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C. C. PALMER

HEAT INSULATOR AND METHOD OF MAKING THE SAME

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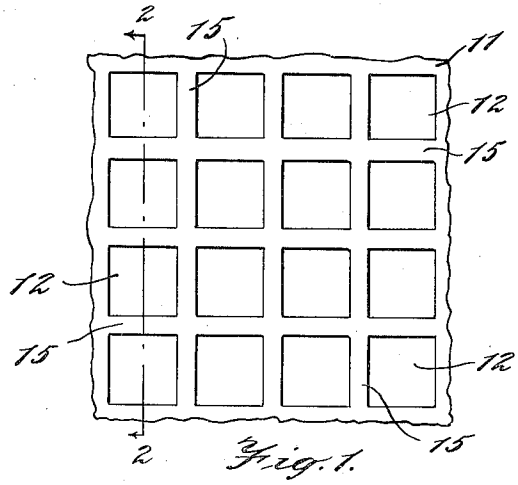


Fig. 1.

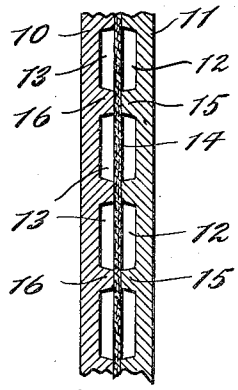


Fig. 2.

INVENTOR.
Cassius C. Palmer
BY
Gifford, Buell & Buell
ATTORNEYS

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CASSIUS C. PALMER, OF NEW YORK, N. Y.

HEAT INSULATOR AND METHOD OF MAKING THE SAME.

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My present invention relates to heat insulators, particularly of the type which have sufficient stiffness to enable structures, such as iceboxes and the like, to be built up of such material.

My invention will be best understood from the following specification and the annexed drawing, in which Fig. 1 is a front elevation of a portion of a sheet of my novel heat insulator in a form which I have adopted for the purpose of illustration only, and Fig. 2 is a section of Fig. 1 on the line 2—2.

Like reference characters indicate like parts in the different views.

Referring now to the illustrative embodiment shown in the drawing, the insulator is made up of a pair of sheets 10 and 11 having their adjacent faces preferably provided with a plurality of recesses or pockets 12, 13, these pockets preferably being arranged so that the walls thereof match in the two sheets. Between the two sheets 10 and 11, I preferably provide a sheet of fabric 14 which may be of muslin, cheesecloth or the like, this sheet of fabric being coated or soaked in glue or other adhesive and serving to bind the reticulated surfaces of sheets 10 and 11 together.

Preferably the sheets 10 and 11 are formed of a hard-pressed wood fibre, so that it has considerable strength and is as rigid as wood itself. Preferably the sheets 10 and 11 are of considerable thickness. For instance, each sheet may be one-half inch thick with the pockets 12 or 13 therein approximately one-quarter inch deep. The pockets 11 and 12 may be of any convenient area, but preferably I make them of relatively small size so as to give a reasonable number of opposing ribs 15, 16, to serve to bind the sheets together through the layer of fabric 14.

In manufacturing my heat insulator, I form the sheets 10 and 11 (which, in practice, are identical) and then soak the fabric 14 in glue and then position the parts as shown in Fig. 2. Then the insulator is subjected to the pressure of a press while the glue is drying.

Preferably, in order to increase the heat insulation, I exhaust the air, partially at least, from the pockets 12 and 13, and in order to insure the maintenance of this partial vacuum thus formed, I preferably close any possible pores in the insulating material of the sheets 10 and 11 as by soaking such sheets in a mixture of white lead and linseed oil or by coating the outer surface of the sheets with some non-porous material, such as enamel, paint or the like.

One way in which the pockets may have the air removed therefrom is to assemble the sheets 10 and 11 with the fabric between them in a chamber from which the air can be exhausted and in which the parts are held beneath a press. Before the parts are pressed together, however, the air in the chamber is exhausted and when the desired vacuum has been reached, the press is operated to bring the sheets 10 and 11 tightly against the fabric 14 to seal the inner edges of the several pockets 12 and 13. After the sheets have been pressed together, the finished sheet is then submerged into a bath of white lead and linseed oil while the sheet is still in the vacuum chamber. This serves to fill any possible pores in the sheets 10 and 11, so that the vacuum in the pockets 12 and 13 may be maintained after the sheet is taken from the bath. While the sheets are submerged the vacuum in the chamber may be broken, the atmospheric pressure serving to force the coating material well into the pores of the sheets.

If desired, the finished sheet may now be given a coat of paint in order to further insure the closing of the pores.

The insulator which I have described may be formed into relatively large sheets and will have sufficient strength so that boxes may be built directly therefrom, to be used as iceboxes or the like or may be used to line refrigerators or other spaces which are to be insulated from heat.

While I have described one form of my invention, it will be understood that the embodiment thereof may be widely varied.

I claim:

1. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, having opposing surfaces formed with a plurality of recesses separated by relatively narrow walls, opposite recesses being in substantial register with one another so as to form chambers, the parts being held together by an adhesive and said chambers being segregated from each other on all sides by the chamber walls.

2. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, with a fabric between adjacent sheets, said sheets having op-

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posing surfaces formed with a plurality of recesses forming chambers with the walls between the chambers relatively narrow, the parts being held together by an adhesive and said chambers being segregated from each other on all sides by the chamber walls.

3. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, with a fabric between adjacent sheets, said sheets having opposing surfaces formed with a plurality of recesses forming chambers with the walls between the chambers relatively narrow, the recesses on opposing surfaces being in substantial register with one another and the parts being held together by means of an adhesive and said chambers being segregated from each other on all sides by the chamber walls.

4. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, with a fabric between adjacent sheets, said sheets having opposing surfaces formed with a plurality of recesses forming chambers with the walls between the chambers relatively narrow, the parts being held together by an adhesive, said insulator having an exterior coating of non-porous waterproof material and said chambers being segregated from each other on all sides by the chamber walls.

5. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, held together by means of an adhesive, and having chambers formed between adjacent sheets, said chambers being separated by relatively narrow walls and said chambers being segregated from each other on all sides by the chamber walls.

6. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of hard pressed wood fibre, held together by means of an adhesive and having chambers formed between adjacent sheets, said chambers being separated by relatively narrow walls and said chambers being segregated from each other on all sides by the chamber walls.

7. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, held together by means of an adhesive, and having chambers formed between adjacent sheets, the chambers being separated by relatively narrow walls and the air in said chambers being partially exhausted and said chambers being segregated from each other on all sides by the chamber walls.

8. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, with a fabric between adjacent sheets said sheets having opposing surfaces formed with a plurality of recesses forming chambers, the chambers being separated by relatively narrow walls and the parts being held together by an adhesive, and the air in said chambers being partially exhausted and said chambers being segregated from each other on all sides by the chamber walls.

9. A heat insulator composed of a plurality of superimposed, substantially rigid sheets of fibrous material, with a fabric between adjacent sheets, said sheets having opposing surfaces formed with a plurality of recesses forming chambers, the chambers being separated by relatively narrow walls and the parts being held together by an adhesive, and the air in said chambers being partially exhausted, said insulator having an exterior coating of non-porous waterproof material and said chambers being segregated from each other on all sides by the chamber walls.

10. The process of forming a heat insulator which consists in binding together under mechanical pressure a plurality of substantially rigid sheets of fibrous material by means of an adhesive-bearing fabric placed between adjacent sheets, the opposing surface of at least one of every two adjacent sheets being recessed, the above steps being carried out in a partial vacuum.

11. The process of forming a heat insulator which consists in binding together under mechanical pressure a plurality of substantially rigid sheets of fibrous material by means of an adhesive-bearing fabric placed between adjacent sheets, the opposing surface of at least one of every two adjacent sheets being recessed, and thereafter coating the said object so formed with a non-porous material, the above steps being carried out in a partial vacuum.

12. The process of forming a heat insulator which consists in binding together under mechanical pressure a plurality of substantially rigid sheets of fibrous material by means of an adhesive-bearing fabric placed between adjacent sheets, the opposing surface of at least one of every two adjacent sheets being recessed, and thereafter coating the said object so formed with a non-porous material, the above steps being carried out in a partial vacuum, and breaking the vacuum while the object is submerged, whereby said coating material better permeates the outer surface of the object.

CASSIUS C. PALMER.