

Jan. 17, 1928.

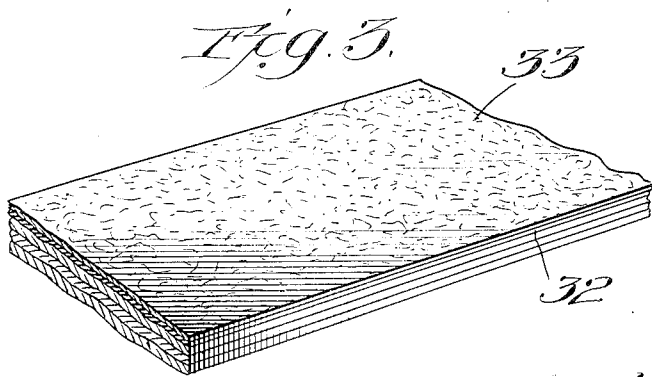
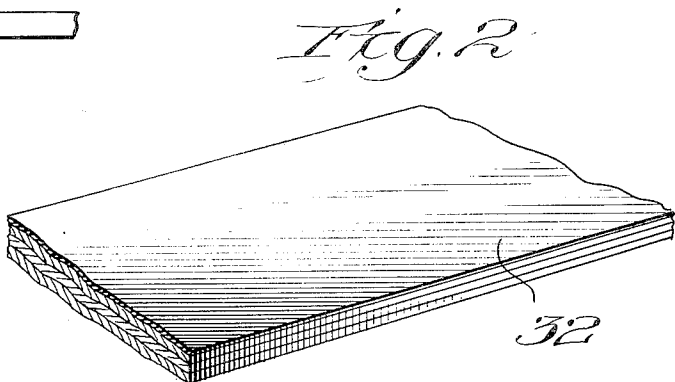
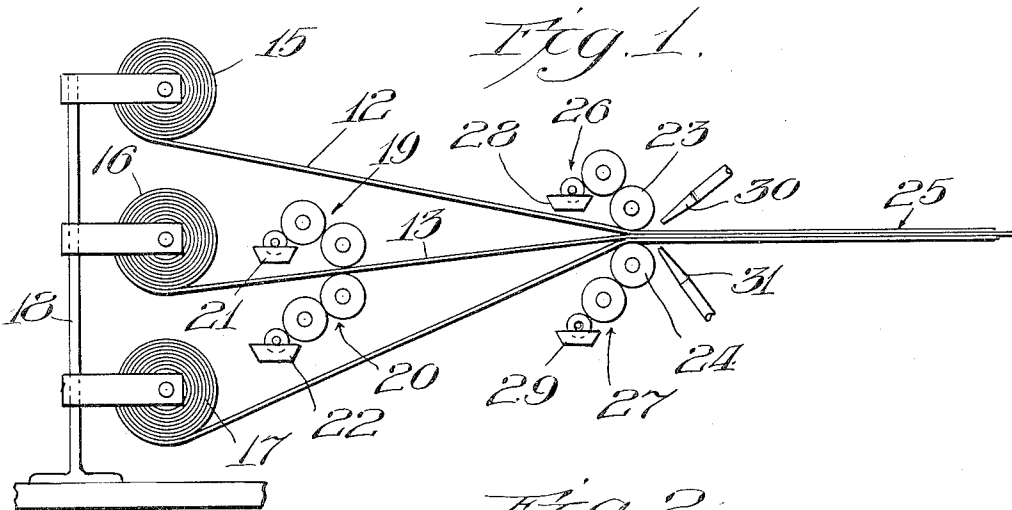
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J. REGENSTEIN

FOUNDATION BOARD

Filed Sept. 29, 1924

2 Sheets-Sheet 1



Inventor
Joseph Regenstein
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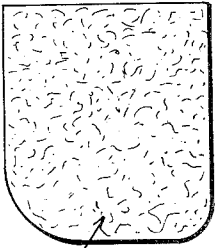
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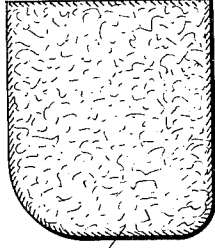
2 Sheets-Sheet 2

Fig. 4



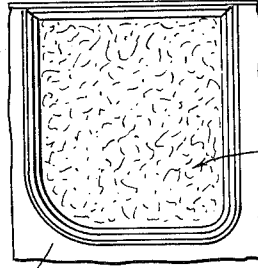
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Fig. 5



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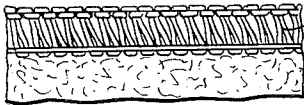
Fig. 6



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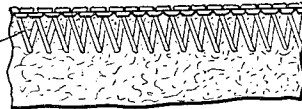
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Fig. 7



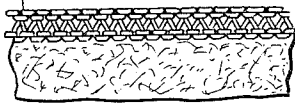
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Fig. 8



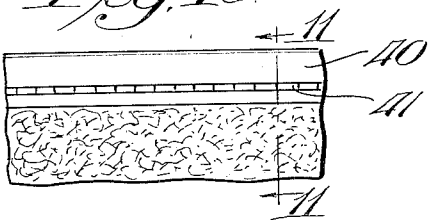
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Fig. 9



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Fig. 10

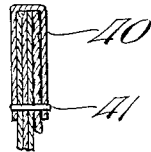


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Fig. 11



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Patented Jan. 17, 1928.

1,656,647

UNITED STATES PATENT OFFICE.

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FOUNDATION BOARD.

Application filed September 29, 1924. Serial No. 740,439.

This invention has to do with improvements in paper boards. The invention has reference particularly to improvements in a form of paper board which is intended to establish the backing for such articles as door panels for automobiles and also for trimming the interiors of automobiles, etc. It will presently appear, however, that the foundation board to which the present invention particularly relates may be used for many other purposes than in the manufacture of door panels or for vehicle trimming. Inasmuch, however, as it is intended specially for this class of work, I have illustrated and will describe the features of the present invention as applied particularly to the manufacture of automobile door panels and for interior trimming, although in so doing I wish it distinctly understood that I do not intend thereby to limit myself except as I may do so in the claims.

Bearing the above in mind, I will state that in order for the foundation board to successfully accomplish its purpose, it should be of an essentially water-proof nature, so that moisture can neither permeate it nor detrimentally affect its surface. The entrance of moisture between the layers of which the foundation board is made would result in allowing the same to become loosened up, as well as allowing the foundation board to warp; and the direct entrance of moisture into the surface of the foundation board would naturally cause the same to disintegrate and be correspondingly damaged. Furthermore, the foundation board would in many cases be bent around relatively sharp corners in trimming the interiors of vehicles; and it must therefore be of sufficient flexibility to allow for such bending but without cracking or other damage. This means that its thickness and nature must be such as to allow for this bending. On the other hand, it must be sufficiently stiff and tough to properly resist the forces to which it is subjected under service and to insure permanence of structure. In many cases it becomes necessary to sew through the foundation board, as in reinforcing the edges of the same by the use of protecting strips of tape. This sewing is ordinarily done by power machines operating at relatively high speed and the needles thereof are therefore subject to considerable friction in piercing the foundation board.

Various expedients have been adapted in

the past in an effort to make foundation boards thoroughly water-proof including the impregnation by asphaltum and similar tarry products. All such materials, however, are subject to serious objections. Among other things, a paper board so impregnated presents very considerable resistance to the movement of the needles, so that the latter very quickly become over-heated and either break or burn the threads which they carry. Furthermore, it is a common practice to face the foundation boards with a cloth covering of desired color and grain, the same being held in place by a suitable rubber cement. The solvents used in the rubber cement, such as ether and benzene, tend to draw the asphaltum and tarry materials out of the foundation board and to its surface, so that they stain the cloth finishing sheet and thus ruin the appearance of the completed article.

The main object of the present invention is to provide a foundation stock comprising sheets of paper board which are impregnated with alum and resin size to begin with, so as to afford a considerable degree of water-proof quality in the original sheets. Such impregnation with alum and resin size may be performed either at the paper mill or at the plant where the foundation board is made. These sheets are then joined together by a suitable paste, such as casein paste which is water-proof, being made from lactic products. Ordinarily this paste is applied to both sides of the central sheet of a series of three sheets, and the other two outside sheets are then attached to it. I then provide a superficial application of paraffine on each of the exposed surfaces, said paraffine being preferably applied by the use of rollers and spray action combined. For this purpose, use should be made of hot paraffine. The superficial application of paraffine serves the beneficial purpose of making the foundation board water-proof, and it also serves to grease the needles during the subsequent sewing operations. Furthermore, the paraffine does not expand and contract nearly as much as asphaltum or tarry materials; and as a consequence the completed board does not tend to warp or bend under severe changes of temperature and atmospheric conditions. A further advantage in the use of sheets initially impregnated with alum and resin size and protected by the superficial application or im-

pregnation of paraffine, is the fact that the completed board is very much lighter per square foot than asphaltum or tar impregnated board of equal thickness.

5 After the foundation board has been established, it can be cut up into different shapes and sizes and properly finished according to the panel boards, or other articles which it is desired to produce.

10 Referring to the drawings—

Figure 1 shows more or less diagrammatically a simple form of machine for bringing together the three sheets of paper impregnated with alum and resin size, and also for
15 treating the out side faces of the combined series of sheets with the paraffine finish;

Fig. 2 shows a perspective view of a short section of completed board having applied to its top surface a layer of rubber cement;

20 Fig. 3 shows a view similar to that of Fig. 2, with the exception that the finishing layer of cloth has been applied to the rubber cement coat;

Fig. 4 shows a door panel cut out from the
25 strip of Fig. 3 without any protecting finish for its edges;

Fig. 5 is a view similar to that of Fig. 4, with the exception that the edges of the panel have been protected by a line of stitching;
30 ing;

Fig. 6 shows a door in place in the automobile, the same being provided with a door panel embodying the features of the present invention;

35 Fig. 7 shows a fragmentary face view on enlarged scale illustrating one form of stitch for protecting the edge of the panel;

Fig. 8 shows a view similar to Fig. 7, but illustrates a modified form of stitch;

40 Fig. 9 shows a view similar to Figs. 7 and 8, but illustrating another modified form of stitch;

Fig. 10 shows a view similar to those of Figs. 7, 8, and 9, but the edge of the panel
45 has been protected by a strip of tape sewed in place; and

Fig. 11 shows a fragmentary section on the line 11—11 of Fig. 10, looking in the direction of the arrows.

50 Referring first to Figs. 1, 2, and 3, I take three strips of paper preferably impregnated with alum and resin size, these strips being indicated by the numerals 12, 13 and 14, respectively. These strips may be of any desired thickness, but are each preferably approximately .022 of an inch thick. These
55 strips may be drawn from the rolls 15, 16 and 17 mounted in a suitable rack 18. Experience has demonstrated that a foundation board established by the use of three sheets, each approximately .022 of an inch in thickness, joined together and treated as herein disclosed, will possess the desired characteristics of sufficient flexibility for bending
60 around the corners of the vehicle interior,

combined with sufficient stiffness and rigidity to resist the distorting forces to which the interior trimming will ordinarily be subjected in service.

The top and bottom surfaces of the middle strip 13 are preferably coated with paste
70 by the rollers of the trains 19 and 20 drawing paste from the wells 21 and 22, respectively. This is preferably casing paste made from lactic product. The sheets are then passed
75 between rolls 23 and 24, by which they are pressed together, so that the top and bottom sheets are firmly adhered to the top and bottom faces of the middle sheet. They emerge
80 as a unitary strip 25 of triple thickness.

With the joining of the strips together, or immediately thereafter, the top and bottom faces of the completed strip may be superficially treated with paraffine so as to render the entire board correspondingly waterproof and also to provide a completed board
85 which will be more easily pierced by the rapidly moving needles. In some cases the same rolls 23 and 24 may be used for applying paraffine as are used for pressing the sheets
90 together. In such cases the trains of rollers 26 and 27 may be provided, drawing hot paraffine from the wells 28 and 29, respectively. At the same time spray nozzles 30 and 31 may also be provided for spraying a
95 fine spray of hot paraffine onto the surfaces. The hot paraffine so applied, especially by the rollers, will immediately impregnate the fibers of the board so as to result in a board having its surface portions impregnated with
100 paraffine wax to a distance depending largely on the conditions under which the process is carried on. Furthermore, this result may be secured while leaving little, if any, free paraffine or wax on the exposed surfaces.
105 After the sheet has been completed, the top surface thereof may be coated with a layer of rubber cement 32 to which may then be applied the finishing strip of fabric 33. This rubber cement will not draw any detrimental material from the body of the foundation board, and therefore will not stain or otherwise injure the fabric strip 33.

The completed strip may then be cut into
115 panels 34 of any desired shape and size, as shown diagrammatically in Fig. 4. The edges of these panels may be left unprotected, as shown in said figure, or, as shown in Fig. 5, a line of protecting stitch 35 may be established around the edges of the panel.
120 The completed panel 35 may be set into the door of a car 36, as indicated in Fig. 6.

The exact form of protection for the edges of the panel is optional and may include either of the kinds of stitching 37, 38 or 39,
125 as shown in Figs. 7, 8, and 9, respectively, or no stitching may be used. In some cases, a strip 40 of tape may be set over the edges of the panel and stitched into place by a line of stitching 41.
130

While I have herein shown and described only a single process for the manufacture of my improved product, and have only illustrated certain forms of product, it will be understood that I do not intend to limit myself thereto, except as I may do so in the claims.

I claim:

1. As a new article of manufacture, a foundation board of sufficient flexibility to permit bending around the relatively sharp radii of vehicle interiors without damage, combined with sufficient stiffness and rigidity to withstand the forces which it will ordinarily be subjected to in service, and adapted to be sewed, said board being composed of a plurality of sheets of paper stock, impregnated with alum and resin size, said sheets being joined together face to face by the use of water proof casein glue, at least

one outside surface of the assembled board being superficially treated with water proofing and lubricating material for the purpose specified.

2. As a new article of manufacture, a foundation board of sufficient flexibility to permit bending around the relatively sharp radii of vehicle interiors without damage, combined with sufficient stiffness and rigidity to withstand the forces which it will ordinarily be subjected to in service, and adapted to be sewed, said board being composed of a plurality of sheets of paper stock, impregnated with alum and resin size, said sheets being joined together face to face by the use of water proof casein glue, the assembled board being superficially treated with water proofing and lubricating material, for the purpose specified.

JOSEPH REGENSTEIN.