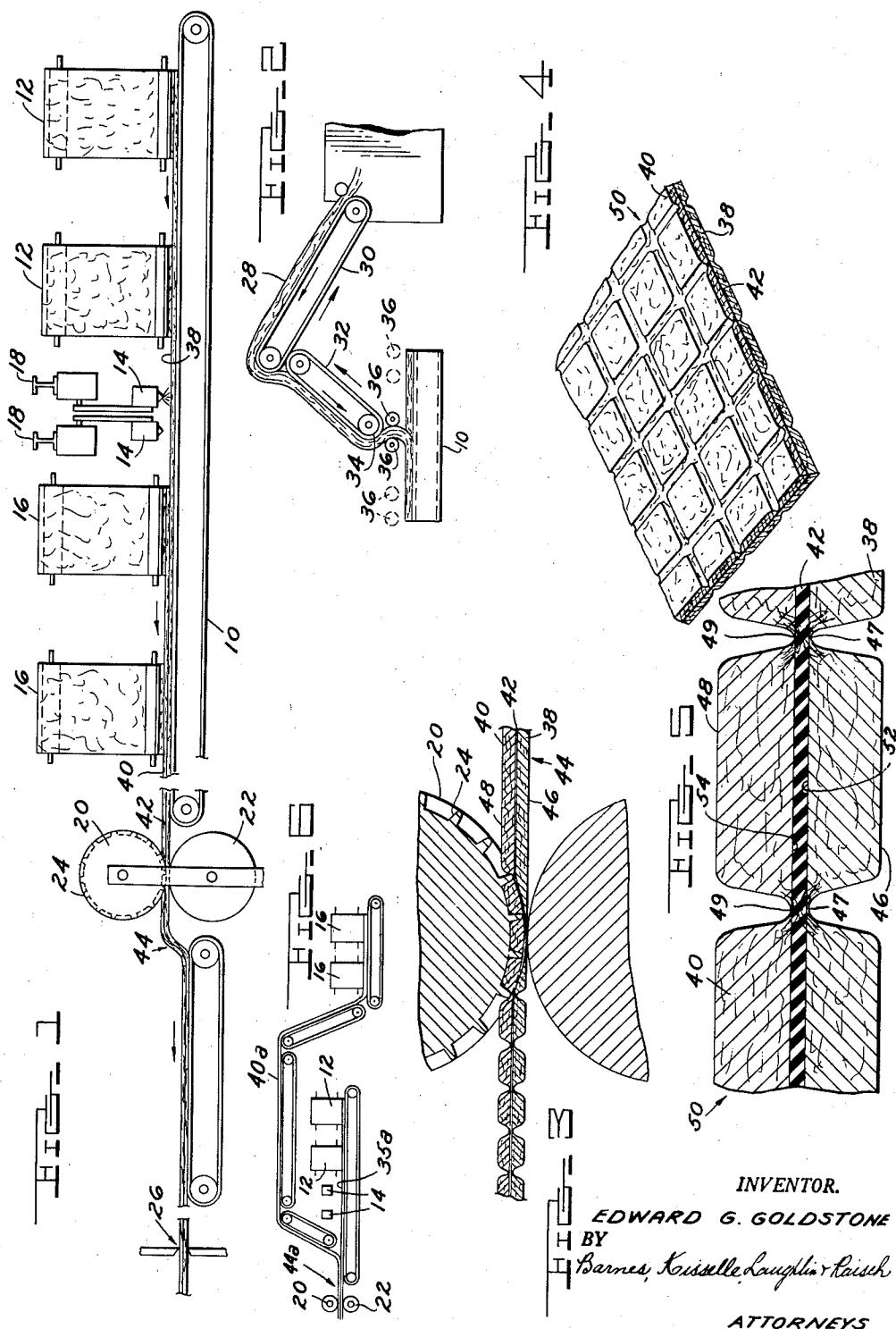


Dec. 13, 1960

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METHOD OF MAKING A FABRIC

2,964,441

Filed Aug. 23, 1954



1

2,964,441

METHOD OF MAKING A FABRIC

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Filed Aug. 23, 1954, Ser. No. 451,590

2 Claims. (Cl. 154—106)

This invention relates to a method of making fabric from fibrous materials and to products made by the method. The method is especially well adapted to making form-retaining pads of fabric from non-woven fibrous materials.

An exemplary application of the invention lies in making batts or padding for use in upholstered chairs, automobile seats and the like. Such padding usually comprises a body of loosely matted, fluffy, non-woven fibers such as jute or cotton fibers and backing means for the fibers. The purpose of the backing means is to hold the fibers in the form of a pad during handling prior to actual use and to prevent the fibers from migrating during use. The backing has been provided in several ways, for example: by compressing portions of the pad so that some of the fibers are more firmly matted together; by stitching a woven cloth covering over the pad and sometimes by quilting the covered pad; by applying fluid adhesives which penetrate portions of the pad and which, upon drying, secure together the fibers contacted thereby. Numerous variations and combinations of these types of backing have been used.

It is an object of this invention to provide a simple, economical, improved method of making form-retaining fabrics such as batts or pads and to provide a fabric structure having improved form-retaining characteristics. The invention is carried out generally by compressing portions of a body of fibrous material into a membrane of latex which is in a cohesive state and allowing the latex to cure. The cured latex forms a matrix of rubber holding the fibers pressed into it. In the accompanying drawings:

Fig. 1 is a diagrammatic representation of apparatus suitable for carrying out the method of this invention.

Fig. 2 is a diagrammatic elevational view of a camel-back lapping machine.

Fig. 3 is an enlarged sectional view illustrating operation of the compressing rollers.

Fig. 4 is a perspective view illustrating a batt produced by the method of this invention.

Fig. 5 is an enlarged diagrammatic sectional view illustrating the construction of the batt shown in Fig. 4.

Fig. 6 is a diagrammatic illustration of a modified apparatus for carrying out the method of this invention.

Shown in Fig. 1 is a conveyor belt 10 moving in the direction of the arrows. Disposed along the length of the conveyor belt are two camel-back or lapping machines 12 of a well known type used in connection with Garnett machines, two spray guns 14 for spraying fluent latex and two more camel-back lapping machines 16. Spray guns 14 are mounted on supports 18. Downstream of lapping machines 16 are compression rollers 20 and 22, roller 20 having projections 24 thereon and roller 22 being preferably smooth. Downstream of the compression rollers is a cut off device generally represented at 26. Lapping machines 12 and 16 may be of identical construction but are given different reference characters for convenience in description.

2

Operation of the lapping machines is illustrated in Fig. 2. Each lapping machine feeds a veil or web 28 of combed, loosely matted fibers, such as jute or cotton fibers, to a conveyor belt 30 from where it is delivered to another conveyor belt 32. The lower end 34 of conveyor belt 32 is oscillated back and forth above main conveyor belt 10 as indicated by the alternate positions of guides 36 in Fig. 2. The veil 28 of fibrous material is lapped or folded back and forth upon itself on conveyor belt 10, thereby generating a laminate body of fibrous material.

Camel-back lapping machines 12, upstream from spray guns 14, generate a continuous laminate sheet 38 of fluffy, loosely matted fibers on conveyor belt 10. The sheet is then carried beneath spray guns 14 which preferably oscillate back and forth above the sheet and spray an aqueous dispersion of rubber such as latex uniformly onto the sheet. The sheet is then carried to lapping machines 16 where another continuous sheet 40 of the fibrous material is generated over the sprayed face of sheet 38.

The latex at this point is in a liquid or fluent state. The latex is now allowed to cure or set up partially so that it forms a cohesive membrane 42 between the two layers 38 and 40 of fibrous material. This partial curing of the latex is accelerated by absorption of the water by the fibrous material of the sheets. While the membrane is still in a cohesive state and before it has cured completely, the composite body 44 comprising sheets 38 and 40 and membrane 42 is passed between compressing rollers 20 and 22. Projections 24, cooperating with the smooth surface of roller 22, compress the fibers of spaced apart opposing regions of sheets 38 and 40 into the membrane, leaving intermediate regions in uncompressed, fluffy condition.

In the rolling operation, fibers throughout the thickness of sheets 38 and 40, including fibers at outer surfaces 46 and 48, are pressed into the membrane as best illustrated in Fig. 5 at 47 and 49. The cohesive latex of the membrane welds around the fibers pressed into it and forms a cohesive matrix which securely holds the fibers. The latex is then allowed to cure completely so that the fibers are permanently secured together in a matrix of rubber. The rolled body 44 may be cut into batts of desired sizes by suitable cut off means 26.

Projections 24 on roller 20 preferably have a reticulate pattern so that the compressed fibers are secured together in a unitary network. In the form of roller 20 illustrated, projections 24 have the pattern of a rectangular grid. This pattern may be altered as desired.

The thickness of the sheets or layers 38 and 40 may be varied by varying the capacity of the Garnett machines supplying the lapping machines 12 and 16 and relative speeds of operation of conveyor belt 10. In some situations, suitable sheets 38 and 40 may be built up by using only one each of the lapping machines 12 and 16. Also in some situations a single gun 14 may provide adequate latex for the operation. In these situations the provision of duplicate machines facilitates continued operation during a stoppage of one of the machines, for example, for maintenance purposes.

Figs. 4 and 5 illustrate a batt 50 made according to the method described. The entire inner faces 52 and 54 of sheets 38 and 40, respectively, are bonded to membrane 42 which is of strong cured rubber so that the batt as a whole has relatively great tensile strength in the plane of the membrane. The reticulate surface portions anchored in the membrane provide a network of strengthening elements supporting intermediate surface portions against being plucked or torn away from the batt prior to use and against forces tending to cause migration of the fibers during use. At the same time the loose fluffy character of the batt, and its value as a pad, is retained.

3

The terms "latex," "aqueous dispersions of rubber," and "rubber" as used in the specification and claims are intended to cover both natural and synthetic materials, as well as compounds or mixtures of natural or synthetic lattices with other ingredients which may be added to impart stability, fluidity, viscosity and other desirable features to the coating bath, provided that the resultant film is cohesive and has the property of self-adhesion.

The modified arrangement of apparatus shown in Fig. 6 is similar to the arrangement shown in Fig. 1 except that lapping machines 12 and 16 are arranged more nearly in parallel than in series with sheet 40a being imposed in completed form over latex coated sheet 38a. This arrangement reduces the time between the spraying of sheet 38a and the rolling of the composite sheet 44a. This arrangement may be used in situations where the latex might otherwise cure beyond a cohesive state before reaching the compressing rollers.

It will also be seen that the pressing of portions of fibrous material can be accomplished by different types of pressing mechanisms; it will also be understood that the rollers such as 20 and 22 forming the configurations can be of duplicate configuration in that both the rollers 20 and 22 may have the projections 24 formed in the surfaces thereof.

Thus, it is seen that the invention provides a method of improved economy and simplicity for making batts having superior form-retaining characteristics by utilizing the ingenious expedient of pressing portions of a fibrous material into a membrane of cohesive latex and then allowing the latex to cure so that the fibers are secured together in a matrix of rubber.

I claim:

1. In a method of making batting, the steps which comprise applying a coating of liquid rubber latex to one

4

side of a body of loose non-woven fibrous material, applying a second body of loose non-woven fibrous material over said coating of latex, allowing the latex to cure partially until it reaches a cohesive state, and while the latex is still in a cohesive state compressing substantially the entire thickness of opposing, spaced apart, uncoated portions of said bodies of material into the latex without cutting said portions, and allowing the latex to cure completely, whereby the fibers in the compressed portions of the bodies of material are bonded in a rubber matrix.

2. The method of making batting defined in claim 1 and characterized in that said opposing, spaced apart, uncoated portions of said bodies of material are compressed into the latex in a reticulate pattern.

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