Aug. 7, 1962 T. A. HUGHES 3,048,513

REINFORCED FIBROUS BATT

Filed Aug. 25, 1954

Fig. 1.

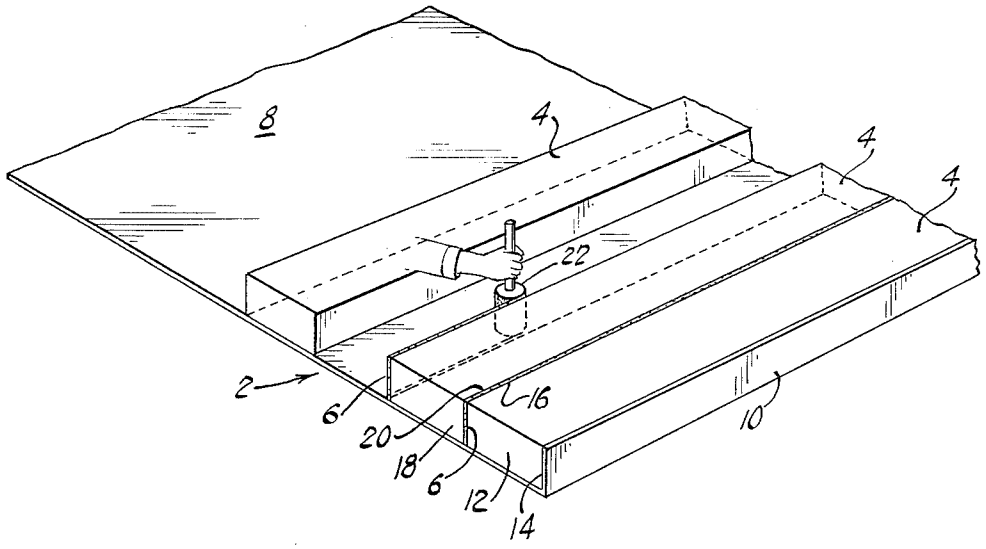
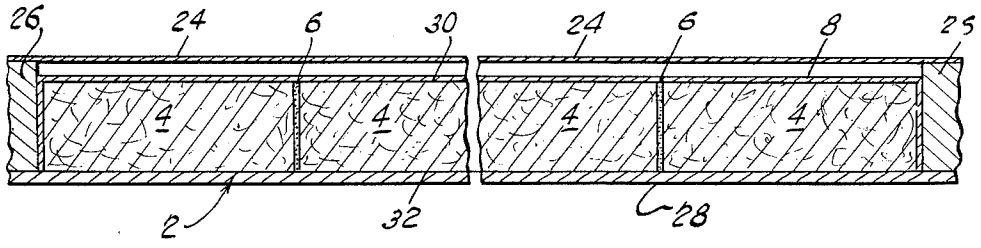


Fig. 2.



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REINFORCED FIBROUS BATT

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The present invention relates to an improved fibrous batt and more particularly to a mineral wool thermal insulating batt peculiarly adapted for use where insulation may become wet, either from condensation or flooding, as, for example, in the floor structure of a refrigerated railway car. It will be understood that the term "mineral wool" is used herein in a generic sense and includes fibrous material manufactured from rock, slag, glass, or the like.

A primary object of the present invention is to provide a fibrous batt which retains its resilience and thickness after wetting.

A further object of the present invention is to provide a fibrous thermal insulating batt having good resistance to compacting from wetting and also having an insulating efficiency comparable to other batts made from the same fibrous material but without substantial resistance to compacting.

The invention will be more fully understood and further objects and advantages thereof will become more apparent when reference is made to the following detailed description and to the accompanying drawing in which:

FIG. 1 is an isometric view illustrating a portion of the product of the present invention and one method of assembling the same in an inverted position, and

FIG. 2 is a sectional view, with parts broken away, of a structure including the product of the invention.

Referring to the drawing, and particularly to FIG. 1, there is shown a partially formed fibrous batt **2** composed of a plurality of strips **4** of fibrous material, such as mineral wool, joined together at their lateral edges by ribs **6** of a relatively rigid adhesive material such as a mixture of three parts of asphalt with one part of wood rosin. The batt may be provided with a generally waterproof but vapor permeable covering **8**, such as a perforated 15 lb. asbestos felt saturated with asphalt, the covering being adhered to the batt at least at the side edges thereof and extending over one face (the bottom face in FIG. 1) of the batt. In one method of assembling the batt **2** the covering **8** is placed on a flat surface and edge portion **10** thereof, corresponding in width to the thickness of the strips of fibrous material, is bent upwardly and adhered to the lateral edge **14** of strip **12**. The opposite lateral edge **16** of this strip **12** is then coated with the desired adhesive material by brush or other means **22**, the adhesive serving to join lateral edge **20** of strip **18** to the edge **16**. In a like manner successive strips **4** are joined together until a batt of the desired width is formed, after which the adhesive used is hardened or set by the required process. If desired, of course, the covering **8** may be adhered to the strips **4** throughout its area rather than at the side edges only of the batt. Where the use to which batt **2** is to be put does not require a covering, this item may be eliminated, but where such a covering is required, it is apparent that it can be used to advantage in hand-assembly of the product.

One material from which strips **4** can be made is mineral wool felted in the manner disclosed in United States Patent to Coleman No. 2,561,843, issued July 24, 1951, but any water stable mineral fiber material formed by collecting fiber on a conveyor from an air suspension will usually be suitable. With such material the majority of fibers in the felt lie generally parallel to the plane of the conveyor and, hence, to the faces of the felt, and strips **4**

are formed by cutting the felt in planes substantially at right angles to the faces. While the strips may be made of various widths, it has been found satisfactory with felts of ordinary thickness to provide a width of about twice the thickness of the strips. Where batt **2** is composed of 2½ to 6 pounds per cubic foot mineral wool and is intended for use as a thermal insulation, strips three inches thick and six inches wide will be suitable.

Ribs **6**, joining the lateral (cut) edges of strips **4** should be thin but relatively rigid, i.e., the ribs should be sufficiently strong and inflexible to sustain the batt when the same is soaked with water and subsequently dried. The ribs are sheet-like in general contour but may, depending upon the care with which the adhesive is applied, have somewhat irregular or discontinuous surfaces and yet be satisfactory. Where the adhesive employed is a mixture of asphalt and rosin, the materials are mixed and applied in a molten state and permitted to harden by ordinary drying.

A particularly important feature of the present invention lies in cutting a felt of fibrous material in planes substantially at right angles to the faces thereof and joining the strips thus formed by adhesive connecting the cut edges. The arrangement is such that the sheet-like ribs of adhesive lie at right angles to the faces to which a majority of fibers are generally parallel and hence the ribs reinforce the batt against compressive forces from directions in which the fibrous material has least resistance. The arrangement also provides for maximum insulating efficiency in the reinforced batt, as will be clear in FIG. 2 wherein a batt **2** is shown as installed under the floor plate **24** of a refrigerated chamber. The batt **2** is supported under the plate **24** and between plate supports **26** by sub-flooring **28**. Obviously, the direction of heat flow in FIG. 2 is upwardly, and thus the general fiber orientation is across the path of heat flow to provide maximum insulation. Also, the undesirable compressive forces which may result from wetting and drying batt **2** act in vertical planes in FIG. 2 and ribs **6**, being positioned to lie in substantially vertical planes, provide maximum resistance to such forces. It will be understood that a satisfactory, though not the best, result may be obtained when the ribs are at angles differing slightly from right angles to the faces of the batt (faces **30** and **32** in FIG. 2), and that for purposes of the present invention it is only necessary to arrange the ribs substantially at right angles to the faces.

Having thus described my invention in rather full detail, it will be understood that these details need not be strictly adhered to and that various changes and modifications may suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What I claim is:

1. A thermal insulating batt comprising a fibrous insulating material a majority of the fibers of which lie generally parallel to the face of the batt, said fibrous insulating material when not reinforced being compactible in directions perpendicular to said face by flooding with water, said thermal insulating batt comprising a plurality of strips of said fibrous insulating material, each of said strips having lateral edges, and relatively rigid sheet-like ribs of adhesive joining the lateral edges of adjacent strips and lying substantially at right angles to said face to reinforce said fibrous material against compacting.

2. An insulated structure comprising a thermal insulating batt positioned with a face thereof across a path of heat flow, said thermal insulating batt comprising a plurality of strips of fibrous insulating material a majority of the fibers of which lie generally parallel to said face, each of said strips having lateral edges, said fibrous insulating material when not reinforced being compactible in

directions perpendicular to said face by flooding with water, and relatively rigid sheet-like ribs of adhesive joining the lateral edges of adjacent strips and lying substantially at right angles to said face to reinforce said material against compacting.

3. A method of forming a thermal insulating batt comprising forming a felt of fibrous material with the majority of the fibers of the felt lying generally parallel to a face thereof, said fibrous insulating material when not reinforced being normally compactible in directions perpendicular to the face thereof by flooding with water, cutting said felt in planes substantially at right angles to said face to form elongated strips having lateral edges, coating at least one lateral edge of each of said strips with an adhesive material, and joining the cut lateral edges of said strips to form a thermal insulating batt having said cut lateral edges joined by relatively rigid sheet-

like ribs of adhesive to reinforce said fibrous material against compacting.

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