A DEVICE COMPRISING A COMPUTER AND INTEGRATED TELECOMMUNICATION APPARATUS

This invention relates to a portable device comprising a computer and integrated telecommunication apparatus, where the computer, the computer keyboard, the display facility and the telecommunication apparatus are accommodated in modules which are mounted so that they can rotate about a common axis.

A device of this kind is disclosed in the text of DE 296 10 265 U1. In a closed or folded state, the computer keyboard and the display surface abut each other at the inner surfaces of the two modules, while the keyboard of the telecommunication apparatus and the microphone, the loudspeaker and a display to display entered digits or characters are arranged on the surface of the module which is directed away from the display surface.

With this device it must be considered a disadvantage that when the display surface is marked by means of an input pen only one possible stable position of the two modules with respect to each other, namely the unfolded or open state, can be occupied. In this respect, the device must rest on a level hard base because the modules cannot be fixed in this position.

Since the telephone keyboard likewise rests on the base in the unfolded state, when the device is switched on an unintentional actuation of telephone keys can result.

The present invention seeks to provide a device of the type named in the introduction in which operability is substantially facilitated.

According to the invention, there is provided a portable device comprising a computer and integrated telecommunication apparatus, where the computer, a computer keyboard, a display facility and the telecommunication apparatus are accommodated in modules

which are mounted so that they can rotate about an axle which is common to them, wherein the device is assembled from a system unit, a display unit and a keyboard unit, whereby the system unit and the keyboard unit can be locked with respect to each other in a closed position and in an open position in which the system unit and the keyboard unit are rotated by 180° with respect to each other, while the display unit arranged between them can be adjusted and locked at an angle of 0 to 90° with respect to the system unit.

With a design of this kind the device only needs to be unfolded or opened by 180° for the input of data or for the marking of the display unit and, because the device is locked in this position, it forms a stable base for the rotatable display unit. This device configuration is provided for mobile use, for example in a train, whereby the display unit preferably rests on the system unit. When the opened device is placed on a fixed base, for example on a table, after the release of a lightweight mechanical latch the display unit can be brought into a desired inclined position and can be locked in this position. The desired inclined position is at an angle of 0° to 90° with respect to the system unit, and more preferably at an angle of 45° to 90°. The locked position of the system unit and keyboard unit and the fixed inclined position of the display unit guarantee that the device does not tip over when operated on by an input pen, i.e. as a result of mechanical pressure on the display facility. It is also conceivable that when the device is opened, the display unit is automatically brought into a preferred inclined position and is fixed therein. If necessary, after the latch is released, the display unit can be returned into a flat base position (resting on the system unit). Furthermore, there can be the possibility of rotating the display unit by an angle of

more than 90° to be able to carry out replacement and maintenance jobs on the system unit.

In order to avoid an unintentional actuation of keys or other control elements as with the known device previously described, according to another development of the invention the surfaces of the system unit and keyboard unit which are on the outside when the device is in the folded state are free of these input elements. In this way, even when the device is switched on during transportation or in the unfolded state, no input elements can be pressed, this again increasing the safety of the device.

In this respect, the telecommunication apparatus can be integrated advantageously into the system unit with the modules and components necessary for its operation, such as loudspeaker, microphone, connection and disconnection device and aerial. In this respect, the connection and disconnection device and the loudspeaker, the microphone and the aerial can be arranged on the end faces or on an inner surface of the system unit which is not covered by the keyboard unit, with the result that telephoning is possible when the device is in the folded state. When the device is open, call numbers can be entered by way of the keyboard unit or, with appropriate operator interfaces stored or entered on the display unit, by means of an input pen.

In addition to the telecommunication apparatus, the system unit can furthermore comprise a computer platform, fixed and replaceable peripheral components, sockets and an attachable battery compartment. In this respect, the computer platform contains the computer and memory components, while non-volatile memories and reading devices are provided as fixed peripheral components. SIM cards and memory cards can be used as peripheral components which can be replaced as required

in each case, the cards being supplied by way of the surface of the system unit. These cards can be inserted, for example, by way of receiving slots provided on the inner surface of the system unit.

Furthermore, the system unit can be designed in such a way that it has a receptacle for the display unit. In this way the display unit can be arranged in a space-saving manner within the system unit and in this way is securely supported in the unfolded state for mobile operation of the device.

The keyboard unit is substantially formed from a keyboard and an input pen located in a resting place, whereby the keyboard is supported in a keyboard housing which is closed at its outer surface by a snap-on cover. By removing this snap-on cover smaller maintenance jobs on the keyboard unit can be carried out quickly and easily. A further facilitation of the maintenance of the keyboard unit can be achieved by the keyboard being supported in a latched manner within the keyboard housing.

As already explained, the display unit is used for marking by means of the input pen or for retrieving characters arranged on operator interfaces by touching with the input pen (touch screen). The display unit has an LCD display and is mounted within frame-shaped housing parts.

Finally, the units can be designed in such a way that they can be replaced as entire modules for repair or for maintenance purposes.

For a better understanding of the present invention, and to show how it may be brought into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

In each case in a perspective representation,

Figure 1 shows the device comprising a computer and integrated telecommunication apparatus in the

closed state;

Figure 2 shows the device in the open or unfolded state;

Figure 3 shows a part of the device in a first fixed position;

Figure 4 shows a part of the device in a second fixed position;

Figure 5 shows an exploded view of the device.

The device 1 shown, comprising a computer and an integrated telecommunication apparatus is substantially composed of three individual components, namely a system unit, a display unit and a keyboard unit which are rotatably connected to each other by way of an axle which is common to them.

Figure 1 shows the device 1 in the closed, or shut, state. In this state the rear side of the keyboard unit 2 which is free of control elements and the inner side of the system unit 3 can be recognized. A switching-on and switching-off device 4 and a loudspeaker covering 5 and an aerial 6 for the telecommunication apparatus are arranged on the system unit 3. Moreover, a battery compartment 7 serving the power supply and containing batteries is fitted by means of a stop connection to the system unit. Furthermore, in the upper area of the picture a recessed grip 8 on the keyboard unit 2 can be recognized, while the switch to put the device 1 into and out of operation is denoted as 9.

By engaging behind the recessed grip 8 the keyboard unit is unfolded into the position shown in Figure 2. In the process, the keyboard unit 2 is rotated by 180° with respect to the system unit 3 and is locked in this position. The third component, the display unit 11, is likewise rotatably mounted about the axle 12 in a receptacle 10 within the system unit. Next to the axle 12 there is a depression-shaped

resting place for the input pen 14.

The position of the device shown in Figure 2 is provided, for example, for mobile use, for example when using the device in a train.

If, for better operability, there is to be a good view of the display unit on a fixed surface, for example a table, and if it is to be written on by the input pen 14 for example, one of the positions of the display unit shown in Figures 3 and 4 can be selected. For this purpose the display unit can be rotated out of the receptacle 10 into the desired position either continuously or also in screen steps and it can be latched in this position, while the positions of the keyboard unit 2 and the system unit 3 remain unchanged. On a hard base this has the great advantage that the latched display unit cannot tip over when being marked because the keyboard unit and system unit together form a stable base.

As a further variant it is also conceivable that the display unit 11, when the device 1 is opened, is automatically moved into a specified inclined position, from which it can be moved back into the position shown in Figure 2 after the stop connection is released.

Figure 5 shows in a perspective exploded drawing the substantial assembly of the device 1 which is assembled in the middle of the picture.

The system unit located in the upper level of the picture has, in addition to the already mentioned control elements 4 and 9, and the aerial 6, a computer platform 15 with the computer and the memory 16, corresponding modules 17 and components, for example loudspeaker 18 and microphone for communication operation, corresponding plug-in elements for receiving, for example, headphones, battery compartment and additional peripheral components, for example non-volatile memories, card-reading devices etc. The

computer platform 15 is closed by the covering 19 which has a rotary axle receptacle 20 on a longitudinal side. This covering 19 has on its side directed away from the computer platform 15 additional entrances, reachable from the outside, for the introduction of SIM cards for telephone operation or memory cards. When the device is switched on, a telephone connection can be established by inputting digits by way of the keyboard 27, by touching symbols appearing on the LCD display 22 or by writing digits or characters with the input pen 14 on the LCD display 22. The outer surface of the system unit 3 present when the device is in the folded state is free of control elements, like the outer side of the keyboard unit 2, with the result that an unintentional initiation of any functions when the device is switched on by mistake is excluded.

The display unit shown in the middle of the picture is composed of the covering frame 21, the LCD display 22 with ribbon cable 26, the spacing plate 23, the display housing 24 and a holding part 33. Two rotary axle receptacles 25 are in turn arranged on the display housing 24 on one of its longitudinal edges.

As already mentioned, for the purpose of character input by means of an input pen 14, the display unit 11 can be supported either flat within the receptacle 10 of the system unit 3 or it can be set upright at a specified angle of up to 90° and fixed in this position. However, the display unit 11 can also be rotated by an angle of more than 90° in order to make better access possible to the peripheral units on the surface of the system unit 3.

The keyboard unit 2 shown in the lower half of the picture comprises the keyboard 27 with the ribbon cable 28 which is introduced into the keyboard housing 29 and is arrested there, for example by means of the holding device 30. A cover 31 is snapped onto the outer side

which is present when the device is in the folded state, which cover makes access possible to the component parts of the keyboard unit 2 if necessary. Moreover, the place of deposit 13 for the input pen 14 is introduced into the keyboard housing 29. On a longitudinal edge of the keyboard housing there are in turn conically running bearing bushes 32 to receive the axle which is common to all three components.

The keyboard unit and the display unit 2 and 3 can be replaced as entire modules for maintenance and repair jobs.



CLAIMS

1. Portable device comprising a computer and integrated telecommunication apparatus, where the computer, a computer keyboard, a display facility and the telecommunication apparatus are accommodated in modules which are mounted so that they can rotate about an axle which is common to them, wherein the device is assembled from a system unit, a display unit and a keyboard unit, whereby the system unit and the keyboard unit can be locked with respect to each other in a closed position and in an open position in which the system unit and the keyboard unit are rotated by 180° with respect to each other, while the display unit arranged between them can be adjusted and locked at an angle of 0 to 90° with respect to the system unit.

2. Device according to claim 1, wherein when the device is in the closed position the external surfaces of the system unit and the keyboard unit are free of input elements.

3. Device according to claim 1 or 2, wherein the telecommunication apparatus with the modules and components necessary for its operation, such as loudspeaker, microphone, switching-on and switching-off device and aerial, is integrated into the system unit.

4. Device according to any preceding claim, wherein the system unit is formed by a computer platform, fixed and replaceable peripheral components, sockets and an attachable battery compartment.

5. Device according to claim 4, wherein the computer platform contains the computer and memory components.

6. Device according to claim 4 or 5, wherein non-volatile memories and reading devices are provided as fixed peripheral components.

7. Device according to one of claims 4-6, wherein SIM cards and memory cards are used as

replaceable peripheral components, which are supplied to the system unit by way of the surface.

8. Device according to one of claims 4-7, wherein the system unit has a receptacle for the display unit.

9. Device according to any preceding claim, wherein the keyboard unit contains the keyboard and an input pen, whereby the keyboard is supported in a keyboard housing which is closed by a snap-on cover on its outer surface.

10. Device according to claim 9, wherein the keyboard is supported in a latched manner within the keyboard housing.

11. Device according to any preceding claim, wherein the display unit has an LCD display which is supported in frame-shaped housing parts.

12. Device according to claim 11, wherein the LCD display is introduced by way of a spacing plate into a display housing which is closed by a covering frame.

13. Device according to any preceding claim, wherein the individual units can be replaced as complete modules.

14. A device substantially as described herein with reference to the accompanying drawings.