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(54) **Fabrics for use in composite sheeting.**

(57) A smooth faced fabric for use for example, in the manufacture of rubberised composite sheeting suitable for printing blankets, is composed of a rigid warp knitted structure of fine man-made filament yarns A, an inlaid warp of smooth, coarse man-made filament yarns B and C, and a weft insertion of coarse and preferably bulked or textured man-made filament yarns D. The warp inlay and weft insertion do not interlace, so that a very flat and smooth warp surfaced fabric is achieved. In making a printers' blanket, the fabric may be rubberised by conventional techniques.

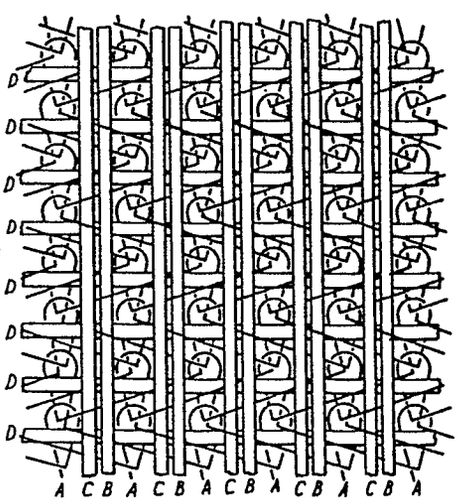

FIG. 1

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FABRICS FOR USE IN COMPOSITE SHEETING

The present invention relates to composite sheeting, and more especially to fabrics suitable for use in the manufacture of printers' blankets and to blankets incorporating such fabrics.

Conventional offset printing blankets are composite materials composed of layers of woven fabric and rubber, presenting a smooth rubberised surface to receive the ink to be transferred. The woven fabric is usually composed of combed cotton in warp and weft, but may have high modulus spun rayon in either warp or weft. The main requirements for such a fabric are that it should have a high modulus in the warp direction (to prevent stretching of the blanket on the printing machine), be smooth and without slubs or knots, be stable under vulcanizing conditions (when this is utilized) and afford adequate adhesion to the rubber layers. The blanket should also be sufficiently flexible to pass round rollers in the printing machine, and afford adequate cushioning for printing.

The present invention seeks to provide a novel smooth-surfaced fabric of improved properties and an improved printers' blanket incorporating the fabric.

The fabric according to the invention comprises a rigid warp knitted base fabric composed of relatively fine yarns of continuous man-made filaments, closely spaced and relatively coarse inlaid warp yarns and

relatively coarse weft insertion yarns, the inlaid and insertion yarns being also composed of man-made fibres and extending through the knitted structure without interlacing with one another, one face of the fabric being substantially constituted by the inlaid warp yarns.

By 'rigid' is herein meant that the fabric resists two-dimensional distortion in its own plane.

The fabric according to the invention has several advantages over the conventional fabric, because, apart from the basic knitted structure of fine yarn, the relatively coarse load-carrying warp and weft yarns do not interlace and lie completely flat, and there is no crimp in the warp and weft such as is imposed by a woven structure of similar strength. In consequence, the fabric has a higher modulus than a woven structure.

Preferred fabrics employ continuous filament yarns for both the inlaid warp and inserted weft. Moreover, for use in printers' blankets, it is preferred that the inserted weft yarns should be bulked or textured, and preferably also closely spaced.

The absence of yarn interlacings, and especially the use of smooth continuous filament yarns in the closely spaced inlaid warp, give the fabric and outstandingly smooth surface on the warp face.

The preferred yarns for the warp knitted base fabric are 33 dtex 6F polyester filament yarns. These fine yarns, preferably having a count in the range 33-110 dtex, contribute little to the load-carrying properties of the fabric or to the surface, but confer two-dimensional rigidity on the inlaid and inserted, but not interlaced, structure of the warp and weft.

The preferred inlaid warp yarns are 550 dtex 96F polyester. These yarns are relatively coarse, for example in the range 110 - 1100 dtex but are smooth and untextured. In the preferred fabrics, the inlaid warp yarns are disposed in pairs, with only one wale of the knitted base between each pair. Being closely spaced in the fabric, and held rigidly in position by the knitted base, the inlaid warps provide a substantially continuous, smooth surface on one face of the fabric

Particularly in the case of fabrics intended for use in printers' blankets, the weft insertion yarns are preferably textured or bulked yarns, more especially having a count in the range 120 - 1220 dtex.

Examples of suitable yarns are air-textured nylon or polyester yarns, which may be analogous to 'Taslanized' yarns although much heavier than the yarns usually textured by that process. Alternative yarns suitable for this purpose are torque-textured polyester yarns.

The bulked or textured weft yarns afford the desired cushioning and also offer a greater adhesion key to the layer of rubber or other elastomer in the manufacture of printers' blankets.

In the manufacture of printers' blankets from the fabric of this invention, the fabric is prepared as necessary to receive one or more elastomeric coatings and is then coated and, if appropriate, vulcanized, for which purposes conventional techniques may be employed. The blanket may include more than one layer of fabric, of which not all need be fabrics according to this invention. However, in any layer of fabric according to this invention the warp face should be directed towards the face of the blanket.

After being knitted, the fabric may be stretched in the warp direction and heat set in this condition to adjust the modulus as desired, followed by calendering to assist in closing gaps in the fabric structure and to increase the smoothness of the fabric surface.

If a key coat, for example an isocyanate coat, is to be applied to enhance adhesion between the fabric and the elastomeric layer, this is conveniently coated after the calendering operation.

Alternatively, a rubber-receptive yarn may be used, for example in the warp, with a resorcinol/formaldehyde latex adhesive dip treatment or other adhesive system known in the art.

The elastomers that may be used in conjunction with the fabric of this invention in the fabrication of printers' blankets include:

(1) vulcanizable elastomers, such as natural and synthetic rubbers;

(2) cross-linkable elastomers, such as non-thermoplastic polyurethurethanes, which may be of either the polyester or the polyether type;

(3) thermoplastic rubbers, such as block polystyrene/ butadiene polymers or styrene/butadiene block copolymers; and

(4) thermoplastic polyurethane.

Printers' blankets according to the invention are thinner and lighter than conventional blankets of comparable strength without any sacrifice of performance. They are also cheaper. Because of their reduced thickness, they are able to pass round smaller rollers without buckling at the inside surface and are therefore more adaptable in their application.

In the drawings:

Fig. 1 shows the structure of a preferred fabric for use in this invention; and

Fig. 2 is a knitting diagram for the fabric of Fig. 1.

In the drawings, A is the warp knitting yarn,

B and C are the smooth, untextured warp inlay yarns, and D is the bulked or textured weft insertion yarn. The preferred yarn parameters are identified above. The threading of the machine is as follows:

A = Bar 1 - Full

B = Bar 2 - Full

C = Bar 3 - Full

D = weft

In the knitting pattern shown in the diagram of Fig. 2, the warp yarns follow the arrangement:

A	B	C
2	0	0
0	0	0
—	—	—
4	4	2
6	4	2
—	—	—
2	0	0
0	0	0
—	—	—
4	2	4
6	2	4
—	—	—

Although when knitted with yarns of the character set forth above, the fabric structure described is outstandingly well adapted for use in composite sheeting such as printers' blankets, the structure is believed to be novel in its own right and, with the substitution of yarns of different characteristics (for example extensible yarns), can be used to provide smooth-faced fabrics for a variety of different end uses.

CLAIMS

1. A smooth-faced fabric comprising a rigid warp knitted fabric composed of relatively fine yarn of continuous man-made filaments, closely spaced and relatively coarse inlaid warp yarns and relatively coarse weft insertion yarns, the inlaid and insertion yarns being also composed of man-made fibres and extending through the knitted structure without interlacing with one another, and one face of the fabric being substantially constituted by the inlaid warp yarns.

2. A fabric according to claim 1 wherein the inserted weft yarn is a bulked or textured nylon or polyester filament yarn.

3. A fabric according to claim 1 or 2 wherein the inlaid warp yarns are disposed in pairs, with one wale of the knitted fabric between each pair.

4. A printers' blanket comprising at least one layer of a fabric according to claim 1, 2 or 3 embedded in at least one elastomeric layer, the smooth surface of the or each such fabric being directed towards the face of the blanket.

5. A printers' blanket according to claim 4 wherein the or each elastomeric layer is composed of vulcanized rubber.

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FIG.1

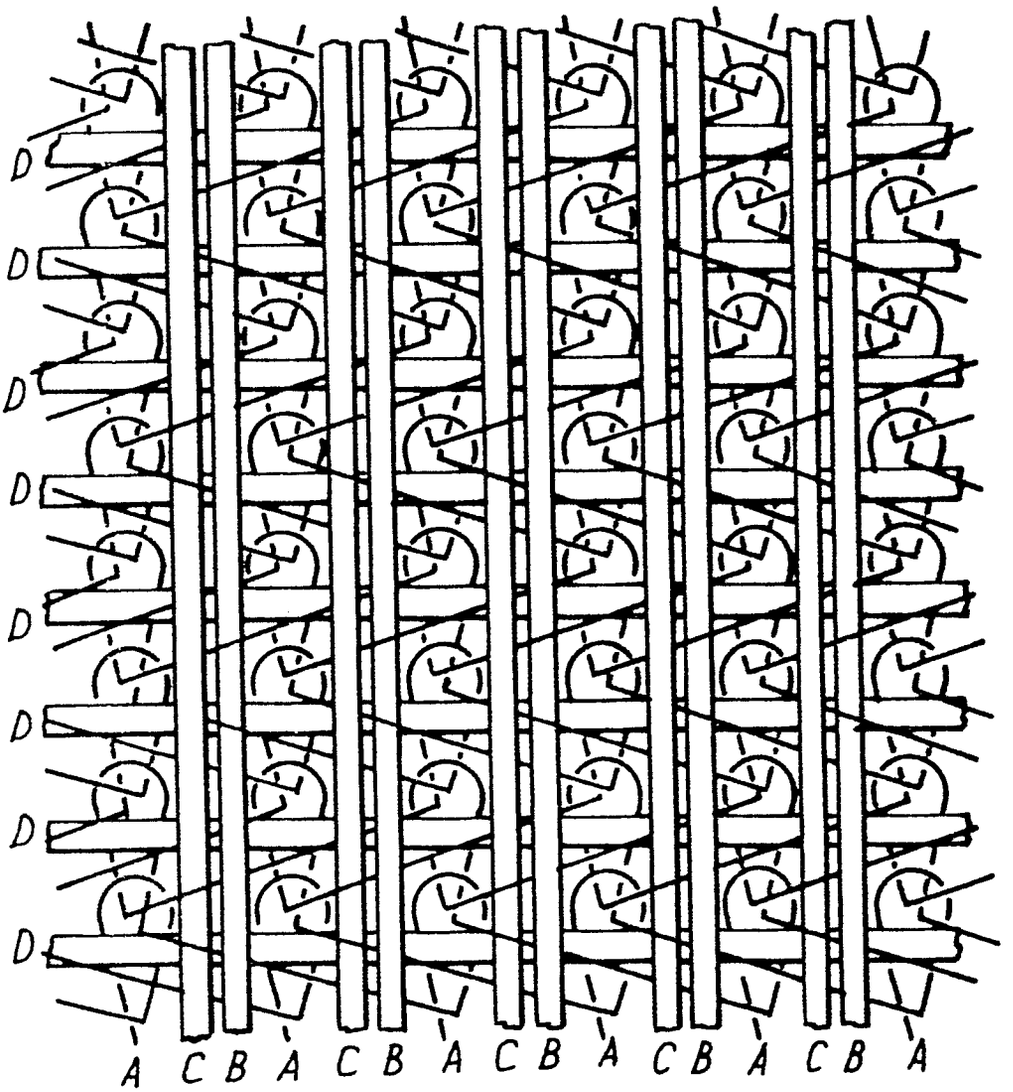

FIG.2