

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) PANEL ASSEMBLY

(71) We, HUNTER DOUGLAS, a Corporation organized and existing under the Laws of the Kingdom of The Netherlands of 2 Pickstraat, Rotterdam, Holland do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to panel assemblies comprising a plurality of carriers each provided with panel holding means offering at least three points of support for a panel and oblong resiliently deformable panels, the general planes of which extend at an angle relative to the plane through said carriers, each panel projecting with a free portion beyond its respective holding means.

The panel assembly according to this invention presents a number of advantages. Among other things it offers the possibility of cheap and simple manufacture and in addition a very simple assembling and disassembling. In particular when used as a wall cladding or as a false or suspended ceiling the latter feature is exceedingly important because in many cases this panel assembly is used where a high degree of accessibility of the spaces behind the assembly is required. For in these spaces often all kinds of piping and wiring systems are accommodated as well as heating or cooling apparatus.

The invention is characterized in that said holding means are formed by at least two support members integral with the carrier, at least one of which being embodied as a snap-locking member and each panel comprising one or more profiled portions to co-operate with the or each snap-locking member by snap action.

By using this invention it is possible to place the panels simply between the support members and by pushing then just a little until the panel is fixed by snap-action.

According to a preferred embodiment of the

invention three support members are provided which are situated alternately at one and at the other side of the panel in question and are spaced apart viewed normally to the direction of insertion of the panel.

Such an embodiment makes it possible to keep the panel shape simple.

A particularly advantageous embodiment according to the invention, by which an aesthetic unit is obtained and the panels present a considerable stiffness is characterized in that at least one longitudinal marginal portion of each panel has a V-shaped continuous cross-sectional profile which constitutes the profiled portion co-operating with the snap-locking member, said snap-locking member and the other support members being embodied as projections and said snap-locking member being constituted by the innermost support member, the carrier being formed from thin material, and the support members for each panel forming part of two projecting parts of the carrier, said projecting parts being situated in one plane and constituting the extension of one of the legs of a substantially U-shaped body. This embodiment constitutes a combination of a number of characteristics according to the invention.

The invention also provides a carrier as defined in the appended claims.

Within the scope of the invention various variants may be made including variations of panel shapes. For instance a panel may be composed of a sheet-like central portion, the marginal profiled portions consisting of separate parts which in some manner may be coupled with the central portion.

A great number of materials is suitable for the panels as well as for the carriers, but it is preferred to use for both purposes pre-lacquered aluminium. As is commonly known, the advantage thereof is the cheap and simple method of manufacture by rollforming. With such a selection of material and method of manufacture one obtains the considerable ad-

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vantage that the various embodiments of the carrier according to the invention — in other words the carrier constructed as one continuous unit for accommodating a large number of panels, or the carrier as a unit for one or a few panels, or the carrier as a separate part which co-operates with a continuous supporting beam and is movable, especially adjustable, with respect to said supporting beam — may be manufactured in one production step. In all of these cases a continuous carrier is manufactured and the difference resides in cutting off the desired lengths according to requirements.

The invention will be further explained by way of example with reference to the accompanying drawings showing a plurality of embodiments of the invention.

Fig. 1 shows in perspective a partial top view of an embodiment of a ceiling according to the invention.

Fig. 2 shows a side view of a portion of a carrier and two panels in mounted condition.

Fig. 3 shows a left hand side view of the assembly according to Fig. 2.

Figs. 4, 5, 6, 7 and 8 each show an embodiment of the invention by means of a schematic side view of a portion of a carrier with a panel.

The panel assembly according to the invention is designated in general with reference numeral 1 and comprises a plurality of spaced apart carriers 2 which are provided with pairs of projecting parts 6 and 7. These projecting parts comprise a number of support members 8, 9, 10, 12, 13, 16, 17, 18, 21, 22, 24, of which at least one support member 8, 17, 18, 22 and 24 is embodied as a snap-locking member. The snap-locking members comprise a run-on side and are followed at their other side by a recess. Each panel 3 comprises at least one profiled portion or indentation 4, 11, 15, 19, 20, 23 and 25 which upon insertion of the panel in question into the space 5 formed between the projecting parts 6 and 7 runs on the run-on side of the snap-locking member and subsequently snaps entirely or with a portion into the recess behind the snap-locking member. Thus close to said profiled portion the panel is temporarily resiliently deformed and after the snapping action it resumes its original shape. The "run-on side" of the snap-locking member comprises the forward part of the snap-locking member, which part is adapted to guide the profiled portion 4 of the panel 3 so that it can slip over the snap-locking member for engagement with the recess behind the snap-locking member. The support members 9, 10, 12, 13, 16, 18 and 21 not serving as snap-locking members serve in addition to hold the panel. Preferably this is done tension-free, in other words such that the support members barely touch or barely do not touch the panel, but it is also completely within the scope of the invention to arrange the support members including the snap-locking

members such that the various support members exert a slight pressure on the panel. In both cases the result is that the panel is held rattle free. As is clearly apparent from the drawings the assembling and disassembling of the panel is particularly simple. When being mounted the panel need only to be inserted into the accommodation space 5 between the two projecting parts 6 and 7 and to be pushed until the profiled portion in question snaps into place behind the snap-locking member. The disassembling of the panels is done by pulling the panels down in vertical direction so that the profiled portion in question is pulled out of the recess and across the snap-locking member.

The embodiments of Figs. 2 and 5 distinguish themselves mainly by a different cross-sectional profile of the panels and a difference in the shape of the accommodation spaces 5 relating thereto. In particular the embodiment of the panel according to Fig. 2 presents considerable advantages since the V-shaped profile extending along the entire length of the panel renders said panel very rigid, and has a pleasing appearance while, moreover, it facilitates the snapping in and snapping out. It is preferred to provide both rim portions of the panel with said profile in opposite sense. In these two embodiments the other support members in addition to the snap-locking member are embodied as projections. In the embodiments according to Fig. 4, however, these support members 12 and 13 are formed as flat sides of the projecting parts 6 and 7 and on the other hand the profile 3 comprises profiled portions 14 in addition to the snap-in profiled portion 11. The profiled portions 14 support the panel against the support members 12 and 13. Also in this embodiment the profiled portions 14 as well as the profiled portions 11 are oppositely symmetrical. In the embodiment according to Figs. 2, 4 and 5 the inner support members constitute the snap-locking members. In the embodiment according to Fig. 6, however, the snap-locking member 17 is constituted by the central support member bounded on either side at some distance by the support members 16 and 18. In this Fig. the panel 3 shows in dotted lines an imaginary third profiled portion 20 to indicate the possibility according to the invention of having two support members act as snap-locking members.

In Figs. 7 and 8 the outer support members 22 and 24 are embodied as snap-locking members. The support member 21 and the support member 22 may in fact be regarded as one support member in which a recess for the snapping-in of the profiled portion 23 of the panel 3 is provided. The embodiment according to Fig. 8 differs from the preceding embodiments insofar that the profiled portion 25 does not snap in its entirety behind the snap-locking member but only partly. As is appa-

rent from the Fig. this is a consequence of the fact that the snap-locking member 24 engages with the recess of the profiled portion 25. Also such a co-operation between snap-locking member and profiled portion is entirely within the scope of the present invention. Application of the invention: wall-cladding, ceiling-cladding, awnings, canopies etc.

The profiled portions of the panels according to the invention may also be embodied as local deformations so that the considerable advantages of the simple assembling and dis-assembling and the aesthetical appearance are maintained, but the drawback remains that the selection of the carrier is dependent on the location of the profiled portions of indentations, or that the latter can only be provided after the location of the carrier is known. On the other hand such a local indentation can be simply and cheaply provided at the spot.

Fig. 3 shows a side view of a carrier 2 in the longitudinal direction. Said carrier is asymmetrical in cross-section. Without departing from the scope of the invention said carrier may, however, be of a differently shaped section, such as for example a symmetrical U- or V-shape, or an L- or T-shape.

As shown in Fig. 1 the carriers may also be embodied as separate parts 26 made to carry only one or a small number of panels. These carrier parts 26 are arranged on a supporting beam 27 and are movable preferably slidable with respect to said beam so that consequently the distance between the panels or groups of panels carried by said carrier parts 26 is adjustable.

WHAT WE CLAIM IS:—

1. A panel assembly for surfaces such as walls or ceilings, comprising a plurality of carriers each provided with panel holding means offering at least three points of support for a panel and oblong resiliently deformable panels, the general planes of which extend at an angle relative to the plane through said carriers, each panel projecting with a free portion beyond its respective holding means, said holding means comprising at least two support members integral with the carrier, at least one of which being embodied as a snap-locking member and each panel comprising one or more profiled portions to co-operate with the or each snap-locking member by snap-action.

2. A panel assembly according to claim 1, characterized in that three support members are provided which are situated alternately at one and at the other side of the panel in question and are spaced apart viewed in the direction of insertion of the panel.

3. A panel assembly according to claim 1

or 2, characterized in that the snap-locking member comprises a projection with a run-on side and a recess or accommodation space behind said projection, viewed from the direction of insertion of the panel, said recess or accommodation space being destined for receiving a profiled panel portion of part thereof.

4. A panel assembly according to claim 3, characterized in that the other support members are likewise embodied as projections and the snap-locking member is constituted by the innermost support member.

5. A panel assembly according to any one of the preceding claims, characterized in that at least one longitudinal marginal portion of each panel has a V-shaped continuous cross-sectional profile which constitutes the profiled portion co-operating with the snap-locking member.

6. A panel assembly according to any one of the preceding claims, characterized in that the carrier is formed from thin material, preferably metal, and that the support members for each panel form part of two projecting parts of the carrier.

7. A panel assembly according to claim 6, characterized in that both projecting parts of the carrier are situated in one plane and constitute the extension of one of the legs of a substantially U-shaped body.

8. A panel assembly according to any one of the preceding claims, characterized in that each carrier is embodied as a separate part for carrying one or a restricted number of panels, which part is movable, especially adjustable, with respect to a supporting beam serving for movably mounting a plurality of said parts.

9. A carrier for a panel assembly according to any one of the preceding claims, characterized in that said carrier is formed from thin material and comprises a body portion of substantially U- or V-shape, at least one of the legs of the body comprising a number of pairs of projecting parts, the side edges of the parts of each pair facing each other and together comprising three support points of which at least one is provided with a snap-locking formation including a run-on side (as hereinbefore defined) and a recess or space situated behind said run-on side for engagement with a corresponding panel formation.

10. A panel assembly substantially as described in the specification and illustrated in the accompanying drawings.

11. A carrier as claimed in claim 9 substantially as described in the specification and illustrated in the accompanying drawings.

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The profiled portions of the panels according to the invention may also be embodied as local deformations so that the considerable advantages of the simple assembling and disassembling and the aesthetical appearance are maintained, but the drawback remains that the selection of the carrier is dependent on the location of the profiled portions of indentations, or that the latter can only be provided after the location of the carrier is known. On the other hand such a local indentation can be simply and cheaply provided at the spot.

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As shown in Fig. 1 the carriers may also be embodied as separate parts 26 made to carry only one or a small number of panels. These carrier parts 26 are arranged on a supporting beam 27 and are movable preferably slidable with respect to said beam so that consequently the distance between the panels or groups of panels carried by said carrier parts 26 is adjustable.

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1. A panel assembly for surfaces such as walls or ceilings, comprising a plurality of carriers each provided with panel holding means offering at least three points of support for a panel and oblong resiliently deformable panels, the general planes of which extend at an angle relative to the plane through said carriers, each panel projecting with a free portion beyond its respective holding means, said holding means comprising at least two support members integral with the carrier, at least one of which being embodied as a snap-locking member and each panel comprising one or more profiled portions to co-operate with the or each snap-locking member by snap-action.

2. A panel assembly according to claim 1, characterized in that three support members are provided which are situated alternately at one and at the other side of the panel in question and are spaced apart viewed in the direction of insertion of the panel.

3. A panel assembly according to claim 1

or 2, characterized in that the snap-locking member comprises a projection with a run-on side and a recess or accommodation space behind said projection, viewed from the direction of insertion of the panel, said recess or accommodation space being destined for receiving a profiled panel portion of part thereof.

4. A panel assembly according to claim 3, characterized in that the other support members are likewise embodied as projections and the snap-locking member is constituted by the innermost support member.

5. A panel assembly according to any one of the preceding claims, characterized in that at least one longitudinal marginal portion of each panel has a V-shaped continuous cross-sectional profile which constitutes the profiled portion co-operating with the snap-locking member.

6. A panel assembly according to any one of the preceding claims, characterized in that the carrier is formed from thin material, preferably metal, and that the support members for each panel form part of two projecting parts of the carrier.

7. A panel assembly according to claim 6, characterized in that both projecting parts of the carrier are situated in one plane and constitute the extension of one of the legs of a substantially U-shaped body.

8. A panel assembly according to any one of the preceding claims, characterized in that each carrier is embodied as a separate part for carrying one or a restricted number of panels, which part is movable, especially adjustable, with respect to a supporting beam serving for movably mounting a plurality of said parts.

9. A carrier for a panel assembly according to any one of the preceding claims, characterized in that said carrier is formed from thin material and comprises a body portion of substantially U- or V-shape, at least one of the legs of the body comprising a number of pairs of projecting parts, the side edges of the parts of each pair facing each other and together comprising three support points of which at least one is provided with a snap-locking formation including a run-on side (as hereinbefore defined) and a recess or space situated behind said run-on side for engagement with a corresponding panel formation.

10. A panel assembly substantially as described in the specification and illustrated in the accompanying drawings.

11. A carrier as claimed in claim 9 substantially as described in the specification and illustrated in the accompanying drawings.

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