Nov. 4, 1941. H. A. MITMAN 2,261,730

COVERING MATERIAL

Filed Jan. 8, 1937 2 Sheets-Sheet 1

Fig. 1.

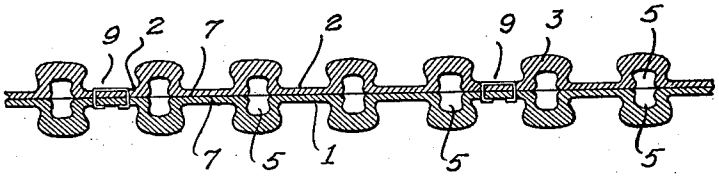


Fig. 2.

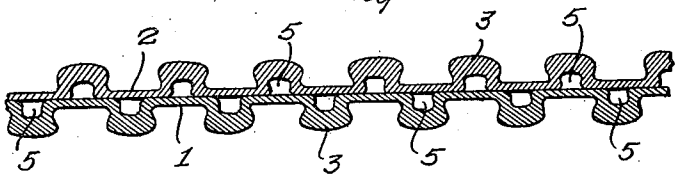


Fig. 3.

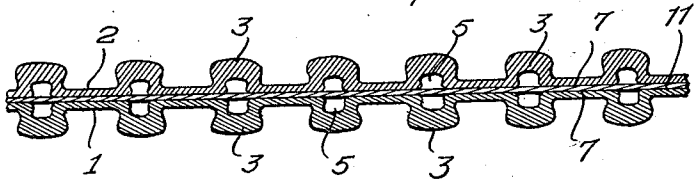
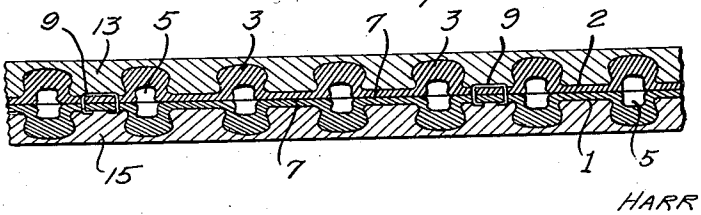


Fig. 4.



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Fig. 5.

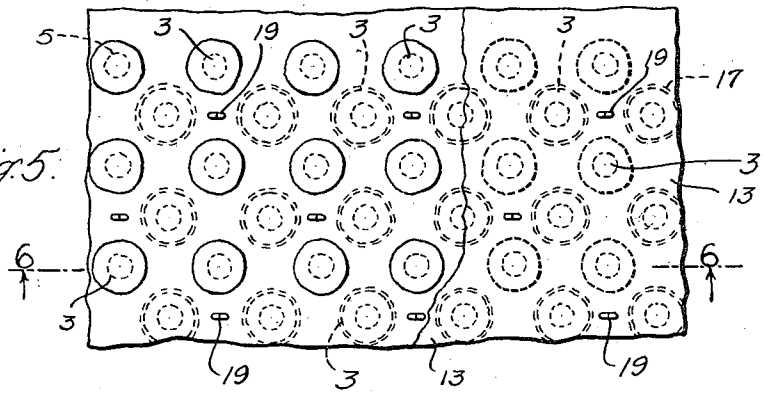


Fig. 6.

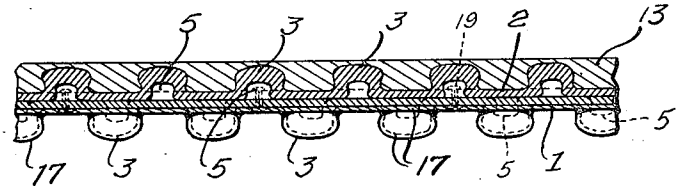


Fig. 7.

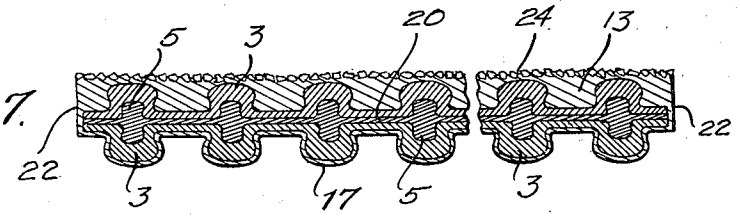
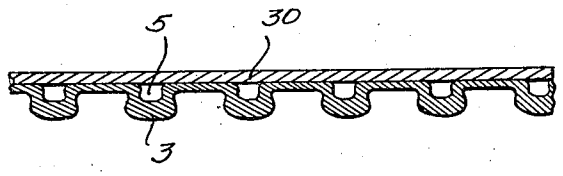


Fig. 8.



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UNITED STATES PATENT OFFICE

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COVERING MATERIAL

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Application January 8, 1937, Serial No. 119,606

4 Claims. (Cl. 154—51)

This invention relates to covering materials and especially to covering materials to be used as protection against the weather. The invention particularly relates to roofing and roofing units.

It has been proposed heretofore to emboss a sheet of fabric having an open structure, and particularly a fabric of felted fibers, to form therein indentations and raised portions. It also has been proposed, as described in the United States Letters Patent #2,045,384 to William Gerb, so to form these indentations and raised portions as to expand the fibrous structure of the material in raised portions or knobs leaving the remainder of the sheet with the original structure. Such materials have been used for insulating purposes in building construction and in connection with floor coverings. It also has been proposed to saturate with a waterproof or water resistant saturant a sheet having portions thereof so expanded and to produce roofing elements or shingles by applying coatings of waterproofing material, such as asphalt, binding to the surface of the element a granular surfacing material, one purpose being to secure a shingle of substantial thickness by virtue of the knobs or raised portions of the fabric.

The present invention utilizes embossed fabrics having such raised portions and depressions and particularly the type of fabric, such as a felt, having the structure thereof at defined places expanded to produce knobs or raised portions with corresponding depressions on the opposite face of the sheet. According to the present invention it is proposed to laminate together two such sheets in order to obtain an increased thickness of the resulting fabric while maintaining the several advantages heretofore obtained or proposed by virtue of the raised portions or knobs of expanded structure. The lamination of the two sheets may be carried out in such a way as to maintain the heat and sound insulating characteristics provided by the fabric having raised portions and depressions and, if desired, also may be carried out to utilize for the purpose of sound or heat insulation depressions which commonly are formed on one side of the fabric when the structure of the fabric is expanded into knobs or raised portions upon the other side of the fabric.

Various means may be utilized for holding the laminations together including mechanical fastening means as well as adhesives placed between the two laminations or sheets. Such adhesives may include asphaltic materials which commonly are used in the manufacture of roofing.

Within the scope of the invention are included the products which may be produced by laminating two or more sheets of fabric embossed or having expanded portions in the form of knobs or raised portions and applying to one or more surfaces of the laminated sheets, or to units cut therefrom, coatings of asphalt or similar materials which also may be surfaced with granular material or otherwise treated to provide the finished surface. Also included in such products are those which may be obtained by enclosing or enveloping the laminated product of the invention in a coating of mastic material which for the purpose of manufacture of roofing materials or elements may be asphalt or similar bituminous material. The invention proposes the application of such coatings in such a way as to cover the surface to be exposed of the material or the roofing elements as well as at least some of the edges of such material or elements to secure the sealing of the individual laminations and to prevent water and air from entering between the laminations.

The invention will be more particularly described in connection with the drawings in which

Fig. 1 represents one form of a laminated product of the invention.

Fig. 2 represents a modified form of the invention.

Fig. 3 represents another modified form of the invention.

Fig. 4 represents a further modification of the invention.

Fig. 5 shows a modified arrangement of the laminations.

Fig. 6 is a sectional view taken on line 6, 6 of Fig. 5.

Fig. 7 shows in section a roofing element embodying the invention.

Fig. 8 shows a form of the invention utilizing a flat lamination.

In Figure 1 is shown a laminated product consisting of sheets 1 and 2 each for example composed of felted fibers such as rag felt commonly used in the manufacture of roofing. By a process such as that described in the patent to William Gerb No. 2,045,384, above referred to, knobs or expanded portions 3 may be formed in each of these sheets with corresponding depressions 5 on the opposite side of the sheet. By forming these knobs with a sufficiently close spacing a substantial portion of the area or extent of the sheet may be expanded and provided with an additional thickness. When as shown in Figure 1 two such sheets 1 and 2 are placed with the faces

7 thereof in which the depressions appear together, a product of considerable thickness is secured which may be utilized for sound or heat insulating purposes without further treatment. For this purpose by mechanical fasteners 9 of suitable type, but which in the embodiment illustrated in Figure 1 are in the form of wire staples, the two sheets 1 and 2 may be held together. It will be clear that when such a laminated sheet is placed beneath a carpet or rug that considerable heat and sound insulation is obtained and an additional resilience is secured for such woven floor fabrics or coverings.

Figure 2 shows a modified form of the laminated product of the invention in which the knobs 3 and the corresponding depressions 5 are in staggered relation in one sheet with respect to the other.

In Figure 3 is shown a modification of the invention in which similar sheets 1 and 2 are used but are held together by an adhesive coating 11 therebetween. In this embodiment the adhesive material does not fill the depressions 5 which are formed in the face 7 of the sheet. Thus are obtained dead air pockets formed by the depressions 5 similarly to those obtained in the embodiment illustrated in Figure 1. Such a laminated fabric may have greater strength and be capable of greater resistance to abuse by virtue of the action of the mastic adhesive or asphalt while retaining the insulating properties of the expanded portions of the felt and of the air pockets 5 as well as of the spaces between the knobs 3.

In Figure 4 is shown a further modification of the invention in which sheets laminated and fastened together in a manner similar to that illustrated in Figure 1 are coated or covered with an overlay of a mastic material such as asphalt. Preferably, the sheets 1 and 2 in this embodiment are saturated with a suitable saturant, such as asphalt commonly used for this purpose in the roofing industry. Within the scope of the invention, however, the embodiment of Figure 4 may be produced with unsaturated sheets 1 and 2, the overlay of asphalt being applied to and held upon the face of the sheets upon which are formed the raised or expanded portions or knobs 3. In the particular embodiment illustrated in Figure 4, whether or not the sheets 1 and 2 or either of them are saturated with asphalt or other saturant, the recesses or depressions 5 form air pockets between the sheets to add an insulating property to the product. Particularly when such a laminated pair of sheets 1 and 2 are completely enclosed in an asphaltic envelope in a manner similar to that illustrated in Figure 7 the recesses or depressions 5 may be left without being filled because the asphaltic envelope then will prevent moisture and air which may carry moisture from passing along the contacting faces 7 of the sheets, in which pockets the moisture may condense. If such condensation were to occur upon changes of temperature to which the product would be subjected damage to the product would occur due to vaporization of the moisture or in some cases due to its solidification under low temperature as well as to its permeation of the fabric and its tendency to cause blistering.

In the modification shown in Figures 5 and 6 the laminated sheets 1 and 2 are arranged in a manner similar to that illustrated in Figure 2 with the knobs 3 on one sheet staggered in relation to those on the other sheet. As appears in Figure 5 the fasteners 19 are passed through the portions of the sheets which lie between two knobs on each sheet. The fastener 19 may be a fastener of the rivet type or in some cases may be a staple, such as the staple 9 illustrated in Figure 1. When asphalt coatings 13 and 15 are applied to the sheet as in Figure 4 as well as when asphalt coating 13 is applied to one lamination and a coating 17 overlaying the contour of the knobs is applied to the other sheet, as illustrated in Figure 6, the rivets or fasteners 9 and 19 may be covered by the asphalt coatings which may act to assist in holding them in place. This particularly may be the case when the sheets 1 and 2 are first saturated with a mastic saturant, such as asphalt, and after the sheets are laminated together and the fasteners are in place the asphaltic coatings 13, 15 and 17 are applied.

A further modification of the invention is illustrated in Figure 7 which represents a section of a roofing element having the sheets laminated and coated in the manner illustrated in Figure 6 but held together by an adhesive layer 20 which may also be asphalt or similar bituminous adhesive. In the embodiment illustrated in Figure 7 this adhesive layer 20 also fills the recesses or depressions 5, whereby a secure fastening of the two sheets 1 and 2 together is obtained. In the embodiment in Figure 7, to such a laminated and adhesively bound base is applied the coating 13 on one face thereof and the coating 17 on the other face thereof, said base also having the ends thereof covered by coatings 22 which connect coatings 13 and 17. Thus a complete envelope of waterproof or water resisting coating such as asphalt is formed about the laminated base. Particularly when the sheets 1 and 2 are saturated with an asphaltic or other waterproof or water resisting saturant, the embodiment of the invention illustrated in Figure 7 provides a roofing element having the characteristics usually secured by saturating a fibrous base and applying thereto a waterproof or weather-proof coating, covering one or more faces of the element and an edge or edges thereof. It also will be noted that the coating 22 contacts the adhesive coating layer 20 at the edges thereof and may become adhesively and integrally bound thereto. The invention, however, secures a thick shingle without proportionate increase in weight because of the expanded portions of the felt, some or all the edges of which may be coated and sealed. It also secures this thickness with a base that has the parts thereof, that is the laminations, mechanically cooperating to maintain the shingle in shape, to prevent curling, to prevent weathering of the fibrous sheets because the edges are protected and to increase the insulating value of the covering.

It will be apparent from Figures 4, 6 and 7 that a unit of considerable thickness may be produced by having the sheets 1 and 2 laminated together which sheets have the knobs expanded to a substantial volume. The thickness of the adhesive coating 20 may be sufficient to adhesively bind the two sheets 1 and 2 together without adding a substantial amount of material between the two laminations, thus the addition of a relatively heavy material such as asphalt may be avoided while securing the advantages of the two sheets 1 and 2. As has been indicated in connection with Figure 3 the recesses or depressions 5 may be left as air spaces which likewise will act to lighten the product.

By suitable control means the coating 17 applied upon one face of the laminated base may be

sufficient to seal the saturant in the felt of the lamination 1. This coating 17, conforming to the contour of the knobs 3, leaves spaces between the knobs which when a base is applied to the supporting structure of a roof may form air pockets acting to insulate against heat and sound transmission. The coating 13 upon the upper face of the element may be made with sufficient thickness over the tops of the knobs 3 properly to seal these knobs against entrance of water and thereby provide a waterproof and water resisting product. The thickness of the coating 13 in the spaces between the knobs may be made sufficient to provide a smooth, flat surface upon the upper face of the element upon which may be applied, as shown in Figure 7, granular surfacing material and further treatment of the base of the element may be carried out in a variety of ways commonly understood in the art to secure various effects of color variation, contrast of granule color and characteristic simulation of brickwork and other modification as at present practiced. If desired, a coating 15 having a flat surface similar to the coating 13 and filling the spaces between the knobs on the lower lamination in the manner illustrated in Fig. 4 may be applied to the underside of the laminated base of the element illustrated in Figure 7.

Figure 8 shows an embodiment of the invention in which a flat sheet or web 30, such as a roofing felt, is laminated with a sheet having expanded portions or knobs 3 and corresponding recesses 5 to produce a composite sheet for insulation or one which may serve the usual function of a cushion to be placed beneath rugs or carpets. For this purpose the laminated product may be laid with knobs 3 downwardly positioned leaving the upper surface flat for the bearing of the rug or carpet. Insulation as well as sound deadening are provided by the depressions 5 and the spaces between the knobs.

If desired, the construction shown in Figure 8 may be made with saturated felts and further treatment as described in connection with Figures 3 to 7 inclusive may be carried out to provide different exposed surfaces, or different mechanical actions or to serve different purposes such as have been described above.

When in the constructions above described the felts or fabrics are not "saturated" but are left as "dry" felts without impregnation with a material such as asphalt, they may then be treated with a germicide or disinfectant to prevent dry rot. For some purposes, for example for rug cushions, a material such as bichloride of mercury may be used which has no odor and does not evaporate. In certain materials where odor is not objectionable such chemicals as phenol may be used. When bituminous saturants are used further disinfecting against dry rot is unnecessary.

Other features or practices known and understood in the art may be combined with the present invention. All such modifications which utilize laminations of a plurality of sheets mechanically or adhesively bound together to form a base sheet which further may be treated in various ways, are within the scope of the invention when such sheets have expanded portions or portions raised above the surface of the sheet and of loosened structure.

Instead of utilizing a mechanical fastening means or a mastic or other adhesive to bind together the two laminations within the scope of the invention I may utilize any other means suitable for fastening these laminations together, including the application of pressure upon the two sheets or laminations in spots at different places upon the sheet or over substantial areas but preferably at places other than those occupied by the expanded portions or knobs. Such pressure may be utilized to cause the fibers of the felted fabric from which the laminations 1 and 2 are formed with expanded portions to knit together at the contacting faces of the two sheets 1 and 2 when such sheets are not saturated with a saturant. Such pressure also may be utilized to force the faces of the saturated laminations 1 and 2 into contact, the pressure causing the saturating material in the two sheets to become adhesively bound together.

Having thus described the invention I now claim:

1. A water resisting covering comprising a plurality of sheets of felted fibrous material laminated together, at least two of said sheets having portions of the felted structure formed into a plurality of spaced elevations of looser fibrous structure than the material of the felted sheet lying therebetween, each of said two sheets having pockets upon the opposite face of the sheet at places corresponding to said looser elevations, each of said two sheets being impregnated with an asphalt saturant, said sheets being laminated together by means of an adhesive layer of asphalt therebetween binding said sheets together with said looser elevations of the outermost sheets positioned outwardly, said asphalt layer adhering to said opposite faces of the sheets and bridging across the openings of said pockets in said faces of the sheets and closing over the pockets to form dead air cells.

2. A water resisting covering according to claim 1 having a coating of asphalt on said laminated base covering a face thereof which has said loosened elevations thereon.

3. A water resisting covering according to claim 1 having a coating of asphalt on said laminated base covering a face thereof which has said loosened elevations thereon, said coating extending about said laminated base so as to contact and be integrally bound to said adhesive layer of asphalt between said sheets.

4. A water resisting covering according to claim 1 in which the elevations of looser structure and the corresponding pockets in one sheet are in offset relation to the elevations and their corresponding pockets in the other sheet.

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