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Miller

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[54] **ONE PIECE CHARACTER DISPLAY DEVICE**

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[73] Assignee: **The Magnavox Company**, Ft. Wayne, Ind.

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[52] **U.S. Cl.** ..... **40/130 E**, 40/28 C, 40/132 D, 340/336

[51] **Int. Cl.** **G09f 9/34**

[58] **Field of Search** ..... 40/28 C, 130 E, 130 K, 40/132 D; 340/336; 313/109.5

[56] **References Cited**

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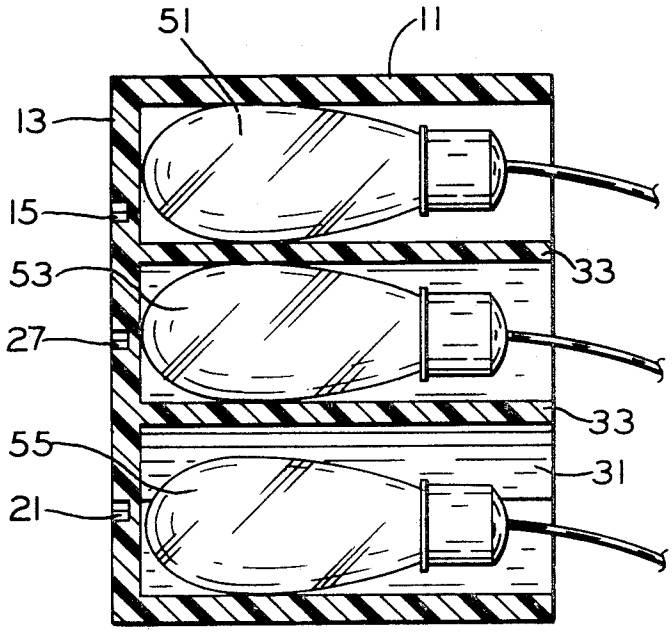
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Assistant Examiner—John F. Pitrelli
Attorney—Richard T. Seeger et al.

[57] **ABSTRACT**

A one piece molded character display device, to be used in conjunction with a plurality of selectively energizable segment illuminators to thereby display a character in accordance with the selected illuminators when energized is disclosed, comprising a main housing of translucent material having a primary character display face and having a plurality of interior partitions integral with and substantially perpendicular to the face to form a plurality of cells within the housing, one for each segment illuminator. Each cell has associated therewith on the character display face a character forming or decimal point forming segment having a thickness substantially less than the surrounding portions of the face so as to transmit a substantially higher percentage of the light from within its associated cell to the exterior to thereby selectively illuminate the segments in accordance with whether the corresponding segment illuminator is energized or not.

12 Claims, 2 Drawing Figures



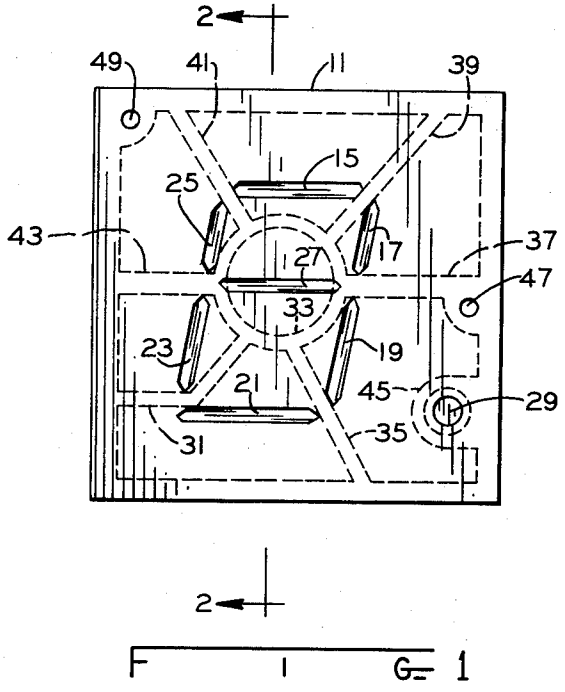

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FIG 1

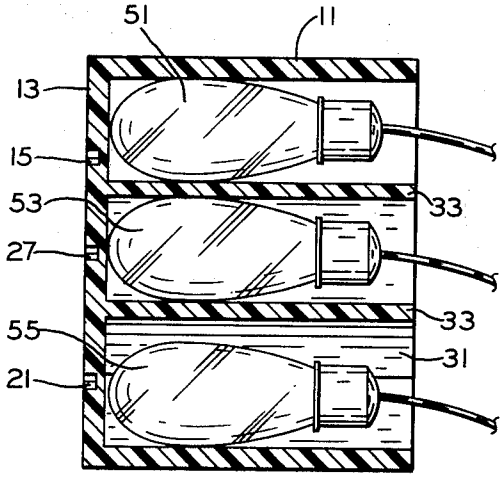

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FIG 2

ONE PIECE CHARACTER DISPLAY DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to a character display device and more particularly to an improved device for displaying alphanumeric characters such as the decimal digits zero through nine and a decimal point. Such digital display devices are well-known and find widespread application, for example, a plurality of such devices could be employed to indicate station frequency or channel to which a radio or television receiver is tuned. Such a digital display device is illustrated, for example, by U.S. Pat. No. 3,570,157 to Ohlsson. Prior art digital display devices suffer from a number of drawbacks and in particular are expensive to manufacture requiring the production and assembly of a number of distinct parts in proper orientation. Such digital display devices are lacking in versatility and are simply too expensive to use on competitively priced items such as A.M.-F.M. receivers.

Accordingly it is a primary object of the present invention to provide a more economical character display device.

It is another object of the present invention to provide a character display device which is easily fabricated.

It is a further object of the present invention to provide a one piece molded character display device.

SUMMARY OF THE INVENTION

The foregoing as well as numerous other objects and advantages of the present invention are achieved by providing a one piece injection molded character display device of translucent material having a primary character display face with the character forming segments being portions of that face of substantially reduced thickness to thereby pass substantially more light from within the display device housing. The housing is separated into a plurality of segment cells by a plurality of partitions integral with and substantially perpendicular to the primary face, and each such cell is adapted to receive a segment illuminator to thereby selectively illuminate the corresponding segment. The display device may be molded of a translucent polycarbonate material or thermoplastic polyester and its light passing characteristics may be easily controlled by varying the material, additives to that material, and the thickness of the character display segments.

It is accordingly a still further object of the present invention to provide a character display device which, when mounted, is sealed on its exposed face against contamination.

Yet another object of the present invention is to provide a character display device which does not require condensing lenses, diffusers, light blocking inserts, or accurate positioning of the light sources.

BRIEF DESCRIPTION OF THE DRAWINGS

The aforementioned and other objects, features and advantages of the present invention will become more apparent from the following detailed description thereof when considered in conjunction with the drawings wherein:

FIG. 1 is a front view of the character display device showing the seven elongated character forming segments and a circular decimal point forming segment; and

FIG. 2 is a cross sectional view along the line 2—2 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The character display device illustrated in FIGS. 1 and 2 is a one piece injection molded device for displaying a single decimal digit and decimal point and may be made of a translucent plastic material such as a polycarbonate. Other materials may be employed, however, completely opaque or transparent materials will defeat the advantageous features of the present invention. The present invention relies on the fact that more light is passed through the thinner portions of the face and less through the thicker portions thus eliminating the need for diffusers, condensing lenses, light blocking inserts or accurate positioning of the light source. The device is generally configured as a rectangular parallelepiped which forms a main housing **11** having a primary face **13**, the primary face **13** being provided with a plurality of substantially straight elongated character forming segments **15, 17, 19, 21, 23, 25** and **27** and a substantially circular decimal point forming segment **29**. All of the segments have a thickness substantially less than the surrounding portions of the face and are formed by providing a plurality of non-intersecting grooves of substantially rectangular cross section on the side of the face which is toward the outside of the housing.

Inside the housing are located a plurality of partitions **31, 33, 35, 37, 39, 41** and **43** which are substantially perpendicular to the primary face **13** to thereby form a plurality of cells within the housing where the primary face **13** forms one surface of each such cell, and there is one cell for each segment. The decimal point segment **29**, of course, also has a partition **45** forming a cell. As viewed in FIG. 2 only the angled partition **31** and the circular partition **33** are visible, and these as well as the remaining partitions and side walls of the housing **11** may be tapered toward the right to allow the device to be molded as one piece and then easily removed from the mold. For the same reason the segments may be trapezoidal in cross section. A pair of mounting holes **47** and **49** are provided with their axes relatively parallel and with each axis being substantially perpendicular to the primary face and function for mounting the display device, for example, with the primary face in a substantially vertical attitude on the front panel of an A.M-F.M. receiver.

The face of the device opposite the primary face is open to allow the insertion and removal of segment illuminators such as **51, 53** and **55**, there being one illuminator for each cell and one cell, of course, for each segment. Since the grooves forming the segments do not pass entirely through the primary face there is thus exactly one opening in each cell, that being the passageway from behind through which the illuminators may be moved.

The illuminators may be any type of electric lamp, light emitting diode or other lighting device so long as they are selectively energizable and will function to illuminate the particular cell in which they are placed. The function, of course, of the partitions within the device is to limit the lighting from a particular illuminator so that it lights only the segment associated with that cell and does not light a segment associated with an adjacent cell. As viewed in FIG. 1 the cell associated with

the segment 27 has six other segments adjacent to it, whereas the remaining cells are adjacent to three other segments with the exception of the cell associated with segment 19 which, due to the presence of the decimal point segment 29, is adjacent to four other cells. The decimal point segment is adjacent only one other cell. The positioning of the partitions may, of course, be varied in many ways while still achieving the desired isolation between segments, however, it should be noted that all practical configurations of partitioning will result in at least one cell which is adjacent at least five other cells and at least two less than the total number of cells which are adjacent to not more than four other cells. The decimal point segment cell may, in some configurations, be adjacent to more than one other cell.

Thus while the present invention has been described with respect to a specific embodiment numerous modifications will suggest themselves to those of ordinary skill in the art. For example, any type of character might be displayed on the primary face, and the present invention is not limited merely to the display of decimal digits. Any translucent injection moldable material which meets the heat requirements of the lamps could be used. The width, depth and configuration of the segments may be varied to obtain almost any desired display. The type of material employed in molding the display device may be varied or additives for color variation may be employed to give desirable display effects. Numerous further modifications will suggest themselves to those of ordinary skill in the art, and accordingly the scope of the present invention is to be measured only by that of the appended claims.

I claim:

1. A one piece molded character display device to be used in conjunction with a plurality of selectively energizable segment illuminators to thereby display a character in accordance with the ones of the illuminators which are energized comprising:

a main housing of translucent material having a primary face;

a plurality of partitions inside said housing integral with the primary face to thereby form a plurality of cells within the housing, the primary face forming one surface of each said cell and there being one cell for each illuminator, each said cell having exactly one opening, the opening facing away from the primary face to allow the insertion and removal of the corresponding segment illuminator from the side of the display device opposite the primary face;

said primary face being provided with a plurality of segments having a thickness substantially less than the surround portions of said face, there being one such segment for each said cell.

2. The device of claim 1 wherein the main housing is in the shape of a rectangular parallelepiped.

3. The device of claim 1 wherein said partitions are substantially perpendicular to the primary face.

4. The device of claim 1 wherein the plurality of segments are provided by forming in said primary face a like plurality of elongated grooves of substantially rectangular cross section.

5. The device of claim 4 wherein each said elongated groove is separated from the other elongated grooves by a portion of said primary face to thereby form said segments as a plurality of nonintersecting segments.

6. The device of claim 5 wherein the grooves are formed on the side of the face opposite the said partitions, there being seven substantially straight elongated character forming segments and one substantially circular decimal point forming segment.

7. The device of claim 4 wherein the grooves are formed on the side of the face opposite the said partitions.

8. The device of claim 1 further comprising means for mounting the display device with the primary face in a substantially vertical attitude.

9. The device of claim 1 wherein the primary face is provided with at least two mounting holes having their axes relatively parallel with each axis being substantially perpendicular to the said primary face.

10. The device of claim 1 wherein there are seven substantially straight elongated character forming segments and one substantially circular decimal point forming segment.

11. The device of claim 1 wherein there are n cells formed by the said plurality of partitions at least one of which is adjacent at least five other cells and at least $n - 2$ of which are adjacent to not more than four other cells.

12. The device of claim 11 wherein n is eight, there being seven substantially straight elongated character forming segments and one substantially circular decimal point forming segment.

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