Oct. 23, 1934. P. S. DENNING 1,977,874

ACOUSTICAL COMPOSITION

Filed Jan. 21, 1932

Fig. 1

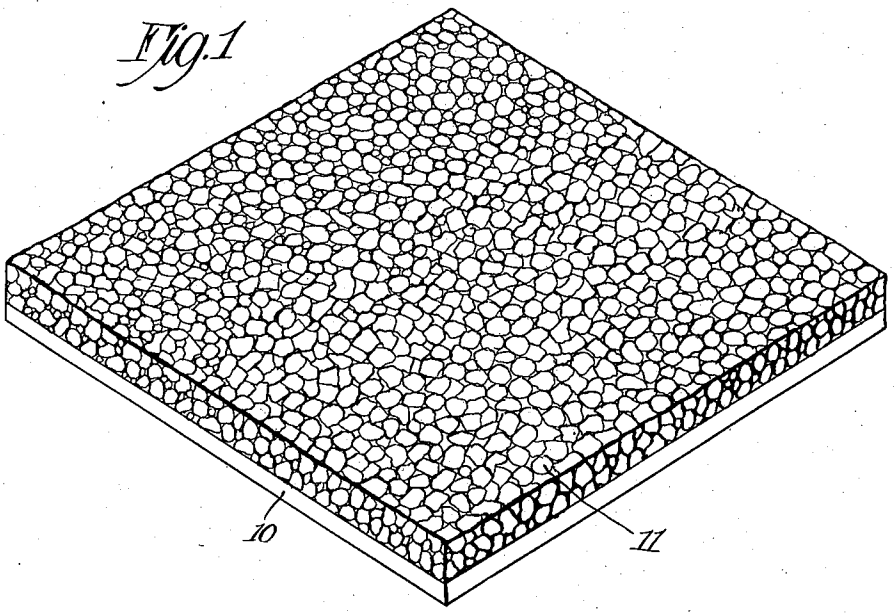
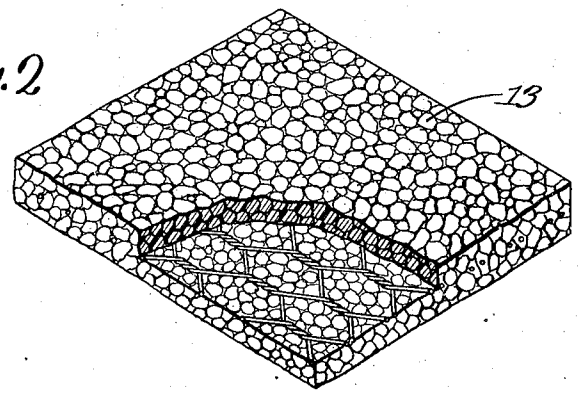


Fig. 2



Inventor:
Paul S. Denning
By Nielson, Mann & Cox
Attys.

Patented Oct. 23, 1934

1,977,874

UNITED STATES PATENT OFFICE

1,977,874

ACOUSTICAL COMPOSITION

Paul S. Denning, Joliet, Ill., assignor to F. E. Schundler & Co., Inc., a corporation of Illinois

Application January 21, 1932, Serial No. 587,958

2 Claims. (Cl. 154—44)

This invention relates to acoustical insulating material.

The principal object of the invention is the provision of a new and improved composition having a very low coefficient of sound transmission.

Another object of the invention is the provision of a new and improved composition which is not only a good insulation against sound transmission but is also a non-conductor of heat.

A further object of the invention is the provision of a new and improved sound insulating material that is constructed in sheets or attached to boards, or the like, whereby it may be easily handled and may also be placed in position with the walls of buildings and the like.

Other and further objects and advantages of the invention will appear from the following description taken in connection with the accompanying drawing, in which—

Fig. 1 is a perspective view of the sound insulating member; and

Fig. 2 is a similar view of a modified form of construction with parts broken away.

It has been found by experiment that expanded vermiculite of Jeffersonite is an excellent insulating material against the transmission of sound. Vermiculite is a micaceous product and may be expanded by subjecting the native material to a fairly high temperature.

It is common practice to employ porous material divided into relatively small particles and in loose condition as insulation for preventing the transmission of heat or sound waves through walls and partitions of buildings and the like. But insulation in loose condition tends to settle and become denser at the bottom than at the top, due to the weight of the material. The settling of the particles leaves a space above the same that contains no insulating material.

The present invention seeks to remedy these defects by the provision of means for securing the individual particles in position on suitable supports or reinforcing members with a binder that will not materially increase the coefficient of sound transmission of the insulation.

The expanded vermiculite or other porous insulating material is mounted on boards or panels or is prepared in sheets in any suitable manner. In any event, the particles are held together by a binder that will not only attach the particles together but will attach them to what may be termed a support.

Fig. 1 shows a panel 10 for supporting the insulating material. This panel may be of wood, metal, or any suitable composition. In the construction shown, the commercial form of gypsum board is employed as a backing or reinforcing member for the insulating material. The particles of expanded vermiculite 11 are secured to this board and to each other by a suitable cement or binder.

In the form of construction selected to illustrate one embodiment of the invention, latex is preferably employed as the binding agent. The particles of vermiculite are cemented together and to the wall board by latex. Vermiculite is laminated and when the particles are coated with a thin film of latex, the exposed edges of the particles will be more or less cemented together and the particles will be so connected together that there will be formed innumerable pockets, cells or spaces that will be more or less completely separated from each other. By the use of these materials, sound waves striking the composition and passing through the surfaces will be trapped within the air pockets or spaces within the body of the material. The latex will tend to isolate each void or cell from the others, thereby creating innumerable isolated dead air spaces, the walls of which will divergently reflect the sound waves and these reflected waves will be absorbed by the dead air spaces.

Latex is used preferably inasmuch as it will not materially detract from the acoustical insulation properties of the expanded vermiculite and will at the same time constitute a cement for securing the material to its backing 10. The latex causes the particles to yieldingly adhere and since the laminæ of the exfoliated material is more or less elastic, the walls of the isolated voids will yield more or less, thereby assisting in absorbing or dissipating the energy of the sound waves passing into the insulating material.

The form of construction shown in Fig. 2 differs from that shown in Fig. 1 in that reinforcing material is embedded in the insulating material. Preferably, though not necessarily, reticulated material 13 is employed because of the ease with which it may be incorporated in the material. This wire reinforces the material so that the same may be constructed in sheet form, thereby facilitating the handling of the same. While only a single layer of woven wire is used, it is understood that wire of other form and reticulated members of other material may be employed. The number of layers of reticulated material employed, the size of the mesh and the gauge of the wire will depend on the thickness of the insulation and the stiffness of the sheet de-

sired. A single layer of ordinary chicken wire is shown on the drawing as one example of the embodiment of the invention.

The use of a binder enables the insulating material to be assembled in sheet or board form without the necessity of impairing the efficiency of this material by unduly compressing the same.

By constructing the insulating in sheets that are reinforced by suitable reinforcing members, the insulation can be easily handled and readily placed in the desired position when needed.

By mounting the material on wall board, the insulation will be installed whenever the wall board is placed in position. But whether the reinforcing member be a board or be embedded in the material, the insulating panel may be secured in position by nails or the like, if desired.

If desired, the latex may be chemically treated so that it will vulcanize at atmospheric temperatures. It may also be treated with chemicals in the well-known manner to prevent oxidation.

What I claim, therefore, is:

1. A sound insulating unit comprising fragmentated insulating material of expanded vermiculite forming a porous mass, a separate wall board adapted to be attached to the side wall of a building, a binder comprising latex for cementing the fragments of said material together and to said board, said insulating material being coextensive with the extension of said board whereby a wall built with a plurality of said boards will have a continuous layer of insulation on one side thereof.

2. In a sound insulated wall, a supporting member, a quantity of expanded vermiculite forming a porous mass of material thickness over one side of said support, and latex for cementing the particles of vermiculite together, thereby forming a porous structure, the cellular walls of which are more or less resilient, said latex also securing said mass to said supporting member.

PAUL S. DENNING.