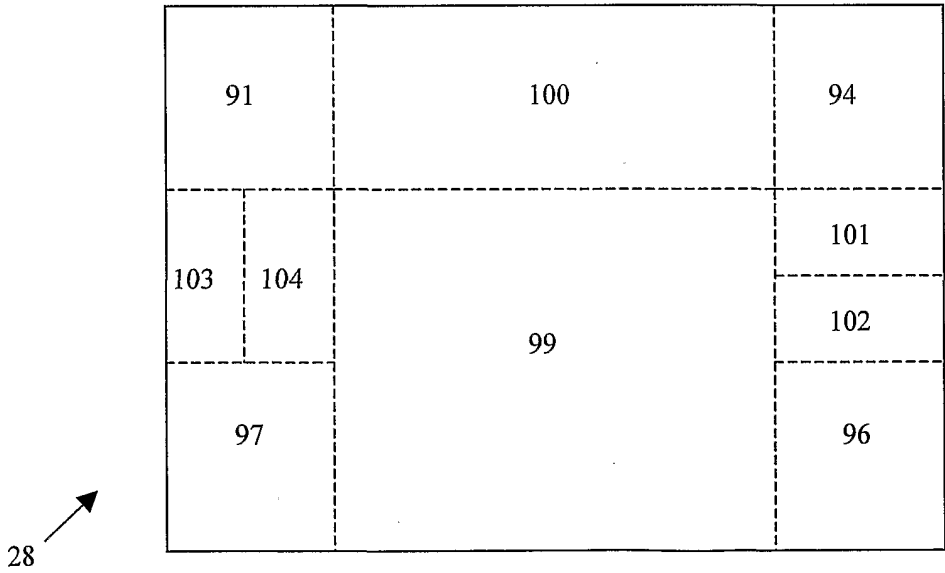
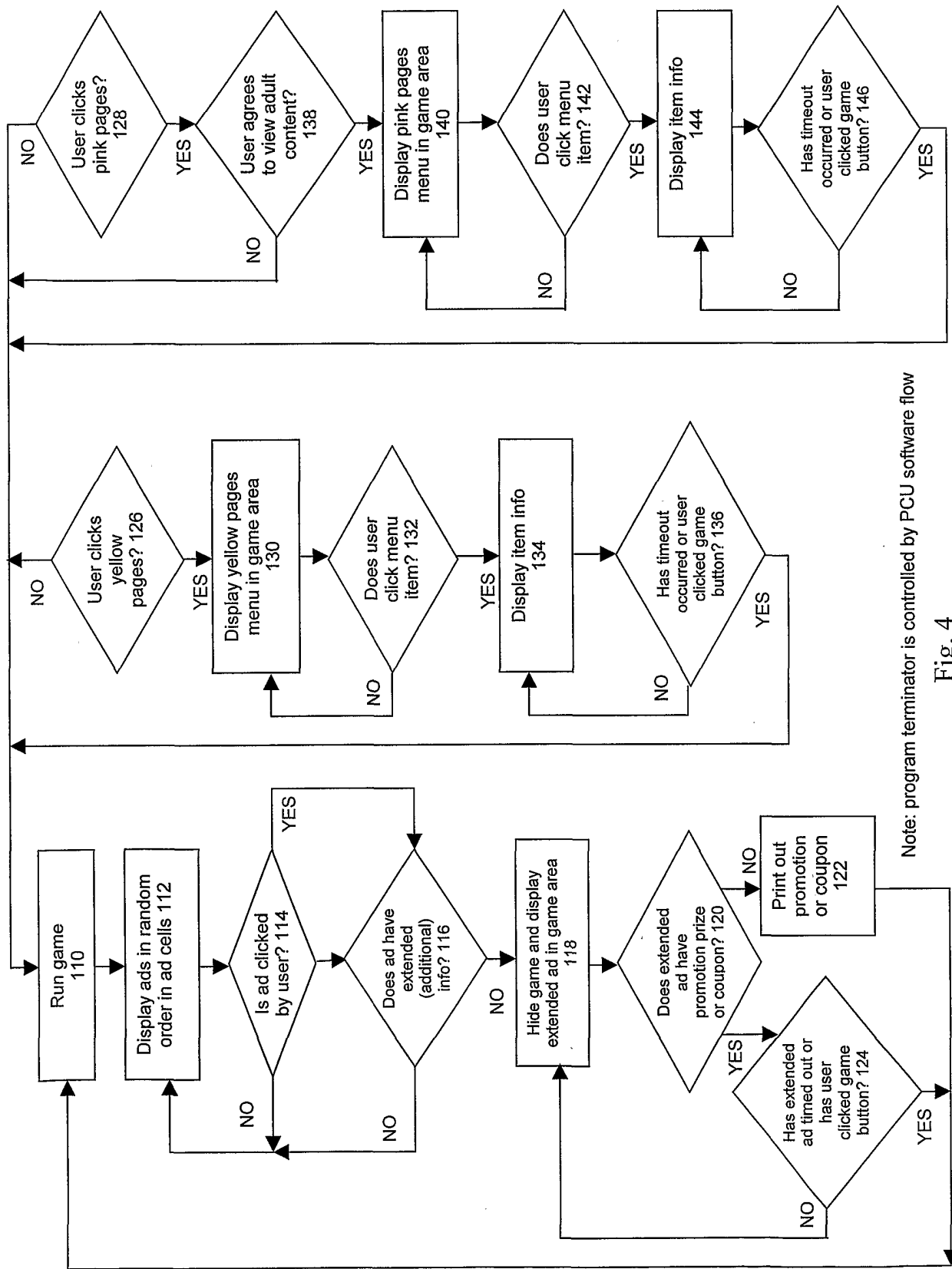


FIGURE 3B



Note: program terminator is controlled by PCU software flow

Fig. 4

Server software flow

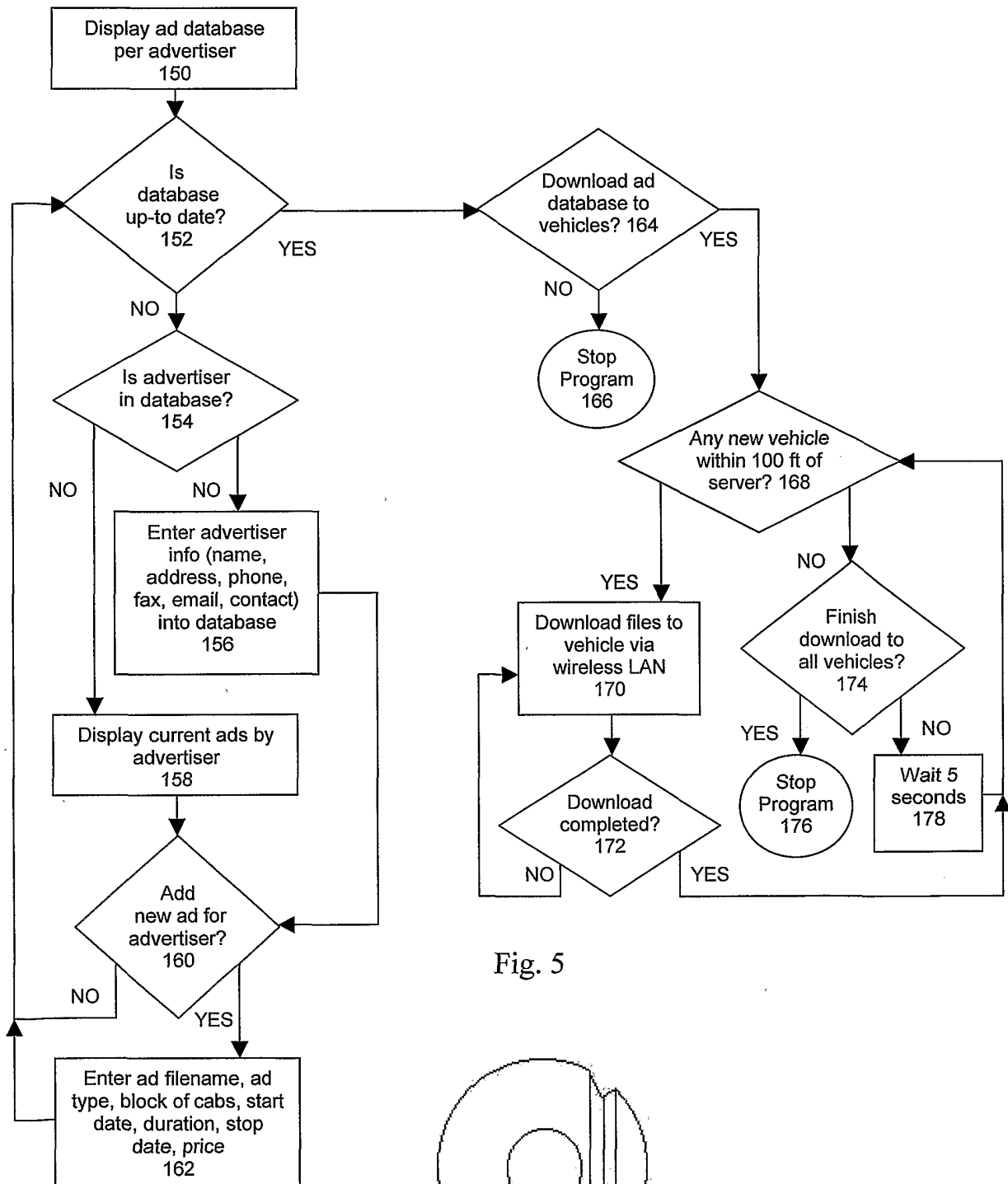


Fig. 5

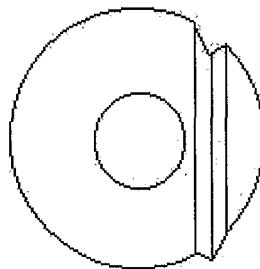


Fig. 10

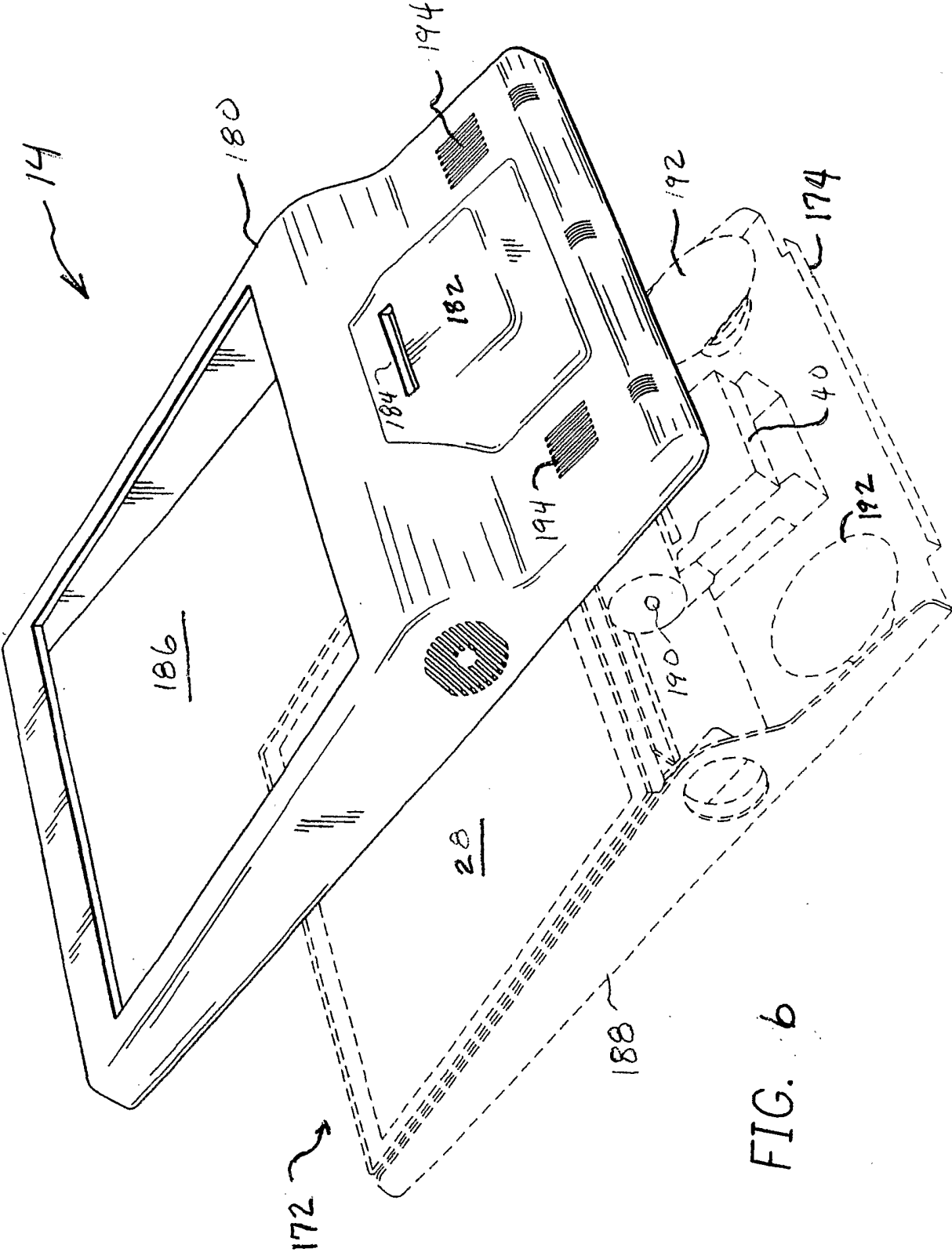


FIG. b

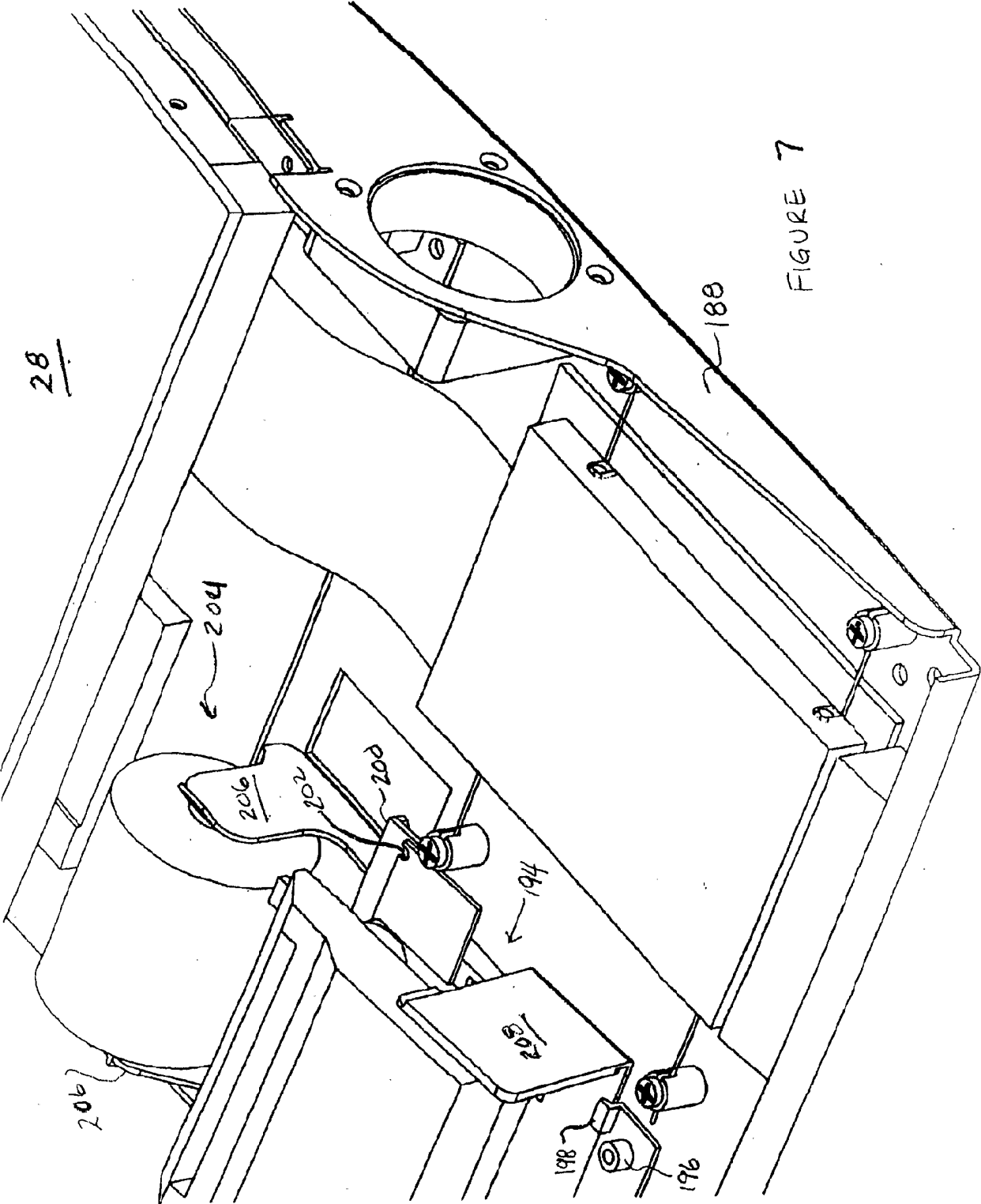


FIGURE 7

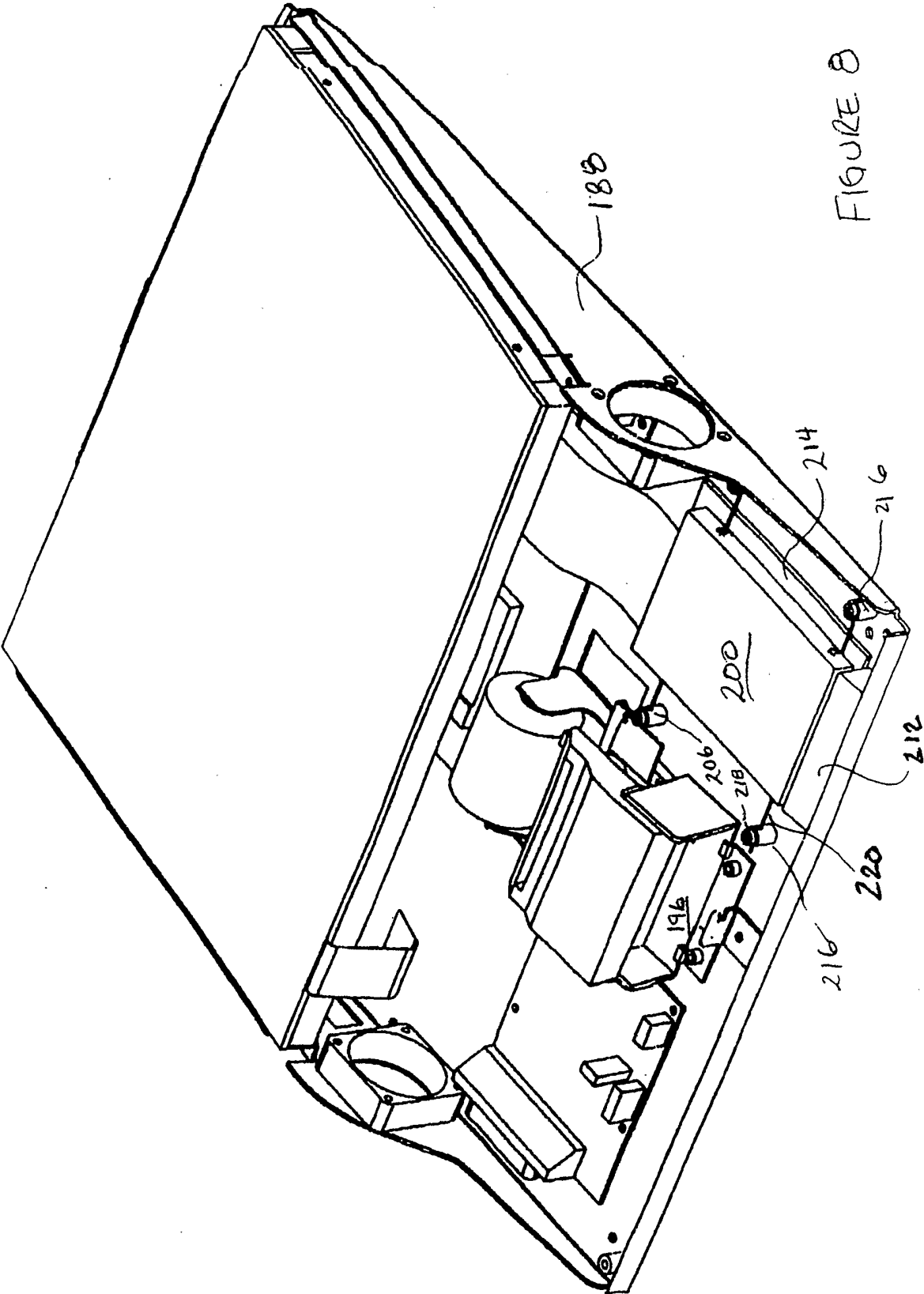


FIGURE 8

