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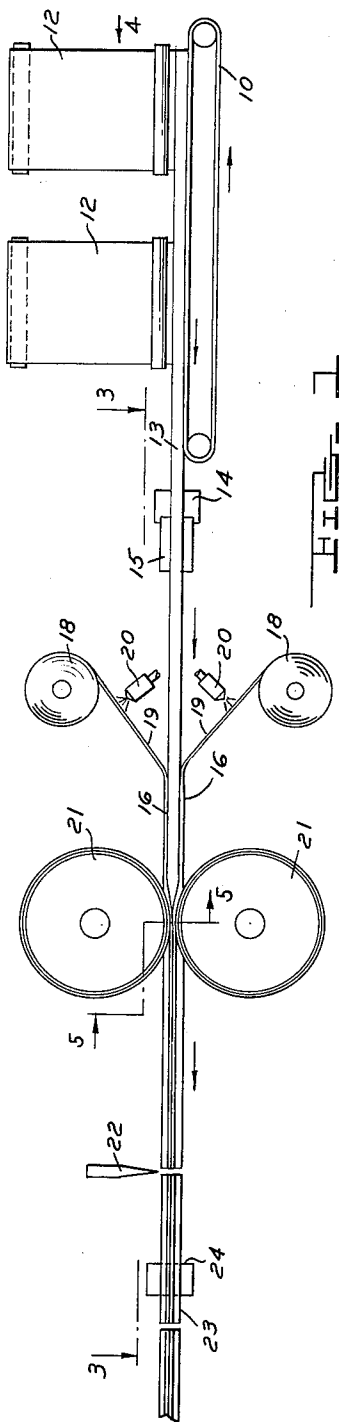
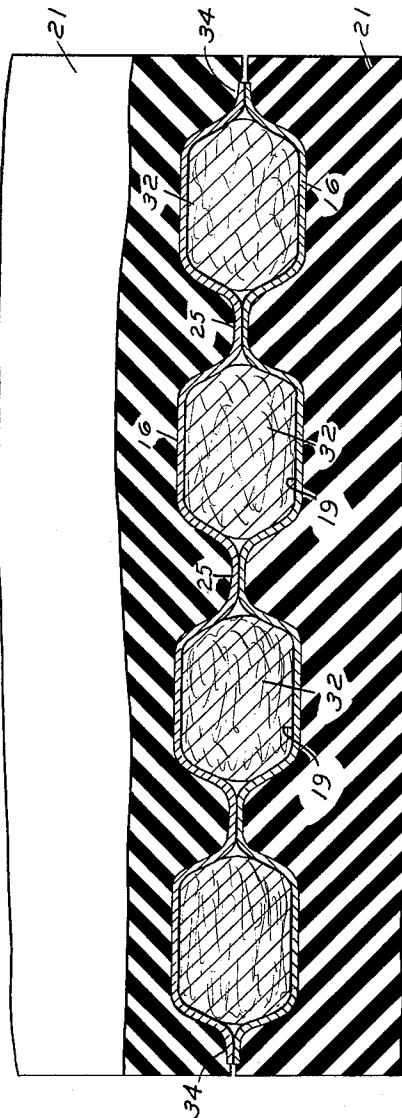
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FIBROUS BATTS AND METHOD OF PRODUCING THE SAME

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2 Sheets-Sheet 1



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FIBROUS BATTS AND METHOD OF PRODUCING THE SAME

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5 Claims. (Cl. 154—46)

This invention relates to a method of making batts from a loosely matted, nonwoven, fibrous material and to products of the method.

The invention can be used in making various types and sizes of batts for such use as upholstering furniture, automobile seats and the like. The invention is especially adapted to quantity production of relatively small or narrow batts. Heretofore small batts have been made by generating a narrow strip of batting by the use of a camel back or lapping machine in connection with a Garnett machine and then folding or rolling the strip to tubular or pipe form. This method is wasteful, utilizing only a small part of the capacity of the machinery which is usually capable of forming wide sheets of batting material.

An object of this invention is to provide a rapid economical method of producing relatively small or narrow batts in quantity. Another object is to provide an inexpensive batt structure improved to facilitate rapid convenient handling and having improved tensile strength characteristics.

The invention is carried out generally by forming a relatively wide sheet of fibrous padding material and severing the sheet into strips which are then spaced apart and sandwiched between two layers of a retaining material having coatings of cohesive latex thereon. The layers are pressed together so that the membranes contact and weld together around the fibrous strips to form casings therefor. One form of the invention is shown in the accompanying drawings:

FIG. 1 is a diagrammatic view illustrating apparatus suitable for carrying out the method of this invention.

FIG. 2 is a generally perspective view of batting produced by the method of this invention.

FIG. 3 is a diagrammatic plan view taken on line 3—3 of FIG. 1 and illustrating several steps in the method.

FIG. 4 is an enlarged diagrammatic elevational view taken in the direction of arrow 4 in FIG. 1, illustrating operation of a lapping machine.

FIG. 5 is an enlarged diagrammatic, partly sectional view on line 5—5 of FIG. 1, illustrating a compression step in the method.

FIG. 1 shows a conveyor belt 10 moving in the direction of the arrows adjacent two camel back or lapping machines 12 of a well known type used in connection with Garnett machines. The lapping machines generate a sheet of padding material 13 on the conveyor and the padding material is then moved downstream to slitting knives 14 and spreaders 15 where it is divided into strips. The strips are sandwiched between layers 16 of retaining material drawn from rolls 18 and coated with fluent latex or an aqueous dispersion of rubber by such means as spray guns 20 to form coatings 19. The laminated materials are pressed between rollers 21, passed to knives 22 which cut the material to the desired lengths, and then passed to knives 24 which sever the interconnecting webs 25 of retaining material to form individual batts 23. The padding material preferably moves continually downstream or to the left as FIG. 1 is viewed and is supported by suitable traveling or stationary means, not shown, after leaving conveyor 10.

Operation of the lapping machines is illustrated in FIG. 4. Each lapping machine feeds a veil or web 26

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of combed, loosely matted fibers such as jute or cotton fibers to a conveyor belt 27 from where it is delivered to another conveyor belt 28. The lower end 29 of belt 28 is oscillated back and forth above conveyor belt 10 as indicated by the alternate positions of guides 30 in FIG. 4. The veil 26 of fibrous material is lapped or folded back and forth upon itself on conveyor belt 10, thereby generating a laminate sheet 13. The lapping machines are adjusted to generate a relatively wide sheet 13 in order to utilize their full capacity or a major part of their capacity.

Sheet 13 is moved to the left as FIGS. 1 and 3 are viewed and is slit longitudinally by knives 14 to form a plurality of strips 32 which are spread apart by spreaders 15 to provide interspaces 33 between the strips. The spaced apart strips are then sandwiched between two sheets of a very light weight, slightly stretchable retaining material having just sufficient strength to allow it to be fed from rolls 18 to strips 32. An example of such a material is a paper of the type commercially known as Kimpak. Latex coatings 19 may be sprayed onto sheets 16 after leaving rolls 18 and are allowed to cure partially to a cohesive state before being brought into contact with strips 32. Sheets 16 preferably span the combined widths of strips 32 and the edge portions 34 of the sheets project outwardly of the edges 35 of the outer strips as represented in FIG. 3.

After the fibrous padding material and latex coated sheets 16 are assembled in laminated relation, they are passed between squeezing rolls 21 which are preferably formed of a resiliently compressible material such as foam rubber. The material of the rolls extrudes around the outer edges of strips 32 and into the interspaces 33 therebetween to mold sheets 16 around the strips and force coatings 19 into contact as shown in FIG. 5. The cohesive coatings or membranes immediately weld together at the edges and interspaces of the strips so that sheets 16 form casings for retaining the shape of the strips of fibrous material and form webs 25 interconnecting the strips. The batting is passed to knife 22 where it is sheared to a desired length and then to knives 24 which sever webs 25 to form individual batts 23. Webs 25 may be severed before the batting is sheared by knife 22 if desired. When the latex cures completely it forms a bond of rubber securely locking sheets 16 together for containing strips 32.

The latex coating strengthens sheets 16 somewhat for improving the form retaining characteristics and tensile strength of finished batts 23. During the compression step there is some compressing of padding 32 and some tightening of sheets 16 around the edges thereof so that the fibrous material is securely retained in its predetermined shape. In addition, the surface fibers of the padding material are compressed somewhat into adjacent membranes 19 during the pressure step and are secured against migrating relatively to sheets 16, thereby improving the form retaining characteristics of the padding.

The drawings illustrate the production of batting from four similarly shaped strips 32 which are sheared transversely to their direction of travel by knives 22. However, the number and sizes of strips may be varied as desired and the padding emerging from rollers 21 may be sheared in other directions to provide batts of various sizes and shapes.

The terms "latex," "aqueous dispersion 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 latices with other ingredients which may be added to impart stability, fluidity, viscosity, and other desirable features to the coating material, provided that the resultant film is cohesive and has the property of self-adhesion.

The latex reinforced casing secures the fibrous body of padding 32 together in a unitary batt which is both very light weight and flexible. At the same time the casing provides improved tensile strength characteristics for the batt so that it will retain its shape during the handling incident to packaging, shipment, installation and use. Batts of desired sizes and shapes may be packaged as they emerge from the knives at the end of the production line represented in FIG. 1. It has been found that batts can be produced by the method of this invention at approximately twice the rate of prior production methods using the same number of lappers and Garnetts and employing the same number of personnel.

Thus it is seen that the invention provides a method of producing batts more rapidly and economically than methods heretofore used while employing equipment of standard types. Moreover, the resulting batt structure has improved tensile strength and form retaining characteristics to facilitate rapid, convenient handling in packaging, installation, and use. These ends are achieved by separating the wide fibrous sheet emerging from a lapping machine into strips and sandwiching the strips between layers of light, flexible material coated with cohesive latex and pressing the coated portions of the layers together around the strips so that the coatings weld together to form casings therefor.

I claim:

1. Battng comprising, a strip of loosely matted non-woven fibrous material, a lightweight flexible casing for said strip of material, said casing including a thin, flexible, lightweight retaining material having in itself inadequate tensile strength to form said casing, said retaining material having a coating of adhesive material thereon, said adhesive material and said retaining material cooperating to provide said casing with relatively greater tensile strength adequate to effectively retain said strip of fibrous material in its pre-formed shape, said coating of adhesive material also contacting fibers in said fibrous material to secure the same against migrating.

2. The method of making batts which comprises, forming a relatively wide, elongate sheet of loosely matted, non-woven, fibrous material, moving said sheet longitudinally relative to severing means and thereby severing said sheet longitudinally to form a plurality of relatively narrow, elongate strips, spacing said strips apart laterally while continuing to move the same, sandwiching the spaced apart strips between two sheets of retaining material having cohesive membranes on their apposed faces with said sheets arranged so that edge portions thereof extend outwardly of the edges of the outer strips while continuing to move said strips, applying inward force to the outwardly disposed faces of said sheets, said force being applied in a region which is substantially continuous across the entire width of said sheets between their edge portions so that said sheets are pressed together at said edge portions and wherever said spaces between said strips occur and so that said membranes are adhered to the surfaces of said strips between said spaces, whereby to weld said membranes together at said edge portions and interspaces, and curing the membranes completely to form a bond securing said layers together, whereby to retain said strips in their pre-formed shapes.

3. The method defined in claim 2 wherein said inward force is applied by resiliently distortable means forced against said sheets, the material of said means extruding

into said interspaces and around the edges of the outer of said strips.

4. The method of making batts which comprises, forming a relatively wide elongate sheet of loosely matted, non-woven fibrous material, moving said sheet longitudinally and severing said sheet longitudinally to form a plurality of relatively narrow strips, spacing said strips apart laterally while continuing to move the same, sandwiching the spaced apart strips between two sheets of retaining material having cohesive membranes on their apposed faces with said sheets arranged so that edge portions thereof extend outwardly of the edges of the outer strips while continuing to move said strips, applying inward force to the outwardly disposed faces of said sheets, said force being applied in a region which is substantially continuous across the entire width of said sheets between their edge portions so that said sheets are pressed together at said edge portions and wherever said spaces between said strips occur and so that said membranes are adhered to the surfaces of said strips between said spaces, whereby to weld said membranes together at said edge portions and interspaces, curing the membranes completely to form a bond securing said layers together, whereby to retain said strips in their pre-formed shapes, and severing said layers longitudinally at said interspaces to form a separate complete batt on each side of the line of severing.

5. The method of making batts which comprises, forming a relatively wide, elongate sheet of loosely matted, non-woven, fibrous material, moving said sheet longitudinally and severing said sheet longitudinally to form a plurality of relatively narrow strips, spacing said strips apart laterally while continuing to move the same, providing adjacent opposite face portions of said strips a source of supply of light weight, flexible, sheet material having in itself just sufficient tensile strength so that it can be fed from said source toward said strips, applying a membrane of cohesive material to said sheets of material and thereby increasing the tensile strength of the resulting sheet material to a degree adequate for providing a casing for containing the loosely woven material, applying the sheets of material to opposite faces of said strips with the membranes in apposed relation and with edge portions of said sheets of material extending outwardly of the edges of the outer strips, then applying inward force to the outwardly disposed faces of said sheets, said force being applied in a region which is substantially continuous across the entire width of said sheets between their edge portions so that said sheets are pressed together at said edge portions and wherever said spaces between said strips occur, whereby to weld said membranes together at said edge portions and interspaces, and curing the membranes completely to form a bond securing said layers together, whereby to retain said strips in their pre-formed shapes.

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