

BRaille CELL

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a braille cell improved in its maintenance and manufacture and, more particularly, it relates to a braille cell used as a personal electronic terminal to transmit information, without using any sheet of paper, to persons who have trouble with their eyes.

When the conventional braille cell of this kind is often used, tactile pins which are most often touched by fingers and those portions of a member which enclose these tactile pins become severely worn and dirty. When the tactile pins and the member become unduly worn and dirty, they must be replaced with new ones. In addition, piezoelectric element reeds which make the tactile pins operative are relatively often broken and this also requires them to be replaced with new ones.

As disclosed in Japanese Utility Model Disclosure Sho 62-71673, European Patent No. 0237090 and U.S. Pat. No. 4758165, the braille cell includes the tactile pins provided on free ends of the piezoelectric element reeds and projected outside from a finger scanning section at the tips thereof. In the case of these finger scanning section and tactile pins, dust adheres to their exposed portions and to pins-inserting holes as well. In addition, they are made dirty by greasy fingers when they are unceasingly and directly touched by fingers to touch-read braille characters. However, the conventional tactile section is formed integral to a base body of the braille cell. This makes it impossible to detach the tactile section from the base body while holding the tactile pins therein, or wash the tactile section as a unit and to exchange the tactile section with a new one.

Piezoelectric element reeds disclosed by Japanese Utility Model Disclosure Sho 62-71673 are directly bonded to the base body by adhesive. This makes it difficult to exchange the piezoelectric element reeds with new ones. A support member disclosed in European Patent No. 0237090 and U.S. Pat. No. 4758165 is U-shaped to hold piezoelectric element reeds in its curved inner face and is bonded to a frame by adhesive. This also makes it difficult to exchange the piezoelectric element reeds with new ones. These conventional braille cells make it difficult to exchange the piezoelectric element reeds with new ones, and the whole braille cell must be sometimes exchanged with a new one to exchange the piezoelectric element reeds with new ones.

SUMMARY OF THE INVENTION

The present invention is therefore intended to eliminate the above-mentioned drawbacks and the object of the present invention is to provide a braille cell capable of making the maintaining and controlling of the electronic braille terminal easier, the maintaining, exchanging and assembling of the braille cell easier, and enabling of washing of the tactile section and the tactile pins as a unit without detaching the tactile pins from the tactile section.

This object of the present invention can be achieved by a braille cell comprising plural piezoelectric element reeds which are bent at the front ends thereof when a DC voltage is applied to them, a base body to which the piezoelectric element reeds are fixed at the base ends thereof through a printed circuit board which supports

the piezoelectric element reeds piled like steps at a certain interval, and tactile pins provided on corresponding free ends of the respective piezoelectric element reeds, wherein a tactile section for holding the tactile pins and provided with a detachably attaching means is detachably attached to the base body.

The present invention also comprises fixing plates for defining the piezoelectric element reeds in left and right directions are detachably attached to both sides of the base body.

The present invention also comprises allowing the piezoelectric element reeds to be attached to the base body without using any adhesive is detachably supported and fixed to the base body.

The present invention also comprises providing a cap for the tactile section for holding the tactile pins therein.

As described above, the following merits can be provided by the braille cell of the present invention.

1) The tactile section for holding the tactile pins therein is detachably attached to the base body. This makes it easier to maintain the tactile pins and the tactile section and to exchange them with new ones. The maintaining work of them can be thus made simpler.

2) The tactile section for holding the tactile pins therein is detachably attached to the base body. This enables the tactile section and the tactile pins to be washed as a unit without detaching the tactile pins from the tactile section. Therefore, pin-inserting holes can be also more easily washed in addition to the tactile pins and the exposed portion of the tactile section.

3) The cap attached to the tactile section makes it easier to maintain and exchange the tactile pins with new ones.

4) The fixing plates detachably attached to the both sides of the base body makes it easier to attach and assemble the piezoelectric element reeds with the base body.

5) The attaching of the piezoelectric element reeds can be achieved without using any adhesive and the print circuit board can be detached from the base body. This makes it easier to exchange the piezoelectric element reeds and the print circuit board with new ones.

6) Stoppers against which free ends of the piezoelectric element reeds are struck can prevent the piezoelectric element reeds from being broken by impacts caused during transportation and reduce the chattering of them.

Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate presently preferred embodiments of the invention, and together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

FIGS. 1A and 1B are plan and side views showing the braille cell according to a first embodiment of the present invention;