Oct. 30, 1951 P. G. PEIK 2,573,482

SOUND-DEADENING UNIT

Filed April 25, 1945

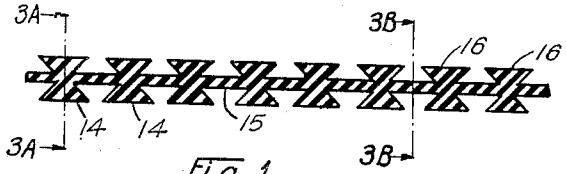


Fig. 1



Fig. 2

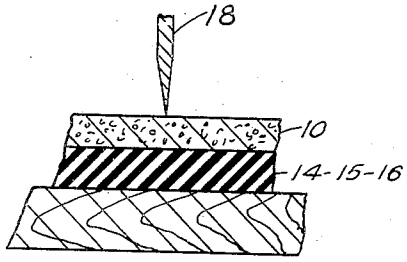


Fig. 3A

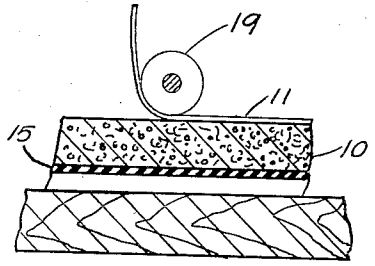


Fig. 3B

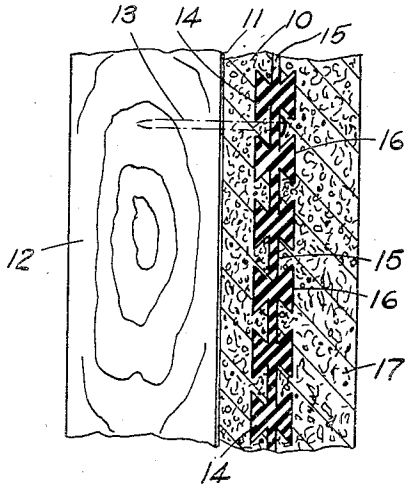


Fig. 4

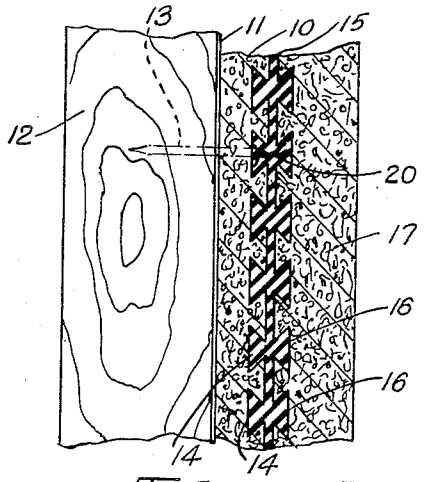


Fig. 5

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SOUND-DEADENING UNIT

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3 Claims. (Cl. 72—124)

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This invention relates to sound-deadening or vibration-damping structures, and especially to those comprising a layer of a setting material such as plaster or concrete and a mounting therefor, and to procedure for obtaining such structures.

Its chief objects are to provide an improved structure for insulating against passage of sound; to provide a highly non-resonant wall; to provide a structure having high sound-absorbing or vibration-damping characteristics; to provide a wall having good acoustic or non-echoing characteristics; and to provide simplicity and economy of procedure for producing a structure having some or all of these advantages.

Of the accompanying drawings:

Fig. 1 is a section of an anchoring and cushioning element adapted for incorporation in an embodiment of the invention in one of its preferred forms.

Fig. 2 is a section of an alternative type of anchoring and cushioning element.

Fig. 3 is a vertical section of a table and the work thereon illustrating diagrammatically a preferred method of associating some of the elements of the final structure.

Fig. 4 is a fragmentary vertical section of a wall structure embodying the invention in its preferred form.

Fig. 5 is a fragmentary section of a modification.

Referring to the drawings, and at first to Fig. 4, the final structure comprises a backing layer 10, here shown as being of plaster-board material having a paper facing layer 11 and secured to studding 12 by nails such as the nail 13, which can be spaced widely apart by reason of the stiffness of the layer 10.

Embedded in the opposite face of the backing layer 10 are dove-tail ribs 14, 14 formed on one face of an anchoring and cushioning element such as is shown in Fig. 1, which has a medial web portion 15 and dove-tail ribs 16, 16 formed on the opposite face of the web, and here shown as being in non-staggered relation to the first mentioned ribs 14.

In interlocked relation to the ribs 16 is a layer of setting material 17, which can be any one of the usual types of plaster or can be a Haydite concrete, as described in my copending application Ser. No. 561,473, now Patent No. 2,542,428, issued February 20, 1951, or other composition comprising Portland cement or other suitable setting material.

The anchoring and cushioning member 14—15—16 preferably consists of an inexpensive rubber composition having high energy absorption or hysteresis in being deformed, or at least of a material having substantially the resilient deformability of vulcanized soft-rubber, so that it will have a cushioning effect between the relatively rigid embracing layers 10 and 17 of setting material and so that of itself it will have a natural rate of vibration widely different from that of either of the embracing layers and from that of the composite structure as a whole.

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The anchoring and cushioning element 14—15—16 preferably is formed by extruding the stock through a die and then, either before or after it is vulcanized or otherwise caused to set, it is associated with the plaster-board backing layer 10, the latter being given suitable uniform thickness as by means of a leveling blade 18, Fig. 3A, and the facing sheet of paper 11, if desired, can be applied by means of a roller 19 as illustrated diagrammatically in Fig. 3B.

When the layers have both been set, the resulting structure, in panels of suitable size, is secured to the studding 12 or other support as by means of nails 13, after which the layer 17, which can be continuous throughout the extent of a plurality of the panels, is applied as by troweling and allowed to set. I do not wholly limit my claims, however, to applying the layer 17 to the underlying structure after the latter has been mounted upon the studding or other final support.

The cushioning element shown in Fig. 2 corresponds to that of Fig. 1 except that the ribs 14*a*, 14*a* on one of its faces are staggered with relation to the ribs 16*a*, 16*a* on its other face.

Even when the nail heads, as in Fig. 4, are in contact with the layer 17, the nails can be so far apart that such contact does not greatly detract from the sound-deadening or vibration-damping effect of the structure, the middle layer of resilient material insulating the embracing, relatively rigid layers from each other substantially throughout their extent.

More complete insulation can be had by driving the nails so far that their heads cut through the rubber-like material and directly engage the backing layer 10, as in Fig. 5, the resilient material closing over the head of the nail as there shown at the line 20.

The anchoring and cushioning layer being of highly deformable material, and insulating the embracing layers of relatively rigid material from each other throughout large areas, the

structure provides the advantages that are set out in the above statement of objects.

I claim:

1. As an article of manufacture, a pre-fabricated, sound-deadening unit for incorporation in a housing structure, said unit comprising a thin and extensive cushioning sheet of material having substantially the resilient deformability of vulcanized soft-rubber and a thin and substantially coextensive supporting sheet of hardened plastic anchored to one of the extensive faces of the said cushioning sheet substantially throughout the extent of the two said substantially coextensive sheets, the said cushioning sheet comprising a web of generally plane form in continuity substantially throughout the extent of the two said substantially coextensive sheets and being formed, on the side of said web farthest from said supporting sheet, with anchoring projections for anchoring thereon a layer of setting material applied thereto, said unit being in the form of an unattached and manually manipulatable unit.

2. An article of manufacture as defined in claim 1 in which the cushioning sheet is formed with anchoring projections of the resilient material on both of its extensive faces.

3. An article of manufacture as defined in claim 1 in which the cushioning sheet is formed

with anchoring projections of the resilient material on both of its extensive faces and in which projections on one of the said faces are positioned in staggered relation to projections on the other of the said faces.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
906,025	Howe	Dec. 8, 1908
1,115,266	Wiltse	Oct. 27, 1914
1,646,598	Routt	Oct. 25, 1927
1,870,101	Davey	Aug. 2, 1932
1,906,637	Schulke	May 2, 1933
2,139,851	Roberts	Dec. 13, 1938
2,168,949	Bentz et al.	Aug. 8, 1939
2,261,730	Mitman	Nov. 4, 1941
2,323,936	Roberts	July 13, 1943
2,374,186	Fischer	Apr. 24, 1945

FOREIGN PATENTS

Number	Country	Date
171,632	Switzerland	of 1934
456,189	France	of 1913