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Computer input output apparatus integral with vessel passenger seat

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Abstract

There is disclosed a computer input output apparatus to be employed by a passenger in a vessel. The apparatus includes a tray, which is mounted on the rear of a vessel passenger seat. The tray has an aperture on the top surface into which is fitted an input output device which surface faces upwards to the passenger when the tray is placed in a usable position. The computer input output device operates to provide an input device that operates computer-based systems accessible to the passenger. The computer input output device also includes output elements, which are coupled to the computer-based systems including an electronic notepad for handwritten notes. The computer input output device is connected to the vessel communications network and passenger systems by cable or wireless means.

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFICATION

INNOVATION PATENT

Computer input output apparatus integral with vessel passenger seat.

The following statement is a full description of this invention, including the best method of performing it known to me.

EDITORIAL NOTE:

Page 3 of this description appears as the claims.

Page 4 of the description appears at the end of the description as 'Description of Drawings'.

Field of Invention

The present invention relates to a computer input output apparatus and more
5 particularly to an embodiment of such in a passenger vessel integral with a
passenger seat and tray table therein.

Background

10 Passenger vessels, such as aircraft, ferries and trains, generally provide means of
entertainment at passengers. Although often limited, it is known to offer video
games and interactive games, and at least music, and movies. More advanced
systems currently provide a limited range of on-demand movies and games, with a
video apparatus often attached proximal to the passenger seat.

15 In the future vessel operators will find it advantageous to provide a greater range
of entertainment, including more interactive entertainment and more interactive
customer services. This will include much greater two-way interaction than at
present. Applications will include passenger to passenger chat, email, instant
20 messaging and video/keyboard dialogues and interaction. Similar applications in
communication with the Internet will also be available.

A problem with more intensive interaction is the potential disturbance to other
passengers. For example voice input would be disturbing to close neighbours,
25 and keyboard input is noisy and mechanically disturbing to people in close
proximity. It is known in the art to provide screen based video games with special
purpose controllers, which are relatively undisturbing to other passengers.
However with greater keyboard interaction required by future on-board
entertainment systems a quite interaction means is needed.

30 Thus, a need exists for an apparatus to provide silent input with a full range of
input functions and capabilities which provides for future on-board passenger
systems.

Summary of the Invention

- 5 According to a feature of the invention the system provides a means for
passengers on a vessel to interact with computer systems and entertainment
systems on the vessel. The apparatus has the advantage of being integral with
commonly provided passenger equipment in particular a tray table, and silent in
use so as to not disturb other passengers, and effective and efficient in that icons
10 and interaction displays can be both general and specific to the particular needs of
each passenger.

Detailed Description of the Invention

Implementation embodiments of the present invention include a computer input output touch screen means integrated into an aperture in a tray table. Although
5 the present invention will be described with reference to certain specific embodiments thereof, it can be appreciated by one skilled in the art that these specific details disclosed herein for the purpose of providing an understanding of the present invention, and do not limit its scope. One skilled in the art can appreciate that another skilled in the art may perform many departures and other
10 modifications of the implemented embodiments of the present invention. This invention can be practiced without these specific details.

The present innovation is directed to the provision of an apparatus for the computer input and output integral with a passenger seat. The noted determination
15 is of particular use with respect to being integral with a passenger tray table. While the innovation will be described with respect to an aircraft passenger tray telephone, it should be understood that the innovation can be used to advantage with any type of passenger seat and table for the use of the passengers with respect to interacting with computer systems during a voyage on many types of
20 voyage vessels and craft including ships, hovercraft and buses.

Referring to FIG 1 there is illustrated a typical passenger seat 100 as those normally deployed on vessels carrying large numbers of passengers. For purposes of teaching the invention an embodiment using an aircraft passenger
25 seat is illustrated. The passenger seat as associated with a tray 120 which can be raised or lowered 140 by the occupant of a seat, most commonly an occupant to the rear of the illustrated seat 110 when fixed in a configuration, and is used to accommodate meals, drinks and other passenger conveniences. The tray is normally either in the closed, or locked position, close against the seat back in
30 front of the passenger. When desired for use, the conventional tray is moved down to an approximately horizontal position 140 directly in front of the (rear) passenger.

The design of such seats is well known in the art and said associated trays such as from US patent US3762766 *Airplane Seat Assembly*, granted Oct 2, 1973, remain the art. Passenger tray is normally secured to the back of the seat by means of a latch or latches, and which latches may also provide for different stops or positions of securing of the tray. Key to the innovation is that all such trays constitute a flat planar surface which is large enough surface area to conveniently accommodate a thin touch screen computer input output apparatus, for example a thin LCD touch screen. Such a screen 130 would be fitted into a tray, perhaps into an aperture of the tray for example.

10

A touch screen is a computer display screen that is sensitive to human touch, allowing a user to interact with the computer by touching pictures or words on the screen. Touch screens are used with information kiosk computer-based training devices, and systems designed to help individuals who have difficulty manipulating a mouse or keyboard. Touch screen technology can be used as an alternative user interface with applications that normally require a mouse, such as a Web browser. Some applications are designed specifically for touch screen technology, often having larger icons and links than the typical PC application. Monitors are available with built-in touch screen technology or individuals can purchase a touch screen kit.

20

A touch screen unit logically includes a touch screen panel, a controller, and a software driver. The touch screen panel registers touch events and passes these signals to the controller. The controller then processes the signals and sends the data to the software driver. The software driver translates touch events into "mouse" events.

25

For a general explanation see "At Your Fingertips" (Scientific American, April 2001).

30

Touch screen systems are known, however an inhibition in prior installation in passenger vessel seats has been the distortion of viewing angle. For example parallax is a particularly acute problem with touch sensitive screens where the user of the system provides inputs to the system by pointing to, or touching,

objects displayed on the screen. This is because the construction of flat panel LCDs causes the image to appear at a position that is not the true tangible screen surface position. The difference in depth between the image position and the surface of the flat panel display is called the image depth. Large image depth
5 contributes to the problem of parallax because the larger the image depth the worse the parallax. Often the image depth is enlarged when touch sensitive flat panel touch screens are employed because a special thick touch sensitive layer rests on top of the outer layer of the LCD. This touch sensitive layer presents a layer between the displayed image and the viewer through which the viewer must
10 view the display.

As a result of the image depth created by the touch sensitive layer, when the flat panel touch sensitive screen is viewed off-axis the optical position of the image is different from the tangible position on the screen surface. Thus, the apparent
15 position of the pixel is not the same as the position on the surface of the screen vertically correspondent with the electrode grid below responsible for creating the apparent image. This is true because the screen tilt and image depth causes the image to appear in a screen location which is not directly above the image and thus difficult to touch when using thick touch sensitive screens, and is therefore
20 difficult to target when the display is used in a touch sensitive configuration.

This is a problem because when such a display is used as a touch screen, the user touches the surface of the display with the expectation that the surface coordinates correlate to the coordinates of the pixels visible within the display.
25 Therefore, if a touch sensitive screen is used with this type of LCD then it is difficult, if not impossible, to accurately select various on-screen items because of the parallax problem. Accordingly US Patent US6,028,581 *Method and Apparatus for a Liquid Crystal Display having an Input Function*, granted 22nd Feb, 2000 addresses the above mentioned problem, and is incorporated into this description.

30 The present innovation is directed to the embodiment of a thin display of the type generically discussed above having an input function being integral with a passenger tray table. FIG 2 illustrates an embodiment. The physical dimensions of appropriate thin input output devices are congruent and available or will be

shortly available to match the dimensions of the commonly available trays. Such screens will be integrated with a plastic or other unit of a strength and character fit for purpose and an artisan skilled in the art can appreciate the known craft of fitting a tray casing to the computer input output device.

5

With the advantage of US6,028,581 this apparatus will be practical and functional as a device to input and view responses, and furthermore to accurately input by human touch and to easily be viewed in the average passenger ergonomic configurations.

10

While all the above are feasible input and interactions means, it seems most likely that in areas of confinement, such as airline seating configuration, quietness of operation will be a key requirement.

15

Further innovation is achieved by the computer input output device being able to present dynamic options to passengers for interacting with on-vessel systems. For example, while the primary purpose is to allow for silent input for advanced passenger entertainment systems, incorporating computer games and interacting with other passengers, a further purpose is to enhance crew to passenger

20

communications and service. A range of flexible and icon-oriented displays can be much more effective and more content rich in communicating the features of a journey, for example with respect to catering and movie options, and in seeking assistance from the crew during a journey.

25

With respect to forms of passenger electronic entertainment, US Patent US6,177,887 *Multipassenger Vehicle Catering and Entertainment System*, granted 23rd Jan, 2001, includes in its content an apparatus integrated into the passenger tray to allow for input to video games and to make screen selections. However a stated objective of US6,117,887 is to present a simple and limited number of input controls to passengers, comprising as illustrated 6 buttons being special function buttons such as "Attendant Assistance" and menu commands such as "Scroll Up" or "Enter". US6,117,887 claims such simple input as a virtue e.g. claim 12 "information entry to be accomplished with a minimum of input controls, generally scroll up, scroll down, enter, and help".

30

The minimization of controls, as indicated by US6,117,887, is in general
5 undesirable and is also not necessary with the present invention. The computer
input output touch screen device can present unlimited icons and images 210 to
offer the most effective form of interaction for any desired purpose, including video
game controls 230.

10 Thus, the present innovation claims as full data entry capabilities as are available
to any user of any general purpose information system and at least as full as can
be provided by the systems on board or in communication with a passenger
vessel. This is because the computer input output device, integral to the tray, can
receive and transmit information to the full extent of known computer keyboards.
15 Further it can transmit more effectively where special purpose interactions are
transmitted for display 210 to the output apparatus contained therein, and are
responded to via the input apparatus namely the touch screen. The extent of such
special purpose interactions is only limited by the capabilities of the interacting
computing system and the possible limitations on bandwidth between the
20 computer input output device and the interacting computer.

For example, any other techniques can be used for inputting commands and
designating display positions. Joysticks and trackballs are technologies often
employed in military applications. Digitising tablets transform the tablet area into
25 an equivalent of the display screen when a "digitiser", say 230, is moved over the
tablet. A "mouse", say also 230, is akin to turning a trackball over and rolling it on
top of the desktop surface. A "touch screen", the key means of achieving the
present innovation, can be embodied as a thin transparent screen placed over the
display screen. This can then be activated with fingertip pressure. Of more recent
30 development is "voice input," although still in the development stage for most
practical applications, and is not suitable for the environment for which the present
invention is intended. These alternative input devices can feasibly be incorporated
into a more advanced version of the present invention, but are not considered
further herein at present, except for a computing tablet 220 discussed below.

"Mouse emulation" is known in relation to such computer input output apparatus and refers to the main function of a touch screen software driver. The software driver runs on the host system of a touch screen system, being the one in
5 communication with the tray table (see below). It has the job of taking touch event data from the touch screen controller and translating it into something that the computer's operating system can understand. Since most operating systems are designed to work with mouse events, the software driver translates touch events into mouse click and move events. By doing this mouse emulation at the system /
10 driver level, it frees application programmers from having to do any difficult programming to interface their program with the touchscreen. It also allows the touch screen to work with a wide variety of software that was originally designed for use with a mouse, thus being advantageous to the passenger's interaction.

15 The computer input output device illustratively links to a computing device via a cable or cables 310 carried through the arms 140 linking the tray to the attaching seat, and the means and apparatus to do this in accordance with say aircraft requirements are known. This link would carry power and data communications and other sensors information if necessary, such as heat or tray orientation
20 sensors. The mechanical design of the tray and hinges would be designed to ensure the safe carriage of the weight, and the power and heat of the cables and wiring, as is known in the art.

Further to the wired communication the present innovation claims that the
25 computer input output apparatus in conjunction with the integral tray may include a wireless network connection capability 320. For illustration a PCMCIA LAN 802.11 card or a Bluetooth card 320. It is known for such cards as the Apple Airport card and numerous PCMCIA cards for the Palm Pilot to connect effectively and economically to wireless and cellular networks. This same technology, for
30 example by chipset, can be innovatively incorporated into the present invention.

Further to the input functions being by human touch input the present innovation being aimed at more effective interaction with a vessel passenger advantageously includes an electronic notepad, which stores handwritten notes. Such is known

(see IBM TransNote Computer 2001 or Stylistic from Fujitsu Corporation 2000) and comprises an electronic slate that stores handwriting and transfers it to the communicating computer system. This innovation combines a tablet computer with a computer input output apparatus advantageous to the travelling passenger.

- 5 The unit 220 would be integral with the tray table 120, and configured for optimal human ergonomics, which would be particular to specific seat and passenger facilities.

- 10 In an embodiment it is expected that the cabling 310 and any hardware interconnections between screens and tablets and other input devices would occurs not necessarily in the confines of the tray or the aperture. Most likely the cabling for each device respectively would be taken to a junction point via a mechanical bridge such as tray table arms. At that bridging point they would be joined into means to coordinate their utility and inter-operability. Such means
- 15 include data networks, computing systems, and intelligent network connectors. An embodiment of the present invention preferably includes computing means in proximity to the computer input output touch screen device, perhaps for example in or proximal to each passenger seat 110. The latter computing system would then be connected into the vessel entertainment and communication system by
- 20 network means such as ethernet or TCP/IP or other known networking methods.

- It is, therefore, understood that a major advantage of this innovation is the incorporation of a silent touch screen computer input output apparatus integral with the passenger seat tray. This enables silent and effective communication
- 25 with an on-board vessel system that may provide games, entertainment, movies, requests, catering and interactive and inter-passenger communications. Furthermore such communication may include handwritten notes and graphics input to the computer input output device by the passenger.

- 30 The foregoing description of the invention has been presented for purposes of illustration and description. Further, the description is not intended to limit the invention to the form disclosed herein. Consequently, variations and modifications commensurate with the above teachings, and the skill or knowledge in the relevant are within the scope of the present invention. The preferred embodiment described

hereinabove is farther intended to explain the best mode known of practicing the invention and to enable other skilled in the art to utilize the invention in various embodiments and with the various modifications required by their particular applications or uses of the invention. It is intended that the appended claims be
5 construed to include alternate embodiments to the extent permitted by the prior art.

10

Walter J Adamson
May 24, 2001

Related Art

- 15 **US 6028581** Method and apparatus for a liquid crystal display (LDC) having an input function Feb 22, 2000.
US 5659378 Polarizing fibre-optic layer in use with a flat panel display device Aug 19, 1997.
US 6177887 Multipassenger vehicle catering and entertainment system Jan 23,
20 2001.

Brief Description of the Drawings

FIG 1 is a general schematic illustrating the configuration of the invention in relation to a passenger seat.

5

FIG 2 is an illustrative drawing of the input output screen in as in a tray.

FIG 3 is a schematic highlighting mechanical connections.

Claims

What is claimed:

1. An article of manufacture, including electronic means and communication
5 means operative to control a computer input output device, said device
including:
 - an input means comprising a computer input output touch screen;
 - an output means comprising a computer input touch screen;
 - 10 • an input and output means comprising a tablet and control devices.
2. The device of claim 1, wherein said computer input output touch screen is
integral with a passenger tray device in a multi-passenger vessel.
- 15 3. The device of claim 1, wherein the said computer input output device has
communication means to a multi-passenger catering and entertainment
system.
- 20 4. The device of claim 1 wherein said computer input out device is capable of
displaying a full icons, images, simulated keyboards, and commands as
required by a multi-passenger catering and entertainment system.
- 25 5. The device of claim 1, wherein the said table and control devices further
include mouse devices, game control devices, tablet computer devices.

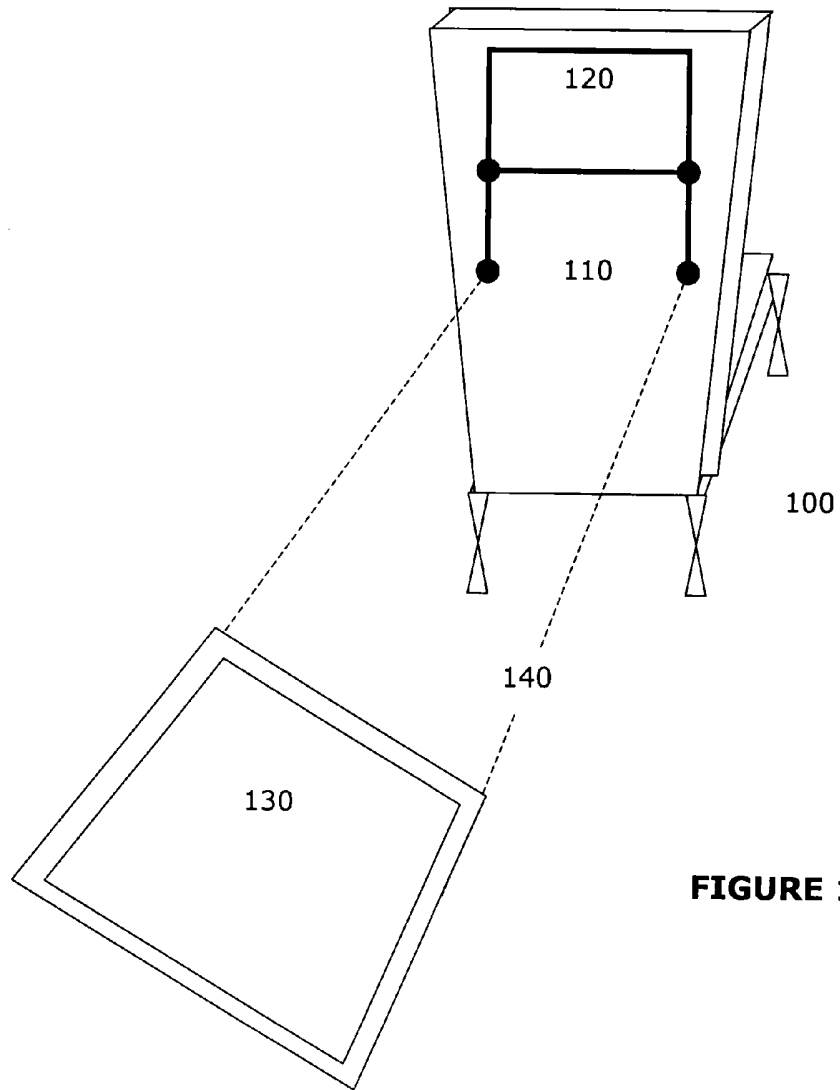


FIGURE 1

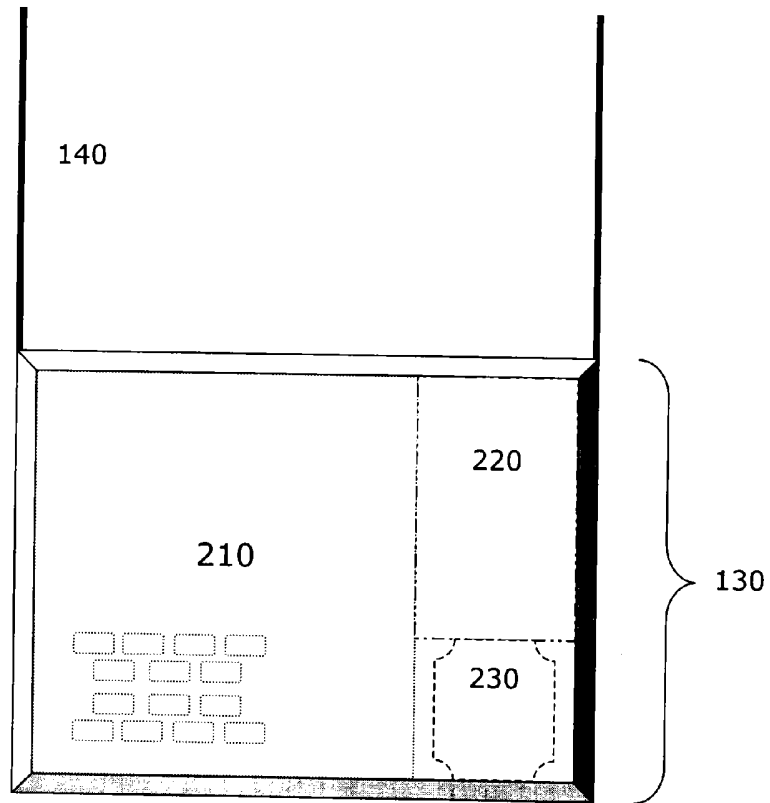


FIGURE 2

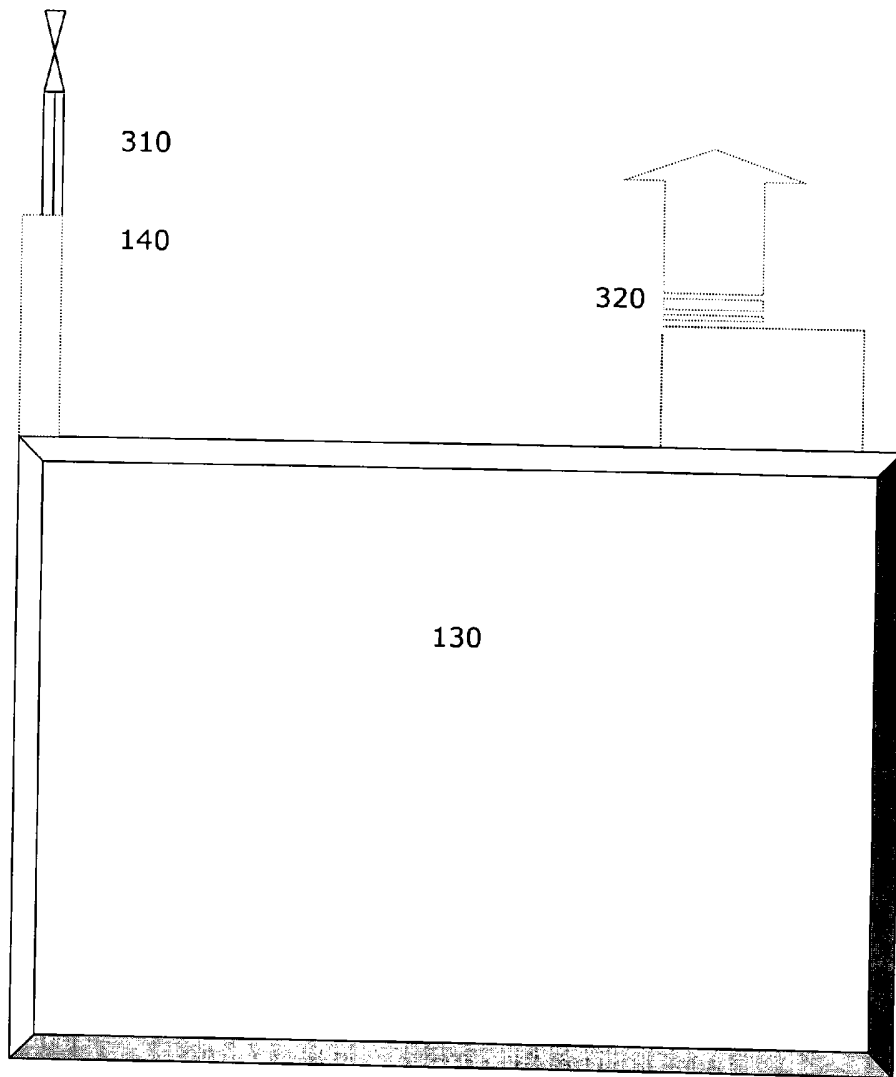


FIGURE 3