

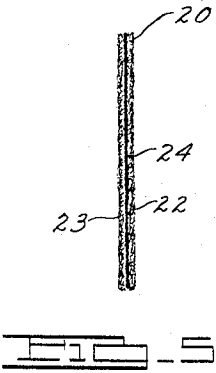
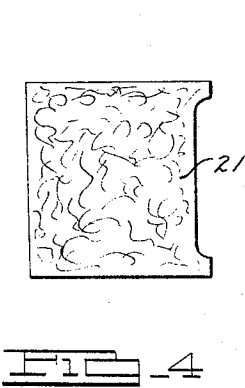
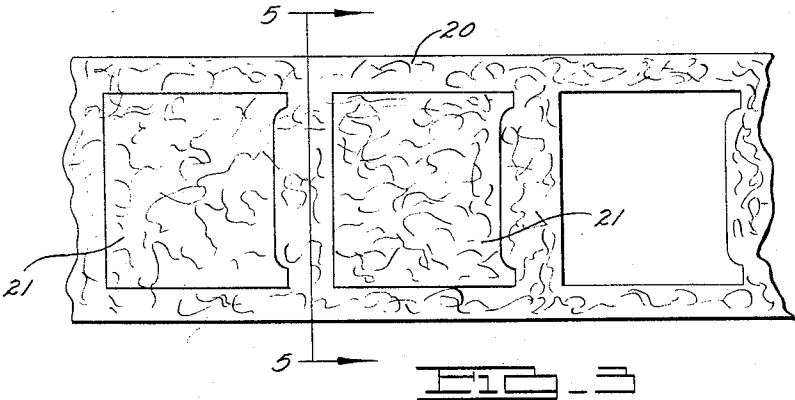
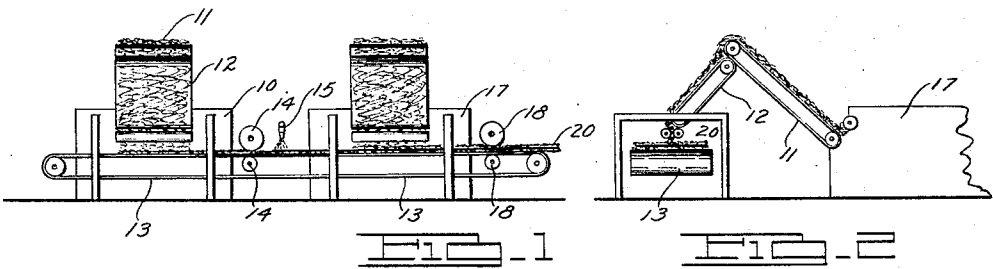
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METHOD OF PREPARING PADDING FOR INNER TRIM PANELS

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METHOD OF PREPARING PADDING FOR
INNER TRIM PANELS

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This invention relates to a novel method of forming sections of padding material adapted for subsequent application to backing sheets to form inner trim panels for automotive vehicles.

Heretofore inner trim panels for automotive vehicles have been formed in numerous different ways. In practically all instances, however, the cardboard backing sheets forming a part of the completed panel are stamped to form prior to application of the padding material. After these backing sheets have been stamped to form, loosely felted, non-woven, fibrous material is applied thereto to provide a padded surface therefor. After the application of the fibrous padding material, the whole is covered with a suitable sheet of fabric finish trim, which is generally adhesively secured or stitched directly through the padding to the cardboard backing sheets.

The method of the present invention contemplates the formation of a continuous web of loosely felted, non-woven, fibrous material, which is adhesively bonded together to provide a continuous integral strip of padding material. Sections of this strip of padding material are stamped or blanked out to form sections of padding material for application to backing sheets of inner trim panels.

The present invention contemplates the provision of a method for forming strips of padding material, which method results in a strip which may be easily handled and has sufficient inherent rigidity to be easily blanked out to substantially the finally desired form and yet has the inherent resiliency and softness necessary for the particular purpose for which it is designed.

Further, the present invention contemplates the provision of a method for forming sections of padding material for use in combination with inner trim panels, which method virtually eliminates all waste of fibrous material and insures the fact that all the fibrous material will be utilized in the resulting trim panels.

A particularly important feature of the present invention resides in the fact that the Garnett machine 10 is regulated in such a manner that the fibrous web generated thereby is approximately twice as thick as the web generated by the Garnett machine 17. It has been found that the penetration of the sizing into the lower web is so much greater than the penetration into the subsequently applied upper web that the use of a thicker lower web results in a composite strip in which the bonding material is disposed equidistant from each face.

Many other and further objects and advantages of the present invention will become clearly apparent from the following specification when considered in connection with the accompanying drawing forming a part thereof.

In the drawing:

Figure 1 is a diagrammatic side elevational view of one form of apparatus particularly adaptable for forming padding material in accordance with the present invention;

Figure 2 is a front elevational view of the apparatus shown in Figure 1;

Figure 3 is an enlarged plan view of a portion of a strip of padding material illustrating the manner in which sections thereof are blanked out to form padding sections for inner trim panels;

Figure 4 is a plan view of a padding section after it has been blanked out in final form; and
Figure 5 is a transverse, sectional view, taken substantially on the line 5—5 of Fig. 3, illustrating in detail the manner in which two loosely felted layers of fibrous material are adhesively bonded together.

With more particular reference to the drawing, the method taught therein may be accomplished in any one of a number of suitable ways and by way of illustration, the drawing discloses one particular set-up of apparatus which has been found peculiarly adaptable to the practice of the method of the present invention.

Referring to Figures 1 and 2, it will be seen that the apparatus therein shown comprises a Garnett machine 10, which is of conventional construction and into which suitable fibrous material, such, for example, as jute fibers, may be fed. This Garnett machine serves to comb these fibers and generate therefrom a loose mass of fibers distributed at random, which is fed out in a substantially uniform layer upon a conveyor belt 11. This conveyor belt 11 serves to pass the fibrous material to a conveyor belt 12, which, as is conventional in this general art, is mounted for reciprocation transversely of a longitudinally movable conveyor belt 13. The relative operating speeds of these various conveyors are such that a uniform layer of desired thickness of loose, non-woven, fibrous material will be continuously distributed upon the conveyor 13 as it moves forwardly, and it will be readily appreciated that the thickness of this layer may be varied as desired, by varying the ratio between the rate of speed of the conveyor belt 13 and the speed of operation of the Garnett machine 10.

The fibrous material distributed upon the conveyor belt 13 lies in a loose layer of desired thickness and as it passes forwardly along the conveyor, it is fed between a pair of rolls 14 which serve to compact and consolidate the fibrous material into a loosely felted web or bat. Extending transversely of the conveyor 13, as a whole, is a spray element 15 which serves to apply a substantially uniform layer of liquid adhesive or sizing to the upper exposed surface of the loosely felted web of fibrous material. Immediately upon leaving the spray 15, the conveyor belt 13 passes by a second Garnett machine 17 which serves to

distribute thereon a substantially uniform second layer of non-woven, fibrous material, much in the same manner as the base layer was applied. The Garnett machine 17 is provided with conveyors 11 and 12, as have been described above, and it will be appreciated that the thickness of this second layer of non-woven, fibrous material may be regulated in substantially the same manner as has been described. It will be appreciated that the various elements of the machine described so far, are arranged so that the second layer of fibrous material will be distributed upon the adhesive covered first layer while the adhesive or sizing, which has been sprayed thereon, is still damp, in order to effect a strong, adhesive bond between the two layers of fibrous material and provide a substantially integrally formed felted web of padding material. Upon leaving the second Garnett machine 17, the composite web of padding material passes through a second pair of compacting rolls 18 which serve to further compact and consolidate the mass of fibrous material and, as has been described above, the adhesive which has been sprayed on top of the first layer serves to provide an adhesive bond for unifying the fibrous material into a substantially continuous, integral, composite web 20.

It has been found that this web of loosely felted, fibrous material, formed in accordance with the method described above, provides a continuous strip of padding material which is sufficiently loosely felted so that it has great inherent resiliency, yet is sufficiently compacted and bonded together in order that it may be efficiently handled as a single strip of material.

After leaving the forming machine shown in Figures 1 and 2, this strip of padding material 20 is passed in between suitable dies, which serially serve to blank out sections thereof to a configuration substantially identical with the configuration of the backing sheets with which the padding material is adapted to be associated. It will be appreciated that the web of padding material may be formed in width sufficiently wide so that padding sections for inner trim panels of numerous and various sizes may be blanked out therefrom and that these various sizes will depend upon the particular application for which the padding material is designed. The manner in which these sections of padding material may be stamped from a continuous strip 20 is an important feature in connection with the present invention. It has been found that the strip of padding material formed by the machine illustrated in Figures 1 and 2 has sufficient body so that it may be cut by ordinary stamping dies and consequently sections 21 may be stamped or blanked out to the desired configuration by a relatively simple process.

Still another object of the present invention consists in the provision of a strip of padding material which is of substantially equal resilience on both sides. Thus, when a pad is blanked out, it may be utilized for the formation of either a right or left trim panel by merely reversing its position.

Another object of the invention consists in the provision of a method of forming a pad which includes the deposition of sizing on a relatively thick, compacted, fibrous web and subsequently applying a thinner fibrous web thereto, the sizing bonding the two webs together and resulting in a construction in which the bonding material will be disposed in the center of the composite

strip thus formed and the strip will have sufficient body and rigidity to be pushed into a blanking press.

It will be appreciated that after the sections 21 have been blanked out of the strip 20, the strip 20 may be fed back into the Garnett machines and that the fibrous material thereof will be combed into loose condition again and fed out to form a padded strip, as has been described above. Thus, it will be appreciated that the method taught in this application virtually eliminates the waste of padding material in the formation of sections for inner trim panels.

By reference to Figure 5, it will be appreciated that the section of padding, formed in accordance with the teachings of the present invention, comprises a pair of sections or strips of loosely felted, non-woven, fibrous material 22 and 23, which are secured together by means of a suitable layer of adhesive or sizing 24 to provide a substantially integral strip of non-woven padding material of great inherent resiliency.

It will be appreciated that the method illustrated in the drawing and described above is merely illustrative of the generic inventive concept presented in this application. Many other and further modifications thereof falling within the scope of the invention, as defined in the subjoined claims, will be apparent to those skilled in the art.

I claim as my invention:

1. The method of forming padding material which includes generating a relatively heavy layer of non-woven fibrous material, applying a liquid adhesive coating to the upper surface of the web thus generated of such viscosity as to penetrate said surface, and applying a second layer of non-woven fibrous material to said adhesively coated first mentioned layer, said second layer being substantially thinner than said first mentioned layer to have the adhesive disposed substantially midway between the top and bottom surface of said pad.

2. The method of forming padding material which includes generating a relatively heavy layer of non-woven fibrous padding material, compacting said padding material, applying adhesive to the upper surface of the web thus formed of such viscosity as to penetrate said surface, superimposing a second layer of padding material on said first mentioned layer, said second layer being substantially thinner than said first mentioned layer and compacting the composite strip thus formed whereby said adhesive material is disposed substantially midway between the top and bottom surface of the resulting pad and serves to bond said layers of fibrous material to form a compact unitary strip of padding.

3. The method of forming padding material which includes generating a relatively heavy web of non-woven fibrous material, compacting the web thus formed, applying liquid adhesive to the upper surface of said web of such viscosity as to penetrate said surface, applying a second layer of non-woven fibrous material to said first mentioned layer, said second layer being approximately one-half the thickness of said first mentioned layer, and compacting the composite strip thus formed whereby said adhesive material is disposed substantially midway between the top and bottom surface of the resulting pad and serves to bond said layers of fibrous material to form a compact, unitary, strip of padding.

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