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(54) **Neon sign**

(57) An illuminated sign including an edge casing (1) determining the shape of an advertisement figure, a cover (2) substantially covering the section defined by the edge casing, as well as a light source (3) disposed beneath the cover in a space defined by the edge casing. According to the invention, the edge casing (1) is made of a sheet profile having a sheet portion (4) that forms the edge casing, and a first stiffener flange (5) that is perpendicular with respect to the sheet portion and ex-

tends inwards of the advertisement figure; the first stiffener flange is disposed in the vicinity of the first edge of the sheet portion and includes notches (7) in the sections of the edge casing deviating from straight ones to implement the curved shapes of the edge casing; the cover (2) is attached on top of the first stiffener flange, and a number of LEDs function as the light source.

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Description

FIELD OF THE INVENTION

[0001] The invention relates to an illuminated sign defined in the preamble of claim 1.

BACKGROUND OF THE INVENTION

[0002] Conventional illuminated signs are made by cutting sheet metal and bending it to form an edge casing that defines the shape of an advertising figure. Approximately to the midpoint of the depth of the advertising figure, inside thereof, a bottom of sheet metal is mounted, on whose top a neon tube is usually mounted to act as a light source, although also fluorescent tubes and glow bulbs can be used. The neon tube to be used is always built and bent individually, for each advertising figure specifically. As neon tubes require a voltage of 1000V to operate, and as usually a series connection of four tubes is used with the voltage being 4kV, the necessary couplings and a transformer are built in the space beneath the bottom, in order to convert the normal means voltage to be suitable. The space underneath the bottom is relatively big because a high voltage requires relatively much room and distance.

[0003] Due to the high voltage being used, an illuminated sign must be made of non-flammable material, because of the fire safety, i.e. in practice wholly of steel. This makes an illuminated sign relatively big and heavy. Because of the individual handicraft and laborious manufacture, a half of the cost of an illuminated sign consists of the cost of labour.

OBJECTIVE OF THE INVENTION

[0004] The objective of the invention is to eliminate the disadvantages referred to above. One specific objective of the invention is to disclose a new kind of illuminated sign that is simple and light in structure, easy and fast to manufacture, and practically maintenance free and inexpensive in respect of its operating costs, and that also avoids the safety risks involved in the high operating voltage of the prior-art.

SUMMARY OF THE INVENTION

[0005] The illuminated sign in accordance with the invention is characterised by what has been presented in claim 1.

[0006] The illuminated sign in accordance with the invention comprises an edge casing defining the shape of an advertising figure, a cover substantially covering the area defined by the edge casing, as well as a light source disposed beneath the cover in the space defined by the edge casing. According to the invention, the edge casing is made of a sheet profile having a sheet portion that forms the edge casing, and a first stiffener flange,

perpendicular with respect to the sheet portion and extending inward of the advertising figure, the first stiffener flange being disposed in the vicinity of the first edge of the sheet portion. In addition, arranged in the first stiffener flange are indentations in the sections of the edge casing deviating from straight ones to implement the curved shapes of the edge casing, whereby in the straight sections of the edge casing, the stiffener flange is maintained uniform, which guarantees that the profile is kept straight. As the stiffener flange is disposed in the vicinity of the first edge of the sheet portion, i.e. in the vicinity of the upper edge of the illuminated sign, it also forms a good mounting substrate for the cover of the illuminated sign. Further according to the invention, as the light source, a low voltage light source, a number of LEDs are used, which are placed suitably and uniformly within the illuminated sign.

[0007] The cover can be mounted on top of the first stiffener flange using e.g. an adhesive label. A translucent coloured plate that determines the colour of the advertisement can function as the cover, enabling one to use colourless, i.e. white LEDs. On the other hand, it is possible to use as the cover, a colourless, white or bright, translucent plate, enabling one to determine the desired colour of the illuminated sign based on the colour of the LEDs being used.

[0008] A third possibility is to use a translucent cover plate, whereby the light of the LEDs being used is directed backwards inside the advertisement figure, illuminating the background wall of the advertising figure. In this manner, an advertisement figure, such as letters remain black, and the light wall behind is coloured according to the colour of the LEDs being used.

[0009] Advantageously, the first stiffener flange is disposed at a greater distance from the first edge of the sheet portion than what the thickness of the surface plate being used is. In this manner, on the surface of the light figure, an edging is left that prevents the light from reflecting sideways, making the illuminated sign more sharp-featured and more easily observable and readable.

[0010] In one embodiment of the invention, the sheet profile being used also includes a second stiffener flange disposed in the vicinity of the second edge thereof, the second stiffener flange stiffening the profile being used in a similar way as the first stiffener flange and being notched in the curved profile sections. As it is disposed in the lower part of the illuminated sign, it forms a good mounting buttress for the bottom of the illuminated sign.

[0011] As the bottom of the illuminated sign, it is possible to use a solid or perforated plate structure having a sufficient number of LEDs mounted therein.

[0012] In case there is a wish to make the illuminated sign even simpler in structure, the bottom of the illuminated sign can be left out and the LEDs can be mounted directly on the wall surface or other mounting substrate, onto which the illuminated sign is meant to be mounted.

In this manner, the boxes with the illuminated signs are just hanged or otherwise mounted on the wall surface on top of the LEDs that have been mounted using e.g. adhesive labels.

[0013] As the illuminated sign in accordance with the invention utilises low voltage light sources having a good efficiency, the electrification used does not cause any kind of fire risk. Due to this, it is possible to use as the sheet profile, an injection-moulded aluminium profile or an injection-moulded plastic profile.

[0014] The illuminated sign in accordance with the invention has several advantages over prior art. The manufacture of illuminated signs is made quicker and simpler so that the cost of labour only is about 10% of the corresponding cost of the illuminated signs conventionally manufactured. The weight of the illuminated sign is 30% and depth 50% of the conventional illuminated signs, making them easier to handle and mount. The voltage being used is reduced from 4000 volts to 9 volts, so there will be no fire risks and no safety distances are needed. The light sources are the same for all the advertisements, i.e. a sufficient number of LEDs, whereby there is no need to separately bend the Neon tubes, and they need not be transported to the installation site, which is cumbersome. The need for maintenance or replacement is practically eliminated as the operating life of LEDs is more than 20 years, and you do not notice in a big advertisement if there are some LEDs broken. Furthermore, the consumption of energy is reduced to a fraction from the energy consumption of conventional illuminated signs, to less than 10%, so the illuminated sign in accordance with the invention saves its purchase cost back in a couple of years as saved maintenance and operating costs.

LIST OF FIGURES

[0015] In the following section, the invention will be described in detail with reference to the accompanying drawings, wherein

Fig. 1 schematically represents one straight illuminated sign in accordance with the invention as seen from the open end;

Fig. 2 schematically represents one round illuminated sign in accordance with the invention as seen from the top;

Fig. 3 represents one profile in accordance with the invention; and

Fig. 4 represents another profile in accordance with the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Fig. 1 shows one straight illuminated sign in accordance with the invention shown open at the end. Both edges of the illuminated sign consist of the same kind of sheet profile having a straight, planar sheet por-

tion 4 and in the vicinity of both edges 6 and 7 of the sheet portion perpendicular stiffener flanges 5 and 8, which stiffen and keep the profile straight. The stiffener flanges 5, 8 are opposite each other, i.e. they extend towards each other in opposite profiles, i.e. the stiffener flanges are disposed inwards of the illuminated sign.

[0017] On top of the first stiffener flange 5, i.e. the top-most stiffener flange there is mounted the cover 2 of the illuminated sign, which is made of translucent material. It can be e.g. glued or attached to the stiffener flanges using a two-sided adhesive label. Mounted on the second, i.e. lower stiffener flanges 8 is similarly a uniform bottom plate 9. It can be freely selected e.g. from a suitable metal or plastic plate, since it is practically not subjected to any kind of mechanical or thermal stress. In practice, the mounting is usually performed so that the bottom plate 9 is first mounted on a suitable substrate, such as a wall surface, and after that the stiffener flange 8 is supported and mounted on top of the bottom plate.

[0018] Mounted on top of the bottom plate are, e.g. by means of adhesive labels, a sufficient number of LED lights, the wires between them running freely on top of the bottom. The wires are preferably run to the illuminated sign from some nearby inner space having a small transformer that transforms the normal mains voltage 220-240V to the voltage of 9V suitable for the LEDs. In case the mains voltage already is supplied to the illuminated sign, nothing prevents from installing the transformer inside the illuminated sign or in the vicinity of the illuminated sign in some suitable sheltered place.

[0019] Fig. 2 shows another embodiment of the invention, i.e. a way of making out of the rigid profile being used in the invention round shapes of an illuminated sign. When seen from above, without the cover, the ring-shaped illuminated sign has an annular bottom 9, on top of which there are mounted a number of LEDs 3, which are connected both to one another and to the voltage source.

[0020] The outer casing 10 of the round illuminated sign is made of a sheet profile in which there are in the stiffener flange a number of V-shaped notches worked at a distance from each other along the whole length. When the profile has been bent to form a substantially round shape, the edges of the notches are turned against each other so that a substantially uniform stiffener casing is formed in the illuminated sign, to which the cover of the advertisement can be attached. Similarly, a second flange is formed on the bottom, near the lower edge of the advertisement.

[0021] When manufacturing the inner casing 11, no V-shaped notches are needed, instead it is enough that the stiffener flanges are cut at regular intervals. Hence, when turning the inner casing to be round with the stiffener flanges pointing outward, a number of separate parts of the stiffener flange are formed on the outer surface of the inner casing 11, i.e. inside the advertisement, the parts being separated from each other by V-shaped notches. Also these flanges form a good mounting sub-

strate both for the cover and the bottom.

[0022] It must be noted that in practice the curved parts of the illuminated sign will not be evenly curved, instead they consist of short, straight parts of the edge casing, between which there are folds. This is, however, not important as illuminated signs always are looked at from a distance of tens and in most cases of hundreds of meters, so they look completely evenly curved and round-shaped from a viewing distance. In this manner, also the density of the notches being used can be adjusted according to the size of the advertisement and according to the viewing distance from which it is looked at.

[0023] Fig. 3 shows an inventive profile as viewed from the end, of which profile inventive illuminated signs usually are made. At its simplest, the profile consists just of a straight and even sheet portion 4 and of stiffener flanges 5 and 8, which are disposed in the vicinity of both edges 6 and 7 of the sheet portion, extend in parallel to them and are perpendicular to the sheet portion 4. The profile can be made very light and rigid when it is extruded to form a uniform piece.

[0024] In particular, when making smaller advertisements, material can be saved and the lightness can be increased by leaving out the second stiffener flange, which gives us the profile as shown in Fig. 4, which only has the sheet portion 4 and the first stiffener flange 5 in the vicinity of the second edge. The lightness of this advertisement structure is further increased by the fact that no actual bottom is attached to it, instead the LEDs are attached directly to the wall or similar surface, and the advertisement is suspended on top of it.

[0025] The invention is not limited merely to examples presented above, instead many variations are possible within the scope of the inventive idea defined by the claims.

Claims

1. An illuminated sign including an edge casing (1) that determines the shape of an advertisement figure, a cover (2) that substantially covers the section defined by the edge casing, as well as a light source (3) disposed underneath the cover in a space defined by the edge casing, **characterised in that**

the edge casing (1) is made of a sheet profile having a sheet portion (4) that forms the edge casing, and a first stiffener flange (5) which is perpendicular with respect to the sheet portion and extends inwards of the advertisement figure, the first stiffener flange is disposed in the vicinity of the first edge (6) of the sheet portion, the first stiffener flange includes notches (7) in the sections of the edge casing deviating from straight ones to implement the curved shapes

of the edge casing, the cover (2) is attached on top of the first stiffener flange, and that a number of LEDs function as the light source (3)

2. The illuminated sign as defined in claim 1, **characterised in that** the cover (2) is a translucent, colourful plate that determines the light of the illuminated sign.
3. The illuminated sign as defined in claim 1, **characterised in that** the cover (2) is a translucent, colourless or white plate, and the LEDs determine the colour of the advertisement.
4. The illuminated sign as defined in claim 1, **characterised in that** the cover (2) is a plate impermeable to light, and the light emitted by the LEDs is directed backwards inside the advertisement figure, illuminating the background wall of the advertisement figure.
5. The illuminated sign as defined in any one of claims 1-4, **characterised in that** the first stiffener flange (5) is disposed at a distance from the first edge (6) of the sheet portion, this distance being greater than the thickness of the cover (2).
6. The illuminated sign as defined in any one of claims 1-5, **characterised in that** the sheet profile includes a second stiffener flange (8) disposed in the vicinity of its second edge (7), the second flange forming a mounting buttress for the bottom (9) of the illuminated sign.
7. The illuminated sign as defined in claim 6, **characterised in that** the bottom (9) of the illuminated sign is a solid or perforated plate structure which has a sufficient number of LEDs attached thereto.
8. The illuminated sign as defined in any one of claims 1-5, **characterised in that** the bottom of the illuminated sign, to which the LEDs are attached, is formed by the mounting substrate of the illuminated sign, such as a wall surface, onto which the illuminated sign is installed.
9. The illuminated sign as defined in any one of claims 1-8, **characterised in that** the sheet profile is made of an injection-moulded aluminium profile.
10. The illuminated sign as defined in any one of claims 1-8, **characterised in that** the sheet profile is made of an injection-moulded plastic profile.

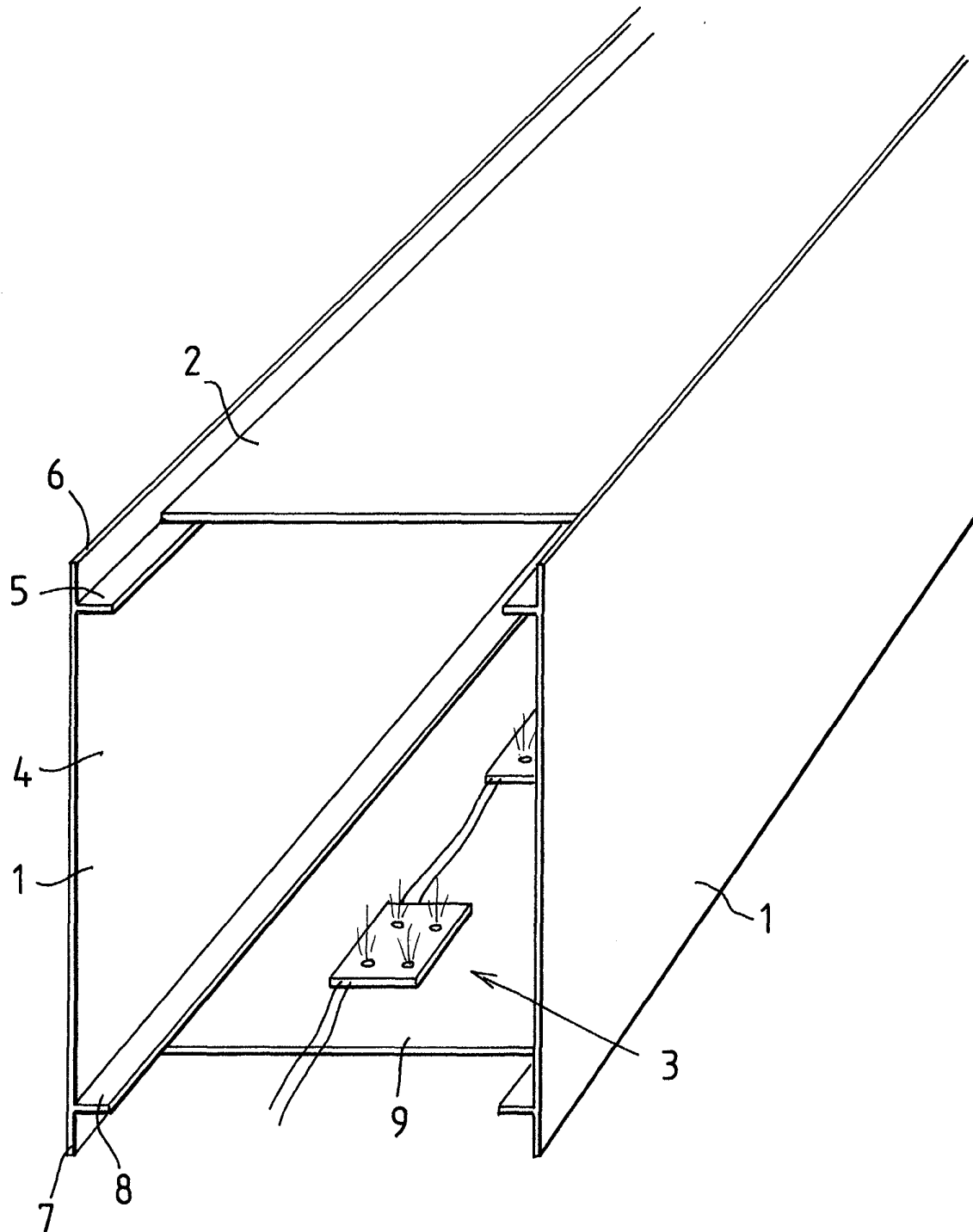


Fig 1

