

and 25 respectively, for instance of silver, nickel or gold.

As shown in FIG. 5, the conducting layers 24 and 25 end shortly before the attachment end of the reed. However, the central leaf 21 of conducting materials extends beyond the piezoelectric layers 22 and 23 by means of an extension 27.

At a braille end opposite extension 27, the central leaf 21 ends short of this end of the reed. Therefore, the conducting layers 24 and 25 can be connected with a connection member 26 without any danger of contact with leaf 21.

A voltage source 40 is provided to supply a central voltage to either central leaf 21 or the connected together conducting layers 24 and 25 and a second voltage to the other of central leaf 21 and conducting layers 24 and 25. The second voltage is selected from a predetermined voltage value above or an equal value below the central voltage.

At the other end of the reed, the extension 27 of the central leaf is sufficiently stiff to allow a stable attachment, for instance by means of soldering or welding, to a plate 28. Plate 28 may, for instance, be a print plate locally having conducting parts or webs 32.

FIGS. 4 and 6 show how the reed 10 is clamped between the support baffles 5 and 6 by means of a clip 29. Clip 29 has a U-shape, with plane outer surfaces engaging the baffles 5 and 6 respectively, and inner surfaces having a convex shape 30. This clip engages a round abutment part 31 (see FIGS. 3 and 4) applied to the central baffle 3 and serving the additional purpose to prevent the reeds 8-11 from engaging the central baffle 3.

The device shown in in the drawings is in fact a braille cell for only one character. A plurality of such cells can be juxtapositioned forming a braille display ruler.

However, the invention is not limited to applications for forming braille characters, but encompasses also devices for communicating arbitrary patterns to a blind or visual handicapped person.

Manufacturing the above described device can be realized by mounting it completely without attaching the extensions 27 of the central leaves 21 to the plate 28. The gauge parts are inserted between the frame and in the drawing the right ends of the reeds, so the reeds take an exactly defined position irrespective of any reed curvature or imperfectness of the clamping means or clips 29.

In this position, the extensions 27 of the reeds are soldered or welded to plate 28 which results in an exact definition of the reed's ends cooperating with the pins 16-19, so that no further adjustment is needed. Consequently, the pins 16, 17, 18 and 19 each may have their own predetermined length. This allows for an important labour savings, because adjustments are rather time consuming. Moreover, the palpating plate 20 with its reading surface can be cleaned by removing the pins and cleaning them separately without need to see to it that afterwards each individual pin is returned to its original position. This is an important advantage simplifying cleaning and/or service activities in a considerably extent.

The braille cell shown in the drawings has the advantage that a braille character is formed at the outer end. Thus, it is possible to position two cells with their braille ends against each other, after which such double

cells may be arranged in a row to form two consecutive braille reading lines in close proximity.

We claim:

1. An electromechanical relief display device comprising:

a frame;

at least one tactile member provided in said frame which is movable between a first position and a second position such that by feeling for said tactile member a user determines in which position said tactile member is;

an oblong piezoelectric flexion member which may be bent under the influence of voltages applied thereto; and

a supporting means for supporting said flexion member on said frame at two separate locations such that a third separate location of said flexion member is coupled to said tactile member to move said tactile member between the two positions as said flexion member is bent, said third separate location being to one side of said first and second separate locations along said fixation member.

2. A display device as claimed in claim 1 wherein said first location is at one end of said flexion member, said second location is in a middle region of said flexion member, and said third location is at the other end of said flexion member.

3. A display device as claimed in claim 1 wherein said flexion members include a conducting central leaf, opposed conducting layers on each side of said central leaf and spaced therefrom, and an extension of said central leaf; and wherein said supporting means for said first location is an attachment of said extension to said frame, and said supporting means for said second location is a clamping member attached to said frame and between which said second location is clamped.

4. A display device as claimed in claim 3 wherein said clamping member includes opposed clamping surface in contact with said flexion member, said clamping surfaces being convex shaped.

5. A display device as claimed in claim 1 wherein there are a plurality of said flexion members and a corresponding plurality of supporting means, said flexion members having the same length; and wherein said supporting means mounts said flexion members in a stepped pattern one above the other in a common bending plane with said first, second and third locations arranged in corresponding stepped patterns.

6. A display device as claimed in claim 5 wherein said flexion member includes a conducting part at said first location; wherein said frame includes a conducting web substantially parallel to the bending plane, and wherein said supporting means for the first location of said flexion members is a connection of said first location to said conducting web.

7. A display device as claimed in claim 6 wherein there are two sets of said flexion members mounted in a stepped pattern and with the sets located beside each other such that a space is provided between said extensions of said flexion members; and wherein said frame includes a plate located in the space and a conducting web located on each side of said plate.

8. A display device as claimed in claim 6 wherein said supporting means for the second location includes a means for allowing each said reed to tilt thereabout in the bending plane prior to the connection of each said reed at the first location whereby each said reed is initially adjusted with respect to an associated said tactile