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1,974,465

COMPOSITE PANEL CONSTRUCTION

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Fig. 1.

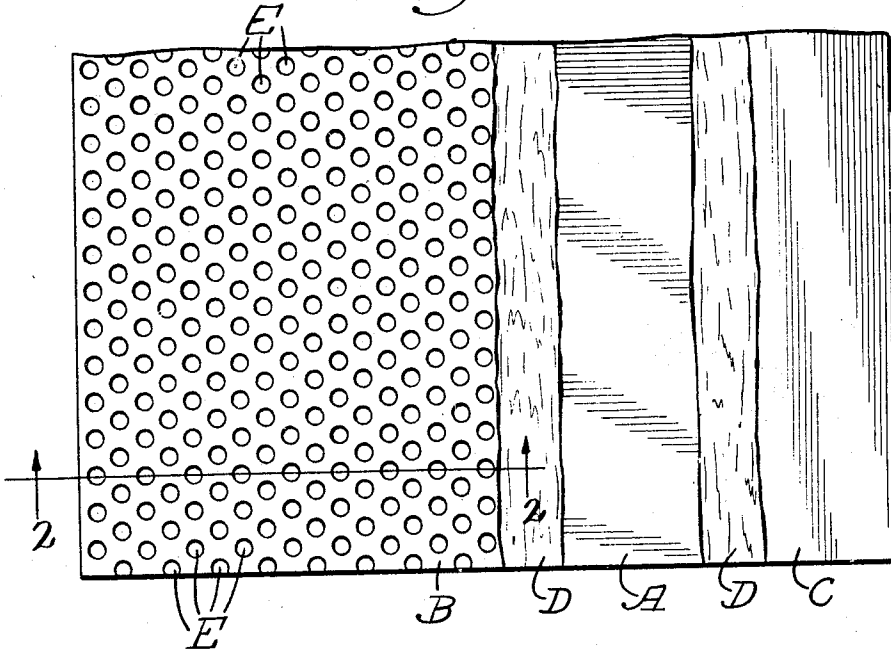
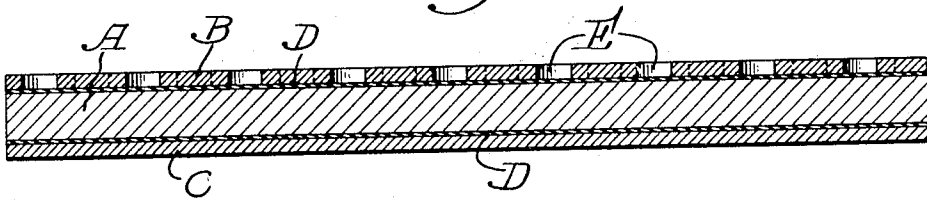


Fig. 2.



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UNITED STATES PATENT OFFICE

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COMPOSITE PANEL CONSTRUCTION

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3 Claims. (Cl. 26-91)

My invention relates to improvements in composite panel construction, particularly of the type in which a core or body of fibrous material such as wood is faced or sheathed on both sides by laminations of sheet metal.

The primary object of my present invention is to provide a laminated panel structure of this character especially light in weight and much thinner than usual but exceptionally strong for application to such uses as airplane lining.

A further object is the provision of at least one of the outer metal laminations with innumerable openings or perforations whereby during the manufacture of the panel the exclusion of moisture will be assured and the panel protected against warping or interior corrosion in use.

Other objects of my invention will appear hereinafter.

In the accompanying drawing, Figure 1 is a plan or face view of a portion of a composite panel illustrating the perforated character of the metal sheathing.

Figure 2 is a sectional view on line 2-2 of Fig. 1.

The composite panel in which my invention is embodied is of the type in which a flat core or body A of wood or other fibrous material is sheathed on both sides by relatively thin sheet metal laminations B and C such as steel or aluminum. The core of body A may be solid or it may be made up of a series of laminations with the grain of the several laminations running in different directions as is the usual practice in making panels of this character. The outer laminations B and C are in the form of thin sheets of metal such as steel or aluminum, superposed on opposite faces of the core body. These sheathings or outer laminations are secured to the wood core by means of a film or layer of adhesive D interposed between the opposed faces of the laminations of the sheet metal and the body. In the drawing the structure is shown greatly exaggerated in size to better illustrate the invention. In practice, however, the thickness of the entire panel preferably does not exceed one-eighth of an inch. In manufacturing a panel of this character, the wood body is prepared with flat parallel faces and the outer sheathing or metal laminations are assembled on either side of the body. A layer of glue or suitable adhesive is applied to either the faces of the body or to the faces of the metal sheets and after the several laminations are assembled, the whole structure is subjected to pressure and sometimes heat, to intimately associate the laminations into an in-

tegral structure. Sometimes in thicker panels, an additional flexible bonding material such as canton flannel, is interposed between the sheet metal laminations and the body to compensate for the stresses set up in the panel and structure by an equal expansion and contraction of the different materials, but in thin panels of the character to which this invention particularly relates, the core or body itself being relatively very thin, yields sufficiently to these stresses to prevent the breaking of the joint between the sheet metal and the wood body.

In a structure of this character, there is moisture present, sometimes in the adhesive which is used and sometimes in the material of the body, and this moisture must be excluded or its presence will be likely to disintegrate the interior of the panel or cause a swelling or distortion of the body and materially reduce the permanence of the structure. I have discovered that by providing at least one of the sheet metal or outer laminations with innumerable perforations, distributed throughout the area thereof, the moisture which might be present in the original material or in the adhesive may be readily excluded from the interior of the panel, these perforations forming innumerable outlets through which the moisture can escape in the process of manufacture of the panel. These perforations E are illustrated in the drawing as being arranged in regular rows throughout the area of the panel but their distribution is, of course, a matter of convenience in manufacture. They are preferably arranged relatively close together and are circular in form and preferably relatively small in diameter, a sufficient number being provided to accomplish the closeness or proximity to each other as desired. These perforations extend through the sheet metal and thereby form outlets in communication with the interior of the panel so that when pressure and heat is applied to the panel in the process of manufacture, any moisture present will be driven off through these outlets throughout the entire area of the panel structure. The compression and other treatment of the panel in the process of manufacture makes a very compact and closely integrated structure which, when in use, because of its compact condition, resists to a great extent absorption of moisture through the perforations. However, any moisture which might be absorbed through these perforations, will just as readily dry out or leave the structure through these perforations. Thus, the moisture does not remain indefinitely within the interior of the panel which would be the case if the metal sheathing

were solid or imperforate throughout the entire area.

This thin panel construction is especially adaptable for the lining of airplane cabins. It is installed with the smooth or imperforate lamination C facing the interior of the cabinet and with the perforate lamination facing the outer walls of the cabinet. The presence of the perforations in the one face of the structure serves also as a very effective sound or noise deadener since the innumerable perforations absorb the sound waves and reduce the transmission thereof to the interior of the cabin.

While I have shown in the drawing and described what I consider to be the best form in which my invention is embodied, it is understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention and I contemplate such changes as are fairly embraced within the scope of the appended claims.

I claim:

1. A composite laminated panel structure comprising a wood core or body having exposed sheet metal laminations secured on its opposite faces, one of said sheet metal laminations having a plurality of closely disposed relatively small perforations distributed throughout the area thereof and

extending through the lamination into communication with the interior of the panel to form outlets for the egress of moisture.

2. A relatively thin composite panel structure of the character described comprising outer exposed laminations of sheet metal and a lamination of wood or fibrous material interposed between and secured to said sheet metal laminations by means of a suitable adhesive, one of said sheet metal laminations being provided with a large number of closely related perforations distributed throughout its area and extending through the lamination and into communication with the space between said sheet metal laminations to form outlet for the egress of moisture from said space in the manufacture of the panel.

3. A composite panel of the character described, comprising outer exposed laminations of sheet aluminum extending throughout the area of the panel, and a lamination of wood interposed between and secured to said outer aluminum laminations by means of a suitable adhesive, one of said outer laminations being provided with a large number of closely related perforations distributed throughout its area and extending through the lamination and into communication between said outer laminations.

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