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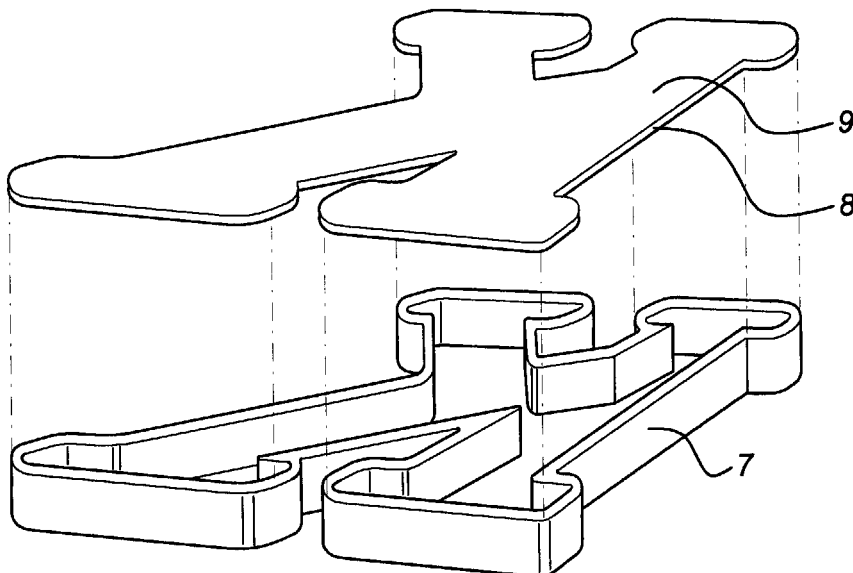
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(54) **Method for producing a box sign**

(57) Method for producing a box sign. The method comprising providing at least one panel substrate (9) with a predefined pattern (8), providing a side panel (7) for the box sign and combining the at least one panel sub-

strate (9) and the side panel (7) to obtain the box sign. The cutting means are used to provide an inner perimeter of the side panel (7) and an outer perimeter of the side panel (7), the inner and outer perimeter being congruent with the pattern (8) of the at least one panel substrate (9).

Fig 4



Description

Field of the invention

[0001] The present invention relates to a method for producing a box sign comprising providing at least one panel substrate with a predefined pattern, providing a side panel for the box sign and combining the at least one panel substrate and the side panel to obtain the box sign.

Prior art

[0002] Such a method for producing box signs is for example known from US patent US-A-6,167,740. This document describes a method and apparatus for bending a work piece to a desired form that can be used as the side surface of a box sign. However, several disadvantages are associated with this method if applied for the manufacture of side surfaces for illuminated (or non-illuminated) box signs. First, the material that is used for the side surface needs to be bendable, which limits the range of materials that can be used to mainly metals, which are expensive, if compared to e.g. plastics. Second, the production of side surfaces for box signs using this method is very time-consuming and therefore expensive. Third, the ability of the aforementioned method to provide a desired form which contains many bends in close proximity, such as in the case of Chinese or other Asian characters, is limited by the physical size of the components of the apparatus that perform the actual bending. Finally, the bends in the material that is used for the side surface lead to stresses in the material which can adversely affect the integrity of the material that is used for the side surface and therefore of the box sign. When manufacturing box signs, the number of identical box signs to be produced is usually limited, as a reason of which most box signs are made by hand. In this case, the accuracy and repeatability of manufacturing box signs is very low, especially with respect to making the side panels (sharp corners at exact locations, bending according to precise pattern, etc.).

Summary of the invention

[0003] The present invention seeks to provide a time-effective, cost-effective, cheap and sophisticated method for producing illuminated box signs, e.g. in the form of a logo, character, number or billboard.

[0004] According to the present invention, a method for producing illuminated box signs is provided according to the preamble of claim 1, in which cutting means are used to provide an inner perimeter of the side panel and an outer perimeter of the side panel, the inner and outer perimeter being congruent with the pattern of the at least one panel substrate. This method provides very reproducible box signs with a very short lead time. Furthermore, more complex signs and more detailed features

can be easily achieved by using this method. At the same time, the production of box signs using this method is an order of magnitude faster, if compared to state of the art methods, and the handling and processing of material is easier.

[0005] In a further embodiment, plastic material is used as a side panel substrate material. Plastic material is attractive because it is not subject to corrosion and because the cutting of plastic material can be done very fast, if compared to metals, such as e.g. aluminum and zinc.

[0006] The combining of the at least one panel substrate and the side panel and comprises gluing in a further embodiment. The advantage of gluing is e.g. that welding seams in the box sign are not visible and that therefore final processing, can be minimized, as opposed to the required final processing in the case of welding.

[0007] In a further embodiment, the cutting means comprise a milling cutter. A milling cutter is a well-known, commercially available and reliable cutting apparatus.

[0008] The cutting means comprise a laser cutter in a further embodiment. A laser cutter is a well-known, commercially available and reliable cutting apparatus. Furthermore, laser cutters are attractive because of their high cutting speed and because their operation can be easily automated.

[0009] A further aspect of the invention relates to a box sign produced according to the method of the present invention. Such a box sign can be produced very easily, quickly and cost-effectively.

Short description of drawings

[0010] The present invention will be discussed in more detail below, using a number of exemplary embodiments, with reference to the attached drawing, in which

[0011] Fig. 1 to 4 schematically illustrates separate phases of a method for producing a box sign in accordance with the present invention.

Detailed description of exemplary embodiments

[0012] Figure 1 schematically illustrates a method for producing a box sign in accordance with an embodiment of the present invention. Figure 1a shows a cutting means 4, arranged for cutting a sheet of side panel material 1 along an inner perimeter 2 of a side panel of a box sign, the cutting means 4 being controlled by an operating means 3, the operating means 3 being arranged for moving the cutting means 4 along the inner perimeter 2 of the side panel.

[0013] The operating means 3 may e.g. comprise a robot for automating the moving of the cutting means 4, the robot comprising a memory for storing data, the data defining a desired perimeter.

[0014] Figure 2 illustrates the next step of the method in accordance with an embodiment of the present invention. Cutting means 4 cut the sheet of side panel material 5 along an outer perimeter 6 of the side panel, which is

congruent with an outer perimeter of a box sign.

[0015] Figure 3 shows the side panel 7 produced using the method in accordance with an embodiment of the present invention. A thickness of the side panel 7 can be varied based upon, for example, the exact size of the side panel and the type of material that is used for the side panel 7.

[0016] In an advantageous embodiment of the method according to the present invention, the cutting means 4 cut along the outer perimeter 6 on a sheet of panel substrate material (not shown in the figures) to produce the panel substrate 9, as shown in figure 4. The cutting means 4 may be e.g. a cutting mill or a laser cutter and the panel substrate material may e.g. be plastic, or another material.

[0017] Figure 4 further shows a combination of side panel 7 and the panel substrate 9 to obtain a box sign in accordance with the present invention.

[0018] In an alternative embodiment of the method in accordance with the present invention, the outer perimeter 8 of the panel substrate 9 could be cut congruent with the inner perimeter 2 of the side panel 7 in which case the box sign is obtained by countersinking the panel substrate 9 with the side panel 7.

[0019] In a preferred embodiment of the method in accordance with the present invention, the panel substrate 9 and the side panel 7 are glued to obtain the box sign. In alternative embodiments of the present invention, other attachment methods, such as welding, soldering or attachment with screws could be used.

[0020] In an alternative embodiment of the present invention, a composite side panel comprises several side panels 7 stacked together in order to be able to provide box signs with different thicknesses from sheets of side panel material 1 with one standard thickness, which is attractive from an economic point of view.

[0021] One advantage of the method according to the present invention is that the duration of the production of the box sign can be reduced significantly if compared to state of the art production methods. The average production time of the side panel can be reduced roughly by a factor of ten, from approximately 25 minutes in case of state of the art methods, to approximately 2.5 minutes, if using the method in accordance with the present invention.

[0022] In a further embodiment of the present invention, the method could be used to produce a box sign comprising a side panel 7, a front panel 8 and also a back panel, providing a closed box sign. In an alternative embodiment of the method according to the present invention, the step comprising cutting along the inner perimeter is avoided, providing a solid box sign.

[0023] A light source, e.g. an array of LEDs (Light Emitting Diodes), could be mounted inside the box sign, in a further embodiment, in order to provide an illuminated box sign. In the case of an illuminated closed box sign, the front panel, the side panel or the back panel, or a combination, may be made of transparent non-colored

or colored material in order to allow the light from the light source to pass. Such a closed box sign is attractive for outdoor use as illuminated advertising, e.g. on the façade of an office building.

[0024] In a further embodiment of the invention, the side panel 7 may be manufactured from plastic material, such as synthetic or man-made fiber, which is attractive because it is relatively light and low-cost. Plastic materials could be, e.g. Stonex, such as sold by Signnovation International Dinxperlo B.V. in Dinxperlo in the Netherlands, plexiglass or acrylic plastic. In an alternative embodiment of the present invention, the side panel may comprise, metal, wood or a solid recycled material.

[0025] In a further advantageous embodiment of the present invention, the cutting means 7 could e.g. be a laser cutter or a milling cutter, which are commercially available cutting tools. Furthermore, the operation of the aforementioned cutting tools can be easily automated, which offers a virtually unlimited variety of illuminated signs, characters etc. that can be produced by using the method in accordance with the present invention.

[0026] While specific embodiments of the invention have been described above, it will be appreciated that the invention may be practiced otherwise than as described. The description is not intended to limit the scope of the invention, which is defined by the appended claims. E.g. it will be clear to the person skilled in the art that multiple permissible locations may be stored and used in the present invention.

Claims

1. Method for producing a box sign comprising:

- providing at least one panel substrate with a predefined pattern;
- providing a side panel for the box sign; and
- combining the at least one panel substrate and the side panel to obtain the box sign; in which
- cutting means are used to provide an inner perimeter of the side panel and an outer perimeter of the side panel, the inner and outer perimeter being congruent with the pattern of the at least one panel substrate.

2. Method according to claim 1, in which plastic material is used as a side panel substrate material.

3. Method according to claim 1 or 2, in which the combining of the at least one panel substrate and the side panel comprises gluing.

4. Method according to claim 1, 2 or 3, in which the cutting means comprise a milling cutter.

5. Method according to claim 1, 2 or 3, in which the cutting means comprise a laser cutter.

6. Box sign produced according to the method of any of the preceding claims 1 to 5.

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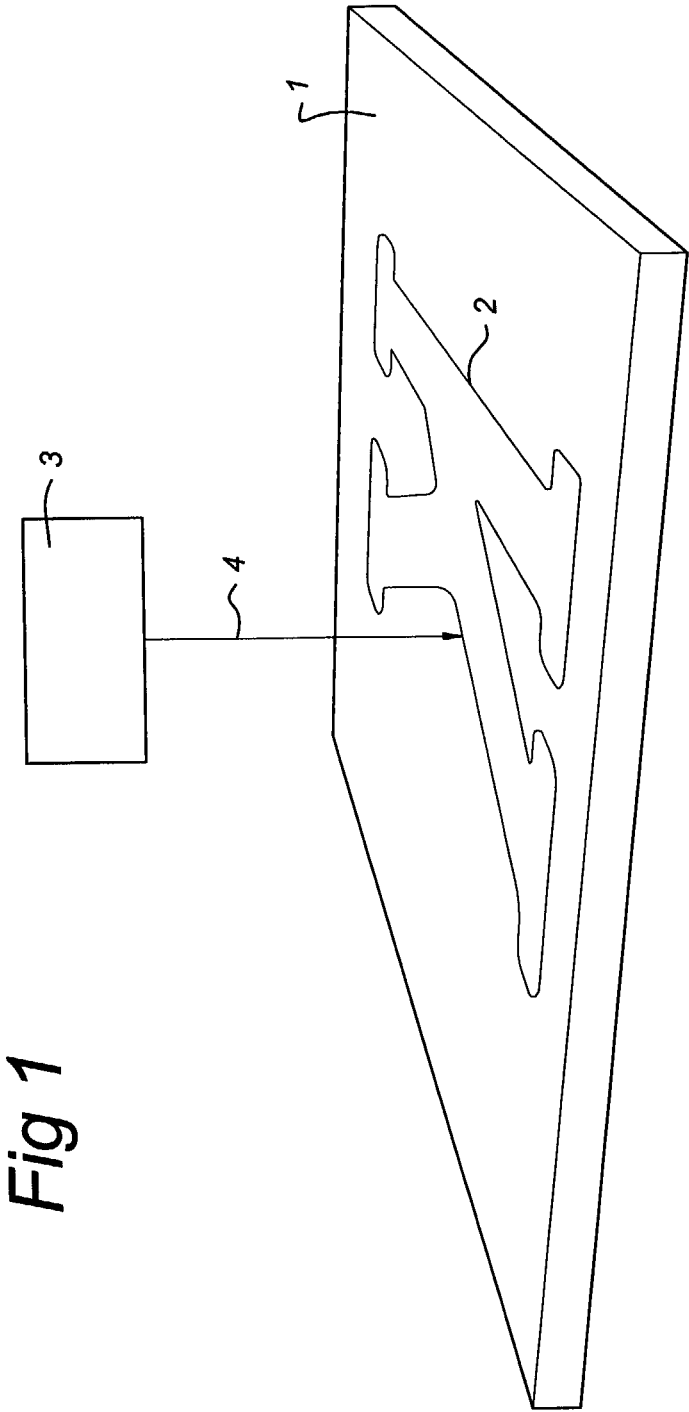


Fig 1

Fig 2

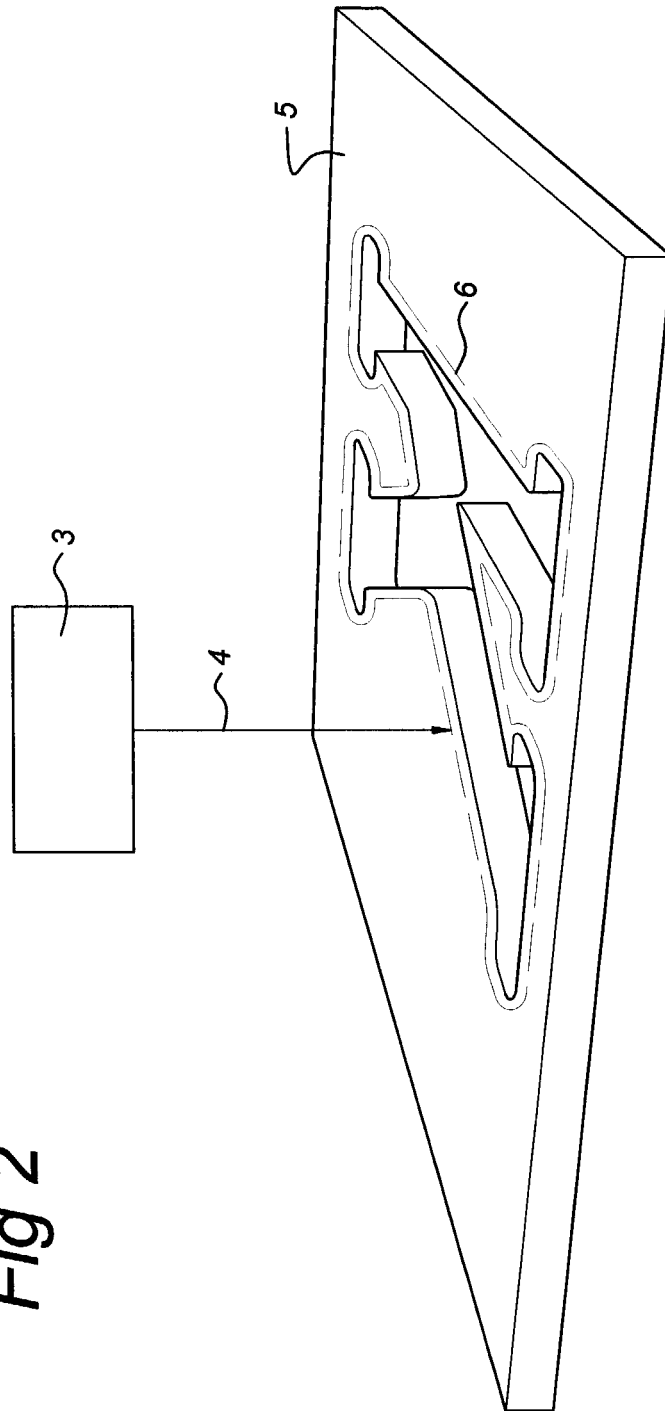


Fig 3

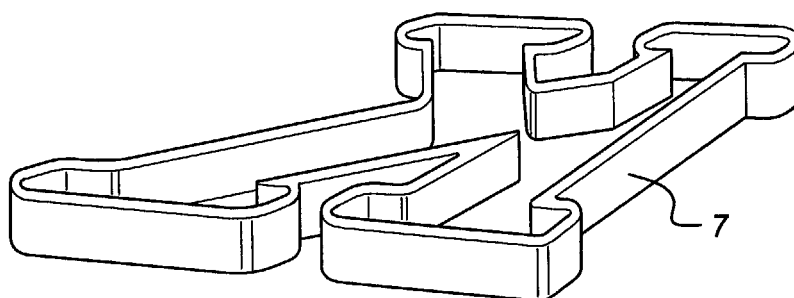
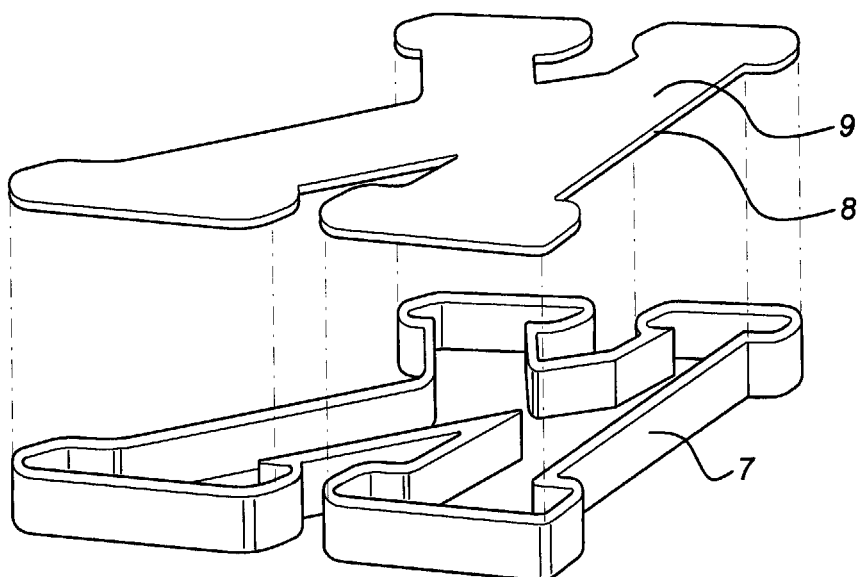


Fig 4





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 07 6962

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 30 March 2005	Examiner Pantoja Conde, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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