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SOUND ABSORBENT SHEATHING FOR WALLS OR CEILINGS

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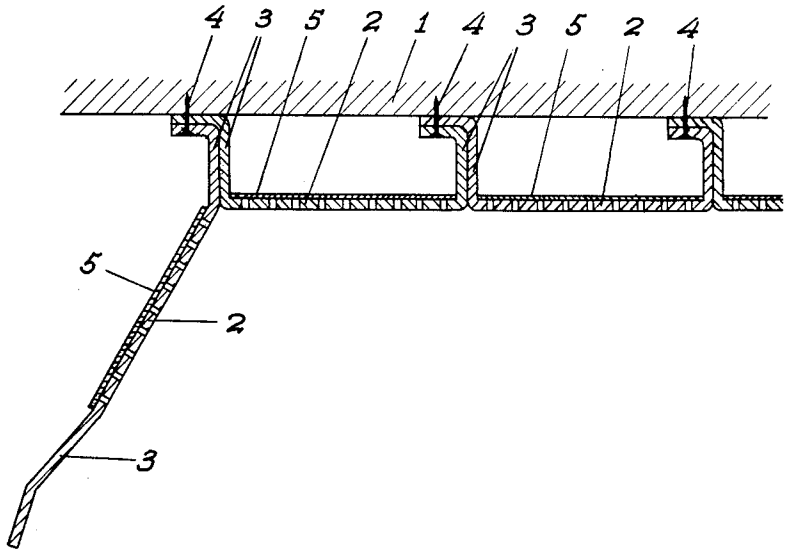

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SOUND ABSORBENT SHEATHING FOR WALLS OR CEILINGS

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2 Claims. (Cl. 20—4)

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The invention here presented concerns a sound absorbent sheathing for walls and ceiling of the resonance-absorbing type. Such sheathing is generally composed of a perforated panel, for instance a sheet of wood-fiber board, mounted on laths on the wall. The air space thus walled off forms, together with the holes in the panel, a series of Helmholz resonators, the dimensions being chosen in such a way as to give resonance on the frequency which it is chiefly desired to damp. In order to increase the sound-damping effect the enclosed air-space can be filled with some porous material, as for instance glass wool, rock wool, or wood fiber, or it is possible to increase the airflow resistance in the holes of the perforated panel, where the particle speed is great.

Known also are sound absorbing panels made with holes or slits penetrating from the outer side some distance into the plate, with the intention that sound waves impinging on the plate shall be able to penetrate into the holes and from these radially into the interstices of the material, the panel being made of some porous material, for example mineral wool or highly porous wood fiber, such panels being intended for direct attachment to wall or ceiling. In order to obtain a sound absorbing sheathing of this last-named type which will not have holes on the front side and will thus stand washing it has been proposed to glue a thin, flexible, air-tight membrane to the panels in such a wise as to cover the holes, in which arrangement the sound waves incident on the membrane can excite it to vibration and thus pass through it into the holes and on into the pores of the panel. This air-tight membrane may consist, for example, of vulcan fiber, metal foil, or paper impregnated with oil paint.

The panels described above are complicated to manufacture, necessitate mounting on laths to obtain the best effect, and are of considerable weight, besides being difficult to fasten in place on wall or ceiling. The aim of the invention here presented is therefore to obtain a wall sheathing of the resonance-absorbent type not afflicted with these drawbacks.

The sound-absorbent wall sheathing disclosed in this invention comprises chiefly making this sheathing of suitably perforated pulpboard, wallboard, plywood, metal, or the like, to which is applied in order to increase the airflow resistance in the holes a layer of paper, asbestos, cloth, or the like, fastened or fastenable, preferably at certain points, or at the edges, or over the whole surface, perforated with only minor holes, which layer,

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in contradistinction to the above described membrane of vulcan fiber, metal foil, oil paint impregnated paper, or the like, must be porous and not air-tight.

Particularly if board or paper are used in the manufacture of this sheathing this manufacture can be greatly simplified as compared to the use of the materials previously employed. This advantage can be further increased by making the sheathing in the form of plane elements with turned down sides and these in turn creased down at the edges in order to facilitate fastening the element on the wall or ceiling, for example by gluing. By this means the laths for mounting the panels and forming the airspace between them and the wall can be eliminated. It is, moreover, assured that the resonance frequency of the sheathing, which among other things depends on the interval between the panel and the wall, is always the same for any one type of sheathing.

Employing the known technique of board emballage, the creased down sides and edges of the panel elements can be turned back out into the plane of the same and the elements thus packed flat, making convenient and cheap shipping possible.

A final appreciable advantage in the use of board or paper is that these materials can be easily and cheaply impregnated against fire and also are suited by their slight weight for gluing up all kinds of wall material.

In the single figure of the accompanying drawing there is shown in vertical cross section an example of the application of the wall sheathing of the invention to a wall.

In this drawing, 1 is a solid wall to which the sheathing is applied, 2 is a perforated sheet of board supplied with a layer of paper, 5, which is glued on, or fastened on in some other way, at the time the board is made or possibly at some later time, the paper being in this type of sheathing fastened to the reverse side of the panel, where it covers the holes in the same as a membrane. The panel element is made with creased-down edges 3 for fastening it to the wall, for example with nails 4, seams, screws, or glue. As shown in the drawing this calls for creases, or bending lines, where the portions 3 depart from the main body of the panel element 2 and also between the main parts of the portions 3 and the short terminating parts thereof which are turned to lie parallel to the wall. The turned-down edges can be straightened out into the plane of the sheet for transportation and may

naturally also be perforated, so that the panel element as a whole may be manufactured from pre-perforated board.

The airspace enclosed by the wall 1 the panel element 2, and the turned-down edges 3 forms a resonator in conjunction with the holes in the plate 2, the resonance frequency of which is determined by the volume of the airspace and the diameter of the holes. The particle speed is greatest in the holes, and the damping effect of the resonator, which determines the sound absorbing properties of the sheathing, can be adjusted by means of the airflow resistance of the layer of paper 5.

The wall sheathing here described can within the limits of the invention be developed in different ways. Thus the perforation may be executed with holes and slits that form a part of the decoration of the wall in some suitable way, a procedure in itself known from other types of sound-absorbing wall sheathing. Moreover the panel elements may be fastened and joined to one another by known methods from other fields of board and wall sheathing technique. Should the panel elements used be of large area it may be advantageous to reinforce them against bulging.

What I claim is:

1. A sound absorbing construction comprising, in combination, a rectangular panel element of board formed with a main portion having a multiplicity of perforations therethrough and with a pair of securing portions extending from opposite edges of said main portion to secure said element to a wall in spaced relation with respect thereto, a membrane of sound absorbent material, said membrane being relatively thin with respect to the thickness of said panel element and being secured to the inner face thereof to lie flat thereagainst about the perforations therein, a bending line formed in the material of said element between an edge thereof and one of said securing portions to facilitate the bending of said one portion at substantially right angles wtih respect to said main portion and to extend from the side of said main portion carrying said membrane, said one portion being

formed with a second bending line parallel to said first bending line and formed in the material thereof at a position in said one portion remote from said first bending line, said second bending line providing a terminating portion bendable in parrallelism with respect to said main portion to engage a wall; the other of said securing portions being formed with a pair of parallel bending lines similar to said pair of bending lines formed in said one portion, the distance between said pair of bending lines of said other securing portion corresponding to the desired spacing distance of said main portion from a mounting wall and the distance between said bending lines of said one securing portion being less than the distance between said bending lines of said other securing portion by the thickness of the material of said panel element, whereby said terminating portion of said one securing portion may be laid over the terminating portion of said other securing portion of an adjacent panel element for applying said overlaid terminating elements to a wall simultaneously.

2. A sound absorbing construction as in claim 1 wherein said bending lines formed to provide said terminating portions of said pair of securing portions are formed into opposite sides of said panel element and said terminating portions, when bent into wall securing position both extend in the same direction.

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