United States Patent [19]

Widdowson

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[54] **PREFABRICATED, INSULATED, METAL WALL PANEL**

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[52] **U.S. Cl.** **52/595,** 52/403, 52/619

[51] **Int. Cl.** **E04c 2/13,** E04c 2/26

[58] **Field of Search** 52/595, 619, 483, 394, 52/403

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[57] **ABSTRACT**

A prefabricated, insulated, metal wall panel of foamed polyurethane or the like having an exterior metal wall panel portion laterally offset from an interior metal wall portion and so constructed that when identical panels are joined side-by-side by two pairs of male and female detachable fasteners, said panels will remain in spaced insulating relationship, whereby cold or hot outside temperatures will not be conducted from the exterior panels to the interior panels.

1 Claim, 3 Drawing Figures

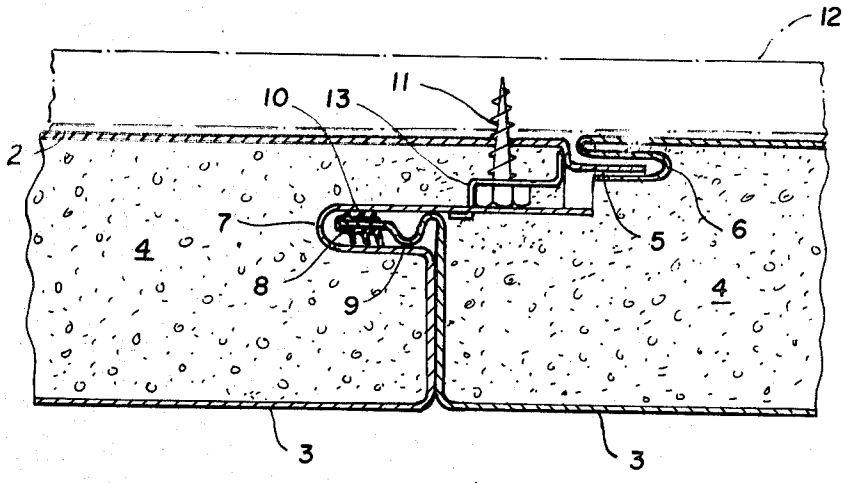


Fig. 1.

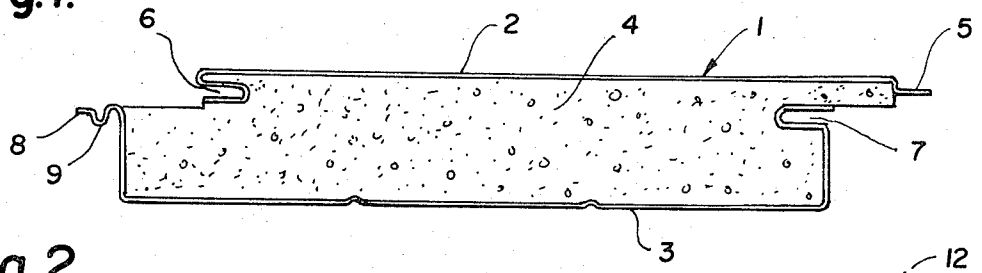


Fig. 2.

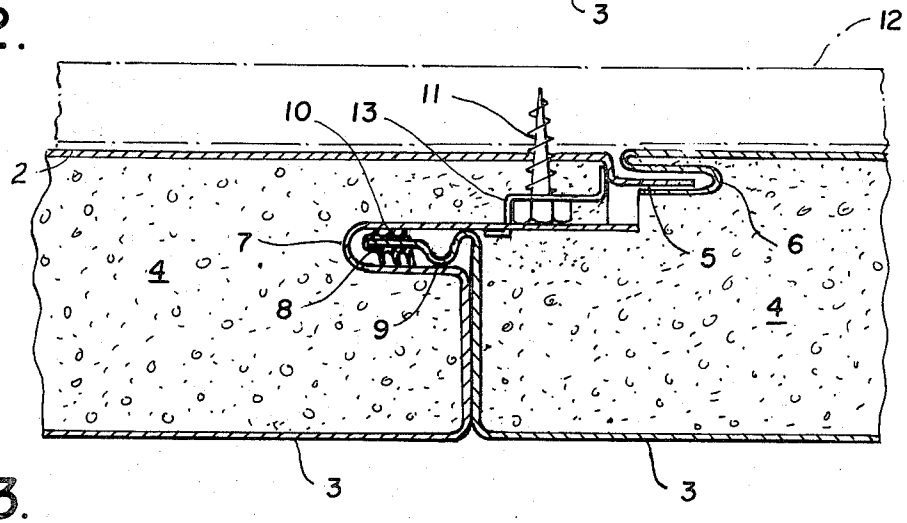
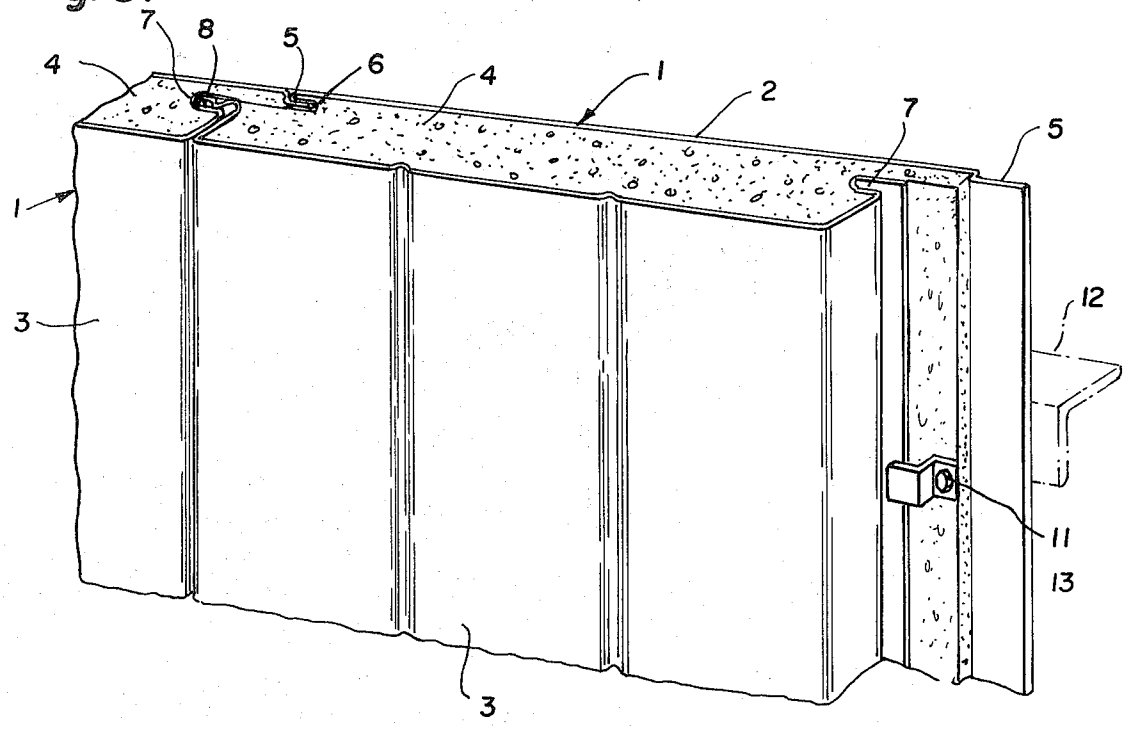


Fig. 3.



PREFABRICATED, INSULATED, METAL WALL PANEL

This invention relates to a prefabricated, insulated, metal wall panel and, more particularly, to one that is foamed-in-place by polyurethane or similar plastic material.

An outstanding disadvantage of presently used metal wall panels with insulated fillers is that after the panels are fastened together, side-by-side, such as by male and female connections on the exterior and interior panels, there is a metallic connection between the exterior and interior walls which readily conducts cold temperatures in winter time or hot temperatures in summer time tending to cause discomfort interiorly of the building. Also condensation, in winter, caused by cold interior walls will take place.

An object of my invention is to provide a novel insulated wall panel which is prefabricated with integral fastening elements on the metal panels to enable side-by-side connection and yet which is so constructed as to eliminate the abovementioned disadvantages of conventional wall structures.

A more specific object of my invention is to provide a foamed-in-place wall panel having metallic exterior and interior panels which will be maintained in insulated relationship without bridging metallic elements that would otherwise conduct heat or cold from the exterior panels to the interior panels.

Other objects and advantages will become more apparent from a study of the description taken with the accompanying drawing wherein:

FIG. 1 is a transverse, cross-sectional view of a prefabricated, foamed-in-place insulated panel embodying the principles of the present invention;

FIG. 2 is an enlarged, fragmentary, cross-sectional view showing how two adjoining panels of the identical construction shown in FIG. 1 are joined together and attached to girts of a building; and,

FIG. 3 is a perspective view showing two like panels, of the construction shown in FIG. 1, when joined together sidewise and fastened to girts of a building or similar frame work.

Referring more particularly to FIG. 1 of the drawing, numeral 1 generally denotes an insulated, metal wall panel, and, more particularly, one containing insulating foam 4, such as polyurethane foam which is foamed-in-place, so as to be integrally attached to an interior metal wall panel 2 and an exterior metal wall panel 3.

The interior metal wall panel 2 is flanged at 5 along one side edge to provide a male fastening element, also it is reversely flanged at 6 along the other side edge to provide a female fastening element.

The exterior wall 3 which may be ribbed as shown or of any other suitable shape, is reversely bent at 7 along one side edge to provide a female fastening element. At the other side edge, it is reversely bent at 9 and provided with a flanged extension 8 to serve as a male fastening element.

It will be particularly noted that there is no continuous metallic connection between the exterior wall panel 3 and interior wall panel 2 even after like panels are joined side-by-side, as shown in FIGS. 2 and 3. It will be further noted that the interior wall panel 2 is laterally offset with respect to exterior wall panel 3 and that an exposed portion of the foam insulation 4 occurs between female element 6 and male element 8, similarly between female element 7 and male element 5. Therefore, when identical wall panels of the construction shown in FIG. 1 are fastened together in side-by-side relationship, in the manner shown in FIGS. 2 and 3, there will still be retained the insulating barrier between exterior wall 3 and interior wall 2.

More specifically, and referring more particularly to FIG. 2, when the male fastener element 8 of one wall panel is inserted into the female fastener element 7 of an adjoining wall panel of identical construction, with an insulating gasket such as vinyl gasket 10 therebetween, there will be a gap containing insulation between such connection and the adjoining connection between male fastener element 5 and female fastener element 6. The adjoining wall panels are moved together until the side wall portions of the exterior panels 3 come into abutting relationship, as shown in FIG. 2. However prior to moving one wall panel into side-by-side relationship to the other, a self tapping screw 11 and clip 13 or similar fastening device is inserted through the interior side wall panel portion of one panel and into girt 12 or other framework element. If desired, an insulating gasket, similar to vinyl gasket 10, may be inserted between male fastening element 5 and female fastening element 6. With such assembly involving two detachable connections on each side, a securely fastened connection is provided on both sides of each wall panel.

The present prefabricated construction involves a minimum number of simply constructed parts. A wall assembly may be erected very quickly and easily with a minimum number of required fastening elements. Moreover, the joints are so arranged that the insulated wall is substantially continuous while still retaining a separation by a mass of foamed insulation between the exterior panels 3 and interior panels 2.

Thus it will be seen that I have provided a highly efficient and simple foamed insulating wall panel of such construction that the exterior panels and interior panels are maintained in insulating relationship even when like panels are joined side-by-side with integrally formed male and female fastening elements; furthermore, I have provided a foamed-in-place wall panel of polyurethane or similar foam material which is integrally secured to exterior and interior panels to form a strong unit and in which the exterior and interior panels are offset to provide a gap separated by foamed insulation between the respective side edges of the exterior panels and those of the interior panels, preventing conduction of cold or hot ambient temperatures from the exterior wall panels to the interior wall panels.

While I have illustrated and described a single embodiment of my invention, it will be understood that this is by way of illustration only and that various changes and modifications may be contemplated in my invention and the following claims.

I claim:

1. An insulated wall panel unit for joining, side-by-side, with a similar panel unit, comprising a metallic interior wall panel and a metallic exterior wall panel in spaced parallel relationship, both side edges of each of said panels being laterally offset with respect to the corresponding side edges of the other of said panels, insulation filling the gap between said panels, said insulation being bonded to said exterior and interior metallic wall panels, one side edge of said interior wall panel

being flanged along the side edge of the insulation and terminating in a metallic flanged portion extending outwardly beyond said side edge portion of the insulation to form, per se, a male element, the other side edge of said interior wall panel being reversely bent to form a female element in spaced alignment with said male element, the side edge of said exterior wall panel corresponding to said one side edge of said interior wall panel having a reversely bent extremity for forming a female element extending immediately adjacent said male element but laterally offset therefrom with no continuous metallic extensions of the panels therebetween, the other side edge of said exterior wall panel terminating in a laterally outwardly extending metallic flange which, per se, constitutes a male element located immediately adjacent but laterally offset from said female element of said interior wall panel and in alignment with said female element of said exterior wall panel and with no continuous metallic extensions of the panels therebetween, a gasket of plastic material covering the sides of said male elements to provide a tight fit with the corresponding female elements, said male and female elements being located closer to said interior wall panel than to said exterior panel, whereby when joining like panels units, side-by-side, the end forming portions of said exterior panels will have continuous flat contact throughout the greatest portion of the width of said panel units, and whereby both male elements will penetrate both of the corresponding female elements, a barrier of insulation being provided between the respective adjacent male and female elements to prevent a continuous metallic connection and transfer of heat or cold between said interior and exterior panels at either side of said panel units, said interior panel being fastened to a frame member of a building by screw fasteners penetrating said outer metallic wall panel and said insulation at the insulation gap between said first mentioned male element and the female element of the outer wall panel.

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