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EUROPEAN PATENT APPLICATION

21 Application number: 84300706.3

22 Date of filing: 06.02.84

51 Int. Cl.³: **B 41 M 1/30**
B 41 M 7/02, D 06 P 5/00
//D06P3/79

30 Priority: 10.02.83 GB 8303739
09.12.83 GB 8332920

43 Date of publication of application:
19.09.84 Bulletin 84/38

84 Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

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54 Process for printing onto polypropylene.

57 A process for printing onto polypropylene or other other plastics material having similar surface characteristics, comprising printing, using normal inks, onto the polypropylene or other plastics material surface and then coating the surface, as well as the printed area with transparent sealant material comprising a mixture of non-rub and hard-dry materials and preferably also a varnish to give a gloss finish.

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"Process for printing onto polypropylene"

This invention relates to a process for printing onto polypropylene or any other plastics material with similar surface characteristics to polypropylene, which is
5 normally considered unsuitable to accept printing inks satisfactorily, due to its grease-like surface.

The problem of printing onto polypropylene or similar material is that there is inadequate adhesion between the ink and the surface of polypropylene sheet resulting in poor definition and increasing repetitive inconsistency during and even after drying of the inks.
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To attempt to solve the problem of adhesion, a number of materials have been added to the ink, such additives also serving other purposes such as providing a non-rub finish or improving drying characteristics of the ink.
15

Up to the present none of these have been found to be satisfactory and it is generally considered that it is not possible to print reliably onto polypropylene or other similar plastics material.

20 The object of this invention is therefore to provide a process for printing successfully onto polypropylene or other plastics material having similar surface characteristics to polypropylene.

25 According to the present invention there is provided a process for printing onto polypropylene or other plastics material having similar surface characteristics comprising printing, using normal inks, onto the polyprop-

ylene or other plastics surface and then coating the surface and the inked area with a transparent sealant material.

5 According to a further aspect there is provided a sealant material for application to a surface of a polypropylene member or other plastics material having similar surface characteristics, characterised by a mixture of a non-rub material and a hard-dry material.

10 Conveniently, in one example the sealant material comprises 20-25% weight of a non-rub material and 20-25% by weight of a hard-dry material and 50-60% by weight of a gloss varnish material.

15 In another example the sealant material may comprise 60-85% by weight of a non-rub material and 15-40% by weight of a hard-dry material.

20 Preferably the sealant material includes a non-rub paste comprising 30% to 35% by weight of a polythene type wax and 65% to 70% by weight of a quick setting varnish to make up the balance.

Typically the optimum proportions of these materials comprise $33\frac{1}{2}\%$ of the polythene type wax and $66\frac{2}{3}\%$ of the varnish.

25 An additive in the form of a hard-dry material is preferably used. This may comprise 2% by weight of cobalt driers, 10% by weight of a wax compound and 88% by weight of china wood oil resin.

Preferably the gloss varnish material where used and which serves as a carrier and results in a gloss finish, comprises a resin base with an oil solvent.

30 Conveniently the ink is allowed to dry, at least partially before application of the sealant material.

It is found desirable to apply the sealant material at a temperature between 50° and 60° Centigrade, to aid drying.

35 The materials chosen include the characteristics, in the case of the non-rub material of providing a non-rub surface finish and in the case of the hard-dry additive of a hard-drying finish and in the case of the gloss varnish, where used, a good gloss surface.

The invention will now be described by way of example.

5 The process is particularly for printing onto polypropylene sheeting but is also useful for printing onto similar materials which are normally considered impossible to print directly using conventional printing inks.

Articles such as cassette packages or the cassettes themselves made from polypropylene material may also be printed by means of this process.

10 The procedure involves printing by any conventional method using conventional inks onto the polypropylene surface. A colour or combination of colours can be applied in exactly the same way as these are applied normally to paper or other materials.

15 The printing inks are allowed to dry to a predetermined extent and then the whole surface including the printing area is coated with a sealant material. This is transparent and the film of the sealant material laid down is very thin and therefore substantially indiscernible in the finished article.

20 The sealant material may be applied using a roller or by spraying. Alternatively a rubber or other flexible blanket or other conventional means for applying a thin coating to the surface may be used.

25 In one example the sealant material comprises a non-rub paste with an additive in the form of a hard-dry material, which serves as a reducing agent, and a gloss varnish.

30 The proportions of non-rub, hard-dry and gloss varnish are approximately 20-25% by weight of non-rub material and 20-25% by weight of the hard-dry additive and 50-60% by weight of the gloss varnish material. The proportions are preferably 25% non-rub and 25% hard-dry and 50% of gloss varnish material.

35 The non-rub paste may comprise 30 to 35% by weight of a polythene type wax and 65 to 70% by weight of a quick setting varnish to make up the remainder. The pre-

ferred proportions are $33\frac{1}{3}\%$ of the polyurethane type wax and $66\frac{2}{3}\%$ of the varnish.

5 The hard-dry additive may comprise 2% by weight of cobalt driers, 10% by weight of a wax compound and 88% by weight of china wood oil resin to make up the remainder.

The gloss varnish material, which serves as a carrier as well as producing a gloss finish, comprises a resin base including a mixture of gum and synthetic resins. To this is added a hydrocarbon drying oil solvent.

10 In the application of the sealant material it is desirable that the temperature should be between 50 and 60° Centigrade to aid rapid drying. It is preferable to premix the non-rub, hard-dry and gloss varnish materials to form the sealant in liquid form prior to application.

15 A suitable non-rub paste such as that referred to above is made by Shackell, Edwards & Company Limited and is identified by their Serial No. 2463. A hard-dry additive is made by Fishburn Printing Ink Company Limited under their Serial No. XC8228. The gloss varnish may be that made by J
20 and C and is identified by their Serial No. 120 H 96659.

In an alternative example, there is used a mixture of non-rub material and hard-dry material in the proportions 60 to 85% by weight of the non-rub material and 15 to 40% by weight of the hard-dry material, to make up the remainder.
25 The preferred proportions in this example are 75% by weight of the non-rub material and 25% by weight of the hard-dry additive material. It is however to be understood that proportions other than those specified may be found to be satisfactory.

CLAIMS

1. A process for printing onto polypropylene or other plastics material having similar surface characteristics, characterised by printing, using normal inks, onto the polypropylene or other plastics surface and then coating the surface and the inked area with a transparent sealant material.
2. A process as claimed in claim 1 characterised in that the sealant material is applied at a temperature between 50° and 60° Centigrade.
3. A sealant material for application to a surface of a polypropylene member or other plastics material having similar surface characteristics, characterised by a mixture of a non-rub material and a hard-dry material.
4. A sealant material as claimed in claim 3 characterised by 20-25% by weight of a non-rub material and 20-25% by weight of a hard-dry material and 50-60% by weight of a gloss varnish material.
5. A sealant material as claimed in claim 3 characterised by 60-85% by weight of a non-rub material and 15-40% by weight of a hard-dry material.
6. A sealant material as claimed in either of claims 4 and 5 characterised by a non-rub paste comprising 30-35% by weight of a polythene type wax and 60-70% by weight of a quick setting varnish to make up the balance.
7. A sealant material as claimed in claim 6 characterised in that the proportions are $33\frac{1}{3}\%$ of the polythene type wax and $66\frac{2}{3}\%$ of the varnish.
8. A sealant material as claimed in either of claims 4 and 5 characterised by a hard-dry material comprising 2% by weight of cobalt driers, 10% by weight of a wax compound and 88% by weight of china wood oil resin.
9. A sealant material as claimed in claim 4 characterised in that the gloss varnish material comprises a resin base with an oil solvent.