May 21, 1935. J. MAZER 2,001,970

SOUND ABSORBING UNIT AND METHOD OF MAKING THE SAME

Filed Oct. 25, 1930

Fig. 1.

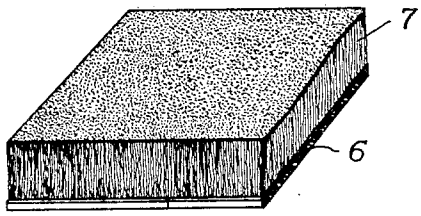


Fig. 2.

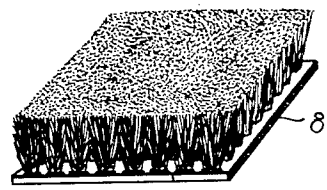


Fig. 3.

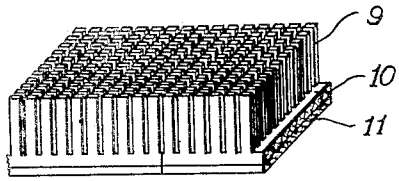


Fig. 4.

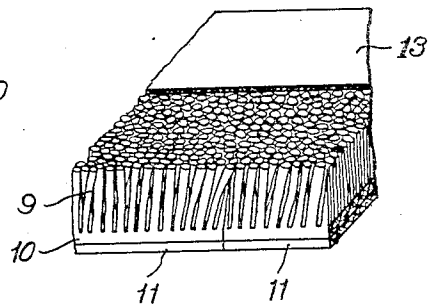
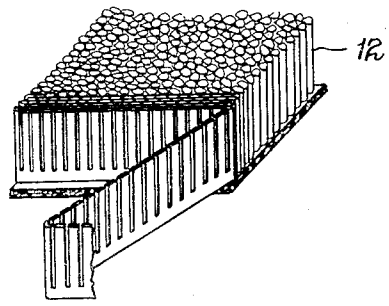


Fig. 5.



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SOUND-ABSORBING UNIT AND METHOD OF MAKING THE SAME

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Application October 25, 1930, Serial No. 491,151

6 Claims. (Cl. 154—28)

My invention relates to sound-absorbing units and a method of making the same, and more particularly to materials such as are employed in the walls and ceilings of auditoriums, studios, etc., for definitely absorbing and controlling reverberation of sound waves.

Various plans have heretofore been adopted for controlling and absorbing sound waves, such as porous masonry materials, fibrous bodies, rigid cellular panels, etc.

These various materials have been open to objections such as the necessity of forming them at the place of installation, and in conjunction with the walls or ceilings to be covered, as in the case of plastic or masonry materials; the fragile nature of the fibrous bodies which are readily subject to damage through handling and which are subject to natural limitations by reason of the elasticity, size, etc., of various vegetable fibers, hair, etc., and the difficulty of applying pre-formed cellular units to spaces of various areas and contours.

Further, in the case of the rigid cellular bodies with exposed apertures, such apertures and lines of division are too clearly visible to permit of various decorative effects.

One object of my invention is to provide sound-absorbing units which are highly flexible so that they will yield under the impacts of sound waves and which can be conveniently handled and installed.

Another object of my invention is to provide a sound-absorbing unit whose exposed surface may conveniently be given various decorative effects and wherein there are no clear lines of division or spaces either on the surface of an individual unit or between assembled units.

Still another object of my invention is to provide a sound-absorbing body that may be formed of various materials including materials which are non-combustible and which is nevertheless highly efficient to absorb and control reverberations of sound waves.

Some of the forms which my invention may take are shown in the accompanying drawing wherein Figure 1 is a perspective view of a sound-absorbing unit containing fine fibres; Fig. 2 is a similar view but showing a modified arrangement of the fibres; Fig. 3 shows another modification; Fig. 4 is a view similar to Fig. 3, but showing the appearance presented by the surface of a plurality of units assembled, of the character as shown in Fig. 3, and Fig. 5 shows another manner in which units similar to that of Fig. 3 may be formed.

Referring to Fig. 1, I show a unit having a backing sheet or base 6 to which the ends of fibres 7 may be secured by cement or otherwise. The backing sheet 6 may be of any suitable material such as a fibrous body or a metallic sheet, and is preferably flexible so that it can be readily bent to the contour of a wall surface to which the unit is applied. The fibres 7 may be vegetable, animal or mineral, as may be desired. These fibres are placed perpendicular to the backing sheet with their inner ends secured thereto so that they will have great yieldability or flexibility and thus be extremely sensitive to sound waves.

Obviously, the yieldability will be greater by reason of their perpendicular arrangement than if they were arranged in mat-like or woven relation. Metallic or asbestos fibres will of course be employed where a structure that is fireproof and vermin-proof is desired. The exposed surface of the units can be brushed to produce a uniformly-stippled effect and to break up visible lines of division between adjacent units and can be given a decorative facing of point or thin plaster, if desired.

In Fig. 2, I show a structure which, on its exposed surface, presents the appearance of Fig. 1, but wherein the fibres instead of being uniformly distributed over the backing sheet 8 are arranged in small groups or bunches, with their outer ends brushed or pressed inward slightly to provide a substantially unbroken appearance at the surface of the unit.

In Fig. 3, I show a unit formed of a block of yieldable material which may be of a fibrous body such as asbestos. The block is cut or slitted in various directions so as to produce the effect of perpendicularly-arranged fibres 9 corresponding to the fibres 7 of Fig. 1, but which are somewhat coarser. The cuts are not made entirely through the block but a portion 10 thereof is left unslitted so as to serve as a backing sheet or base for the fibre-like projections 9, and the base 10 may in turn be secured to a sheet 11.

The exposed ends of the strand-like members 9 are fluffed by brushing or compressing them in a direction perpendicular to the plane of the unit, so as to produce an exposed surface that is of mat-like appearance without pronounced lines of division between the strands of each unit or the strands of adjacent units, as shown in Fig. 4.

Fig. 5 shows a unit which when completed is similar to the units of Figs. 3 and 4, but wherein a more compact arrangement of the perpendicu-

lar strands 12 is secured by reason of the fact that such strands are formed by making slits in a ribbon of sound-absorbing material, and then rolling or folding such strip back and forth in layers that have snug contact with one another.

In the case of coarser fibres or strips arranged in a fringe-like manner as shown in Figs. 3 to 5, the material is preferably of an inherently yielding nature such as asbestos so that the unit will have the required flexibility or yieldability, while in the case of finer fibres these may be of various materials, including a metal, such as copper, lead, certain alloys, etc. The softer metal will permit of the spreading or fluffing of the ends thereof so as to produce the effect of a homogeneous mass at the exposed surface of the unit.

In the case of asbestos fibres or similar material, if they be first wet, their ends can be spread more easily by a fluffing or wiping action than if they are dry. Also, a smooth exterior can be provided on the unit by the use of wetted lime or plaster, which may be wiped or spread across the ends of the fibres, as shown at 13 in Fig. 4.

The term "perpendicular" herein is not employed in its strict technical sense, but includes also fibres, etc., which extend in a generally outward direction.

I claim as my invention:—

1. A sound-absorbing unit comprising a block of material slitted in directions perpendicular to the plane thereof to form outstanding strands, the block being of a material which is deformable to permit fluffing of the outer ends of the strands and thus present a substantially unbroken appearance.

2. The method of forming sound-absorbing units which comprises making numerous slits in a block of material perpendicular to the plane thereof to form strands, and fluffing the outer ends of the strands thus formed to produce an exposed surface that has the appearance of being unperforated.

3. The method of forming sound-absorbing units which comprises cutting a series of slits in a strip of material from one edge thereof to a point adjacent to its opposite edge and folding the said strip upon itself to produce a block-like body.

4. The method of forming sound-absorbing units which comprises cutting a series of slits in a strip of material from one edge thereof to a point adjacent to its opposite edge and folding the said strip upon itself to produce a block-like body, and fluffing the outer ends of the slit portions to conceal the slits.

5. A sound-absorbing body comprising elements each consisting of a homogeneous mass of matted fibrous material, extending generally perpendicularly to the plane of the body and disposed in side-by-side relation, with their outer ends enlarged in directions parallel to the plane of the unit.

6. A sound-absorbing body comprising elements of homogeneous ductile material extending generally perpendicularly to the plane of the body and disposed in side-by-side relation, with their outer ends enlarged in directions parallel to the plane of the unit.

JACOB MAZER.