March 11, 1952 T. M. SCRUGGS 2,588,580

APPARATUS AND METHOD FOR MANUFACTURE OF COMPOSITE WEB MATERIAL

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FIG. 1.

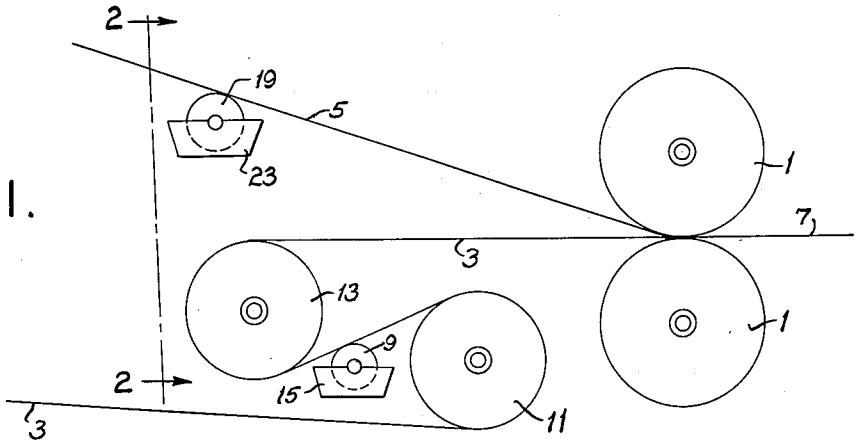


FIG. 2.

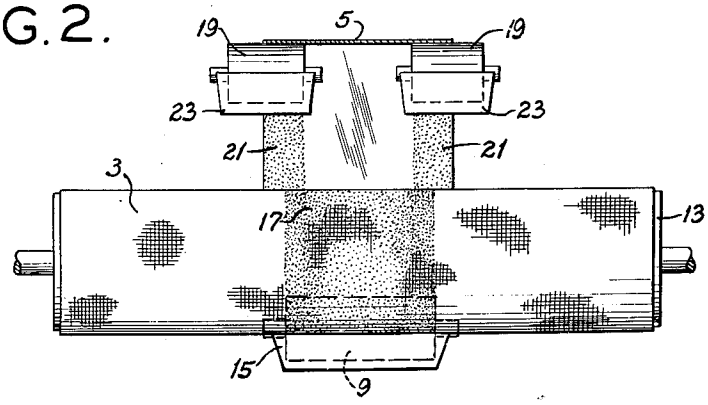
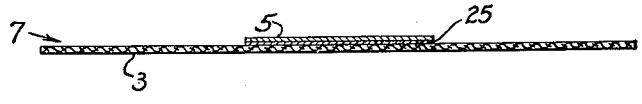


FIG. 3.



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APPARATUS AND METHOD FOR MANUFACTURE OF COMPOSITE WEB MATERIAL

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8 Claims. (Cl. 154—1.6)

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This invention relates to the manufacture of composite web material and more particularly to a method of and apparatus for adhesively combining a web of open-mesh fabric and a paper label strip narrower than the web.

The invention pertains particularly to the production of composite web material used in the manufacture of band-label open-mesh bags such as are shown in the coassigned and copending application of Brady et al. for Labeled Open-Mesh Bag, Serial No. 63,548, filed December 4, 1948, the composite web material consisting of a web of open-mesh fabric, such as a leno-woven fabric of paper yarn, and a paper label strip narrower than the open-mesh fabric and extending generally longitudinally the full length of the fabric, the fabric and the label strip being secured together by adhesive over substantially the entire area of the label strip. Prior to this invention, such composite web has been made by applying a stripe of adhesive as wide as the label strip to the fabric and combining the fabric and label in a continuous process, the combined fabric and label strip being wound into a roll. However, due to relative lateral shifting or weaving of the fabric and label strip, it frequently occurred that the label strip would be laterally displaced to one side or the other of the stripe of adhesive on the fabric. This resulted in exposure of adhesive on one side of the label strip and in non-adherence of its other side margin to the fabric. Exposure of adhesive caused the convolutions of the wound-up composite material to adhere together in the roll and caused trouble in subsequently unwinding the material from the roll.

At first glance it may be thought that the above-mentioned difficulty may be avoided by making the stripe of adhesive on the fabric narrower than the label strip, but this is unsatisfactory because it results in non-adherence of both side margins of the label strip to the fabric, which is conducive toward separation of the strip from the web. It may also be thought that the difficulty might be avoided by applying adhesive to the label strip over its entire width rather than to the fabric, but this is wasteful of adhesive because of the open-mesh character of the fabric.

The purpose of this invention is the provision of a method and apparatus particularly for producing composite web of the above-mentioned type without either exposure of adhesive or non-adherence of one or both side margins of the label strip to the fabric, and without undue waste of adhesive. It will be understood, however, that

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in its broader aspects the invention may be applicable to materials other than open-mesh fabric and a paper label strip.

In general, according to the method of this invention, adhesive is applied to the web in a stripe somewhat narrower than the strip as the web travels to a combining guide where it is combined with the strip, with the width of the stripe of adhesive wholly within the width of the strip. Also, adhesive is applied in narrow stripes to the side marginal portions of the strip which face the web as the strip travels toward the guide. Each of the strips of adhesive applied to the strip is of such width that, at the guide, the strip becomes adhesively secured over its entire area, or at least substantially its entire area, to the web. Thus, while the main body of adhesive is applied to the web, as is desirable to conserve adhesive, due to the fact that the stripe of adhesive applied to the web is narrower than the strip, a considerable degree of lateral displacement of the strip relative to the web cannot result in exposure of adhesive on either side of the strip, and, due to the application of adhesive to the side margins of the strip, the side margins are effectively adhered to the web so that there are no loose edge portions of the strip in the finished composite web material.

In general, an apparatus of this invention for carrying out the above method comprises a combining guide at which the web and strip may be combined, and an adhesive-applying roller somewhat narrower than the strip positioned to apply a stripe of adhesive somewhat narrower than the strip to the surface of the web facing the strip as the web travels over the roller to the guide. The web and strip become combined at the guide with the width of the stripe of adhesive wholly within the width of the strip. The apparatus also includes a pair of adhesive applying rollers positioned to apply narrow stripes of adhesive to the side marginal portions of the strip facing the web as the strip travels over the rollers to the guide. Other features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, steps and sequences of steps, features of construction and manipulation, and arrangements of parts which will be exemplified in the structures and methods hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing, in which one of

various possible embodiments of the invention is illustrated,

Fig. 1 is a generally diagrammatic side elevation of an apparatus of this invention;

Fig. 2 is an elevation as viewed on line 2—2 of Fig. 1; and,

Fig. 3 is a transverse section of the composite web material produced by the method and apparatus of this invention.

Referring to the drawing, an apparatus of this invention is shown to comprise a pair of combining rolls 1 which function as a combining guide for combining a web 3 and a strip 5 to form the composite web material 7 illustrated in Fig. 3. As herein illustrated, web 3 is an open-mesh fabric, such as an open-mesh leno fabric woven of paper yarn, and strip 5 is a label strip having a substantially continuous surface, such as paper, narrower than the fabric. The web and the strip are pulled through the rolls 1 and the composite web material 7 issuing from the rolls is wound into a roll by a winder (not shown).

As the web 3 travels toward the rolls 1, it travels over an adhesive-applying roller 9, being guided by guide rolls 11 and 13. The roller 9 rotates in a receptacle 15 for adhesive. Its width is somewhat less than the width of the strip 5, as will be seen in Fig. 2. It is so positioned relative to the strip 5 that it applies a stripe 17 of adhesive to the web 3 with the width of this stripe of adhesive wholly within the width of the strip 5. As particularly shown, the strip 5 is centered with respect to the roller 9 so that the stripe of adhesive 17 is centered with respect to the strip 5.

As the strip 5 travels toward the rolls 1 it travels over a pair of axially spaced coaxial adhesive-applying rollers 19, which apply comparatively narrow stripes of adhesive 21 to the side marginal portions of the strip facing the web. The rollers 19 rotate in receptacles 23 for adhesive, and their inner adjacent ends are spaced apart a distance somewhat less than the width of the roller 9, as will be seen in Fig. 2. The rollers 19 are wide enough to apply adhesive all the way from their inner adjacent ends to the side edges of the strip 5. As shown in Fig. 2, each of the stripes 21 has a width corresponding generally to the difference between the width of the stripe 17 on the web and the width of the strip 5.

The web 3 and the strip 5 merge at the rolls 1 and become adhesively combined, with adhesive over substantially the entire area of the strip. The adhesive of the completed composite web 7 is designated 25 in Fig. 3, and is a combination of the stripes 17 and 21. Preferably, as shown in Fig. 2, the roller 9 (and consequently the stripe of adhesive 17) is narrower than the strip 5 by one half the amount of the expected lateral displacement of the strip 5 relative to the web 3 as they travel toward the rolls 1 so that such lateral displacement will not expose any of the adhesive 17 on one side or the other of the strip. At the same time, the adhesive 21 insures that the sides of the strip will be adhesively secured to the web without any loose edge portions which would be conducive toward separation of the strip 5 from the web 3 in the finished composite web material 7, and the lateral overlapping of the stripes 17 and 21 insures that the adhesive 25 of the completed web will be substantially continuous over the entire width of the strip 5. Also, it will be seen that the majority of the adhesive is applied to the web 3 so that where this web is of open-mesh fabric material, adhesive is conserved.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions and methods without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. The method of making composite web material consisting of a web of open-mesh material and a strip narrower than the web extending the length thereof and adhesively secured substantially over its entire area to the web, comprising applying adhesive to the web in a single stripe somewhat narrower than the strip as the web travels to a combining guide where it is combined with the strip, with the width of the said stripe of adhesive wholly within the width of the strip, and applying adhesive in a single narrow stripe to each side marginal portion of the strip facing the adhesive-bearing surface of the web as the strip travels toward the guide, the width of the latter stripes being such that the strip becomes adhesively secured over substantially its entire area to the web.

2. The method of making composite web material consisting of a web of open-mesh material and a strip narrower than the web extending the length thereof and adhesively secured substantially over its entire area to the web, comprising applying adhesive to the web in a single stripe somewhat narrower than the strip as the web travels to a combining guide where it is combined with the strip with the center lines of the strip and the stripe at least substantially aligned, and applying adhesive in a single narrow stripe to each side marginal portion of the strip facing the adhesive-bearing surface of the web as the strip travels toward the guide, each of the latter stripes having a width corresponding to the difference between the width of the stripe on the web and the width of the strip.

3. The method of making composite web material consisting of a web of open-mesh fabric and a paper strip narrower than the fabric extending the length thereof and adhesively secured substantially over its entire area to the fabric, comprising applying adhesive to the fabric in a single stripe somewhat narrower than the paper strip as the fabric travels to a combining guide where it is combined with the paper strip, with the width of the said stripe of adhesive wholly within the width of the paper strip, and applying adhesive in a single narrow stripe to each side marginal portion of the paper strip facing the adhesive-bearing surface of the fabric as the paper strip travels toward the guide, the width of the latter stripes being such that the paper strip becomes adhesively secured over substantially its entire area to the fabric.

4. The method of making composite web material consisting of a web of open-mesh fabric and a paper strip narrower than the fabric extending the length thereof and adhesively secured substantially over its entire area to the fabric, comprising applying adhesive to the fabric in a single stripe somewhat narrower than the paper strip as the fabric travels to a combining guide where it is combined with the paper strip with the center lines of the paper strip and the stripe

at least substantially aligned, and applying adhesive in a single narrow stripe to each side marginal portion of the paper strip facing the adhesive-bearing surface of the fabric as the paper strip travels toward the guide, each of the latter stripes having a width corresponding to the difference between the width of the stripe on the fabric and the width of the paper strip.

5. Apparatus for making composite web material consisting of a web and a strip narrower than the web extending the length thereof and adhesively secured substantially over its entire area to the web comprising a combining guide at which the web and the strip may be combined, means for applying a single stripe of adhesive somewhat narrower than the strip to the surface of the web facing the strip as the web travels toward the guide, the web and strip becoming combined at the guide with the width of said stripe of adhesive wholly within the width of the strip, and means for applying a single narrow stripe of adhesive to each side marginal portion of the strip facing the web as the strip travels toward the guide.

6. Apparatus for making composite web material consisting of a web and a strip narrower than the web extending the length thereof and adhesively secured substantially over its entire area to the web comprising a combining guide at which the web and the strip may be combined, an adhesive-applying roller somewhat narrower than the strip positioned to apply a single stripe of adhesive somewhat narrower than the strip to the surface of the web facing the strip as the web travels over the roller to the guide, the web and strip becoming combined at the guide with the width of said stripe of adhesive wholly within the width of the strip, and a pair of adhesive-applying rollers positioned to apply a narrow stripe of adhesive to each side marginal portion of the strip facing the web as the strip travels over these rollers to the guide.

7. Apparatus for making composite web material consisting of a web of open-mesh fabric and a paper strip narrower than the fabric extending the length thereof and adhesively secured substantially over its entire area to the fabric comprising a combining guide at which the fabric and the paper strip may be combined, means

for applying a single stripe of adhesive somewhat narrower than the paper strip to the surface of the fabric facing the strip as the fabric travels toward the guide, the fabric and strip becoming combined at the guide with the center lines of the strip and the stripe at least substantially aligned, and means for applying a narrow stripe of adhesive to each side marginal portion of the paper strip facing the fabric as the strip travels toward the guide with each of said stripes having a width corresponding to the difference between the width of the stripe on the fabric and the width of the paper strip.

8. Apparatus for making composite web material consisting of a web of open-mesh fabric and a paper strip narrower than the fabric extending the length thereof and adhesively secured substantially over its entire area to the fabric comprising a combining guide at which the fabric and the paper strip may be combined, an adhesive-applying roller somewhat narrower than the paper strip positioned to apply a single stripe of adhesive somewhat narrower than the paper strip to the surface of the fabric facing the strip as the fabric travels over the roller to the guide, the fabric and strip becoming combined at the guide with the center lines of the strip and the stripe at least substantially aligned, and a pair of adhesive-applying rollers positioned to apply a narrow stripe of adhesive to each side marginal portion of the paper strip facing the fabric as the strip travels over these rollers to the guide with each of said stripes having a width corresponding to the difference between the width of the stripe on the fabric and the width of the paper strip.

THOMAS M. SCRUGGS.

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