

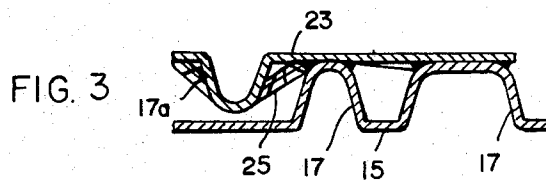
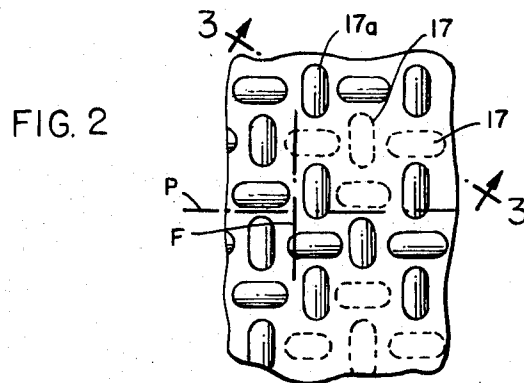
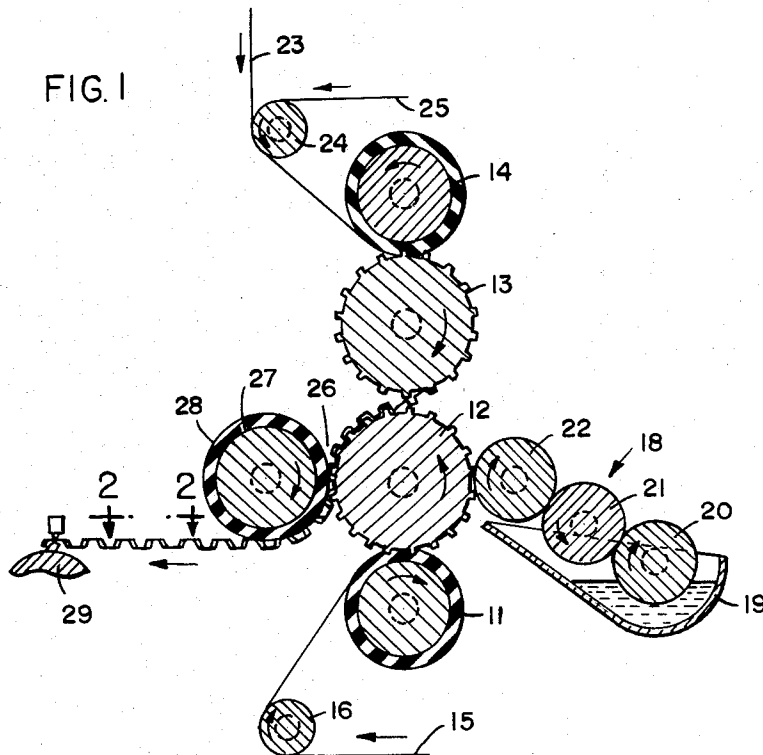
Sept. 26, 1972

R. E. SMALL
BASE PRODUCT FOR TEXTILE REPLACEMENT AND
METHOD OF PRODUCING SAME

3,694,300

Filed Aug. 27, 1971

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 4

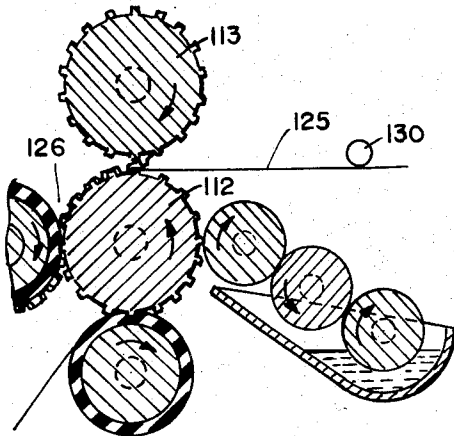


FIG. 5

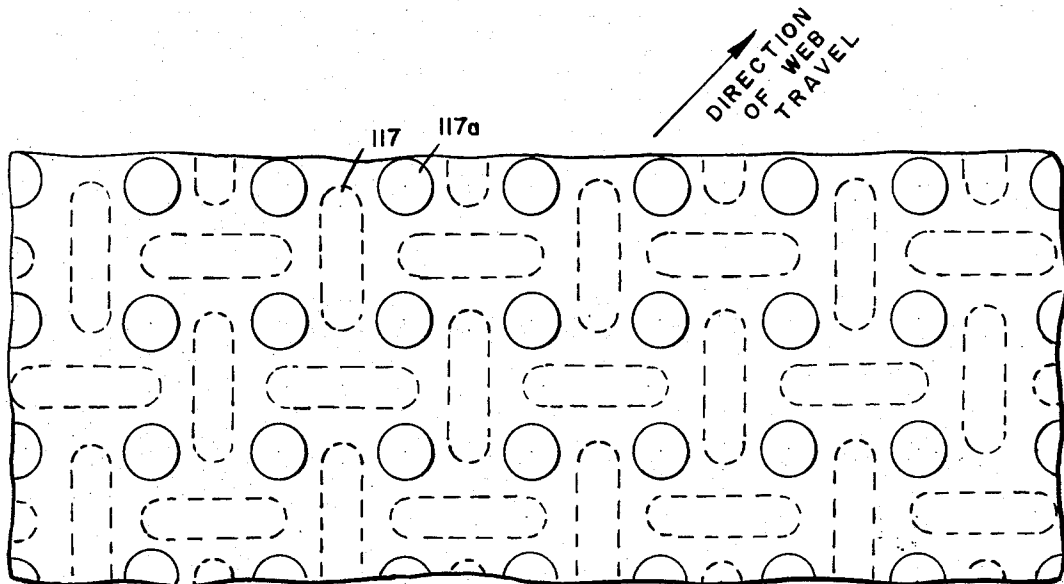
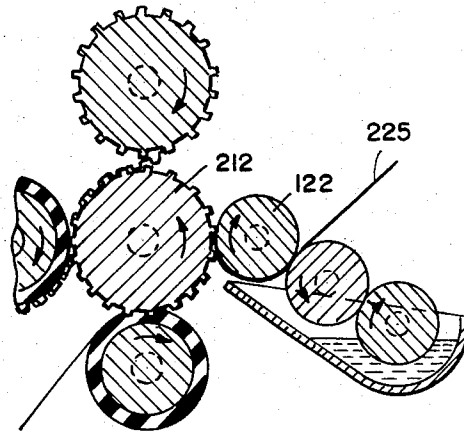


FIG. 6

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3,694,300

BASE PRODUCT FOR TEXTILE REPLACEMENT AND METHOD OF PRODUCING THE SAME

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8 Claims

ABSTRACT OF THE DISCLOSURE

A base product for a textile replacement such as paper garments, paper bedsheets, etc. in which a scrim-like material is confined between adjacent webs which are equipped with nested embossments.

BACKGROUND AND SUMMARY OF INVENTION

This invention is an improvement relative to the co-owned Pat No. 3,556,907, making use of the nested embossing technique described therein.

An essential requirement of the textile replacement product is that it be relatively sturdy, i.e., resistant to tearing, rupture, and severance in general. Webs such as paper webs normally do not possess this resistance so the art has turned to laminating paper webs with other materials having relatively elongated filaments or fibers—generally referred to in the trade as “scrim.” By this term I also include other strength-lending materials such as currently employed unwoven materials—where the fibers are elongated and randomly disbursed. When such a laminate is developed, the solution of one problem created another because the product was difficult to sever properly. For example, where the product was equipped with a line of potential severance such as perforations, the filaments extending through the bonds would not rupture in line with the perforations, resulting in an unsightly product. I termed this undesirable phenomenon “threading” which at the least exposes undesirable filaments protruding beyond the line of severance and in the more aggravated cases may result in bunching or gathering of the laminated web product in the area of the unsevered thread.

I have found that this undesirable phenomenon can be overcome through the use of nested embossments arranged to provide adhesive support for the scrim-like material filaments on each side of a line of potential severance.

DETAILED DESCRIPTION OF THE INVENTION

The invention is described in conjunction with the accompanying drawing, in which:

FIG. 1 is a fragmentary schematic view of a machine useful in the production of the inventive product and for performing the inventive method;

FIG. 2 is a fragmentary plan view of the product issuing from the left hand side of FIG. 1 as seen along the sight line 2—2 applied to FIG. 1;

FIG. 3 is an enlarged scale fragmentary sectional view taken along the line 3—3 applied to FIG. 2;

FIG. 4 is a fragmentary schematic view of a modified version of the machine seen in FIG. 1;

FIG. 5 is a view similar to FIG. 4 but of still a further modification; and

FIG. 6 is an enlarged fragmentary plan view of the inventive product but with a different embossed pattern.

For additional details of machine features and operation, reference may be had to the above-mentioned Pat. 3,556,907.

In the illustration given in FIG. 1, the numerals 11–14 represent rolls which are suitably mounted for rotation

in a frame (not shown). The rolls 11 and 12 constitute a first embossing unit while the rolls 13 and 14 constitute a second embossing unit. For example, the rolls 11 and 14 are platen rolls and the rolls 12 and 13 are embossing rolls. Each embossing roll 12 and 13 has a steel surface with a plurality of outstanding projections formed thereon. On the other hand, the platen rolls may be covered with rubber as shown, paper, etc.

The numeral 15 designates a web issuing from an unwind stand (not shown) and passing around an idler roll 16 and thereafter into the nip defined by the rolls 11 and 12. The projections on the roll 12 develop corresponding projections 17 seen in the web 15 in FIG. 3. Adhesive is applied to some or all of the high points of these projections by means of the adhesive applying unit generally designated 18 and which is seen to include a fountain 19 and a series of transfer rolls 20, 21 and 22 which are driven in conventional fashion.

In analogous fashion, an upper web is designated 23 and is seen to be passing around an idler roll 24 before entering into the nip defined by the rolls 13 and 14 in the second embossing unit. I introduced a web of scrim-like material 25 also into the nip defined by the rolls 13 and 14. As seen in FIG. 1, the web 25 also passes around the idler roll 24 and ultimately is sandwiched between the webs 15 and 23. The webs 15 and 23 are united by passing into the nip 26 defined by the rolls 12 and 27. The laminator roll 27 is advantageously equipped with a surface of resilient material 28. As the laminated web issues from the nip 26 it may be passed through a shear cut perforator 29, details of which can be seen in co-owned Pat. 2,870,840. The resultant composite laminate is designated T in the extreme left hand portion of FIG. 1.

The character of the embossments can be appreciated from a consideration of FIGS. 2 and 3 where the embossments 17a in the web 23 project downwardly while the embossments 17 in the web 15 project upwardly.

It will be noted that in accordance with the type of nested embossing described in the above-identified Pat. 3,556,907, the embossments are offset one relative to another so that the embossments in one web are opposite unembossed sections in the other web. The embossments, which are seen to be relatively elongated, are arranged to provide adhesive support for the various filaments in the web 25. For example, one such filament is designated F in FIG. 2 and is seen to be positioned within the bond between perforations P by the arrangement of embossments. I insure that generally no more than about 1 inch of a filament is not supported by adhesive contact of the adjacent webs. More particularly I prefer to dispose the embossments in such a fashion as to provide support for the filaments F at least about 1/2 inch on each side of any line of potential severance—such as the line of perforations P. Thus, I am able to provide a substantially even line of severance where indicated without the undesirable phenomenon of threading characteristic of prior laminates of this nature.

It will be appreciated that a wide variety of interlaced embossment patterns will be determined by aesthetic considerations, viz., appearance for marketing purposes. Therefore, it is entirely possible to utilize only a few up to several hundred projections per square inch.

FIGS. 4 and 5 show alternative arrangements of travel for the scrim-like web, 125 or 225, as the case may be. In each instance (FIGS. 4 and 5) there is provided a scrim-like web which is equipped with adhesive. In FIG. 4, for example, adhesive is applied to the scrim-like web 125 by means of an adhesive unit depicted schematically, referred to by the numeral 130. The web 125 is seen to travel into the region between the embossing rolls 112 and 113 and with the nested embossed webs into the nip 126.

3

In FIG. 5, adhesive is applied to the filamentary or scrim-like web 225 by causing the web 225 to travel in partial wrapping engagement with the transfer roll 222 and thence onto the lower embossing roll 212. Thereafter, the filamentary web 225 is confined between the two nested embossed webs in the fashion previously described. In the arrangements of FIGS. 4 and 5, the scrim-like web 125 or 225 is lightly integrated with one of the webs prior to actual confinement between the two nested embossed webs. On the other hand, in the arrangement of FIG. 1, the filamentary web 25 is partially embossed in conjunction with the web 23 to provide a slightly different type of integration.

Reference to FIG. 6 reveals a slightly different pattern of embossment which is effective to capture scrim filaments which may extend in random directions as well as in the machine or cross machine directions, i.e., parallel or transverse to the direction of travel of the web in passing through the machine. In the arrangement of FIG. 6, it is preferred to have the web travel at about 45 degrees to the length of the elongated embossments and this is designated by the arrow applied to FIG. 6. This arrangement of providing a labyrinth, in effect, insures capture of the filaments desired to be severed. In the arrangement seen in FIG. 6 the elongated embossments 117 are provided on the lower web and thus are shown in dotted line, corresponding to embossments applied to the web 15 in FIG. 1. On the other hand, the solid line embossments 117a are in the web facing upwardly, i.e., the web 23 of FIG. 1. It will be understood that other shapes can be utilized such as oval arrangements for the elongated elements and the round elements 117a could be any one of many shapes such as oval, square, rectangle, star, etc.

I claim:

1. A base product for textile replacement comprising a plurality of superposed, adhesively united webs having a line of potential severance, an inner of said webs having relatively elongated filaments, the next adjacent webs being equipped with nested embossments arranged to provide adhesive support for said material on each side of said

4

line to promote separation of said filaments with said webs.

2. The product of claim 1 in which said embossments are relatively elongated and disclosed to provide support for said filaments at least about 1/2 inch on each side of said line.

3. A base product comprising a nested embossment of a plurality of webs in which an internal filamentary material is adhesively secured to the embossments of one of the webs to promote separation of said material with the remaining webs upon severance.

4. In a method for producing a product for textile replacement, the steps of embossing at least two webs with the embossments of one web being arranged to nest with the embossments of the other web, disposing a filamentary material between said webs and adhesively securing said webs of material together, said embossments being sized and constructed to adhesively support said material on either side of a line of potential severance to promote separation of said material with said webs.

5. The method of claim 4 in which said material is coated with adhesive prior to engagement with said webs.

6. The method of claim 5 in which said product is perforated to provide said line.

7. The method of claim 4 in which said embossments are relatively elongated and disposed to provide support for the filaments of said material at least about 1 inch on each side of said line.

8. The method of claim 4 in which said filamentary material is embossed simultaneously with one of said webs.

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WILLIAM A. POWELL, Primary Examiner

U.S. Cl. X.R.

156—209, 210; 161—130, 146