Jan. 21, 1936. A. L. SPAFFORD 2,028,253

INSULATION PAD AND CONSTRUCTION

Filed Sept. 15, 1930 2 Sheets-Sheet 1

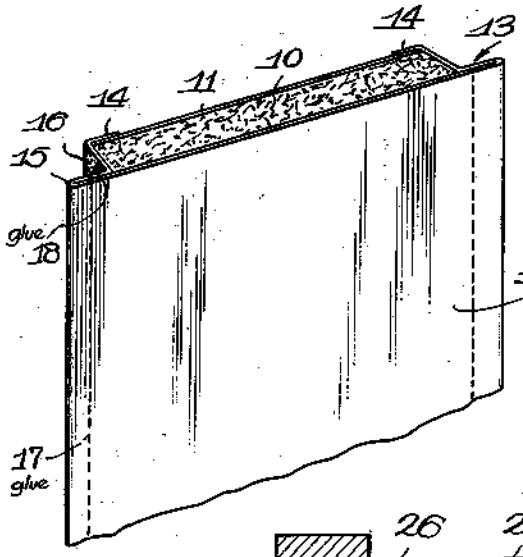
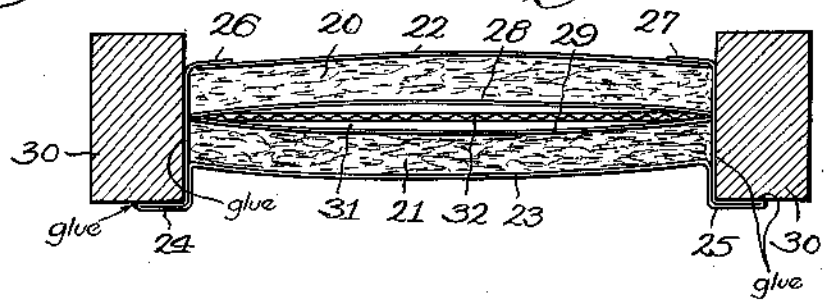



Fig.1

Fig.2



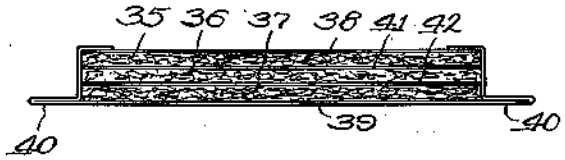




Fig.3

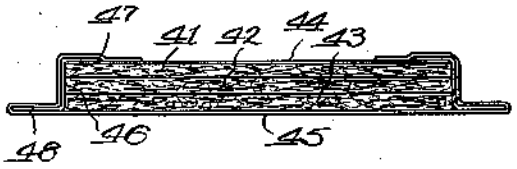



Fig.4

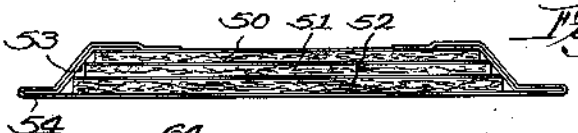
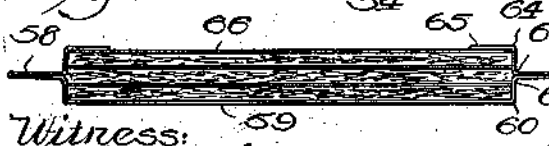



Fig.5

Fig.6

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INSULATION PAD AND CONSTRUCTION

Filed Sept. 15, 1930 2 Sheets-Sheet 2

Fig. 7

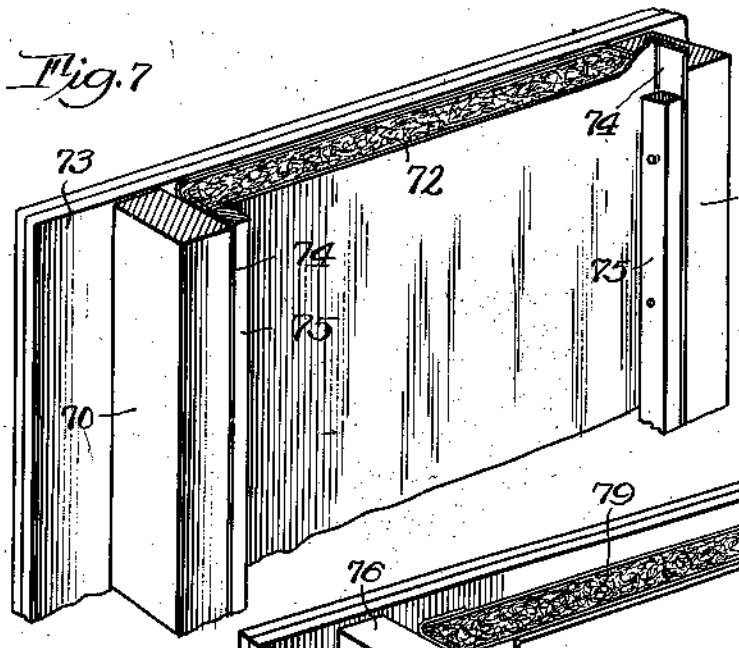



Fig. 8

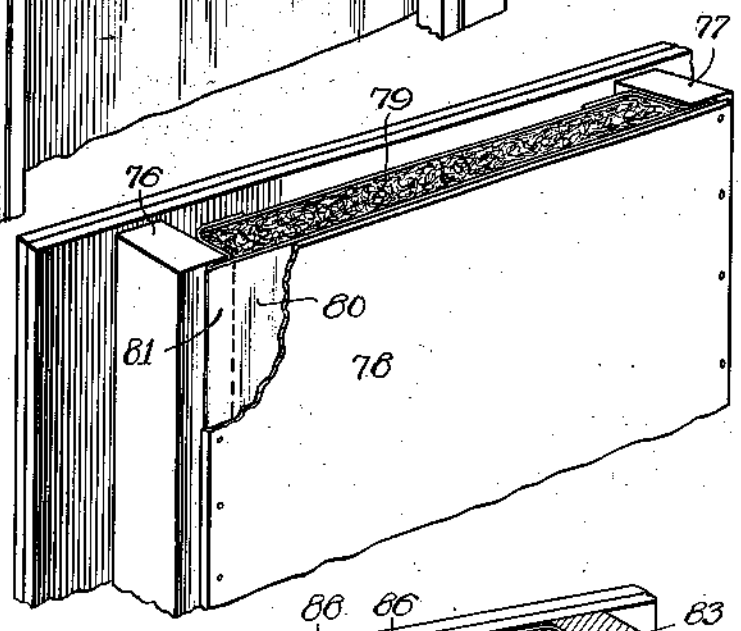
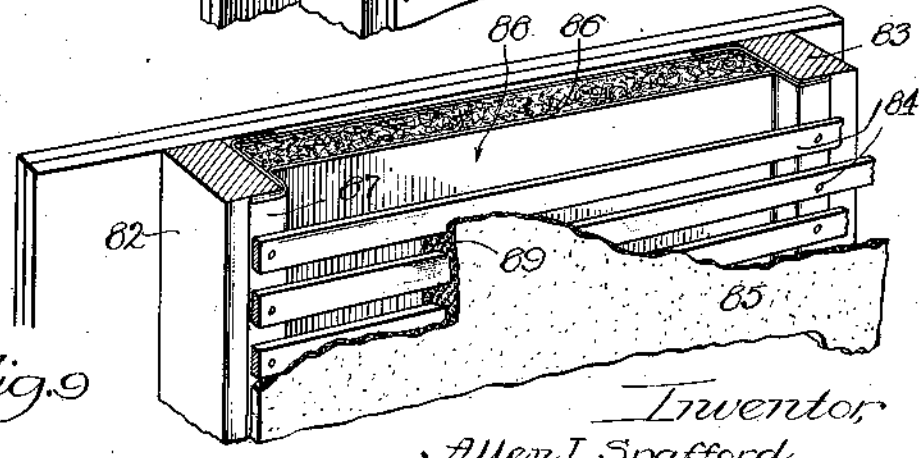



Fig. 9

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Patented Jan. 21, 1936 2,028,253

# UNITED STATES PATENT OFFICE

2,028,253

## INSULATION PAD AND CONSTRUCTION

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Application September 15, 1930, Serial No. 481,830

13 Claims. (Cl. 154—44)

The present invention relates to insulation material and constructions, and has special reference to flexible insulation which can be rolled, such as pads or wadding that may also be tucked into position and readily secured.

Flexible insulation of the type known as Balsam Wool is being used extensively. It is provided to the user in rolls of varying widths, and is usually not over one inch in thickness. It has a mat of fibers cemented together in a loose cushion in a manner similar to that described in U. S. Weiss Patents Nos. 1,336,402, 1,336,403 and 1,336,404.

The mat is cemented to liner sheets of paper, cloth netting or fabric, but preferably to a water-proofed liner, such as a sheet of creped paper having a layer of asphalt on the inner-side to function as an adhesive between the mat and the liner and functioning to render the liner impervious to water and moisture. Ordinarily the edges are unsealed, and when the material is tucked in between studs or rafters, the edges are exposed for entry of moisture or water into the mat itself.

The present day usage of flexible insulation shows the desirability and a demand for insulation thicker than one inch. Flexible fillers or mats of such greater thickness are more difficult to make, to handle and to install. For one reason, an exposed edge of a fibrous mat greater than one inch thick is more easily damaged and hence a ragged edge is likely to result, with imperfect insulation about the edges of the material.

In using the older type of Balsam Wool insulation (about 1 inch thick, or less) the tucking in of the sheet draws back the rear paper liner, which is on the outside of the curve, so that it is not readily caught and supported by the laths which are usually employed to fasten it. If thicker insulation of the same type is employed this difficulty is even more pronounced. The use of strips or lath to hold the older type of Balsam Wool blanket is a practical necessity, and requires of the user a supply of lath as well as a supply of blanket. It is not easy or desirable to ship these companion materials together.

The present invention overcomes these difficulties. It permits using thicker insulation and eliminates the difficulty in securing the rear liner. The provision of a flange on the unit, in the form of a portion of a tubular envelope enclosing the insulation, eliminates from consideration the actual securing of the rear liner. The presence of the flange eliminates the practical necessity of using strips or lath to secure the material, and permits gluing or cementing it in place by a cement on the flange. Glue or cement may be easily shipped with the material in a container in the core of the package, or it may be applied as a film on the flange to be wetted or treated.

One object of the present invention is the provision of a tubular envelope for an insulation core.

Another object of the invention is the provision of a flat sleeve containing an insulation core secured to the sleeve, and means on the sleeve for mounting the unit.

Another object of the invention is the provision of liners for flexible insulation which extend from the edges of the insulation filter as flanges for securing the insulation unit in place.

Still another object of the invention is the provision of a laminated flexible insulation material.

Another object of the invention is the provision of a structure combining all the above named features of the invention.

Other objects of the invention are to employ the new insulation material in novel mountings as walls, floors or ceilings, to effect a windproof and water-proof construction with material which is easily, quickly and economically applied.

In the accompanying drawings I have illustrated a variety of forms of insulation structures contemplated by this invention and also a variety of mounting constructions embodying such insulation. Other forms, mountings, and deviations or modifications of the structures herein disclosed and described are also contemplated as falling within the scope of the invention as expressed in the appended claims.

In the drawings:

Fig. 1 is a fragmentary perspective view of a piece of insulation showing the structure by the endwise appearance.

Fig. 2 shows a laminated form of the invention mounted between studs, the view being a cross-section of the structure.

Fig. 3 is a cross-sectional view of a laminated form of the invention with intermediate liners.

Fig. 4 is a cross-sectional view of a laminated form of structure without intermediate liners, and with slightly rigid edges.

Fig. 5 represents a tapered form.

Fig. 6 represents a modified form with a flange not flush with a face.

Fig. 7 is a perspective view of one form of installation of insulation between studs.

Figs. 8 and 9 are perspective views of modified types of installation.

The invention may be readily explained by reference to a simple and practical embodiment thereof as shown in Fig. 1. In making such a structure I may use a core of flexible insulation material preferably an elongated strip 10 of Balsam Wool, or felted wood fibers, having a width substantially equal to the distance between studding for which the insulation is particularly designed. I prefer to use a strip 10 of mat which has no liners, and thereto apply such types of liner as conditions may require. To one face of the mat 10 I apply a liner 11, preferably of a size equal to the pad. The liner 11 may be paper or other closed fabric, preferably a water-proofed and flexible sheet such as may be provided by cementing a sheet of creped paper to the mat with a water-proof adhesive like hot asphalt. The paper may be impregnated with and creped in hot asphalt and coated on both sides to render it a water-resistant liner, as well as a water-proofing liner for the mat 10.

On the opposite face of the mat I may use sheet 12 of similar material, similarly secured, except that I prefer to use a width greater than the width of the mat in order to secure projecting flanges 13 of flexible material on both edges of the structure. The sheet 12 is made sufficiently wide to permit using the extreme ends thereof as a seal to the liner 11 at zones 14. This provides a double thickness of flange with a fold 15, and a section 16 which is preferably cemented to the edge of mat 10. In manufacture, the flanged liner 12 is preferably coated on its interior face with an adhesive, such as hot asphalt, in order to permit securing it to the mat 10, folding it, and cementing it into the described form in practically one operation, as in a continuous machine. Prepared glue films 17 and 18 to be wetted or treated may be placed on any part of the flanges, being preferably on the rear side and on the face 16.

In place of using one filler or mat 10 between the facial liners I may have laminations of fillers or mats and may separate the mat units by liners which may be and are preferably attached to each filler or mat. Adjacent liners may be cemented together or they may be free as will appear hereinafter.

Fig. 2 shows a unit in which two mats 20 and 21 are sealed into a tubular envelope comprising a liner 22 on rear mat 20 and a liner 23 on the front mat 21, the front liner having extended folded flanges 24 and 25 which extend to and lap over the rear liner 22 and are secured thereto at regions 26 and 27. Each mat has an interior liner, such as waterproofed creped paper secured to the mat, as indicated at 28 and 29, but the interior liners, or the mat laminations, are unattached at their opposing faces. A unit according to this construction may be made slightly wider than the space between studs, for example as at 30, (to which it may be glued or cemented) so that upon insertion the unit will bow as illustrated and form an air space 31 between the laminations. If desired a sheet of rigid material such as corrugated board 32 may be placed between the laminations having a width nearly equal to the distance between the studs and therefore less than the width of the laminations. By reason of these relations the board may be freely inserted from the end of a length and need not be incorporated in the structure in the process of manufacture. The board 32 will give rigidity where this feature is desired. The bowing of the laminated structure imparts a lateral pressure against the studs 29 and 30 and more effectively seals the joints.

In Figs. 3 to 6 multi-ply units are illustrated with more than two laminations and with other features. In Fig. 3 the structure is similar to that in Fig. 1. Three mats 35, 36 and 37 are included in the package or tubular envelope formed by sealing the exterior liners 38 and 39, with provision of flanges 40 coextensive with the surface of liner 39. Separating liners 41 and 42 are shown between the mats, each being cemented to the adjacent mat. Asphalted paper is suitable.

In Fig. 4 three mats 41, 42 and 43 are piled together without separating liners, the single lines indicating the absence of separating means. Rigidity may be imparted to the unit by placing more rigid material such as chip-board along the edges. In the present instance the exterior liners 44 and 45 are secured together as heretofore described to form the tubular envelope, but the edges are reinforced by angular lengths of chip-board. The middle section 46 lies adjacent the edges of the mats and defines the width. Another section 47 forms a square edge with section 46 and protects the corner. The front liner 45 extends sufficiently beyond section 47 to be sealed to back liner 44. If desired, the ordinarily flexible flange formed by the fold in front liner 45 may be stiffened by incorporating a section 48 of the chip-board between the two thicknesses of the liner 45. The stiffening sections 48—46—47 are preferably integral.

Although I have illustrated several forms of insulation units which are flexible in all directions, and one form (Fig. 2) which is substantially rigid by reason of the one layer of corrugated insulating filler, it is to be understood that the invention is not limited to flexibility in the filler. The flexibility in two directions is desirable and advantageous. The one direction of flexibility which permits a strip to be rolled for shipping, and for convenience in installing, is the more important feature of the flexibility. It is to be understood therefore that the filler may vary in flexibility from the rigid corrugated board to the universally flexible fiber mat, without in any way departing from the broadest features of this invention.

In Fig. 5 a modified form of Fig. 4 is shown. Laminated mats 50, 51 and 52 are preferably related like those in Fig. 3, but they may be related like those in Fig. 4, or like the layers of Fig. 2. They are successively narrower from front to rear and provide a tapered or bevelled edge length of insulation. Chip board or other stiffening means 53 is contained within the enveloping liners as in Fig. 4 and defines a flat substantial inclined surface from rear to front. The stiffening means is represented as a three-sectioned length having one section 54 contained in the flange formed by the fold in the front facing.

In Fig. 6 a modified form is shown in which flanges 58 are formed at the edges rearwardly of the front face. Front liner 59 is first carried around corner 60, then part way up the side to a point 61, here located about midway of the thickness, and thence outwardly to 62 where

it is folded upon itself and preferably cemented to itself, until it again reaches the mat at 63, from which point it continues around corner 64 for sealing at 65 to rear liner 66.

It is to be understood that flanges 68 may be located either flush with the front face, or flush with the rear face, and they may be located at any intermediate point along the edge of the mat.

It is also to be understood that the material from which the mounting flange is constructed is not necessarily integral with and an extension of one of the facing liners. The tubular envelope carrying the two mounting flanges may be pieced wherever it is desirable and flanges may be attached to the envelope by other means than by the disclosed integral construction.

The numerous embodiments above described will permit of a multiplicity of methods of mounting the material in structures. They are particularly adapted and in practice are constructed for mounting between studs of standard spacing. They are suitable for use behind wall board coverings or behind lath and plaster. They are particularly constructed to reduce labor in installation.

In Fig. 7 two studs 70 and 71 as in a wall have a strip of flanged envelope insulation 72 mounted therebetween. The pieces 73 represent what may be the outside boards on a house, or equivalent covering. The insulation 72 is placed deep into the recess between studs 70 and 71 and lies against the boarding. Each flange 74 on the insulation lies on the inside surface of the studs and may be secured thereto as by glue or otherwise, but preferably by a strip 75 nailed to the stud at suitable intervals.

In Fig. 8 spaced studs 76 and 77 carry a wall board covering 78 behind which a section of insulation 79 is tucked into the recess between the studs, with its one surface 80 abutting the wall board. The flanges 81 lie between the wall board and the stud and the securing of the wall board to the stud secures the flange 81.

In Fig. 9 the studs 82 and 83 carry laths 84 and plaster 85. Insulation 86 is tucked between the studs with flange 87 lying on two faces of a stud in such a way as to form a space 88 between the laths and the insulation for keying plaster to the lath as shown at 89. The laths hold flanges 87 to the studs.

Various other modifications may be employed in mounting the different forms of insulation herein described.

I claim:

1. Insulation comprising in combination a flexible flat core of insulating material, a liner cemented to one face of the core, and a liner cemented to and covering the other face of the core, one liner being wider than the core and projecting beyond two opposite edges of the core, each of the projecting parts of said liner being folded upon itself along a line intermediate the bounds of the projecting portion to provide a flange, and the extreme edge of each projecting portion passing across the edge of the core and being cemented to the other liner.

2. Insulation comprising in combination two superimposed lengths of flexible cores of insulation material, a liner secured to each of the abutting faces of the cores, a flat elongated open-ended sleeve containing said cores, said liners being uncemented to each other, whereby the cores are free to bow and separate with edgewise compression of the enveloped cores, and mounting flanges projecting from the sleeve in the vicinity of the edges thereof, the insulation being thus provided in a length adapted for crosswise severing.

3. Insulation comprising in combination a flat mat of fibrous material, a tubular envelope containing said mat, flanges projecting from said envelope in the vicinity of the edges of the mat, said flanges being formed of two thicknesses of the envelope adjacent a fold therein, and stiffening means between the said two thicknesses of the envelope.

4. Insulation comprising in combination a flat mat of fibrous material, a tubular envelope containing said mat, flanges projecting from said envelope in the vicinity of the edges of the mat, said flanges being formed of two thicknesses of the envelope adjacent a fold therein, and stiffening means between the said two thicknesses of the envelope, said stiffening means being extended within the envelope from the flange to cover a portion of the edge of the mat.

5. Insulation comprising in combination a flat mat of fibrous material, a tubular envelope containing said mat, flanges projecting from said envelope in the vicinity of the edges of the mat, said flanges being formed of two thicknesses of the envelope adjacent a fold therein, and stiffening means between the said two thicknesses of the envelope, said stiffening means being extended within the envelope from the flange to cover a portion of the edge of the mat, and being bent at a corner of the mat thereby having a portion on one face of the mat.

6. Insulation comprising in combination a flexible elongated flat sleeve which is stretchable in the direction of its length, a stretchable insulating core housed in said sleeve and secured thereto, and external mounting flanges in the vicinity of two opposite edges of said sleeve.

7. Insulation comprising in combination a flat elongated sleeve of creped sheet material, a flexible stretchable insulation core housed in said sleeve and secured thereto, and external mounting flanges in the vicinity of two opposite edges of said sleeve.

8. Insulation comprising in combination a flat open-ended sleeve, two separate insulating cores housed within said sleeve, each core being adhesively united to an interior face of said sleeve, and external mounting flanges in the vicinity of two opposite edges of said sleeve.

9. Insulation comprising in combination a flat open-ended sleeve, two separate insulating cores housed within said sleeve, each core being adhesively united to an interior face of said sleeve, flat separating means removably mounted between said two cores, and external mounting flanges in the vicinity of two opposite edges of said sleeve.

10. Insulation comprising in combination a flat open-ended sleeve, and two facially separable insulating cores housed within said sleeve, each core being adhesively united to an interior face of said sleeve.

11. Insulation comprising in combination a flat open-ended sleeve, two separate insulating cores housed within said sleeve, each core being adhesively united to an interior face of said sleeve, and flat separating means removably held between said two cores.

12. Insulation comprising in combination a flat open-ended sleeve, two separate insulating cores housed within said sleeve, each core being adhesively united to an interior face of said

sleeve, and rigid flat separating means adapted to be inserted endwise of the sleeve between said two cores.

13. An insulation structure comprising two adjacent and separable flat flexible insulation cores in separable face-to-face relation, and an open-ended tubular sleeve closely encompassing said two cores, whereby compression edgewise of the cores, and lengthwise of the sleeve, causes the two cores to bow and separate forming a more rigid unit.

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