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<p>(54) Title: DECAL SUPPORT STRUCTURE</p>		
<p>(57) Abstract</p> <p>A decal support structure comprises a cast-coated backing paper (10) having a low-tack adhesive layer (12) on one surface. The layer (12) holds a translucent biaxially stretched cast polyethylene film (14) having a thickness of 20 to 60 μm on the substrate (10). A decoration layer (18) is printed onto the film (14) and is top-coated with an adhesive layer (20). The stretchable film (14) allows a thin decoration layer (18) to be adhered to a surface of complex shape.</p> <div style="text-align: right;"> </div>		

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DECAL SUPPORT STRUCTURE

This invention relates to decals and is more particularly concerned with a decal support structure which, in use, carries a decal which is to be adhered to a surface of an article. The decal may take the form of a decorative layer to be applied to the surface of the article and/or it may comprise printed matter of an informative nature.

Decals of the water-slide transfer type are well known wherein the decal support structure consists of a substrate in the form of a backing paper and a water-softenable adhesive layer. A design layer is printed on the adhesive layer and, usually, a top coat is provided over the design layer to maintain the structural integrity of the design layer. The design layer and the top coat form the decal. Just before the decal is to be transferred onto the surface of an article to be decorated, the substrate with the decal thereon is immersed in water so as to dissolve or soften the adhesive layer, and then the decal is transferred by sliding onto the surface of the article. The transferred decal is sufficiently thin and plasticised that it is capable of stretching so as to conform even to surfaces which have a complex curvature, e.g. a three dimensional curvature. However, such water slide decals can be scratched quite easily and therefore it is usual to apply a layer of lacquer or varnish so as to increase their abrasion resistance.

It is also well known to provide decals cut from a vinyl or polyester resin sheet which are temporarily secured to a substrate in the form of a backing paper by means of an adhesive layer. In use, such decals are peeled away from the substrate and then applied to the surface of the article to be decorated. Whilst such decals have a higher scratch

resistance than water slide decals, they are formed of a relatively thick material and so cannot be successfully applied to surfaces of complex curvature.

It is also known to provide a decal in the form of a design layer printed onto a polystyrene or polyethylene film. The design layer is overcoated with a pressure-sensitive adhesive layer. A peel-away protective layer is provided over the adhesive layer. Such a structure provides a design layer which is thinner than the above-mentioned vinyl or polyester resin sheet but which does not have a particularly good scratch resistance and which is limited in terms of the curvature of the surface to which it can be successfully applied.

It is an object of the present invention to provide a decal support structure which combines the convenience of use of vinyl/polyester decals with the versatility of use of water slide decals in being very thin and also successfully adherent to surfaces of complex shape.

According to the present invention, there is provided a decal support structure comprising a substrate and a film which is removably carried by the substrate and over which, in use, a decal is printed, wherein said film is stretchable, preferably biaxially.

The film is preferably translucent to allow for positioning of the decal.

In a particularly convenient embodiment, the film is a stretchable cast polypropylene or polyethylene film.

The thickness of the film is preferably in the region of 20 to 60 μm , most preferably 35 to 45 μm .

The film preferably has an elongation DT break of 400 to 800%.

The film preferably has a tensile strength of 10/12 N/mm^2 .

The film is preferably releasably carried on the substrate through the intermediary of a low-tack adhesive layer, eg an aqueous based adhesive such as an EVA, PVA or acrylic adhesive.

The substrate is preferably a cast-coated paper, although it may be any other form of backing, e.g. a silicone-impregnated paper.

The present invention also resides in a decal comprising a decal support structure according to the present invention to which a design layer has been applied.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-
Fig 1 is a cross sectional schematic view of a decal supported a decal support structure according to the present invention, and
Fig 2 is a cross sectional view of a surface decorated by the decal.

In the drawings, the thicknesses of the various layers have been shown much exaggerated and are not to scale.

Referring now to Fig 1, the decal support structure comprises a cast-coated backing paper substrate¹⁰ having an aqueous-based, low-tack

adhesive layer 12 on one surface thereof. The adhesive layer serves to hold a translucent, biaxially stretchable, cast polyethylene film 14 on the substrate 10.

In this particular embodiment, the cast-coated paper substrate 10 has a thickness of 155 μm and has a surface smoothness of $< 0.6 \mu\text{m}$ (Parker Print Surf conditions S10) on its surface upon which the low-tack adhesive layer 12 is provided. The low-tack adhesive layer 12 has a thickness of 15 μm and is an EVA/PVA blend of controlled surface tension, of the type available from Autobond Ltd under the designation 0110/1. The stretchable cast polypropylene film 14 has a thickness of 30 μm and is of the type available from Rexham under the designation CEX001.

The decal is provided over the above-described decal support structure and consists of a localised decoration layer 18 printed onto the polypropylene film 14 and then top-coated with an adhesive layer 20. Although not illustrated in Fig. 1, the stretchable cast polypropylene film 14 is cut through around the area of the localised decoration layer 18 to enable localised separation of the appropriate part of the film 14 from the paper substrate 10.

In use (see Fig. 2), the laminate consisting of the adhesive layer 20, the decoration layer 18 and the film 14 are peeled away from the substrate 10 prior to application, this being permitted by the low-tack adhesive layer 12. This laminate is applied, adhesive layer 20 down, against surface 22 of article 24 to be decorated. The stretchable nature of the film 14 permits the decoration layer 18 to adopt the complex shape of

the surface 22 of the article 24 to be decorated. The stretchable cast polypropylene film 14 is then peeled away.

CLAIMS

1. A decal support structure comprising a substrate and a film which is removably carried by the substrate and over which, in use, a decal is printed, wherein said film is stretchable.
2. A decal support structure as claimed in claim 1, wherein the film is biaxially stretchable.
3. A decal support structure as claimed in claim 1 or 2, wherein the film is translucent.
4. A decal support structure as claimed in any preceding claim, wherein the film is a stretchable cast polypropylene or polyethylene film.
5. A decal support structure as claimed in any preceding claim, wherein the thickness of the film is in the region of 20 to 60 μm .
6. A decal support structure as claimed in any preceding claim, wherein the thickness of the film is in the region of 35 to 45 μm .
7. A decal support structure as claimed in any preceding claim, wherein the film has an elongation DT break of 400 to 800%.
8. A decal support structure as claimed in any preceding claim, wherein the film has a tensile strength of 10/12 N/mm².

9. A decal support structure as claimed in any preceding claim, wherein the film is releasably carried on the substrate through the intermediary of a low-tack adhesive layer.

10. A decal comprising a decal support structure as claimed in any preceding claim to which a design layer has been applied.

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Fig.1

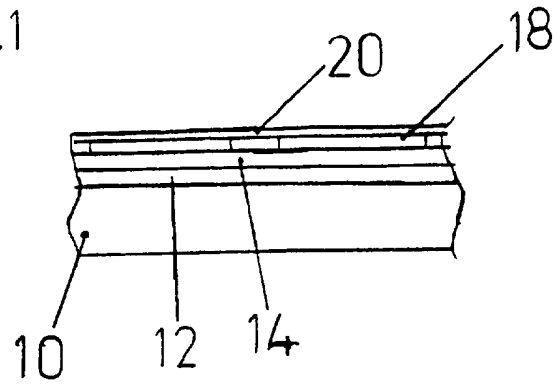
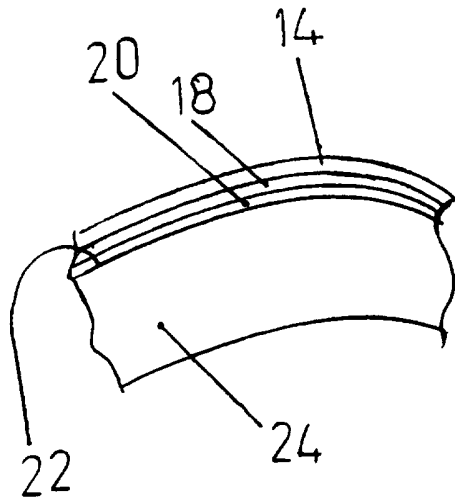


Fig. 2



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 6 B44C1/17		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC 6 B44C		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	DE 94 04 567 U (LEONHARD KURZ GMBH & CO.) 19 May 1994 see page 4, line 17 - page 6, line 19 see page 17, line 29 - page 17, line 33 ---	1,2,4,5, 9,10
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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