Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).
Description

[0001] The present invention relates to a device for providing a display, sign, printer head and the like, which device is composed of a number of picture segments, that are selectively either on or off.

[0002] A large number of variants of such devices are known for different purposes. Some of them are based on the use of picture segments consisting of LCD-elements, which in turn are arranged to form picture segment units comprising identical or different picture segments. It has been possible to build picture systems composed of such units, usually alpha-numeric pictures with a high or low degree of accuracy. A high degree of accuracy requires a very large number of picture segments and attached connections. This applies especially if the picture in question also must comprise characters beyond the alpha-numeric field, for instance traffic signs. For this purpose display screens are usually used which can be illuminated from behind by sources of light, which usually are symmetrically dispersed over a large-area sign, on which the picture should be shown. The display screens may be perpetually activated, i.e. transparent, or non-activated, i.e. non-transparent, showing the intended pattern or character. As an alternative the display screens may consist of LCD-elements which are operated to transparent and non-transparent state, respectively.

Examples of such known displays are published in DE-A-3 816 550 and in EP-A-0 180 685.

[0003] The object of the invention is to provide a device of the kind defined in the introduction, which by means of a small number of picture segments presents an improved readability and a simplified control.

[0004] This object is achieved in accordance with the invention in that the picture segments are arranged to form a number of equal picture segment units positioned side by side and comprising each a square with an inscribed geometrical figure, which by straight or arcuate parts define four identical corner segments of the square, picture segments are composed of the geometrical figure and the four corner segments. The picture segments suitably are composed of LCD-elements, which either are provided with six electrical connections for activating the elements or as an alternative are of the type being activated by means of heat, preferably by a guided laser beam. The picture segments may also, for certain applications, be composed of display screens which can be illuminated from behind by each a light source or by a light source common for several picture segments, which areas together may form large-area light signs.

[0005] The invention will now be described in more detail in the following with reference to the accompanying drawings which schematically show an exemplary embodiment thereof, and in which Figure 1 is a plan view of a picture segment unit, Figure 2 is a display according to the invention composed of picture segment units, Figures 3 and 4 show a display comprising the same device composed of conventional picture segment units according to two possible designs, Figure 5 and 6 are plan views of two alternative embodiments of a picture segment unit, and Figures 7, 8 and 9 are cross sectional views of picture segment units according to three different embodiments.

[0006] Figure 1 shows a picture segment unit 1, also called a pixel, which according to the invention is divided into five LCD-elements or picture segments, viz. a circle segment 2 and four corner segments 3, and which unit has the shape of a circle inscribed in a square. The picture segment unit 1 is designed in a conventional way and comprises a frame 4 having an edge along which connections 5 to the different picture segments 2,3 are arranged. When combining several for instance 5x8 pixel units to a larger picture the frame 4 is arranged in a conventional way around the picture and not around separate pixels.

[0007] Figure 2 shows a display with the device in the shape of a digit "8", which is composed of an area with 5x7 picture segment units 1 of the display. The curved parts of the device have got a shape that is particularly easy to read due to the fact that for instance picture segments 10-15 of three picture segment units at the upper, right hand corner of the digit, and picture segments 9,12-15 of three picture segment units at the right hand, middle part of the digit, and picture segments 9,12-14,16,17 of three picture segment units at the bottom, right hand corner of the digit, and the corresponding picture segment units at the left hand part in the drawing are made non-visible.

[0008] In comparison is shown in Figs. 3 and 4 the same digit formed in two different, possible ways by square picture segment units which are not provided with the division of the squares in the five picture segments 2,3. Accordingly, the digit is very angular and difficult to read.

[0009] As an alternative to a picture segment unit 1 in the shape of a circle inscribed in a square it is possible to use a tetragon 2' or a square inscribed in a square, or an octagon 2" inscribed in a square, as shown in Figs. 5 and 6, with corner segments 3' and 3", respectively.

[0010] Fig. 7-9 show strongly simplified in cross sectional views three different devices for providing a display according to the invention.

[0011] Fig. 7 shows a casing 21 with a front face composed of LCD-elements 22 and a transparent, suitably colored rear face 23, which is illuminated from behind by a light source 24. Non-visible picture segments of the LCD-elements 22 are then clearly exposed even in darkness.

[0012] Fig. 8 shows a corresponding casing 21 with a front face 25 consisting of picture segments made of e.g. colored glass. Behind each picture segment and separated by partition walls 26 there is a light source consisting of bulbs 27.

[0013] Fig. 9 shows an alternative without light source and comprising a casing 21 and a front face 28 consist-
ing of LCD-elements, which can be activated by heat generated by a movable laser beam 29 in a manner known per se. The inside of a rear face 30 of the casing is provided with a suitable color that gives rise to a good contrasting effect between picture segments made visible and non-visible.

[0014] It will be understood that the invention is not restricted to the here illustrated and described embodiment but can be modified in different ways within the scope of the inventive idea defined in the claims. Hence, each picture segment unit may be of the kind where the picture segments have a memory function such that a control voltage can cease after its activating of a picture segment after which the picture segment remains in activated state until a new signal is supplied that deactivates the picture segment.

Claims

1. A device for providing a display, sign, printer head and the like, which is composed of a number of picture segments (2,3), which are selectively either activated or non-activated, the picture segments (2,3) being arranged to form a number of equal picture segment square units (1) positioned side by side, characterized in that each square unit comprises an inscribed geometrical figure, which by straight or arcuate parts define four identical corner segments (3) of the square, whereby the picture segments are composed of the geometrical figure (2) and the four corner segments (3).

2. A device according to claim 1, characterized in that the picture segments (2,3) consist of LCD-elements.

3. A device according to claim 2, characterized in that the LCD-elements (2,3) are provided with electrical connections (5) for activating the elements (2,3).

4. A device according to claim 2, characterized in that the LCD-elements (2,3) can be activated by heat, preferably by a guided laser beam.

5. A device according to claim 1, characterized in that the picture segments (2,3) consist of areas, which can be illuminated from behind by means of each a light source.

6. A device according to any of claims 2-4, characterized in that the picture segments (2,3) comprise a common light source for several picture segment for illuminating from behind the picture segments (2,3) which are made transparent.

Patentansprüche

1. Vorrichtung zum Bereitstellen einer Anzeige, eines Zeichens, eines Druckkopfes oder dgl., die aus einer Anzahl von Bildsegmenten (30) aufgebaut ist, die wahlweise entweder aktiviert oder deaktiviert sind, wobei die Bildsegmente (2, 3) so angeordnet sind, daß sie eine Anzahl gleicher, nebeneinander angeordneter Rechteckeineheit (1) aus Bildsegmenten bilden, dadurch gekennzeichnet, daß jede Rechteckeineheit eine eingeschriebene geometrische Figur aufweist, die durch gerade oder bogenförmige Teile vier identische Ecksegmente (3) des Reckekes definiert, womit die Bildsegmente aus der geometrischen Figur (2) und den vier Ecksegmenten (3) aufgebaut sind.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Bildsegmente (2, 3) aus LCD-Elementen bestehen.

3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die LCD-Elemente (2, 3) mit elektrischen Anschlüssen (5) zu ihrer Aktivierung versehen sind.

4. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die LCD-Elemente (2, 3) durch Wärme, vorzugsweise durch einen geführten Laserstrahl aktivierbar sind.

5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Bildsegmente (2, 3) aus Bereichen bestehen, die von hinten mit Hilfe jeweils einer Lichtquelle beleuchtbar sind.

6. Vorrichtung nach einem der Ansprüche 2 bis 4, dadurch gekennzeichnet, daß die Bildsegmente (2, 3) eine gemeinsame Lichtquelle für mehrere Bildsegmente zum Erleuchten der transparent gemachten Bildsegmente (2, 3) von hinten aufweist.

Revendications

1. Dispositif destiné à fournir un affichage, un panneau, une tête d’impression et similaire, lequel est constitué d’un certain nombre de segments d’image (2, 3), qui sont, de façon sélective, soit activés, soit non activés, les segments d’image (2, 3) étant agencés de manière à former un certain nombre d’unités carrées de segments d’image égales (1) disposées côté à côte, caractérisé en ce que chaque unité carrée comprend une figure géométrique inscrite, laquelle définit grâce à des parties droites ou en forme d’arc quatre segments de coins identiques (3) du carré, grâce à quoi les segments d’image sont constitués de la figure géométrique (2) et
des quatre segments de coins (3).

2. Dispositif selon la revendication 1, caractérisé en ce que les segments d’image (2, 3) sont constitués d’éléments d’affichage à cristaux liquides (LCD).

3. Dispositif selon la revendication 2, caractérisé en ce que les éléments d’affichage à cristaux liquides (LCD) (2, 3) sont munis de connexions électriques (5) destinées à activer les éléments (2, 3).

4. Dispositif selon la revendication 2, caractérisé en ce que les éléments d’affichage à cristaux liquides (LCD) (2, 3) peuvent être activés par la chaleur, de préférence par un faisceau laser guidé.

5. Dispositif selon la revendication 1, caractérisé en ce que les segments d’image (2, 3) sont constitués de surfaces, qui peuvent être éclairées par l’arrière au moyen chacune, d’une source de lumière.

6. Dispositif selon l’une quelconque des revendications 2 à 4, caractérisé en ce que les segments d’image (2, 3) comprennent une source de lumière commune pour plusieurs segments d’image afin d’éclairer par l’arrière les segments d’image (2, 3) qui sont rendus transparents.