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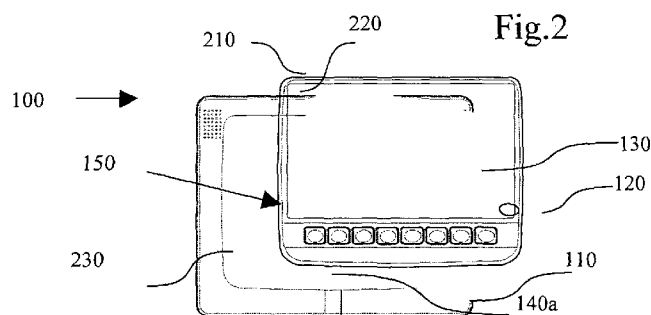
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(54) Title: ELECTRONIC VISUAL DISPLAY ASSEMBLY FOR PERSONAL COMPUTER



(57) Abstract: An electronic visual display assembly (100) suitable for a portable or a desktop personal computer (PC), having a housing (110) on which a visual display panel (130) of a selected size can be removably mounted. This gives the users flexibility to upgrade or replace the display panel (130). The housing (110) has a window (230) and a bezel (120) interfaced with the display panel (130) is mounted on a peripheral surface around the window (230). The housing (110) supports the bezel when interfaced with the display panel (130) of a maximum size and also supports bezels (120) when interfaced with display panels (130) of smaller sizes. A circuitry in the housing (110), detects the display panel (130) and connects it to an external computer.

ELECTRONIC VISUAL DISPLAY ASSEMBLY FOR PERSONAL COMPUTER

FIELD OF INVENTION

The present invention relates generally to the visual display panels in personal
5 computers and more particularly to the portable personal computers.

BACKGROUND OF THE INVENTION

Arrangements are available for providing the flexibility of using replaceable liquid
crystal display (LCD) panels of different sizes with the same housing. Larger sizes of
the LCD panels are desirable for certain applications for better resolution of the
10 display images. For other applications, smaller sizes of the LCD panels may suffice, at
a lower cost. To own multiple versions with various sizes of the display panels, having
different housing sizes for supporting the display panels is not economical for the user
and is not economical for the hardware development too because then a different set of
mechanical tooling is required for each display panel size. The housing is a
15 complicated part hence the tool is expensive, thereby limiting the number of different
LCD panel sizes that can be used economically. Two patents for accommodating LCD
panels of different sizes in the same housing, are discussed herewith.

US patent 6002582 in the year 1999 proposes an LCD adapter mounting for a
computer cover. This includes a cover base and an adapter mounted in the base, with
20 the LCD panel mounted in the adapter. The adapter is mounted in the cover base in a
first orientation when the LCD panel is of a first size. The adapter is mounted in the
cover base in a second orientation inverted from the first orientation, when the LCD
panel is of a second size. A bezel mounted on the cover base secures the adapter and
the LCD panel therebetween.

US patent 7233486 in the year 2007 proposes a computer system including an LCD display part provided with a mounting part in its rear, for mounting on a main housing. The main housing accommodates a main printed circuit board and is detachably attached to the mounting part of the LCD display part. Different sizes of the LCD display parts may be selectively attached to the main housing. Thus the computer system provides replaceable LCD display parts of different sizes.

Simpler arrangements are desirable for mounting the LCD panel on the housing, particularly for portable personal computers (PC)s.

SUMMARY OF THE INVENTION

The present disclosure relates generally to the design of a PC and particularly to a portable PC, which can be fitted with a visual display panel such as an LCD panel of a selected size, for various applications which are commercial, non-commercial, services and education. The invention discloses a simple arrangement where the display panel in the housing is easily removable and replaceable with another display panel of a different size. This gives the users the flexibility to upgrade or replace the visual display panel with one of a different size. The arrangement proposed is with significantly reduced complexity than those in the art that is suitable particularly for portable PCs.

According to an embodiment of the invention, an electronic visual display assembly for a PC comprises a housing that can support a bezel interfacing with a display panel of a maximum size or of a higher resolution and can also support bezels interfacing with display panels of smaller sizes or of lower resolution. This enables the assembly to accommodate different sizes of the display panels on a single housing hence giving users the flexibility to upgrade to the display panels of their choice, without having to change the housing. The housing includes a window. The display panel is peripherally interfaced with the bezel forming a combination. The combination is removably mountable on a peripheral surface around the window,

thereby blocking the window. When mounted, the display panel is visible from outside the housing. The peripheral surface around the window further comprises securing means for removably securing the combination, after mounting. A circuitry is provided in the housing for detecting the display panel and connecting the display panel to an external computer, when the combination is removably mounted on the housing. The bezel has a fixed size of its outer periphery and is configured for being removably mountable on the peripheral surface around the window. The bezel has an appropriate size of its inner periphery for suitably interfacing with the selected size of the display panel. The display panel may be removably interfaced with the bezel for the convenience of handling. The securing means for removably securing the bezel on the peripheral surface around the window may be by fixing screws, which is a reliable mode of fixing.

In a preferred embodiment of the present invention, additional combinations are included with the assembly, where each bezel is interfaced with a display panel of a predetermined size. The user thus has a choice for selecting the size of the display panel appropriately, depending on the demands of the application.

In a preferred embodiment, the bezel is provided with means for user input such as a set of hard-keys or a touch sensitive panel, that is connectable to the circuitry.

In another preferred embodiment of the present invention, the display panel is an LCD panel, which is very commonly used and commercially available in different sizes.

In an advantageous embodiment of the present invention, the assembly is adapted for a portable PC such as a tablet PC, a laptop PC and a notebook PC, for having the convenience of selectively mounting the display panel of a suitable size with minimal complexity.

In an advantageous embodiment of the present invention, the housing further comprises electronic devices such as speaker(s), microphone(s) and a power source for the display panel for compactness of the assembly. The devices are connected to the

circuitry.

In yet another aspect of the invention, a method is proposed for mounting and securing the first combination. The method comprises the steps of mounting the first combination to fit into the window and connect to the circuitry followed by securing
5 the first combination on the housing by the securing means.

In yet another aspect of the invention, a method is proposed where the first combination is already mounted and needs replacement with a second combination including a display panel of a second size. The method comprises steps of releasing
10 the securing means of the first combination, followed by demounting the first combination after disconnecting from the circuitry, followed by mounting the second combination to fit into the window and connecting to the circuitry, followed by securing the second combination on the housing by the securing means.

The present invention consists of certain novel features and a combination of parts
15 hereinafter fully described and illustrated in the accompanying drawings and particularly pointed out in the appended claims; it being understood that various changes in the details may be possible without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

20 In the following drawings, same reference numbers generally refer to the same parts throughout. The drawings are not necessarily to scale, instead emphasis is placed upon illustrating the principles of the invention. The various embodiments and advantages of the present invention will be more fully understood when considered with respect to the following detailed description, appended claims and accompanying drawings
25 wherein:

- 5 -

Fig. 1 illustrates a front view of an electronic visual display assembly, according to an embodiment of the invention, including a housing, a bezel and a visual display panel, all in the assembled form.

Fig. 2 illustrates a front view of Fig.1 where the bezel interfaced with the display panel
5 is taken apart from the housing.

Fig. 3 illustrates a front view of Fig.2 where a smaller display panel interfaced with a wider bezel is being mounted onto the housing as in Fig.1.

Fig. 4 illustrates a front view of Fig.3 after the smaller display panel interfaced to the wider bezel is mounted onto the housing.

10 DETAILED DESCRIPTION OF THE INVENTION

The following description presents several preferred embodiments of the present invention in sufficient detail such that those skilled in the art can make and use the invention.

Before describing in detail embodiments that are in accordance with the present
15 invention, it should be noted that all of the figures are drawn for ease of explanation of the basic teachings of the present invention only. The extension of the figures with respect to the number, position, relationship and dimension of the parts of the preferred embodiment will be within the skill of the art after the following teachings of the present invention have been read and understood. Further, the exact dimensions
20 and dimensional proportions to conform to specific force, weight, strength and similar requirements will likewise be within the skill of the art after the following teachings of the present invention have been read and understood.

As shown in Fig.1, according to an embodiment of the invention, a combination of a selected sized display panel (130) interfaced with a bezel (120) is removably mounted

- on a peripheral surface around a window (230) of a housing (110), thereby blocking the window. The display panel (130) is visible from outside the housing (110). The display panel (130) may be a commonly used LCD panel, such as one of 7 inches. The display panel (130) can be used in applications such as in commercial trucking fleet,
- 5 medical services, mobile sales and services, and education. Some applications that use the display panel (130) as a data terminal, requires a bigger LCD panel size. The invention proposes a common housing (110) that will accommodate the electronic mainboard or a circuitry, electronic devices such as speakers, microphone, and a power source for the display panel (130), as well as support the display panel (130).
- 10 Securing means (140a,b) are provided for removably securing the bezel (120) on the peripheral surface around the window (230), upon mounting. Various types of arrangements for the securing means (140a,b) are possible, such as with screw fittings. For changing a display panel (130), only the corresponding bezel (120) interfaced with the display panel (130) is needed to be replaced. Because the bezel (120) is a very
- 15 simple mechanical part, having separate tooling for the bezel (120) is more economical as compared to a separate tooling for the housing (110). As an example, Fig.1 shows the largest size of the display panel (130) that can be removably mounted on the housing (110).
- 20 Fig.2 shows how the bezel (120) with the display panel (130) can be detached from the housing (110).

- To achieve the flexibility of having a display panel (130) of a size smaller than the former, a corresponding bezel (120) can be interfaced with the display panel (130). As long as all bezels (120) have a common mounting mechanism and adapts to the
- 25 securing means (140a,b), the housing (110) can be fitted with the display panels (130) of different sizes as shown in Fig.3. Fig.4 below shows the final assembly (100) with a smaller display panel (130) and a wider bezel (120) compared to Fig.1. The bezel (120) is wider for smaller display panels (130) and narrower for bigger display panels (130), but the external size for the combination is fixed and is configured for mounting
- 30 on the peripheral surface around the window (230) of the housing (110).

The combination of the bezel (120) and the display panel (130) may be provided with the assembly (100) in the mounted condition or as a combination to be mounted on the

housing (110) by the user.

The typical sizes of the LCD panels may be 7 and 8.9 inches. However these are not limitations and other sizes may be used too, based on the availability and requirement for the application.

- 5 A circuitry such as a printed circuit board is accommodated in the housing (110), for detecting the display panel (130) and connecting the display panel (130) to a computer, when the bezel (120) with the display panel (130) is removably mounted on the housing (110). The bezel (120) has a fixed size for its outer periphery (210) which is configured for being removably mountable on the peripheral surface of the window
10 (230). The bezel (120) further has an appropriate size of its inner periphery (220) for suitably interfacing with the selected size of the display panel (130). The display panel (130) may be removably interfaced with the bezel (120). Various arrangements for the securing means (140a,b) for removably securing the bezel (120) in the combination on the peripheral surface of the window (120) upon mounting, may be provided, such as
15 with screw(s).

Additional combinations where each of the bezels (120) is interfaced with the display panel (130) of a different predetermined size, may be provided with the assembly. The additional combinations are adapted for the same mounting mechanism and the securing means (140a,b), as in the first combination.

- 20 The surface of the bezel (120) may be extended partially as seen in the figures, for accommodating means for user input (150) such as a set of hard-keys or a touch sensitive panel, which are connectable to the circuitry for providing the user input. The display panel (130) may be a commonly used LCD panel of various sizes. The assembly (100) may advantageously be adapted for a portable PC such as a tablet PC,
25 a laptop PC, a notebook PC by virtue of its simplicity in the arrangement for replacing the display panel (130). Additional electronic devices (not shown in the figures) such as speaker(s), microphone(s) and a power source for the display panel (130) are provided in the same housing (110).

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As to further discussion of the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

While the foregoing description presents preferred embodiments of the present invention along with many details set forth for purpose of illustration, it will be understood by those skilled in the art that many variations or modifications in details of design, construction and operation may be made without departing from the present invention as defined in the claims. The scope of the invention is as indicated by the appended claims and all changes that come within the meaning and range of equivalency of the claims are intended to be embraced therein.

CLAIMS

1. An electronic visual display assembly (100) for a personal computer (PC) comprising:

a housing (110) including a window (230);

5 at least one combination, each combination comprising a display panel (130) of a predetermined size and a corresponding bezel (120), wherein the display panel (130) is peripherally interfaced with the corresponding bezel (120), the each combination being removably mountable on a peripheral surface of the housing (110) around the window (230) thereby blocking the window, such that the display panel (130) is
10 visible from outside the housing (110);

a securing means (140a, 140b) being provided for removably securing the corresponding bezel (120) on the peripheral surface around the window (230), the corresponding bezel (120) having a fixed size of its outer periphery (210) and configured for being removably mountable on the peripheral surface around the
15 window (230), the corresponding bezel (120) further having a suitable size and configuration of its inner periphery (220) for peripherally interfacing with the predetermined size of the display panel (130), the predetermined size for the each combination being different; and

a circuitry in the housing (110) for detecting the display panel (130) and connecting
20 the display panel (130) to an external computer when a first selected combination from the at least one combination is removably mounted on the peripheral surface around the window (230).

2. The assembly (100) according to claim 1, wherein the corresponding bezel (120) further comprises means for user input (150) being connectable to the circuitry.

25 3. The assembly (100) according to claim 1, wherein the display panel (130) is a liquid crystal display (LCD) panel.

4. The assembly (100) according to claim 1, wherein the securing means (140a,b) include fixing screw(s).
- 5 5. The assembly (100) according to claim 1, wherein the housing (110) further comprises a plurality of electronic devices for the display panel (130) being connected to the circuitry
6. The assembly (100) according to claim 5, wherein the electronic devices are speaker(s), microphone(s) and/or a power source.
7. The assembly (100) according to claim 1, wherein the display panel (130) is removably interfaced with the corresponding bezel (120).
- 10 8. A method of mounting and securing the first selected combination according to the assembly (100) in claim 1, the method comprising the steps of :
connecting the first selected combination to the circuitry;
mounting the first selected combination to fit into the window (230); and
securing the first selected combination on the peripheral surface around the window
15 (230) by the securing means (140a,b).
9. A method of replacing the first selected combination on the assembly (100) by a second selected combination from the at least one combination according to claim 9, the method comprising the steps of :
releasing the securing means (140a,b) for the first selected combination;
20 disconnecting the first selected combination from the circuitry;
dismounting the first selected combination from the peripheral surface around the window (230);
connecting the second selected combination to the circuitry;
mounting the second selected combination to fit into the window (230); and
25 securing the second selected combination on the peripheral surface around the window (230) by the securing means (140a,b).

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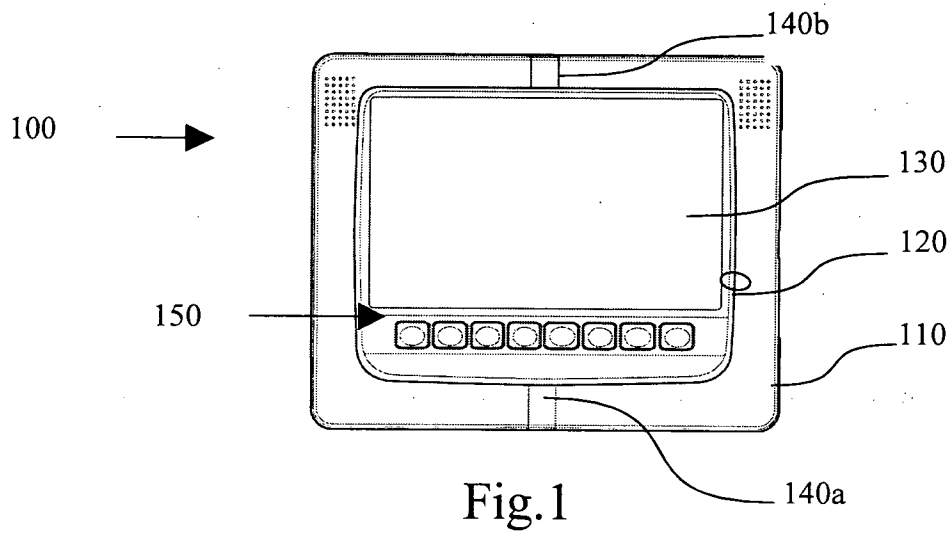


Fig.1

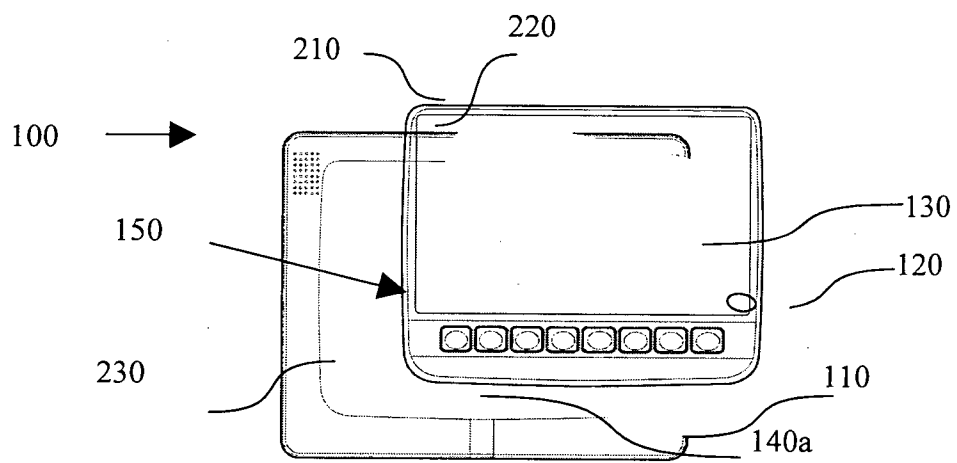
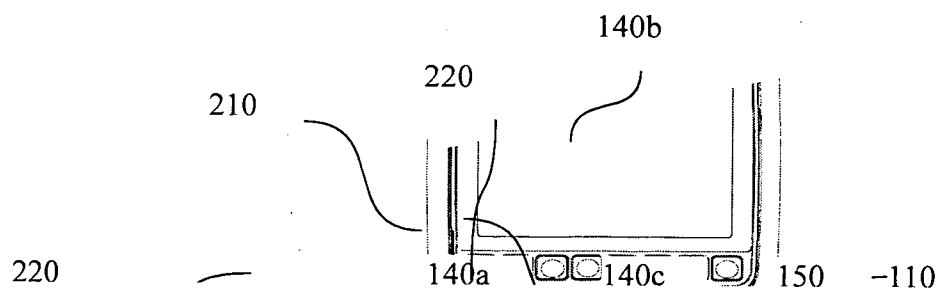


Fig.2



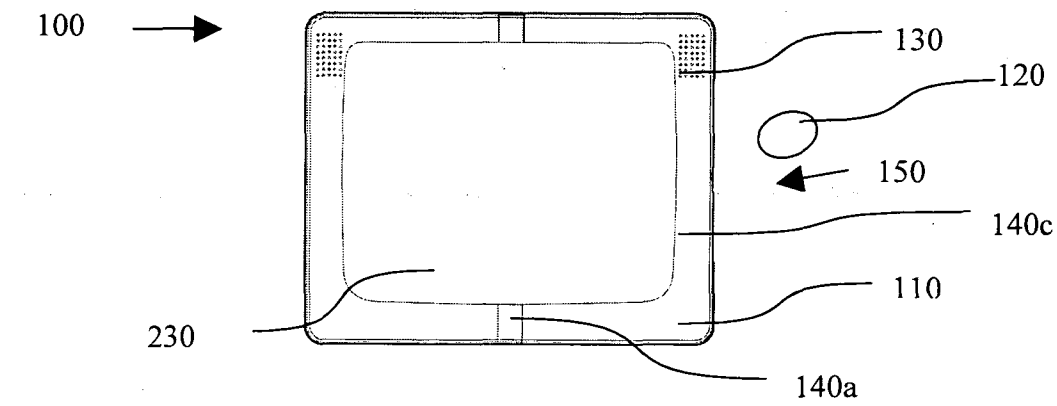


Fig.3

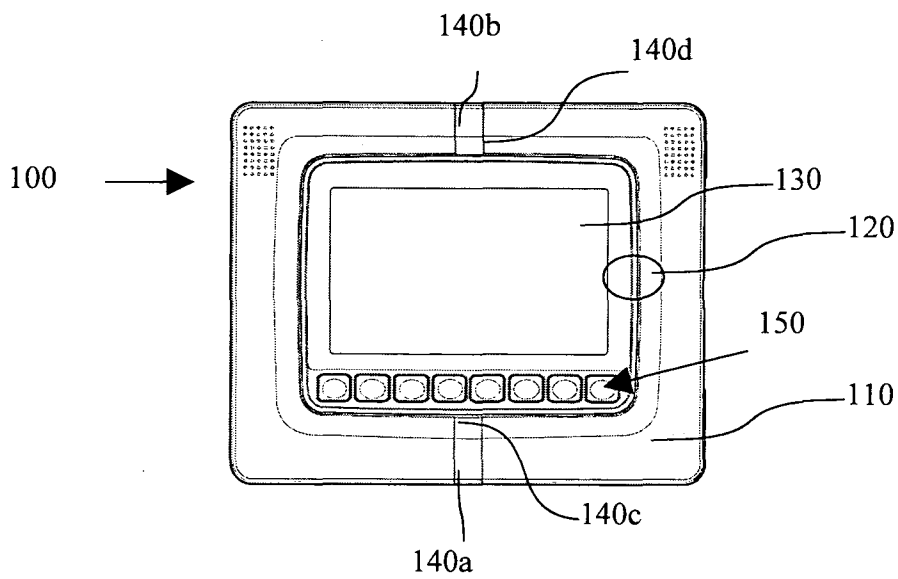


Fig.4