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(56) Documents Cited
EP 1037132 A2 **EP 0971283 A1**
WO 2001/002536 A2 **WO 2000/039493 A1**
WO 1999/035555 A1 **WO 1999/031649 A1**
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(58) Field of Search
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COMPUTER, IEL

(54) Abstract Title
Computer with two displays

(57) A computer comprises a base (21) having a keyboard (22) and a display arrangement comprising first and second displays (23 and 24) comprising respective screens pivotally connected to the base. The pivotal connections enables the screens to be pivoted from a closed, stored position, in which they are aligned with the base and an open position in which the screens face away from each other to provide a person other than the computer operator with a screen display.

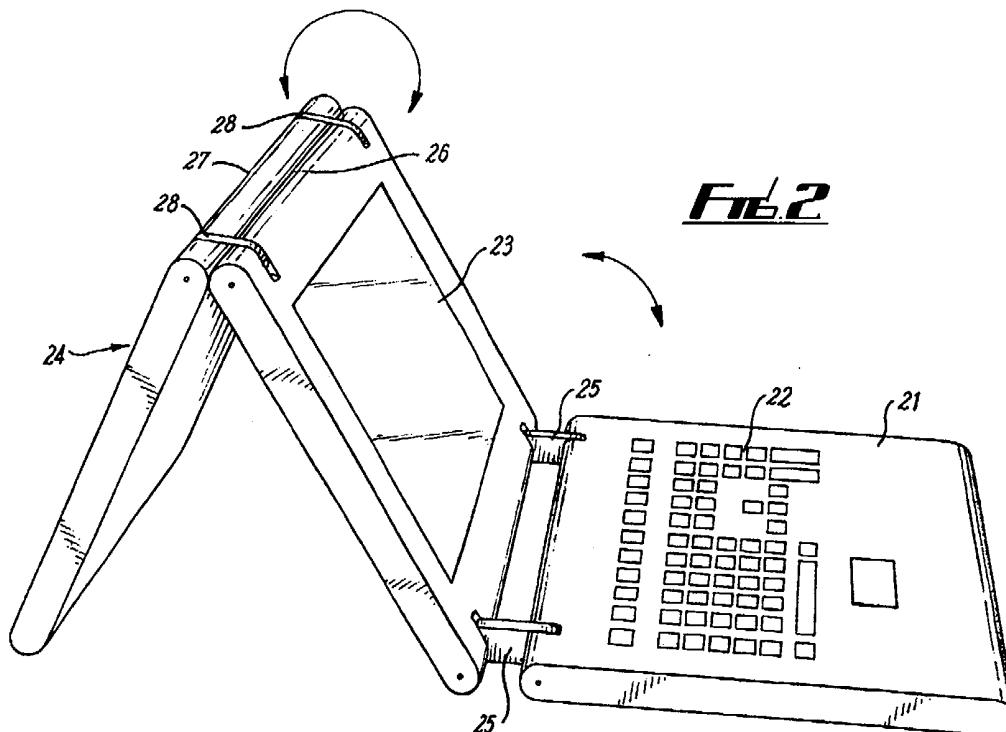


FIG. 2

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

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FIG. 1a

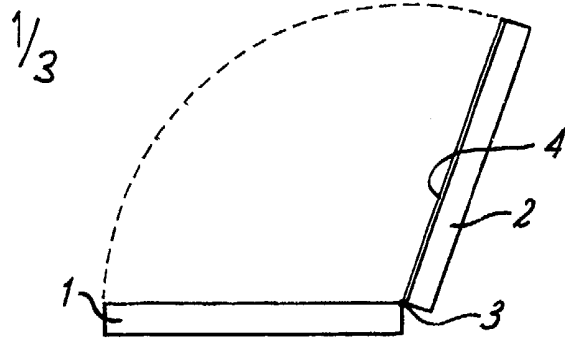


FIG. 1b

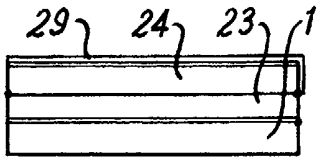


FIG. 4a

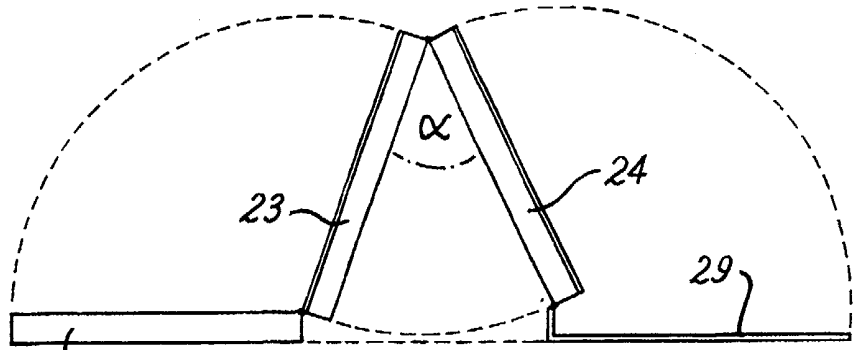


FIG. 4b

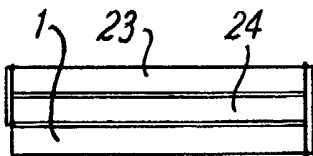


FIG. 5a

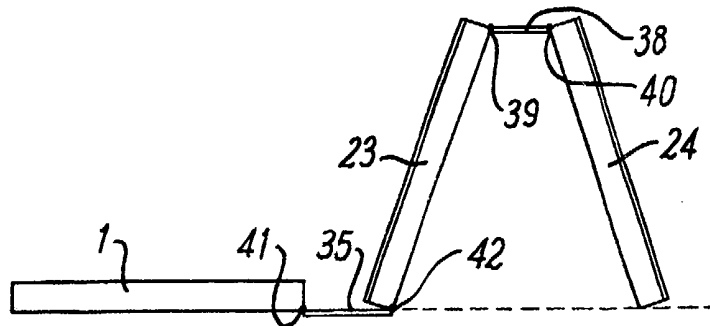


FIG. 5b



FIG. 6a

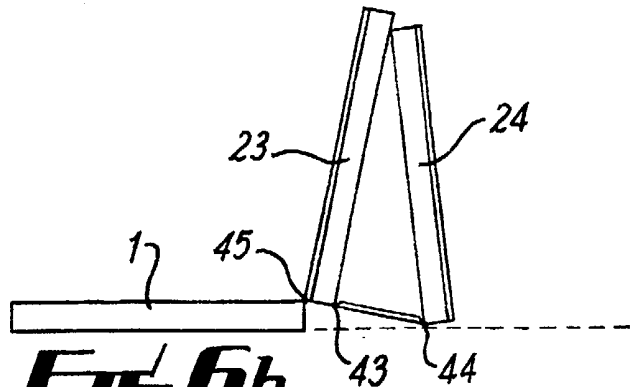
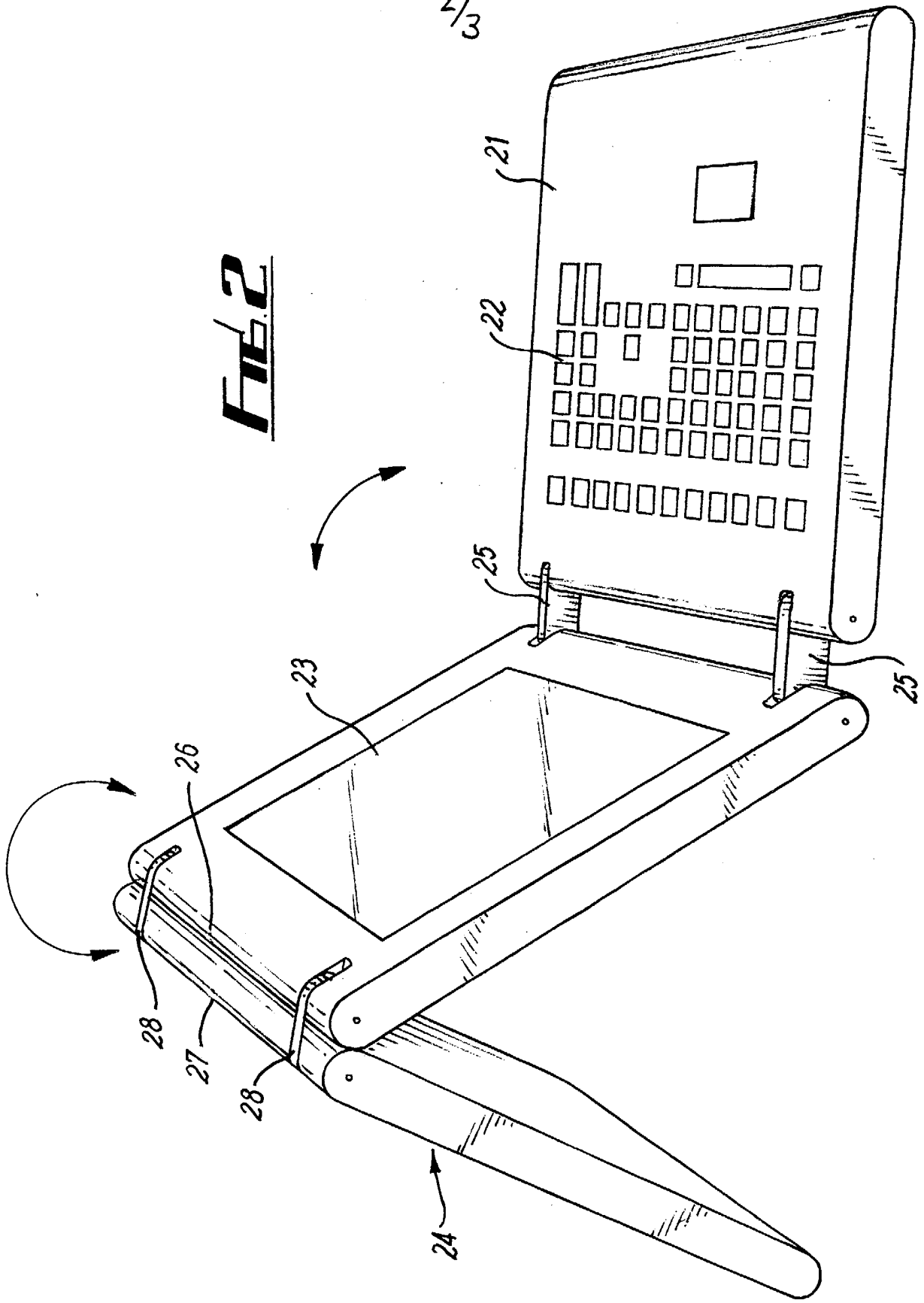


FIG. 6b

FIG. 2



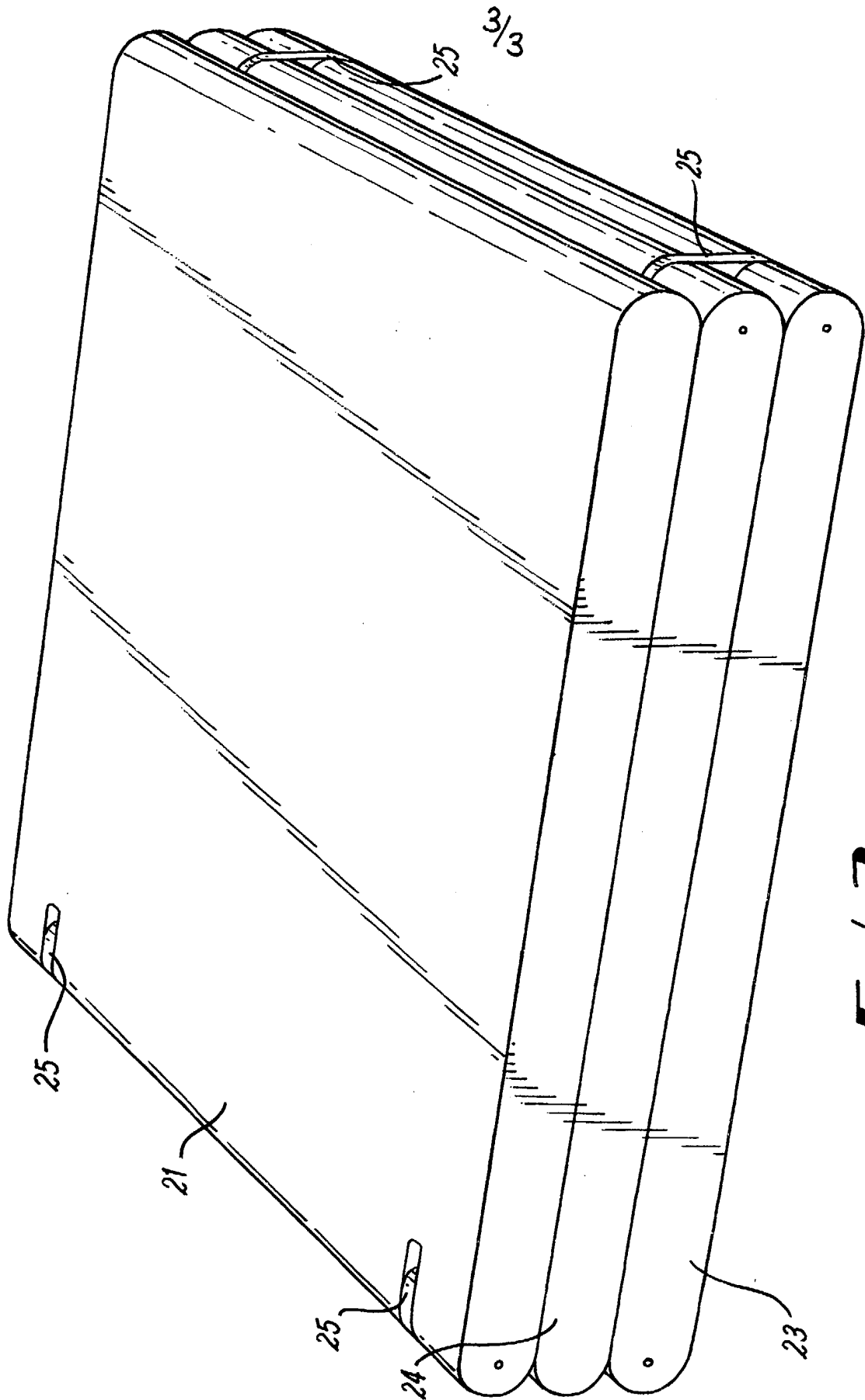


FIG. 3

A COMPUTER

The present invention relates to a computer having a display arrangement and particularly, but not exclusively, to a portable computer having such an arrangement.

5 Portable computers such as laptops are frequently used to give demonstrations to customers associates and the like. The screen of the display on the conventional laptop is directional. As the users line of sight departs from a direction normal to the screen, the screen becomes increasingly less clear and therefore more difficult to read. As a result, it is
10 difficult for both the operator and the customer or associate to have a clear view of the screen which adversely affects the demonstration being given.

According to the present invention, there is provided a computer having a base, a display arrangement comprising first and second displays, comprising respective screens and means for pivotally connecting the
15 displays together and to the base, the means for pivotally connecting being arranged to permit the displays to be pivoted from a closed position in which the associated screens are protected by the base to an open position in which the screens face away from each other.

In a preferred embodiment of the invention, the means for pivotally
20 connecting comprises hinges connecting the displays to each other and to the base. The hinges are advantageously disposed between adjacent edges of the first and second displays and between another edge of the first

display and one edge of the base. The hinges between the adjacent edges of the first and second displays are such as to permit the displays to adopt an inverted V-shape together when in the operative as opposed to the closed or stored position. The hinges may be at the apex of the 'V' or
5 between the ends of the legs of the V. These hinges when at the apex of the 'V' are such as to permit the second display to be rotated through more than half a rotation or less than half a rotation to bring it into line with the first display. In the latter case a protective cover may be provided to cover the screen of the second display when in the closed or stored position. This
10 protective cover may be pivotally connected to the second display and may provide a support for the displays in the open operative position.

In order that the invention may be more clearly understood, several embodiments thereof will now be described, by way of example, with reference to the accompanying drawings, in which:-

15 **Figures 1a and 1b** diagrammatically show a conventional laptop computer in the closed and open positions,

Figure 2 diagrammatically shows in perspective view a laptop computer incorporating a display according to the invention,

Figure 3 diagrammatically shows in perspective view the computer of
20 **Figure 2** in a closed position,

Figures 4a and 4b diagrammatically show views respectively corresponding to **Figures 1a and 1b** for a modified form of the computer,

Figures 5a and 5b diagrammatically show views respectively corresponding to Figures 4a and 4b for a further modified form of the computer, and

Figures 6a and 6b diagrammatically show views respectively corresponding to Figures 4a and 5b for a still further modified form of the computer.

Referring to Figures 1a and 1b the standard laptop computer comprises a base 1 and lid 2. The base usually houses the keyboard and most of the computer circuitry and any ancillary devices such as a floppy disc reader/writer and CD-rom reader and the lid 2 houses the display 4. The base 1 and lid 2 are pivotally connected together by hinges 3 which enable the lid 2 to be placed in any suitable angular position relative to the base 1 for ease of viewing the screen of the display in the lid. When closed, as shown in Figure 1a, the display 4 faces the base 1 and is protected by the lid 2 of the computer.

Referring to Figures 2 and 3, the laptop computer according to the invention comprises a base 21 which houses the keyboard 22, circuitry and ancillary devices already mentioned. There are two displays 23 and 24. The display 23 is pivotally connected to the base 21 by means of cable way containing long hinges 25 through which electrical connections between the circuitry in the base and the display 23 are made. The display 23 is also connected through its upper edge 26 to the upper edge 27 of the display

24. The connection comprises two short hinges 2 which provide a cableway through which electrical connections between the two displays are made. The hinges 25 need only permit the base and display 23 to rotate through 180° with respect to each other whereas the hinges 28 permit the displays 23 and 24 to rotate through more than 270° with respect to each other.

Figure 2 shows the computer in the open operative position with the displays adopting an inverted V-shape. In this position the computer operator would normally sit at the keyboard 22 with the display 23 directly in front, whilst the customer/associate would sit opposite with the display 24 directly in front. In this way the operator would be able to control the content of both displays and both the operator and the customer/associate would have a clear view of the information displayed on the respective screens. If desired the displays could display the same information or the information could differ from display to display. This is a much more comfortable and satisfactory arrangement than having to rely upon an arrangement with a single display where it is difficult for both customer/associate and operator to see the single screen clearly together and where it may even be necessary to move the display between customer/associate and operator. It will be appreciated that both displays may be adjusted as desired to give the best viewing angle. In the position shown in Figure 2, both displays are disposed at approximately 60° to the horizontal plane with the base 21 of the computer on the horizontal plane.

This angle can be adjusted by pivoting display 23 in relation to the base 22 and display 24 in relation to display 23. Different viewing angles may be chosen for the displays by having the displays at different angles to the horizontal plane. This may mean that the display 24 may be provided is supported only by hinged 28 and if necessary a support under the lower edge of the display 24 on the surface on which the computer is supported.

To close the computer up the display 24 is rotated relative to the display 23 through an angle of more than 270° until the screens of the displays 24 and 23 are aligned facing each other and therefore protected. The two displays together may then be pivoted with respect to base 21 onto the keyboard 22 into the fully closed or stored position shown in Figure 3.

Figures 4a and 4b diagrammatically show a modification of the embodiment of Figures 2 and 3. In this modification the two displays 23 and 24 are pivotally connected together and to the base 21 substantially as before. They also adopt similar open positions (as shown in Figure 4b) but the manner in which they are pivoted to the closed position (as shown in Figure 4a) differs. Further, a protective cover 29 is pivotally connected to the lower edge 30 of the display 24 and in the open position provides a support for the displays 23 and 24. When closing from the open position shown in Figure 4b to the closed position shown in Figure 4a the cover 29 is closed over the display 24 to protect its screen and this assembly pivoted

through the acute angle α to the other display 23. The displays and cover may then be pivoted over the base into the position shown in Figure 4a in which both display screens are protected.

5 Figures 5a and 5b diagrammatically shown a further modification in the closed and open positions respectively. In this modification hinges 35 and 38 pivotally connecting the base 1 and displays 23 and 24 together permit the displays and base to be pivoted together in a manner similar to the embodiment of Figures 2 and 3 but with the displays further laterally displaced from one another when in the open operative positions. For this purpose the hinges 38 are pivotally connected to those edges 39, 40 of 10 displays 23 and 24 which are adjacent in the open position. Hinges 35 are pivotally connected between the lower edges 41 of the base and the lower edge 42 of display 23.

15 Figures 6a and 6b diagrammatically show a still further modification in the closed and open positions respectively. In this modification displays 23 and 24 are pivotally connected together at adjacent lower edges 43 and 44 and the other lower edges of display 23 is pivotally connected to the adjacent upper edge 45 of the base 1. In moving from the open position of Figure 6b to the closed position of Figure 6a, display 24 is pivoted to one 20 side of the base 1 and display 23 to the other so that the base 1 is sandwiched between the two displays 2 and 24 with the screens of the displays facing inwards and therefore protected.

It will be appreciated that the above embodiments have been described by way of example only and that many variations are possible without departing from the scope of the invention.

CLAIMS

1. A computer having a base, a display arrangement comprising first and second displays, comprising respective screens and means for pivotally connecting the displays together and to the base, the means for pivotally connecting being arranged to permit the displays to be pivoted from a closed position in which the associated screens are protected by the base to an open position in which the screens face away from each other.

5

2. A computer as claimed in claim 1, in which the means for pivotally connecting comprises hinges connecting the displays to each other and to the base.

10

3. A computer as claimed in claim 2, in which the hinges are disposed between adjacent edges of the first and second displays and between another edge of the first display and one edge of the base.

4. A computer as claimed in claim 3, in which the hinges between adjacent edges of the first and second displays are such as to permit the displays to adopt an inverted V-shape.

15

5. A computer as claimed in claim 4, in which the hinges are disposed at the apex of the V.

6. A computer as claimed in claim 5, in which the hinges permit the second display to be rotated more than half a rotation from an operative position to bring it into line with the first display.

20

7. A computer as claimed in claim 5, in which the hinges permit the second display to be rotated less than half a rotation from an operative position to bring it into line with the first display.

5 8. A computer as claimed in claim 7, in which a protective cover is provided to cover the screen of the second display when in the closed or stored position.

9. A computer as claimed in claim 8, in which the protective cover is pivotally connected to the second display and is operative to provide a support for the displays in the open operative position.

10 10. A computer as claimed in any of claims 2 to 9, in which the hinges are cableway containing long hinges housing electrical connections between base and displays.

15 11. A computer substantially as hereinbefore described with reference to Figures 2 and 3, Figures 4a and 4b, Figures 5a and 5b or Figures 6a and 6b of the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0101379.6
Claims searched: 1-11

Examiner: Ben Micklewright
Date of search: 8 July 2002

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed. T): G4A (ADT)
Int CI (Ed.7): G06F (1/00)
Other: Online: WPI, EPODOC, PAJ, INSPEC, XPESP, IBM TDB, COMPUTER, IEL

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	EP 1037132 A2 (DIETZ) See e.g. the figures	1-11
X	EP 0971283 A1 (LIN) See e.g. the figures	1-11
X,E	WO 01/02536 A2 (SCHWEIZER) See e.g. the abstract and the figures	1-8,10
X	WO 00/39493 A1 (MOSCOVITCH) See e.g. figures 34,35,37,42 and pages 20-22	1-11
X	WO 99/35555 A1 (SCHWEIZER) See e.g. the figures	1-11
X	WO 99/31649 A1 (COMOLATTI) See e.g. the figures	1-11
X	DE 29904821 U1 (PROPSTER) See e.g. the figures	1-11
X	DE 9406985 U1 (IBW) See e.g. the figures	1-11

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.