

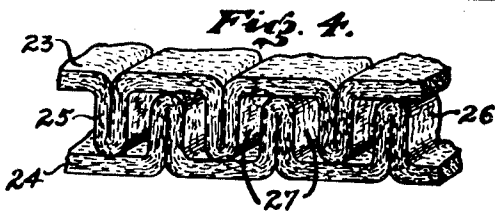
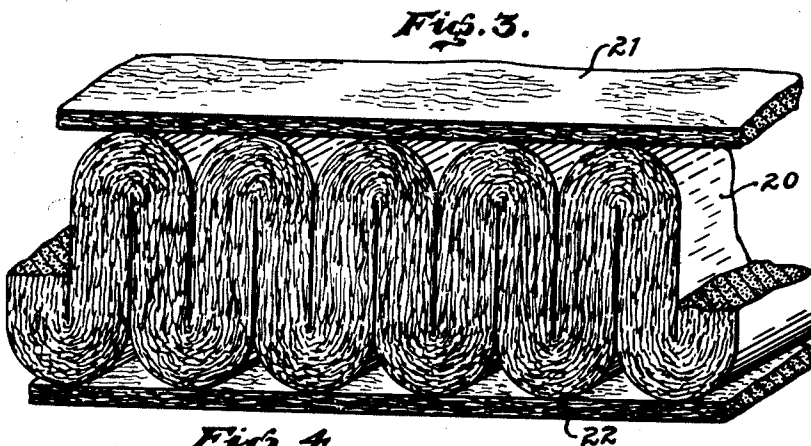
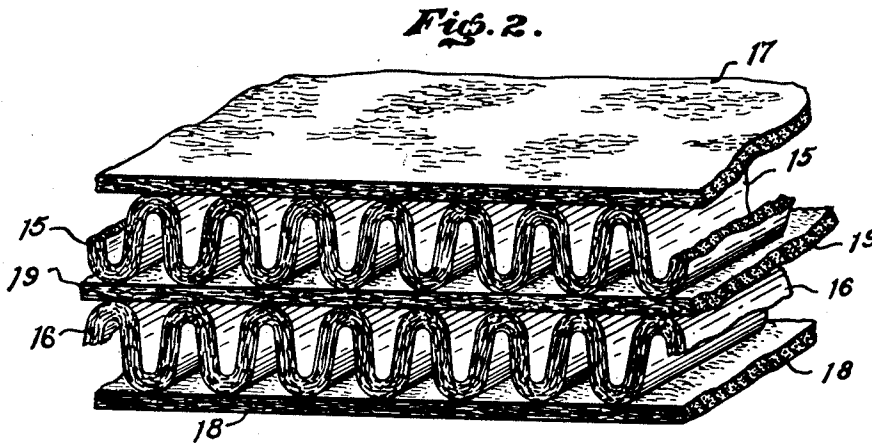
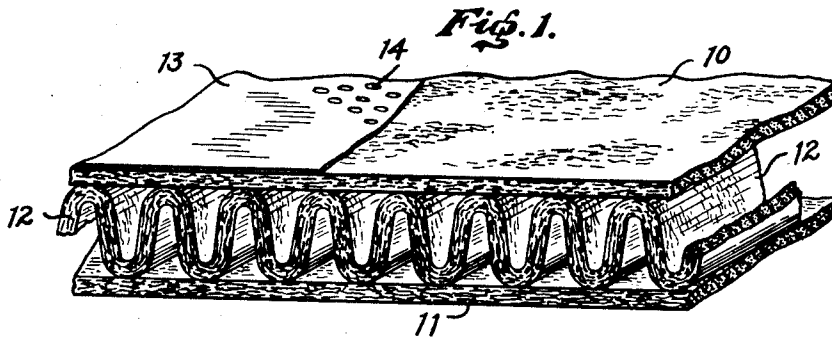
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H. RUMPF ET AL

2,419,971

PADDING AND SOUND PROOFING MATERIAL

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INVENTOR.
HERMAN RUMPF & IRWIN J. RUMPF.

BY

Wm. H. Atkinson
ATTORNEY

UNITED STATES PATENT OFFICE

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PADDING AND SOUNDPROOFING
MATERIALHerman Rumpf and Irwin J. Rumpf,
Burlingame, Calif.

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Our present invention relates to a padding element of flocculated hair or fibrous material, and more particularly to a loosely compacted padding having improved shock and sound wave absorbing characteristics.

An object of our invention is to provide an improved material of loosely compacted and adhesively secured fibrous materials for acoustical padding purposes.

Another object of our invention is to provide a soft surface finishing material of hair or like fibrous material for use as a shock absorbing padding or to improve the acoustical properties of a room, and as an insulating padding for automobile and aeroplane bodies.

Another object of our invention is to provide a new and improved method of producing a sound wave absorbing material from loosely compacted hair or other fibrous material.

Other objects and advantages of our invention will be in part evident to those skilled in the art and in part pointed out hereinafter in the following description taken in connection with the accompanying drawing, wherein there is shown by way of illustration and not of limitation several preferred embodiments thereof.

In the drawing:

Figure 1 is a fragmentary perspective view showing a padding material constructed in accordance with our invention.

Figure 2 is a similar view showing another form which a padding constructed in accordance with our invention may take, and

Figures 3 and 4 show further modified forms of our invention.

As shown in the drawing, our improved padding is comprised of a plurality of layers of loosely matted and adhesively secured hair or fibres of various textures. Where the padding is used as a soundproofing medium, it will be made of comparatively light construction. This can be accomplished either by using very fine and light fibrous materials, or by an extreme flocculation of the fibrous materials prior to the application of the adhesive, and by allowing the matted sheets, after being built up to the proper thickness, to become set without any pressure being applied thereupon. Figure 1 shows a form of padding which will be found suitable for the soundproofing of the walls of a room. In this embodiment the complete padding comprises two spaced layers of loosely compacted and adhesively secured hair or fibrous material, designated by the numerals 10 and 11, between which a similar, but corrugated layer of carded hair or fibres 12

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is disposed. Among some of the fibrous materials which might be used in forming the spaced layers 10 and 11 and the corrugated layer 12, sisal, hemp, mineral wool or asbestos fibres may be mentioned. In the preparation of these layers, the hair or fibrous materials are carded or spread out in a uniform flat layer upon a suitable support and then sprayed with an adhesive, which may be rubber latex or any other suitable adhesive. These materials are then subjected to a preliminary drying. After the preliminary drying, the layer 12 is subjected to a folding or corrugation forming operation. This may be effected by passing the layer of material 12 through two opposed fluted rollers, or by suspending the layer loosely over a series of parallel rods which are spaced to form the corrugations. After the inner layer of material 12, with its corrugations, has taken a preliminary set, the two layers 10 and 11 will be arranged above and below and the three layers thus assembled will then be subjected, in the case of latex, to a vulcanizing temperature, and in the case of another adhesive, to a temperature sufficient to cure or finally set the adhesive used. In this operation the outer layers 10 and 11 will become adhesively attached to the adjacent surfaces of the corrugated layer 12 and all of the layers of the unit will thus be firmly secured together. In the carding and/or distribution of the hair upon the support, preliminary to the application of the adhesive, the individual hairs or fibres will be arranged lengthwise with respect to each other, and flatwise with respect to the outer surface of the padding, and when this operation is carefully carried out, the finished layer of hair or fibrous material will present a uniform surface without any hair or fibres projecting therefrom. It is also contemplated, if the padding is to be used at a point where its natural appearance will be objectionable, that the outer or exposed layer 10 of the padding may be provided with an additional finishing material 13, which may be of paper or loosely woven cloth, and in order that the application of such a finishing layer 13 to the padding will not reduce, to any appreciable extent, the sound absorbing properties of the padding, it is contemplated that this finishing layer 13 may be provided with uniformly distributed apertures 14.

In Figure 2 of the drawing there is shown an arrangement in which two corrugated layers of hair or fibrous material 15 and 16 are disposed between outer layers 17 and 18 of hair or fibrous material, and at opposite sides of an intermediate layer 19 of similar material. In the prepara-

tion of the padding shown in the above referred to figures of the drawing, it will be understood that the several layers may be constructed of different materials. For example, the under layer 11 may be formed of relatively coarse hair and the inner or corrugated layer 12 may be constructed of one or more of the vegetable or other fibres referred to above, and the outer layer 10 may be formed of relatively soft and fine hairs, such as rabbit hair. As an alternative, it is also contemplated that a neat and finished appearance may be provided on the outer surface of the padding unit by spraying a soft flock thereupon. If desired, the outer surface of the padding may also be rendered more or less fireproof by spraying a coating of powdered asbestos thereupon.

While the paddings described above will be found particularly suited for use as a sound-proofing padding for rooms and other acoustical uses, it will also be apparent that with a proper choice of materials and a proper proportioning of the several layers that go to make up the unit, a padding may be produced which can be used as an outer or finishing layer of padding upon upholstered furniture, mattresses and for other similar purposes. In Figure 3 of the drawing there is shown a modification of the invention which is particularly well adapted to this latter use. In this modification the inner corrugated layer, designated by the numeral 20, is considerably thicker than the cooperating outer layers 21 and 22 with which it is assembled. In this instance the corrugated layer 20 is also compressed so that its corrugation forming folds are in close contact with each other. When the padding unit is formed in this manner, it will be seen that the interior portion of the padding unit will be comprised of a substantially solid mass of adhesively secured hair. At the same time, due to the initial carding of the hair in the manner suggested, it will also be apparent that the individual hairs or strands of fibrous material will be disposed in endwise relation with respect to the surface of the outer pad forming layers and, as a result, a relatively stiff, but resilient structure will be produced. In this latter case, as in the previously described arrangement, it will be possible to construct the padding with the several layers each formed of hair and/or fibres with different textures.

In Figure 4 of the drawing there is shown a still further embodiment of the invention which will be found particularly well suited for providing a soft padding upon a hard surface. In this latter arrangement the padding is formed of two similarly constructed layers 23 and 24 of matted and adhesively secured hair or fibrous materials. As shown, the layers 23 and 24 are respectively provided with parallel pleat-like folds 25 and 26 which form spaced ridges that are adapted to interleave with each other and provide air pockets 27 therebetween when the two layers are finally secured together by the application of a vulcanizing or curing temperature.

With the above described arrangement, it will be seen that when the inner layer is corrugated and assembled as proposed, the units will be light in weight and extremely sensitive to the slightest impact and, therefore, highly efficient as an acoustical padding. An additional advantage imparted to the padding by the corrugations of the intermediate layer is that the corrugations will operate to stiffen the padding in the direction in which they extend, and if

the padding is secured to the rafters or studding of a building with the corrugations extending transverse of the rafters or studding, it will be found that no intermediate sheathing or backing surface will be required, as the corrugations will provide a beam effect within the padding which will prevent any sagging between its points of attachment with the rafters or studding.

In the construction of the padding, it will be understood that the cushioning and sound absorbing characteristics thereof may be fully and completely controlled by varying the nature of the adhesive and/or by varying the amount of compaction to which the hair or fibres are subjected during the final vulcanizing or setting operations. In this connection it will also be apparent that the choice of the particular adhesive may be important. For example, in the case of a padding for the absorption of physical impact, it will be found that rubber latex or a synthetic elastic adhesive will be more suitable than would be a hard drying plastic or similar type of binder. Whereas, in the event that the padding is to be used to improve the acoustical properties of a room, it will be found that any of the non-elastic, but pliable adhesives may be used; as for example, vinyl acetate and/or many of the other so-called synthetic plastics which are now available.

While we have, for the sake of clearness and in order to disclose the invention so that the same can be readily understood, described and illustrated specific devices and arrangements, we desire to have it understood that this invention is not limited to the specific means disclosed, but may be embodied in other ways that will suggest themselves to persons skilled in the art. It is believed that this invention is new and it is desired to claim it so that all such changes as come within the scope of the appended claims are to be considered as part of this invention.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. A multi-layer padding material for walls and other surfaces, comprising a laminated sheet having flat outer layers of loosely matted and adhesively secured fibrous material, and a corrugated layer of similar loosely matted and adhesively secured material disposed between said flat outer layers, the corrugations of said corrugated layer being disposed in uniformly spaced relation with respect to each other and having a depth greater than the spacings thereof and with the sides of the corrugations extending in planes substantially transverse to the plane of said outer layers, the fibers of said corrugated and flat outer layers being carded and arranged flatwise to the surfaces thereof and extending substantially parallel to the folds of the corrugations in said corrugated layer, whereby said flat layer will have a maximum resistance to breakage from tension between the successive corrugations and the sides of the corrugations of said corrugated layer will possess a maximum resistance to compaction.

2. A multi-layer padding material for walls and other surfaces, comprising a laminated sheet having flat outer layers of loosely matted and adhesively secured hair, and a corrugated layer of similar loosely matted and adhesively secured hair disposed between said flat outer layers, said flat outer layers and said corrugated layer of adhesively secured hair being formed with the hair of each layer carded and arranged flatwise to the surfaces thereof, and the corrugations of said corrugated layer being adhesively secured at their folds in uniformly spaced relation to the

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inner surfaces of said flat outer layers with their sides extending in planes substantially parallel to each other for a depth greater than the spacings therebetween and transverse to the plane of said outer layers.

3. A multi-layer padding material for walls and other surfaces of the type contemplated by claim 2, characterized by the fact that the corrugations of the corrugated layer of adhesively secured hair are folded into continuous contact with each other, the individual hairs of the interposed corrugated layer being disposed along planes substantially transverse to the plane of the padding material, whereby a greater resistance to compaction of the padding will result.

HERMAN RUMPF.
IRWIN J. RUMPF.

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