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FOLDABLE PORTABLE COMMUNICATION MACHINE

Abstract

PROBLEM TO BE SOLVED: To improve operability, to make a design to be clean-cut, to improve the strength of a casing case and to improve the formability of the casing. SOLUTION: A first easing 1, a second casing 2, a rocking axis 7 connecting the first easing 1 and the second easing 2 so that they can rock and a key 4 arranged on the rocking axis 7 are installed. A first face 8 that the first casing 1 has and a second face 9 that the second casing 2 has can be folded so that they are almost matched. The key 4 can be turned with a turning axis 13 as a center and the key 4 outputs a rotating direction. The number of keys arranged on the surface of the casing is reduced and the area of the opening part of the casing becomes small. The turning axis 13 is almost matched with the rocking axis 7. The key 4 can move in parallel to a direction 15 vertical to the turning axis 13 and it outputs on or off based on parallel movement. In the folded state, the key 4 is exposed to an outer part and a user can operate the key 4. A display part 19 is included in a third face 18 exposed to the outer part. When the key 4 is operated in the folded state, an operation situation is displayed on the display part 19.

BACKGROUND OF THE INVENTION 1. Field of the Invention The present invention relates to a foldable portable communication device, and more particularly to a foldable portable communication device that has good operability and can further improve the strength and formability of a housing case.

2. Description of the Related Art A portable communication device is required to be downsized in order to enhance its portability. A foldable portable communication device that can be folded by connecting it with a hinge so that it can be folded when it is not in use, it is easy to operate when using it, and the display is easy to see. Is being developed.

In addition, the number of key buttons in the mobile communication device increases as the number of functions increases, and the design becomes complicated. Menu selection is used for the operation in order to reduce the number of key buttons. Scroll keys are useful for selecting menus. The scroll key is also used for scrolling the information displayed on the display unit of the mobile communication device.

In the known folding portable communication device shown in FIG. 5, a display side casing 101 having a display unit 105 and a button side casing 102 having a key button 106 and a button type scroll key 104 can be folded by a hinge portion 103. Are linked to. In such a button type scroll key 104, the user must press the key many times in order to scroll the items displayed on the display unit 105. Further, in such a button side casing 102, the area of the opening portion in which the button type scroll key 104 is accommodated is large. Due to such an opening, the strength of the housing is weakened, and the fluidity of the material is poor and the moldability is poor when the case of the housing, which is a mold-molded product, is molded.

SUMMARY OF THE INVENTION An object of the present invention is to provide a foldable portable communication device having good operability and a clean design. Another object of the present invention is to provide a foldable portable communication device in which the housing case has high strength. Yet another object of the present invention is to provide a foldable portable communication device having a good casing case formability.

[Means for Solving the Problem] Means for solving the problem is expressed as follows. The technical matters appearing in the expression are accompanied by parentheses () and added with numbers, symbols and the like. The numbers, symbols and the like are technical matters constituting at least one embodiment or a plurality of examples of the embodiments or a plurality of examples of the present invention, particularly the embodiment or the examples. It corresponds to the reference numbers, reference symbols, etc. attached to the technical matters expressed in the drawings corresponding to. Such reference numbers and reference symbols clarify correspondences and bridges between the technical matters described in the claims and the technical matters of the embodiments or examples. Such correspondence/bridging does not mean that the technical matters described in the claims are interpreted as being limited to the technical matters of the embodiments or examples.

A foldable portable communication device according to the present invention includes a first housing (1), a second housing (2), and a first housing (1) and a second housing (2) which are swingably connected. Including a swing shaft (7) and a key (4) arranged on the swing shaft (7), the first surface (8) of the first housing (1), and the second housing (The second surface (9) of 2) can be folded so as to substantially coincide with the second surface (9), and the key (4) has a rotation axis (13), and the rotation axis (13) is the center. It is rotatable and outputs the direction in which the key (4) rotates. By arranging the keys (4) as described above, the number of key buttons arranged on the surface of the housing is reduced, and the area of the opening of the housing case is reduced. The key (4) outputs two values depending on its rotation direction (14).

The pivot axis (13) preferably substantially coincides with the swing axis (7). The key (4) outputs the angle at which the key (4) rotates. Since the rotation angle corresponds to the number of outputs, usability is improved.

The key (4) is movable in parallel in a direction (15) perpendicular to the rotation axis (13), and outputs ON or OFF based on the parallel movement. With such a function, the number of key buttons arranged on the housing can be further reduced.

In a state where the first surface (8) and the second surface (9) are folded so as to substantially coincide with each other, the key (4) is exposed to the outside. In the folded state, the user can operate the key (4). Furthermore, in the state where the first surface (8) and the second surface (9) are substantially aligned with each other, including the display portion (19) arranged on the third surface (18) of the first housing (1), The third surface (18) is exposed to the outside. When the user operates the key (4) in the folded state, the operation

status of the foldable portable communication device (10) is displayed on the display unit (19). Such a display further improves usability.

The display unit (19) is preferably a light emitting diode. The display unit (19) is more preferably a liquid crystal display device.

BEST MODE FOR CARRYING OUT THE INVENTION Corresponding to the drawings, an embodiment of a foldable portable communication device according to the present invention is formed of a display side casing and a button side casing, and is rotated by a hinge portion connecting them. A scroll key is provided. The display-side casing 1 has a display side surface 8 and a display unit 5 on the display side surface 8, as shown in FIG. The button-side housing 2 has a button side surface 9 and a plurality of key buttons 6 on the button side surface 9. The display-side casing 1 is connected to the button-side casing 2 so as to be swingable around a shaft 7 included in the hinge portion 3. The mobile communication device 10 can be folded such that the display side surface 8 of the display side housing 1 and the button side surface 9 of the button side housing 2 are substantially overlapped with each other. The rotary scroll key 4 is arranged on the hinge portion 3.

FIG. 2 shows a cross section of the mobile communication device 10. The display-side casing 1 has a printed circuit board 11 inside. The button-side housing 2 has a printed circuit board 12 inside. The printed circuit board 11 and the printed circuit board 12 are electrically connected to each other by a flexible printed circuit board or a cable (not shown) in order to perform the function of the mobile communication device 10.

The rotary scroll key 4 has a rotation shaft 13 and can rotate in two rotation directions 14 about the rotation shaft 13. The rotating shaft 13 substantially coincides with the shaft 7 of the hinge portion 3. The rotary scroll key 4 is electrically connected to the printed board 11 or the printed board 12. The rotary scroll key 4 outputs the rotation direction and the rotation angle rotated by the user to the printed circuit board 11 or the printed circuit board 12. The rotary scroll key 4 has a switch unit 16. The rotary scroll key 4 can be pressed in a direction 15 substantially perpendicular to the rotary shaft 8 and substantially perpendicular to the display side surface 8 or the button side surface 9. The switch unit 16 outputs ON or OFF based on whether or not the rotary scroll key 4 is pressed in the direction 15.

By providing the rotary scroll key 4 on the hinge portion 3, the number of key buttons 6 arranged on the button side surface 9 of the button side body 2 is reduced. The reduction in the number of key buttons 6 makes the design of the portable communication device 10 cleaner and reduces the opening of the case of the button side body 2. The reduction of the case opening improves the strength of the case. The case is manufactured by molding. The reduction of the opening of the case further improves the moldability by improving the fluidity of the material during the molding of the case.

The function of the foldable communication device 10 is executed by menu selection using the rotary scroll key 4. A list of a plurality of items corresponding to the function of the foldable communication device 10 is displayed on the display unit 5, and one of the items is selected and displayed so as to be distinguishable from other items. When the rotary scroll key 4 is rotated, the selected and displayed item changes according to the rotation angle. By pressing the rotary scroll key 4 in the direction 15, the selected and displayed item is decided, and the function corresponding to the decided item is executed.

The rotary scroll key 4 is further used when scrolling the information displayed on the display unit 11. Examples of the information include telephone numbers and address books. When the rotary scroll key 4 is rotated, the displayed information is scrolled according to the rotation angle.

Button-type scroll keys require the user to press the key multiple times in order to change the item. The rotary scroll key 4 allows the user to select an item simply by rotating it with his/her finger, which is convenient.

In another embodiment of the folding portable communication device according to the present invention, a rotary scroll key can be used in a folded state. As shown in FIG. 3, when the folding portable communication device 10 is folded, the rotary scroll key 4 is exposed to the outside. An LED 19 is provided on the surface 18 of the display-side housing 1. The surface 18 is a surface opposite to the display side surface 8 of the display-side housing 1.

When the rotary scroll key 4 is rotated while the foldable portable communication device 10 is folded, the foldable portable communication device 10 performs necessary functions such as adjusting the incoming call volume and adjusting the sensitivity in the folded state. .. The LED 13 emits light based on this operation, and

notifies the user of the operating status of the function by changing the blinking interval, color tone, or illumination brightness. A liquid crystal display screen may be provided instead of the LED 19. In this case, the liquid crystal display screen displays the function in the folded state, and the function is executed by the menu selection.

In still another embodiment of the folding portable communication device according to the present invention, a sliding scroll key is provided on the hinge portion. The slide scroll key 21 has a rotary shaft 23, and the rotary shaft 23 is substantially aligned with the shaft 7 of the hinge portion 3. The slide scroll key 21 can swing in two rotation directions 24 about a rotation shaft 23, and does not rotate more than a predetermined angle from the initial angle. When the user swings the slide scroll key 21 and stops the swing, the slide scroll key 21 returns to the initial angle. The slide scroll key 21 is electrically connected to the printed circuit board 11 or the printed circuit board 12. The sliding scroll key 21 outputs the rotation direction rotated by the user to the printed circuit board 11 or the printed circuit board 12.

The slide scroll key 21 has a switch unit 26. The slide scroll key 21 can be pressed in a direction 25 that is substantially perpendicular to the rotary shaft 23 and substantially perpendicular to the display side surface 8 or the button side surface 9. The switch unit 26 outputs ON or OFF based on whether or not the slide scroll key 21 is pressed in the direction 25.

In menu selection, the slide-type scroll key 21 is swung to change the selected and displayed item. When the sliding scroll key 21 does not return to the initial angle, the items selected and displayed continuously change. When the sliding scroll key 21 returns to the initial angle, the item change ends. When the slide scroll key 21 is pressed in the direction 25, the item that is selected and displayed is decided, and the function corresponding to the decided item is executed.

In the folding portable communication device according to the present invention, the scroll keys are arranged in the hinge portion, and the number of key buttons arranged on the surface of the housing is reduced. The reduction in the number of key buttons makes the design cleaner and reduces the opening of the housing case. The reduction of the opening of the case improves the strength of the case, improves the fluidity of the material during the molding of the case, and improves the moldability.