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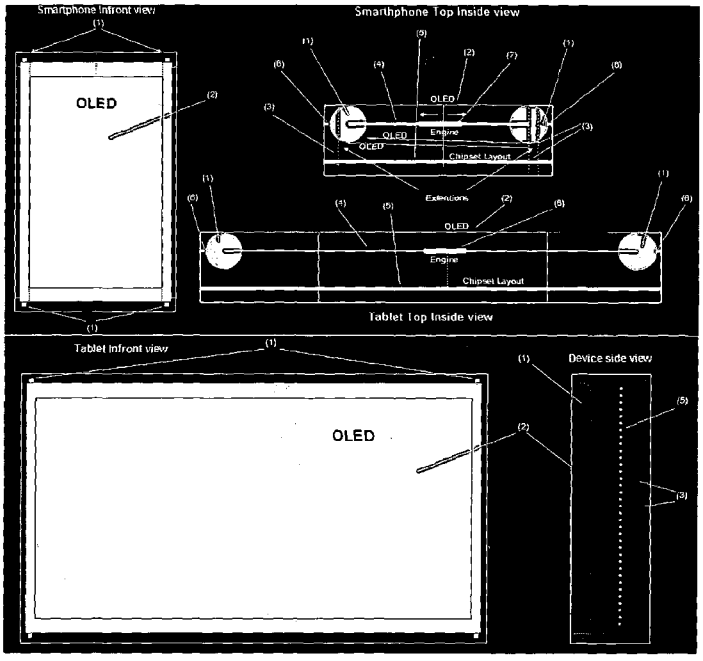
(54) **Title:** SMARTPHONE WITH OLED THAT TURNS INTO TABLET

Fig. 1



(57) **Abstract:** A smartphone device that turns into tablet and viceversa is described. The device includes an OLED (2) as touch screen display that allows its bending for the extention to tablet or riduction from tablet to smartphone thanks to its flexibility feature. The OLED is bended around two bars (1) which are attached (6) inside to the device cover. The bended parts of the display stand inside the device and they are disabled by a display software that manage the screen. They become part of the screen itself when the device turns into a tablet. The device cover is divided by two parts that are connected to two underlying extentions (3). They are moved by an extentioner (4) which is alimented by an engine **(7).** The device chipset (5) is comprised by different layers which get side by side when the device turns into tablet.

Description

Smartphone with OLED that turns into Tablet.

The invention is related to a smartphone with an OLED as a touchscreen display that turns into tablet and viceversa thanks to the extention of the device cover and the flexibility feature of the display. The invention permits to have one device for different use and to take advantage of having data stored in one place whenever the hardware is a smartphone, tablet or a screen attached to ah external keyboard for a small laptop.

The device includes a button which is meant to activate the engine and its either extention mode for smarthphone to tablet or reduction one from tablet to smartphone. The engine allows the extention through an extentioner which is attached to two OLED bending round bars as well as the reduction when the device is on its tablet mode. The extentioner is a coaxial bar which can change its lenght dimension. The engine makes the estentioner become longer to turn the smartphone into tablet and shorter for the transition from tablet to smartphone.

The device cover is divided in two parts in order to allow the device to get extended. They are attached to two underlying extentioners. Their lenght is almost the smartphone width which allow the tablet becomes 3 times larger than the smartphone.

The OLED touchscreen is bended around two round bars that keep the display in tension. It slides together with the two parts of device cover and the two underlying extentions during the transition from smartphone to tablet and from tablet to smartphone.

In the smartphone mode, the display software actives only the not bended part and when the device becomes a tablet by its extention, the software enable the rest of the display.
In the tablet mode when the transition button is pressed, the display software disables the part of the screen that gets bended and actives only the not bended one which is the display of the smarthphone. Also by this mode, the tablet can also be a screen of a small laptop by connecting it to an external keyboard.

Claims

1. A screen moveable between at least first and second configurations. The first configuration having a viewable region that is smaller than the viewable region in the second configuration.

2. A screen according to claim 1, wherein the lenght of the viewable region in the second configuration is approximately three times the width of the viewable region when in the first configuration.

3. A screen according to claim 1 and claim 2 wherein the screen is a flexible screen, for example an OLED screen

4. A device comprising a screen according to any one of claims 1 to 3; and a control means for selectively causing display on the viewable region of the device when the screen is in the first configuration and on the viewable region of the device when the screen is in the second configuration.

5. A device according to claim 4, wherein the control means comprises:

   - A processing means
   - At least one memory having computer program code thereon, wherein the processing means and the at least one memory including the code are together configured to perform the functionality of the control means when the code is executed by the processing means.

6. A device acccording to claim 4 and claim 5 further comprising means for moving the screen between the first and second configuration

7. A device according to claim 6 wherein the control means also controls the means for moving.

8. A device according to claim 7 further comprising a user control connected to the control means whereby operation of the usercontrol causes the control means to control the moving means to move the screen from one of the first and second configuration to the other of the first and second configuration

9. A device according to claim 8, wherein the user control is a physical switch , or swicth opearable by user touch on the viewable region that is presented to the user.

10. A device according to claim 8 wherein the screen is moveable from one to the other of the first and second configuration manually whereby the movement causes operation of the use control.

11. A device according to any one of claims 6 to 10, wherein the moving means comprises at least two members moveable relative to one another so that when the members are in a first relative disposition, the screen is in the first configuration, and when the members are in a second relative disposition, the screen is in the second configuration.

12. A device according to any one of claims 4 to 11, wherein the screeen is moveable to a third configuration having a third viewing region of different size to the size of the viewing regions when the screen is in the first or second configurations.

13. A device according to claim 12 when dependent on claim 11, wherein the at least two members are moveable to a third relative disposition in which the screen is in the third configuration.

14. A device according to any one of claims 4 to 13, wherein the device is changeable from one of a first mode in which the screen is in the first configuration and a second mode; in which the screen is in the second configuration, to the other of the first mode and the second mode.

15. A device according to clain 14 wherein the device includes at least one moveable member, which when in said first mode, extends substentially lenghthwise of said screen, wherein the screen extends around said at least one member so that a portion of said screen is inside the device, wherein the at least one member can be moved to increase the size of the viewing region.

16. A device according to claim 15, wherein the at least one member is comprises parallel first and second members, wherein the screen extends around respectively far side of each of the first and second members, such that first and second portions of the screen are located in the device when the device is in its first mode.

17. A device according to claim 16, wherein each of the first and second portions comprises approssimately 1/3 of the area of the screen.

18. A device according to claim 16 and claim 17, wherein the moving means is configurated to alter the distance between the parallel members, such that at least parts of the first and second portions slide around the first and second members, so as to form part of the viewable region.

19. A device according to any one of claims 14 to 18, wherein the device comprises a casing covering the back of the device when in the first mode, wherein the casing is expandible so as to cover the back of the device when the device is in said second mode.

20. A device according to claim 19, wherein the casing comprises at least two parts slidable relative to one another, wherein the moving means can be operated to move the at least two parts from a first relative disposition to a second relative disposition, wherein in said first relative disposition the casing of the back of the device is of an area roughly corresponding to the size of the viewable region when the screen is in its first configuration, and in said second relative disposition the casing is of an area roughly corresponding to the size of the viewable region when the screen is in its second configuration.

21. A device according to claim 20, wherein the planes of the at least two parts are substantially parallel when the device is in its first mode and wherein the parts are substantially coplanar when the device is in its second mode.

22. A device according to claim 19 or claim 20, wherein the casing comprises three parts slidable relative to one another.

23. A device according to any one of claims 3 to 22, wherein, when the device is in its dfirst mode it is in the form of a mobile telephone or pda and when the device is in its second mode the device is in the form of a tablet.

24. A method of moving a device between a first mode in which a viewing region of a screen is of a first size, and a second mode is of a second size different to said first size, comprising:

- determining that the device is to move from one of the first mode and the second mode to the other of the first mode and the second mode;
- causing a moving means to extend or reduce the size of the screen accordingly;
- causing the casing to expand or reduce so as to correspond approximately to the size of the viewing region.

25. A method according to claim 24, further comprising causing display on the screen to be in the current viewing region.

26. Apparatus comprising a processor and a memory including computer program code; the memory and the computer program code configured to, with the processor, cause the apparatus at least to perform the steps of claim 24 and 25.

27. A computer program comprising computer program code, which, when executed on processing means, causes the processing means to perform the steps of claims 24 and 25.

28. A computer readable storage medium embodying the computer program of claim 27.

29. Apparatus substantially as hereinbefore described with reference to the accomapanying drawings

30. A method substantially as hereinbefore described with reference to the accompanying drawings.

31. A computer program or computer readable storage medium substantially as hereinbefore described with referende to the accompanying drawings.

32. A device according to any one of claims 3 to 23, wherein the device is attachable to an external keyboard when the device is in the second mode.

33. A device according to claim 32, wherein the device includes at least one connector element and the keyboard includes at least one corresponding connector element, so that the device can be connected when in the second mode to the keyboard so that the keyboard is operable as a control of the device, and so that the device is supported in a viewing position by said keyboard.

34. A device according to claim 33, wherein the device and keyboard each include two or three respectively corresponding connector elements.

Drawing

Fig. 1

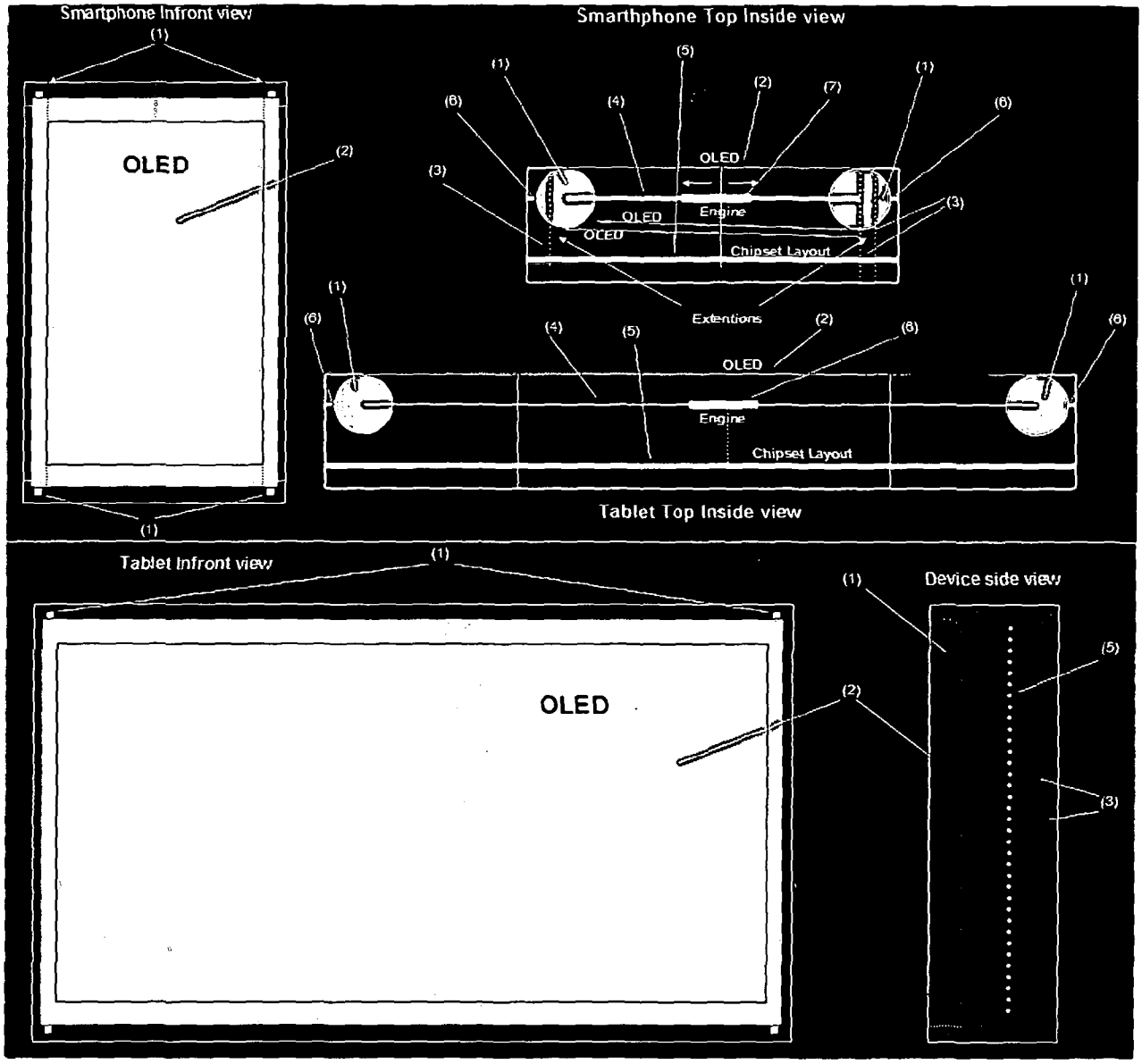


Fig. 2

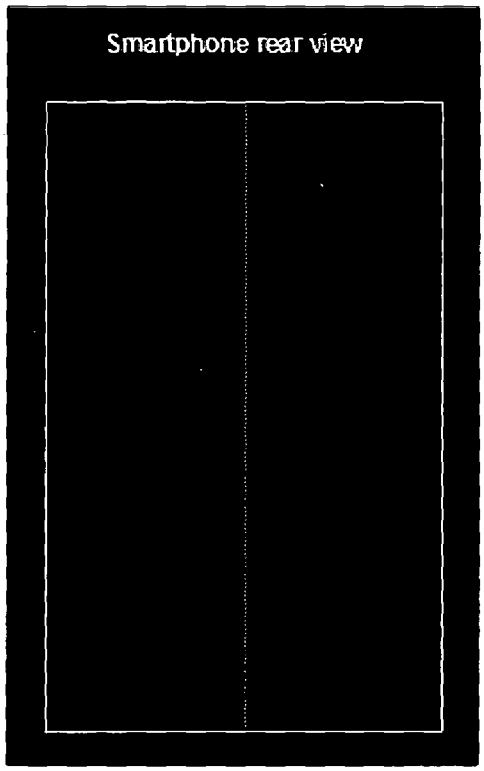


Fig. 3

Fig. 4

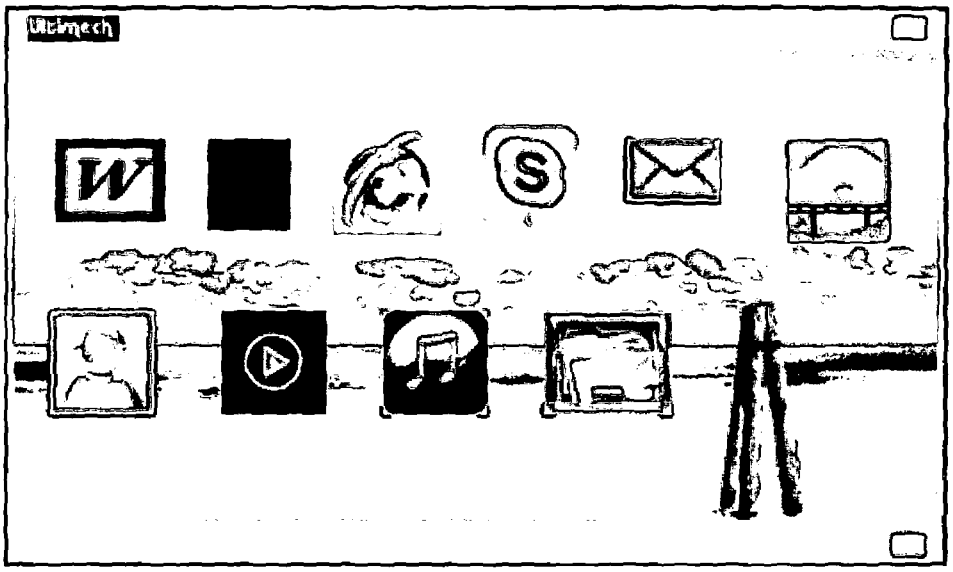


Fig. 5