

## PORTABLE TERMINAL WITH FLEXIBLE DISPLAY

### PRIORITY

**[0001]** This application claims the benefit under 35 U.S.C. §119(a) of a Korean Patent Application filed in the Korean Intellectual Property Office on Dec. 21, 2006 and assigned Serial No. 2006-131810, the entire disclosure of which is hereby incorporated by reference.

### BACKGROUND OF THE INVENTION

**[0002]** 1. Field of the Invention

**[0003]** The present invention relates to a portable terminal with a flexible display.

**[0004]** 2. Description of the Related Art

**[0005]** Conventional portable terminals generally use a Liquid Crystal Display (LCD) having a fixed size and a keypad. Although the LCD of a fixed size has been widely used in various fields, its size cannot be increased in a terminal designed for easy portability. To solve the problem, a flexible display capable of achieving both easy portability and size diversity has been developed.

**[0006]** A terminal having the flexible display mounted therein can be easily carried and its size can also be increased, thereby meeting user's demand.

**[0007]** However, a terminal having a flexible display for practical use has not yet been developed. Therefore, there is a need for a portable terminal which can be easily carried and allows a user to enjoy various moving picture contents with a large display screen.

### SUMMARY OF THE INVENTION

**[0008]** An aspect of the present invention is to address at least the above problems and/or disadvantages and to provide at least the advantages described below. Accordingly, an aspect of the present invention is to provide a portable terminal which includes a display having the overall small and broad size to maintain conventional portability.

**[0009]** According to one aspect of the present invention, there is provided a portable terminal. The portable terminal includes a first housing in which a portion of a flexible display is embedded in such a way to be inserted or drawn from the first housing, a second housing which faces or is separated from the first housing and in which the other portion of the flexible display is embedded in such a way to be inserted or drawn from the second housing, and locking units for fixing the first housing and the second housing in order to expose or hide the flexible display.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0010]** The above and other features and advantages of an exemplary embodiment of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which:

**[0011]** FIG. 1 illustrates a process in which a terminal according to the present invention is transformed according to a user's purpose;

**[0012]** FIG. 2 illustrates perspective view of a first housing and a second housing according to the present invention;

**[0013]** FIG. 3 illustrates cross-sections of a first housing and a second housing, viewed from top;

**[0014]** FIG. 4 illustrates cross-sections of a first housing and a second housing, viewed from top, when the first housing and the second housing are fixed in another shape;

**[0015]** FIG. 5 illustrates a keypad at a side of a first housing and a second housing when a portion of a flexible display is exposed;

**[0016]** FIG. 6 illustrates a soft key in a flexible display whose portion is exposed; and

**[0017]** FIG. 7 illustrates a process in which a support at a side of a first housing and a second housing is unfolded.

**[0018]** Throughout the drawings, the same drawing reference numerals will be understood to refer to the same elements, features and structures.

### DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENT

**[0019]** The matters defined in the description such as a detailed construction and elements are provided to assist in a comprehensive understanding of an exemplary embodiment of the invention. Accordingly, those of ordinary skill in the art will recognize that various changes and modifications of the embodiment described herein can be made without departing from the scope and spirit of the invention. Also, descriptions of well-known functions and constructions are omitted for clarity and conciseness.

**[0020]** The present invention provides a portable terminal that can be easily carried and allows a user to enjoy various moving picture contents with a broad Liquid Crystal Display (LCD) window using a flexible display having a flexible LCD. To implement such a function, the portable terminal according to the present invention has a structure in which the flexible LCD can be drawn or inserted and the size of the flexible display can be adjusted according to user's purpose.

**[0021]** FIG. 1 illustrates a process in which a terminal according to the present invention is transformed according to a user's purpose. In step S100, the terminal includes a first housing and a second housing that face each other. Rotation members capable of rolling up a flexible display are included in the first housing and the second housing. The flexible display may be a flexible LCD made of a thin film. In step S100, a face 3 of the first housing and a face 7 of the second housing face each other. This structure can be implemented by fixing a locking unit of the first housing and a locking unit of the second housing to each other while those locking units face each other. A user can carry the portable terminal in a state as illustrated in step S100. FIG. 2 illustrates an exemplary purpose for which the user can use the portable terminal in the state as illustrated in step S100. In other words, a small LCD 10 is provided in a face 1 of the first housing and a keypad 12 capable of controlling the LCD 10 is provided in a face 5 of the second housing. Thus, the user can enjoy an MP3 function. If the keypad 12 is composed of numeric keys, the user can perform call transmission/reception using the LCD 10 and the keypad 12. Other functions may also be implemented by manufacturers for various purposes.

**[0022]** In step S200, the user separates the first housing and the second housing from each other and thus the embedded flexible display is exposed. At this time, a portion of the flexible display is exposed by rotation of the rotation members of the first housing and the second housing. Step S200 is a process for causing the first housing and the second housing to have a shape illustrated in step S300.

**[0023]** In step S300, a face 4 of the first housing and a face 8 of the second housing face each other. This structure is