COMPOSITIONS,
COATING OR PLASTIC.

Examiner
D i c 38

6
106/86

J. COMERMA.

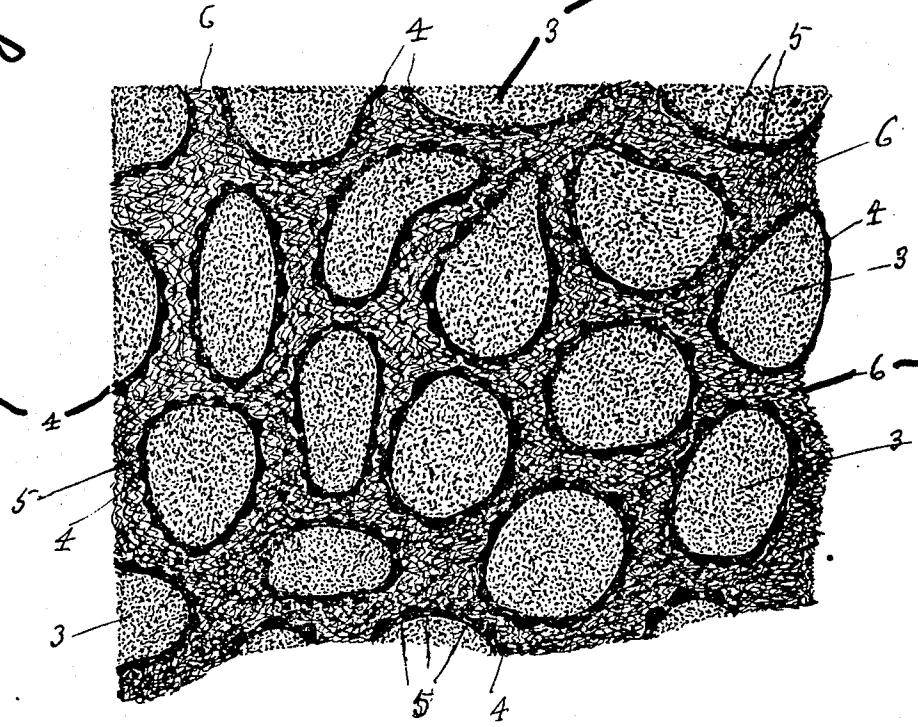
SOUND ABSORBING AND HEAT INSULATING MATERIAL AND PROCESS FOR MAKING THE SAME.

APPLICATION FILED MAR. 1, 1920.

1,358,830. **Patented Nov. 16, 1920.**

Cork

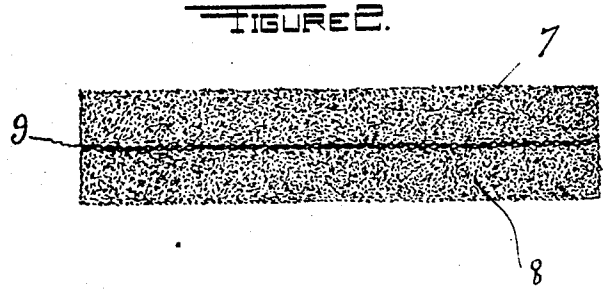
FIGURE 1.



Cement Coating

Hair, Felt, or Asbestos

FIGURE 2.



INVENTOR:
John Comerma
BY
Walton Harrison,
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN COMERMA, OF NEW YORK, N. Y., ASSIGNOR TO HARRY B. NASSOIT, OF NEW YORK, N. Y.

SOUND-ABSORBING AND HEAT-INSULATING MATERIAL, AND PROCESS FOR MAKING THE SAME.

1,358,830. Specification of Letters Patent. Patented Nov. 16, 1920.

Application filed March 1, 1920. Serial No. 362,525.

To all whom it may concern:

Be it known that I, JOHN COMERMA, a subject of the King of Spain, residing in New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Sound-Absorbing and Heat-Insulating Materials, and Processes for Making the Same, of which the following is a full, clear, and concise description.

My invention relates to the preparation and use of a material suitable for facing walls, arches, ceilings, partitions, floors, etc., and is usually employed in buildings, but may be used elsewhere as occasion may require.

My improved material has a considerable degree of flexibility, and because of this quality it may be slightly bent, sprung, flexed or shaped in order to adapt it to a particular fitting; or it may be built in a single piece, in the position it is to occupy; and it may be used to advantage in structures which are subjected to strains or stresses, so that the material, after being placed in position, is adapted to flex either constantly or from time to time, according to the stresses or strains. In some instances my material can be laid with a trowel, or with a float or similar implement.

My improved material has the property of absorbing sound vibration, and is adapted to prevent certain acoustical difficulties due to excessive reverberation or to the undesirable focusing of sound waves.

My improved material has very little heat conductivity, and on this account it is of service in preventing the travel of heat through it; so that the material may be used in some instances to conserve the use of fuel and in others to protect various other materials and structural parts from the destructive or injurious effects of heat.

Reference is made to the accompanying drawing forming a part of this specification, and in which like reference characters indicate like parts throughout the several figures.

Figure 1 is an enlarged sectional view of my material.

Fig. 2 is a section through a block or plate of my material, made in this instance with special reference to its flexibility.

At 3 are shown granules, or particles of body material, which are interspersed throughout the entire mass. These particles of body material are preferably graded to substantially the same size, as here shown, but if desired may be left ungraded and thus may have substantially different sizes. They usually vary as to shape, as shown. In the particular instance here illustrated they are made of cork, but they may be made of sand, crushed stone or the like. I prefer to use cork, owing to the excellence of the qualities it confers upon the final product; and if cork is unavailable or its cost prohibitive, wood sawdust may be used as a substitute.

Each particle of body material carries a coating 4 of cement, prepared and applied as hereinafter described, this coating being provided with minute holes or interstices 5. Because of these holes or interstices, each coating is porous and the porosity of the material as a whole is improved.

A mass of fibrous material 6, consisting preferably of hair, felt or asbestos, extends throughout the thickness of the mass and envelops the particles of body material. Each individual particle 3, with its coating 4, is completely enveloped within the portion of the fibrous material immediately adjacent, which adheres firmly to the cement coating. Thus the particles of body material immediately contiguous to each other do not touch each other at all except in instances where direct contact is accidental, and they are not connected each to the other except by the fibrous material. The fibrous material, however, is treated as hereinafter described in order to improve its qualities as a binder, this step being performed before the fibrous material is brought into contact with the particles of body material.

In the preparation of my improved material, I proceed as follows:

First, I take a suitable quantity of Portland cement, in the form of a dry powder, and mix it with one per cent. by volume of bicarbonate of soda, also in the form of a dry powder. The reason for adding the bicarbonate of soda is to render the cement a little more strongly alkaline than would otherwise be the case. The mixture has of course the form of a dry powder, and in this form I spread it out upon a board.

Second, I take a suitable quantity of par-

ticles of body material, say cork granules, pour them into a tub of water, and there agitate them until they are thoroughly wet. The agitation may be done by hand or by aid of machinery.

Third, in a separate vessel or upon a dry board I mix together, in a dry state, a quantity of fibrous material, preferably hair, felt or asbestos, and Portland cement, in the proportion of six parts of the fibrous material to one part of cement, by volume.

Fourth, I take the wet cork granules from the tub and lay them on a board with the above mentioned dry powder consisting of Portland cement and one part of bicarbonate of soda. The mass thus formed is now thoroughly worked, either by hand or by aid of machinery. The result is that each granule of cork becomes coated. During this step a chemical reaction takes place between the alkaline components of the cement and the tannic acid inherent in the cork granules. In this connection it may be noted that cork, being made of the bark of the cork oak, contains tannic acid as is the case with all other barks of the oak family. As a result of this chemical reaction minute bubbles of gas are formed upon the surfaces of the cork granules and make their escape through the coatings, whereby the latter are provided with minute holes, which ultimately assume the form shown at 5.

Fifth, I place upon the board just mentioned and along with the granules of cork thus coated, the dry mixture of fibrous material and cement above described, the proportions being five parts of coated granules to seven parts of the dry mixture of fibrous material and cement. The entire mixture thus formed is now stirred and worked vigorously. The small content of dry cement carried by the fibrous material becomes moist from the presence of the cork granules, and thus renders the fibrous material more or less adhesive throughout its mass. This all occurs while the cement coatings of the cork granules are still plastic, and while the minute holes or interstices 5 are still being formed. As the result of the working of the entire mass of material as just described, each granule with its coating is completely enveloped, individually, within the fibrous material, and consequently does not touch any of the others. Each individual granule is held firmly by the fibrous material, and the stability and strength of the fibrous material is increased by the presence of the cement which is interspersed throughout its mass. The fibrous material is ramified throughout the entire mass, and holds each granule in suspension. Thus the separate particles of body material are not stuck together, and are movable relatively to each other within the narrow limits permitted by the fibrous material. Such being the case my finished material has considerable elasticity and flexibility, and is distinctly cellular in structure throughout the entire mass.

As the cement gradually sets, it of course becomes dry, and any excess of water held in the material dries out by evaporation. As the cork granules dry out, they gradually become reduced in size. Because of this fact the intercellular spaces throughout the entire mass are virtually increased in size and number. Thus the efficiency of the finished material is increased still further, as to each of the general purposes for which the material is intended.

The sound absorbing and heat insulating qualities of the material above described at length are very great, and the material can be used in any relation where it is customary to employ sound absorbing or heat insulating material. It can be made into blocks, slabs, plates, sheets, bricks, boards or the like, or as above stated it may be built in the first instance as a facing in position, or in some cases it can be laid into its final position by means of a trowel or the like.

In Fig. 2 I show a block or plate of my material so formed and constructed as to present rather unusual qualities of flexibility and elasticity. Two portions 7, 8 of the material are located upon opposite sides of the web 9 of burlap or other fabric to which the material adheres directly. In this instance the finished block or plate can be flexed or bent to a remarkable degree, and on this account it is adapted to undergo either momentary flexure or permanent distortion.

I do not limit myself to the precise details here set forth, as variations may be made therefrom without departing from my invention, the scope of which is commensurate with my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. A material of the character described, comprising fibrous material and particles of body material interspersed throughout said fibrous material and separated from others of its kind immediately adjacent.

2. A material of the character described, containing fibrous material and particles of body material dispersed throughout said fibrous material and adhering thereto, each particle of body material being segregated from others of its kind immediately adjacent, and out of contact therewith.

3. A material of the character described, containing fibrous material and particles of body material each individually enveloped by said fibrous material and thereby supported out of contact with the others of its kind immediately adjacent.

4. A sound absorbing and heat insulating material containing fibrous material and particles of granular material interspersed

throughout said fibrous material and supported thereby, each of said particles of granular material being completely segregated from others of its kind immediately adjacent.

5. In a sound absorbing and heat insulating material, particles of body material immediately contiguous to each other, and means for preventing each particle from touching other particles of its kind in its immediate vicinity.

6. A sound absorbing and heat insulating material containing cork granules interspersed throughout the mass of material and supported out of contact with each other.

7. A sound absorbing and heat insulating material containing cork granules each coated with cement, and a binder to which said cement adheres.

8. A sound absorbing and heat insulating material containing particles of body material each individually provided with a coating of cement, and means coacting with the coatings of cement for supporting said particles of body material each out of contact with others of its kind immediately contiguous.

9. In a sound absorbing and heat insulating material, a plurality of particles of body material, each particle having an individual coating of adhesive material, each coating having openings, and a mass of hair felt to which said coatings adhere.

10. A sound absorbing and heat insulating material containing cork granules each having a coating of adhesive material, and a binder consisting of hair felt to which said coatings adhere directly.

11. In a sound absorbing and heat insulating material, cork granules each provided with a coating of cement, said coating being provided with openings, and a quantity of hair felt to which said coatings adhere directly.

12. The method, herein described, of making a sound absorbing and heat insulating material, which consists in providing cork granules, coating the same individually with an adhesive, bringing the cork granules up coated into contact with loose fibrous material in order to completely envelop each individual cork granule in said fibrous material, so as to support said cork granules each out of contact with others of its kind immediately adjacent, and finally allowing said adhesive to harden.

13. The method herein described of making a sound absorbing and heat insulating material, which consists in providing particles of body material, coating said bodies individually with cement having the properties of an adhesive, bringing said bodies thus coated into contact with fibrous material capable of adhering to said cement, and finally allowing said cement to set.

JOHN COMERMA.