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(54) Method of manufacturing a sign and a sign manufactured by this method and an article carrying such a sign

(57) By a method for manufacturing a sign a layer of transparent two-component polyurethane with cutable properties is moulded onto a base layer, preferably a self-adhesive vinyl on a support paper, where the vinyl could be provided with a background colour or image. On the polyurethane layer an image is printed, whereafter a coating cover layer of a hard transparent two-component polyurethane is moulded. Hereby a sign with a three-dimensional effect is produced. The sign has furthermore a characteristic that makes it suitable for mounting in a recess at the preferred place.

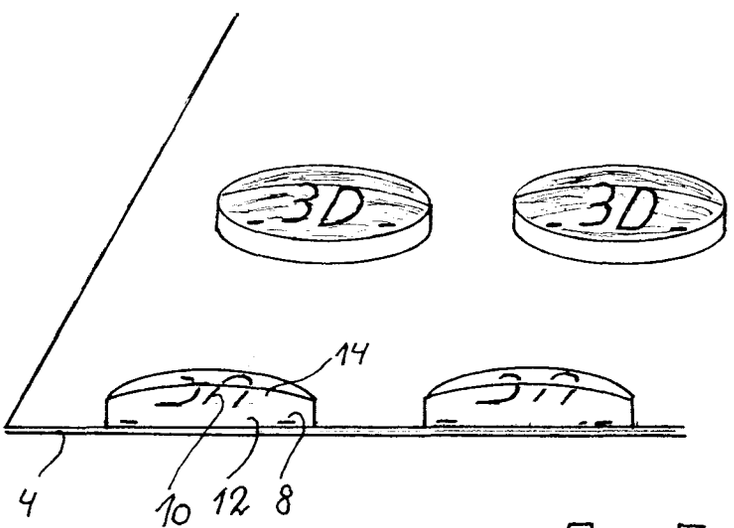

Fig. 7

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Description

The present invention concerns the type of signs where an image is printed on a self-adhesive vinyl on a support paper. After the printing the sign articles are stamped in the vinyl and superfluous material is removed from the support paper, whereafter a moulding of a two-component, transparent polyurethane on the vinyl articles is performed. The supplied amount of polyurethane flows out on the article and is quantitatively measured in such a way that it is in a vaulted shape over the image. The surface tensions in the vinyl article causes the polyurethane to stop when it reaches a sharp edge. This observation together with the used amount of polyurethane and that the vinyl articles are punched out with sharp edges means that the polyurethane by itself is contained within the surface of the article and that it gets this vaulted form. The finished sign article displays a perfect optical result and can be adhesively secured onto the preferred place by removing the support paper that on the finished sign article now serves as cover paper for protecting the adhesive. The employed polyurethane that appears crystal-clear has a reasonably high degree of hardness in order to provide the signs with a good endurance. The signs have an exclusive appearance and is used for e.g. display of logos and trade marks.

It could in certain situations be of preference with signs with a greater appearance of depth. However, then one would have to follow other and more traditional ways such as embossing and moulding. This is however troublesome and expensive.

By the invention it is realised that one can provide a sign of the introductory mentioned kind with a higher degree of spacious appearance if use is made of the observation that it is possible to perform a print on the top of a soft polyurethane with a suitable quality in colour.

By the invention a layer of transparent, two-component polyurethane is moulded on a base layer. The polyurethane layer displays properties that allow for the subsequent performance of a cutting action, such as punching, in which the side edges on the sign articles are created sharp. On the top of the cured polyurethane the images are printed. The printing can be carried out before or after the cut-out of the sign articles. After the cut-out and the removal of superfluous material the cover layer on the articles is laid out for the creation of the finished sign article. Since the image is incorporated in the polyurethane casting a three dimensional effect appears in the finished sign article.

Since the signs appear with a sharp side edge on the lowermost layer of polyurethane it is possible to place a sign in a thereto corresponding recess on an article on which the sign is to be placed; this further enhances the three dimensional effect in the sign. In this relation the best impression is achieved when the recess has a depth corresponding to the thickness of the lowermost polyurethane layer and the base layer. Hereby the printing in the polyurethane is being placed in the same plane as the surface of the article in which the sign is inserted. A further effect hereby is that the sign furthermore only is exposed to wear and tear on the hard polyurethane surface which is suitable for the resistance against wear.

As base layer it is particularly advantageous to use the self-adhesive vinyl on support paper that is utilised by the known signs mentioned in the introduction, and take advantage of the experiences therefrom. However, the support layer is not limited to this type, a base layer of polyester or polycarbonate can for instance also be used. A base layer of paper can likewise also be used, however the surface have to be gas tight, since bubbles otherwise will occur in the polyurethane during the moulding as a result of air and water, that is contained in the paper, during the making diffuse up in the polyurethane layer. The surface of the paper can for instance be made gas tight by the application of a polyester lacquer.

By using a self-adhesive base layer with a cover sheet the sign articles can easily be adhesively secured on the place of utility by the removal of the cover sheet. Alternatively, the signs can be secured thereon by glue. A more untypical solution would be to screw or nail the sign articles onto the carrier surface, but this could be the case by large signs.

The invention shall in the following be described in more detail by reference to the accompanying drawing that schematically illustrates the manufacture of a sign according to the invention.

Figure 1-6 display the successive steps in the produce of a sign according to the invention, and

Figure 7 shows the support paper carrying the finished signs and with a sectional-view after line VII - VII in fig. 6.

A self-adhesive vinyl 2 on a support paper 4 is used as base layer in this embodiment, where the support paper 4 on the finished sign article acts as cover paper on the adhesive. The vinyl can have a background colour or a background image 6 printed or the surface of the vinyl can remain unprinted.

Alternatively or in addition hereto, the self-adhesive base layer 2, which preferably in this instance can be a metal foil, is not required to have a planar surface for receiving the moulding of the layer above. On the contrary, the shape of the surface is somewhat immaterial for the subsequent moulding of the layer.

On the vinyl a layer of two-component polyurethane 8 is moulded with a thickness of 1,3 to 1,9 mm. The polyurethane is crystal-clear so that the background is visible. The polyurethane is mixed so that it appears solid but possible to cut by a stamping or punching action to create sharp side edges.

When the polyurethane is cured the chosen image 10 is printed on the top side thereof, by the application of a silk screen printing technique and with a glossy serigraphic colour with good covering properties and also is quick-drying. The colour is furthermore resistant towards petrol and alcohol and is weather resistant just as it is embossable and weldable.

After the printing a punching of the sign articles 12 is performed on the support paper in the desired shape.

Afterwards a cover layer 14 of hard polyurethane is moulded on the individual articles. The polyurethane is quantitatively measured with respect to each article so that it lays out a coating on the surface of the article and flows out to the edge of the article, and appears with a vaulted surface and on the middle, where the layer is the thickest, has a layer thickness of 1,3 to 1,5 mm.

When the polyurethane in this cover layer 14 is cured the signs are ready for use, since they remain sitting together on the support paper, from where they of course can be punched out if it is wanted. By the application of the signs the support paper is torn off and the sign is adhesively secured.

The invention is advantageous in that by the use of fairly known techniques and materials a sign carrying a three dimensional effect can be produced at relatively low costs, and that the signs furthermore display an exclusive appearance and a resistant outer face.

The term a sign is in the above to be understood in the broadest of interpretations and covers for instance also signs on or inserted in operation handles, layout for operation panels etc.

Claims

1. A method for manufacturing a sign of the kind where a covering layer of a hard transparent two-component polyurethane is moulded on a base layer, **characterised** in

   that a layer of transparent two-component polyurethane having properties so that it is cutable is moulded on the base layer,
   that images are printed on this moulded polyurethane layer and that sign articles are cut out of the polyurethane layer, and
   that the covering layer of the hard polyurethane hereafter is moulded on the articles for the creation of the finished sign articles.

2. A method according to claim 1, **characterised** in that
   a further image is printed and/or embossed on the base layer.

3. A method according to claim 1 or 2, **characterised** in that
   the base layer is constituted by a self-adhesive vinyl on a support paper.

4. A sign manufactured according to the method set forth in one or more of the claims 1-3.

5. An article having at least one sign manufactured according to the claims 1-3, **characterised** in that
   the sign is mounted in a recess in the article, said recess corresponding to the outer contour of the sign and where the recess has a depth that preferably corresponds to the thickness of the innermost polyurethane layer and the base layer.

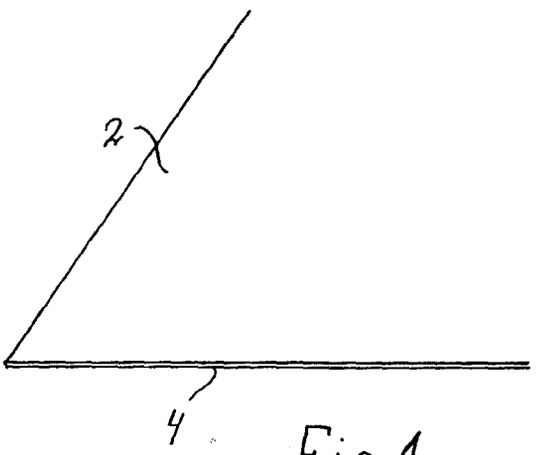

Fig. 1

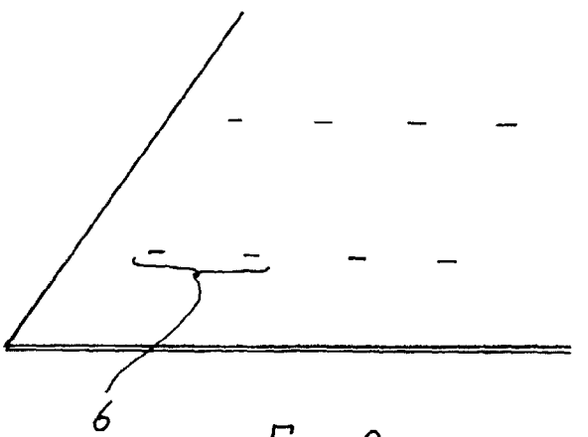

Fig. 2

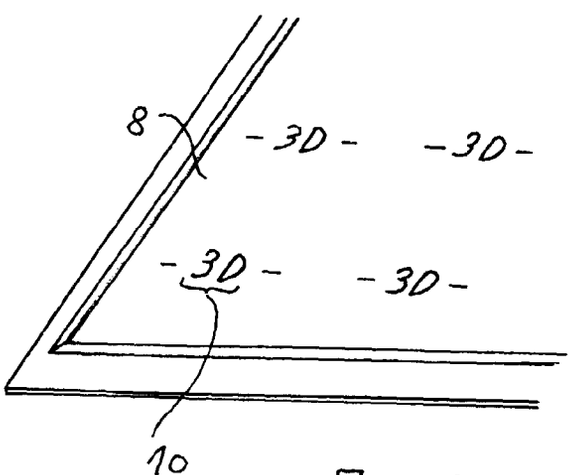

Fig. 3

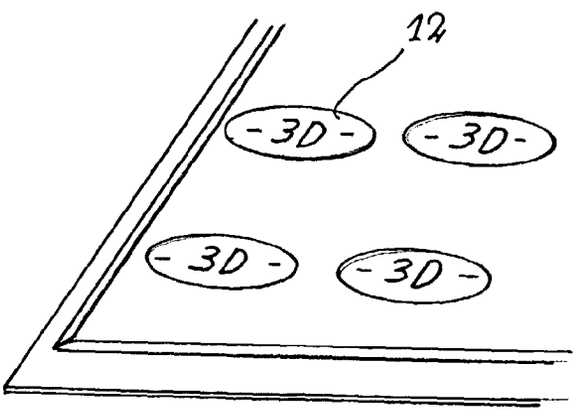

Fig. 4

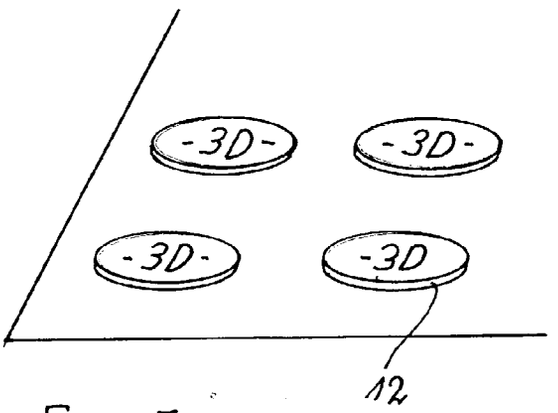

Fig. 5

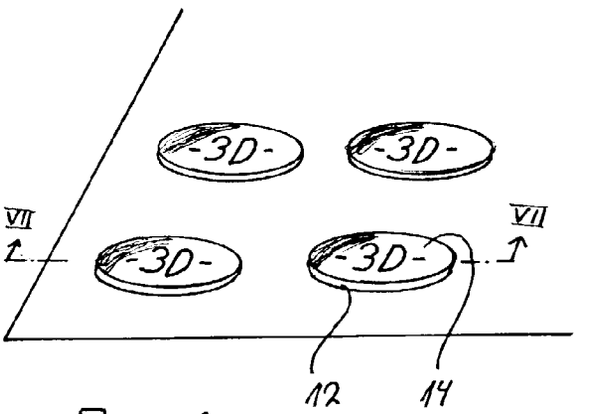

Fig. 6

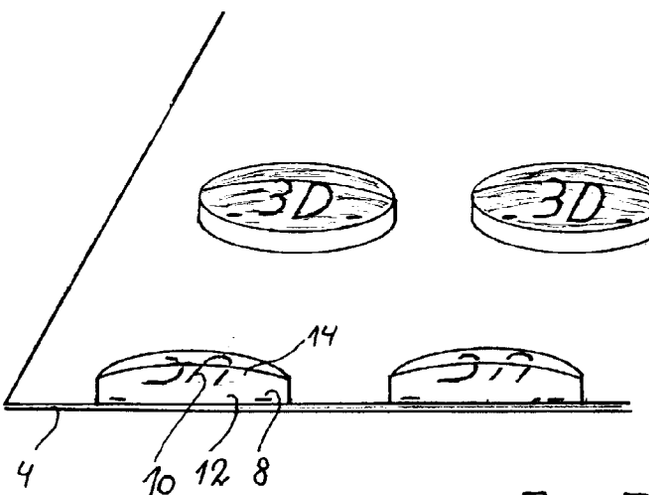

Fig. 7