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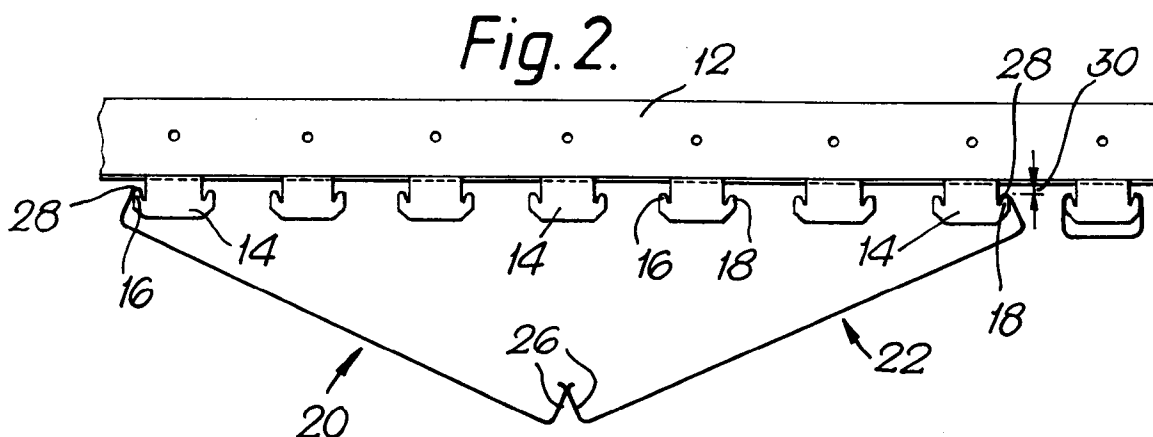
(71) Applicant : **HUNTER DOUGLAS INDUSTRIES  
B.V.  
Piekstraat 2  
NL-3071 EL Rotterdam (NL)**

(72) Inventor : **Brak, Johan Willem  
Paulusberg 24  
NL-4615 LA Bergen op Zoom (NL)**

(74) Representative : **Allen, William Guy Fairfax et  
al  
J.A. KEMP & CO.  
14, South Square  
Gray's Inn  
London WC1R 5LX (GB)**

### (54) Panel carrier and panel assemblies.

(57) A ceiling panelling system in which a plurality of carriers are provided, these each consisting of a body (12) with a plurality of axially spaced lugs (14) these lugs having, at their opposite ends, upstanding projections (16,18). Panels (20,22) are mounted with one rim (28) engaged over one projection (16) of one of the lugs (14). A second panel has the rim (28) on the opposite side engaged over the other projection (18) of another or of the same lug (14). The rims (28) and/or the flanges (26) on the other edges of the two panels (20,22) are secured together either directly or by means of another intermediate panel. A gap (30) is normally left above the projections (16,18) and this can be filled by a resilient abutment engaging the edges of the panel.



The present invention relates to ceiling panelling systems.

One known form of such system consists of a plurality of generally parallel elongate carriers, usually secured to a ceiling or at their ends to the walls of a room, each carrier comprises an elongate body and a plurality of downwardly extending longitudinally spaced lugs.

Mounted on these carriers are a plurality of panels, extending transversely, usually perpendicularly, to the carriers, these panels being of channel cross-section comprising a web, two side flanges and intumed rims to the side flanges. The rims of the flanges are engaged over the lugs which serve to support the panels. The lugs usually include a projection on one end engagable under the rim.

While such ceiling panelling systems are generally satisfactory, it is sometimes difficult to mount the panels if they are long and therefore heavy and especially if they are quite wide. Furthermore, since these ceiling panelling systems are intended to provide an aesthetically pleasing effect and to obscure services, such as electric wiring and central heating water piping etc., the variety of aesthetic arrangement is somewhat restricted.

It is now proposed, according to the present invention, to provide a ceiling panelling system comprising a plurality of general parallel elongate carriers, each carrier comprising an elongate body and a plurality of downwardly extending longitudinally spaced lugs, each lug having at each of its two ends an upstanding projection, the tips of the projections being spaced below the elongate body, and a plurality of panels, each panel being of channel cross-section comprising a web, two side flanges and intumed rims to the side flanges, the rims and lugs being so shaped that any panel can be at least temporarily supported by either one of its rims being engaged over any one of the projections.

Such a system enables one to mount a panel initially by one rim only and then, if so desired, one can tilt the panel upwardly and engage the other rim over the projection on the other side of another lug.

The invention also contemplates a panelling system wherein at least some of the panels are arranged in pairs the two panels of a pair each having only one rim engaged over a projection, the other rim of one of the panels of a pair being secured to the other rim or to the other flange of the other panel of the pair.

This arrangement can provide an interesting effect. If desired the panels of a pair can be identical or they can be different to provide different visual effects.

The system of the present invention also may comprise an arrangement in which at least some of the panels are arranged in groups of three, each group consisting of a central panel and two outer panel, only one rim of each outer panel being engaged

over a projection, the other rim of each outer panel being secured to the central panel.

Each other rim of each outer panel may be secured to a separate one of the rims of the central panel.

It is important to ensure that there is no possibility of the panels jumping off the projections of the lugs. Thus is contemplated that the system should further comprise a resilient abutment extending downwardly from the carrier body and engaging each panel.

These resilient abutments may take a number of forms. In one arrangement they may comprise cantilevered tags formed integrally with the carrier body. In another arrangement at least some of the resilient abutments comprise at least one separate profile including at least one nose portion engaging each panel said separate profile being secured to the carrier body, e.g. by means of a spring clip or clips.

It is also contemplated that the resilient abutment should comprise a resilient plastics material element engaged over flanges formed on the bodies of the carriers.

In order that the present invention may more readily be understood, the following description is given, merely by way of example, reference being made to the accompanying drawings in which:-

Figure 1 is a schematic side elevation showing two panels of one embodiment of a ceiling panelling system according to the invention as they are temporarily mounted on a carrier during assembly.

Figure 2 is a similar view showing the two panels moved to their final mounted position and engaged with one another;

Figures 3 to 9 are similar views of seven other arrangements according to the invention.

Figure 10 is an enlarged perspective view of a portion of a carrier with the panel shown schematically mounted thereon by way of illustration; Figures 11, 12 and 13 show in end elevation, partly in section, three different types of resilient abutment system engaging the panels of a panelling system according to the invention; and Figure 14 is an enlarged view of the plastic clip element shown in figure 13; and

Figure 15 is a view similar to Figure 2 of a further form of panelling system according to the present invention.

Referring first to Figure 1, there is illustrated a carrier 10 secured to a ceiling (not shown) the carrier 10 comprising an elongate body 12 with a plurality of longitudinally spaced lugs 14, each lug having at its two ends, upstanding projections 16, 18.

Figure 1 also illustrates two panels 20 and 22 each consisting of a central web 24, two side flanges 26, and intumed rims 28 on the side flanges. It will be seen that one of the rims 28 of the panel 20 is engaged

ed over a left end projection 16 of one of the lugs and the other rim 28 of the panel 22 is engaged over the other projection 18 of another one of the lugs 14.

It is relatively simple to mount the panels in this way during preparation and the weight of the panel is then borne by the lugs 14. The panels 20,22 are then pivoted upwardly as indicated by the arrows 29 in Figure 1 to the position shown in Figure 2 in which the side flanges 26 of the two panels engage one another. They can be held together by any suitable means (not shown) such as a clip. It will be appreciated that a ceiling panelling system thus provided can have a rather different and pleasing effect compared with the more conventional panelling systems.

It will be noted from Figure 2 that a gap 30 is left between the lower part of the carrier body 12 and the upper tip of the projections 16,18. This greatly facilitates the pivoting of the panels.

It will be noted in that in Figure 2 the panels 20 and 22 are of substantially identical structure. Figure 3 shows a different embodiment that is only different in so far as the panels 32,34 have their central web portions 36,38 of a different width.

Figure 4 shows an alternative arrangement where the panels are again identical but here the angle between the panels 20,22 is more acute, by mounting the flanges on more closely adjacent lugs.

Figure 5 employs a number of different sized pairs of panels 40,42; 44,46; 48,50 and 52,54. It will be noted that the panels 52,54 are of the same size as the panels 44,46, and that the two panels of each of these pairs are mounted on the projections of the same lugs. Interposed between the pairs of panels are single panels 56,58,60 and 62, these panels being mounted so that their rims are mounted on the two projections of the same lugs 14.

In the structures illustrated in Figures 2, 4 and 5, the panels of a pair are joined to one another adjacent their lower edges by securing the panels of a pair at the location of the inturned rims. Figure 8 shows a structure similar to Figure 2, but in which single panels 64 are interposed between the adjacent pairs of panels.

Figures 5 and 5a show in detail one clip arrangement for holding the panels of a pair in this way. Two base parts 41 are each of channel section, having a web 43 and flanges 45,47, and are designed to fit snugly within the channel section panels 40 and 42. Of course, since there are several different panel sizes, several different base parts will have to be provided for a full range of panels. However, the number of different panel sizes is limited. The flanges 45,47 of the base parts include tags 49, having apertures therein into which fit the feet portions 51 of the legs 53 of an inverted U-shaped wire spring 55. A sleeve 57 is slidable along the legs and has two arms 59 pivoted thereto at one end, the other end of each arm being pivoted to a tag 61 on the web portion 43.

Such an arrangement is very versatile and enables the rim portions to pivot relative to one another, while giving a good rigidity to the structure.

Figures 3, 6 and 7 show somewhat modified structures in which the rim 28 of one panel is secured to the flange 26 of the adjacent panel.

As can be seen from Figures 6 and 6a, this is achieved using a clip having a body part 29 of channel section including a web 31 and side flanges 33,35 and a spring tongue 37, including, at its free end, a step 39. The body part is shown as a snug fit in channel section panel 32 and is retained therein by the rims on the free edges of the side flanges thereof. The adjacent panel 34 is pivoted from the position shown on the right in Figure 6 and is pushed to the left, so that the lower side flange of the panel 34 is clamped between the tongue 37 and the lower side flange of the panel 32. The step 39 engages over the rim of the free edge of the lower side flange of panel 34 to retain the latter in place.

Figure 9 shows an arrangement in which the individual panels 66 are of a modified cross section, in which the central web portions are relatively narrow and the side flanges are relatively wide.

If reference is now made to Figure 10 a more detailed indication of one form of carrier body 12 is shown. This consists of a top web portion 68, two side arms 70, and two outwardly extending flanges 72 having down-turned rims 74 and the lugs 14 with their projections 16 and 18 are also shown as being formed integrally with the flanges 72.

Associated with each lug are a pair of resilient abutment members formed by an S-shaped portion 78 cantilevered out from the body of the lug and this having a downwardly bent tongue 78. It can be seen that this is arranged to engage the top of the inturned rim 28 of the panel, which is similar to the panel 64 illustrated in Figure 9. A similar arrangement can be employed to engage the panel rim of any of the other configurations.

In order further to stop movement of the panels 64, a down-turned tag 80 is provided which engages the flange 26 of the panels 64.

The arrangement of the cantilevered abutment 76,78 which acts resiliently, is to provide for the gap 30 illustrated in Figure 2, to facilitate mounting of the panel, but to prevent rattling of the panel on the lugs of the carrier. The cantilevered S-shaped portion 76 will be sufficiently resilient to allow pivoting of the panels to any of the dispositions shown in Figures 2-9.

An alternative arrangement to prevent the rattling is illustrated in Figures 11, 12 and 13. In each instance the carrier 12 is of the same general type as illustrated in Figure 10 and has side arms 70 and upwardly extending flanges 72 from which are integrally formed the lugs 14.

In Figure 11 a separate profile 82 is mounted be-

low the carrier 12 and has a downwardly extending nose 84 extending below the level 86 of the upper part of a panel. The profile 82 is retained in place by a spring clip 88.

In Figure 12 there is a similar arrangement except that the profile 82 with the nose 84 is retained by tags 90 bent out of the lugs 14.

In Figure 13 a somewhat different concept is used in which a plastic abutment element 92 is engaged over the ends of each flange 72 and has a downwardly extending flexible arm 94 extending below the level 86. Details of this clip-like element are shown enlarged in Figure 14 and it will be seen that there is a retaining nose 96 on the clip 92.

Figure 15 illustrates a somewhat different way of mounting panels. In this structure the panels are not arranged in pairs, but in threes. The two outer panels 100,102 are arranged so that the web portions 24 hang essentially vertically and a further central panel 104 is mounted therebetween. The arrangement is therefore such that the two outer panels 100,102 have only one rim engaged over a projection 16,18 of a lug or lugs and the central panel 104 is supported by the other rim or flange of the two outer panels. Figure 15 shows three different sets of three and positioned therebetween a further single panel 106.

It will be appreciated that one can produce a considerable variation in the visual appearance of such an arrangement. Any suitable means can be provided for securing the rims of the panels 104 to the panels 100,102.

## Claims

1. A ceiling panelling system comprising a plurality of general parallel elongate carriers, each carrier comprising an elongate body and a plurality of downwardly extending longitudinally spaced lugs, each lug having at each of its two ends an upstanding projection, the tips of the projections being spaced below the elongate body, and a plurality of panels, each panel being of channel cross-section comprising a web, two side flanges and inturned rims to the side flanges, the rims and lugs being so shaped that any panel can be at least temporarily supported by either one of its rims being engaged over any one of the projections.
2. A ceiling panelling system according to claim 1, wherein at least some of the panels are arranged in pairs, the two panels of a pair each having only one rim engaged over a projection, the other rim of one of the panels of a pair being secured to the other rim or to the other flange of the other panel of the pair.

3. A ceiling panelling system according to claim 2, wherein the panels of a pair are different from one another.

4. A ceiling panel system according to claim 2 or 3, wherein the other rims of the panels are secured together by clips, each clip having a base part engaged in the channel section of one panel of a pair and a spring tongue, the lower side flange of the other panel of the pair engaging between the spring tongue and the lower side flange of said one panel.

5. A ceiling panel system according to claim 2 or 3, wherein the other rims of the panel are secured together by clips, each clip having two base parts, one engaged in each of the channel section panels of the pair, the two base parts being pivoted to one another.

6. A ceiling panel system according to claim 4 or 5, wherein said base part or parts are of a channel section having a web and two side flanges.

7. A ceiling panel system according to claim 6 when dependent on claim 5, wherein the two base parts are pivoted to one another by an assembly comprising an inverted U-shaped spring having two legs, feet on the lower ends of said legs pivoted to tags formed on side flanges of said base part, a slider axially slidable on said legs and two arms, each arm being pivoted at one end to the slider and at the other end to the web of a respective base part.

8. A ceiling panelling system according to claim 1, wherein at least some of the panels are arranged in groups of three, each group consisting of a central panel and two outer panel, only one rim of each outer panel being engaged over a projection, the other rim of each outer panel being secured to the central panel.

9. A ceiling panelling system according to any preceding claim and further comprising a resilient abutment extending downwardly from the carrier body and engaging each panel.

Fig. 1.

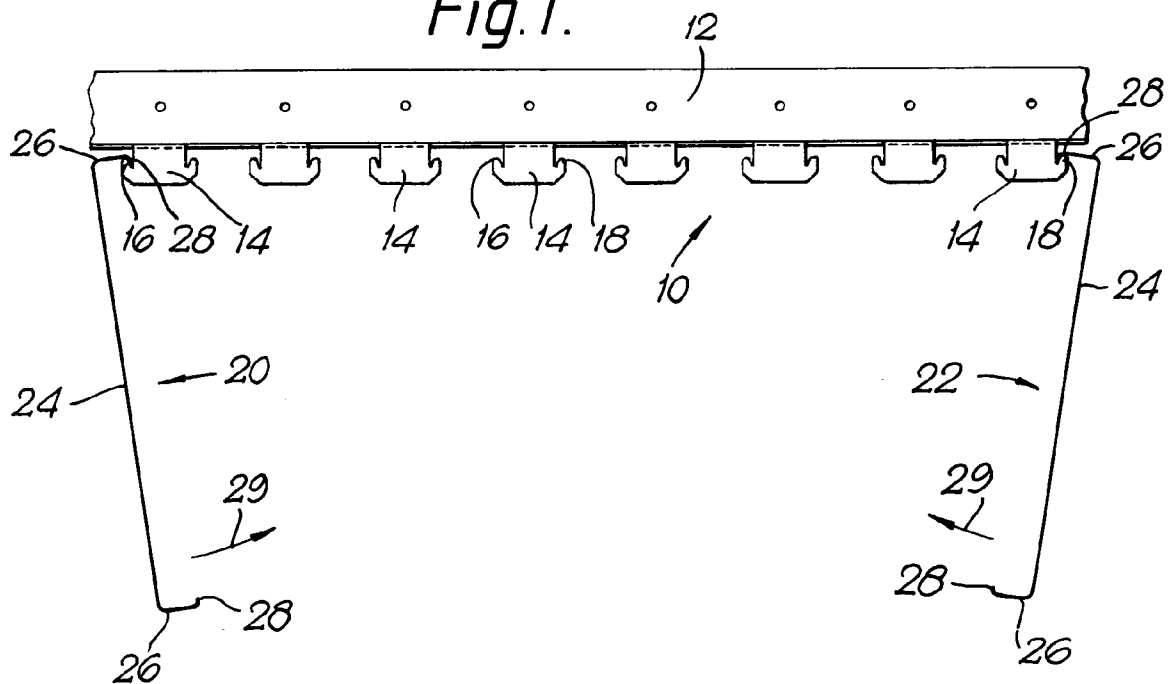


Fig. 2.

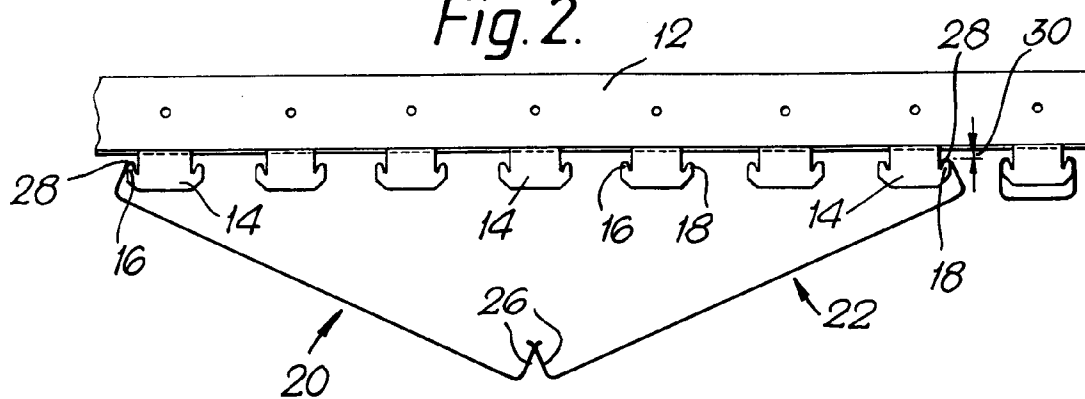
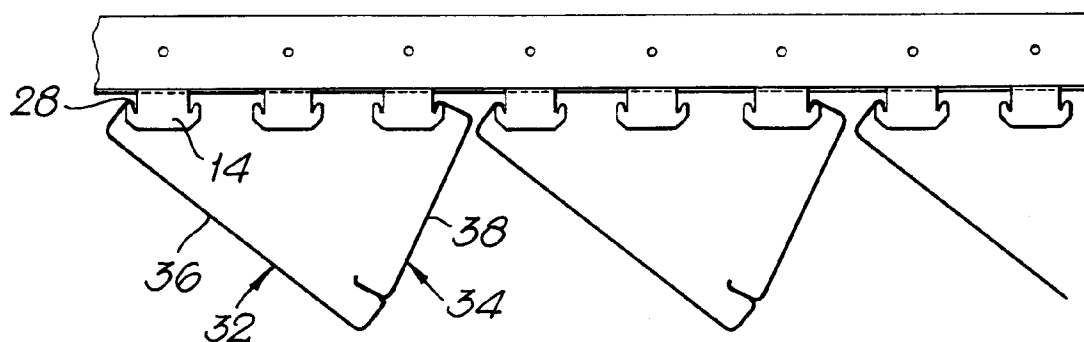
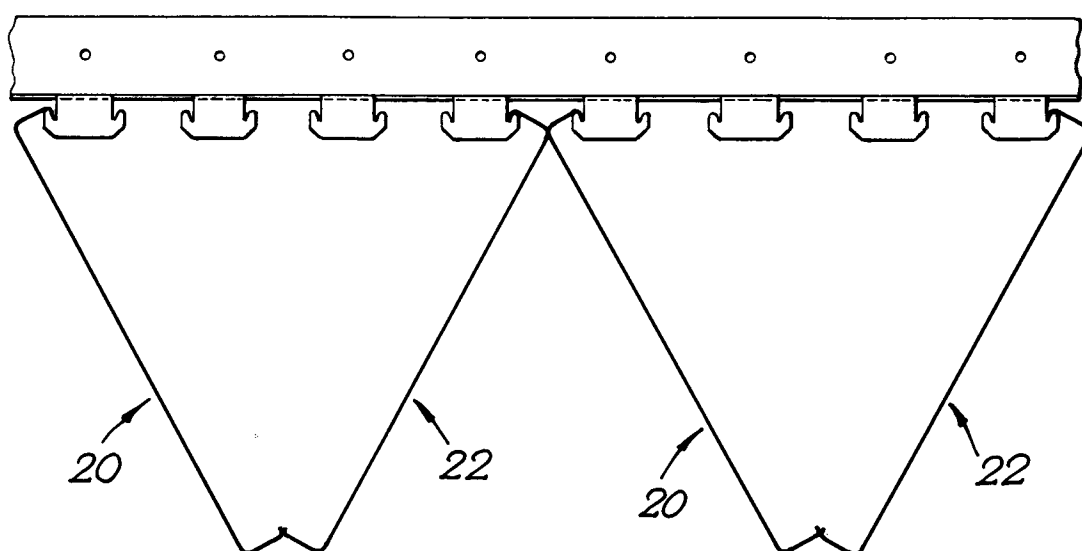


Fig. 3.



*Fig. 4.*



*Fig. 6.*

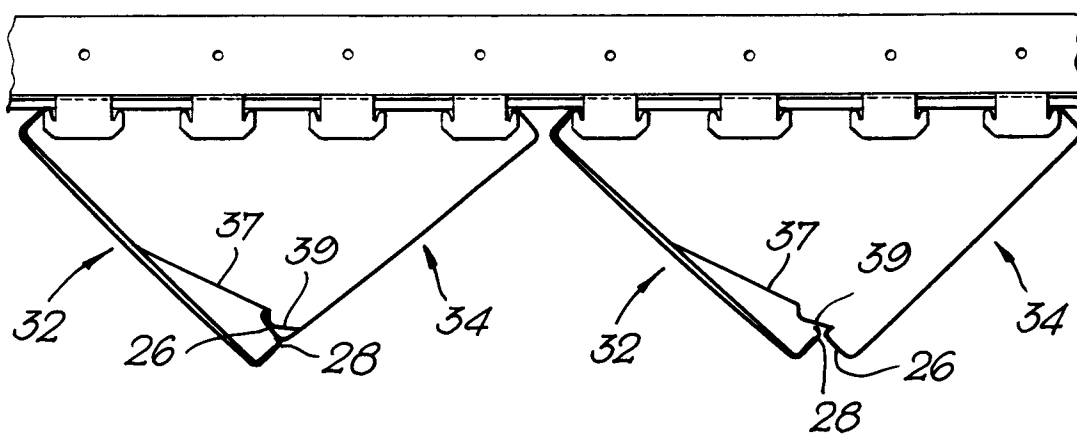
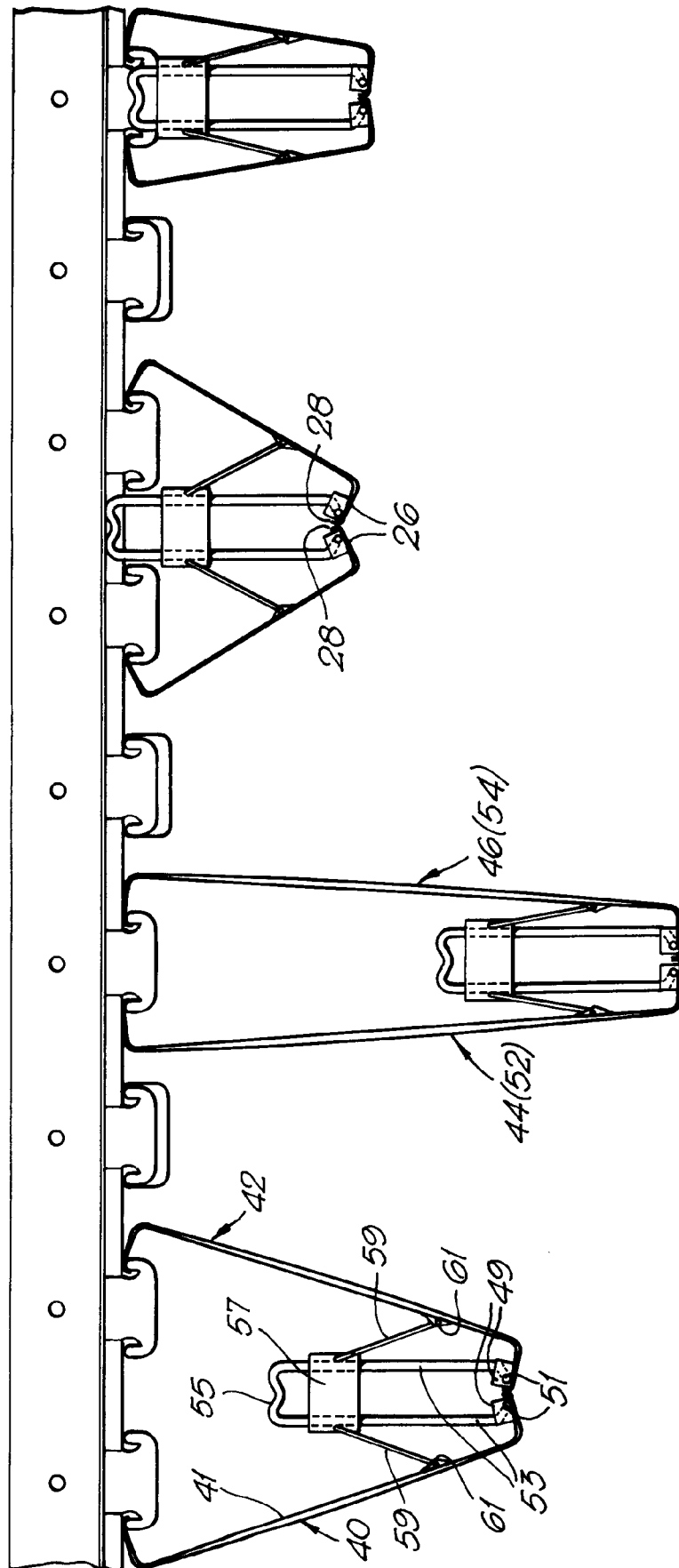
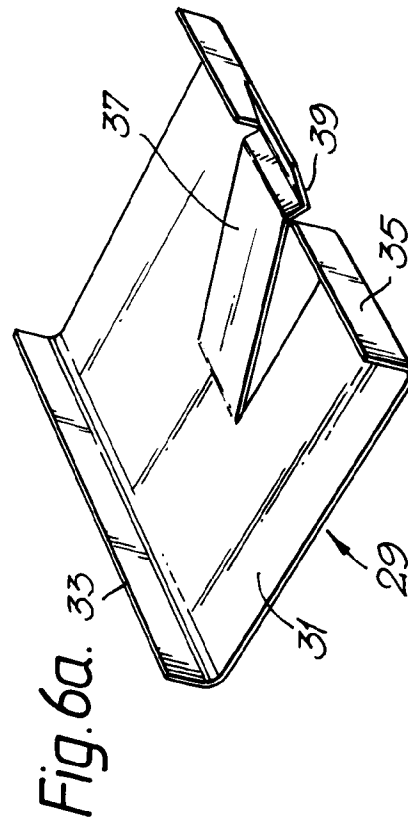
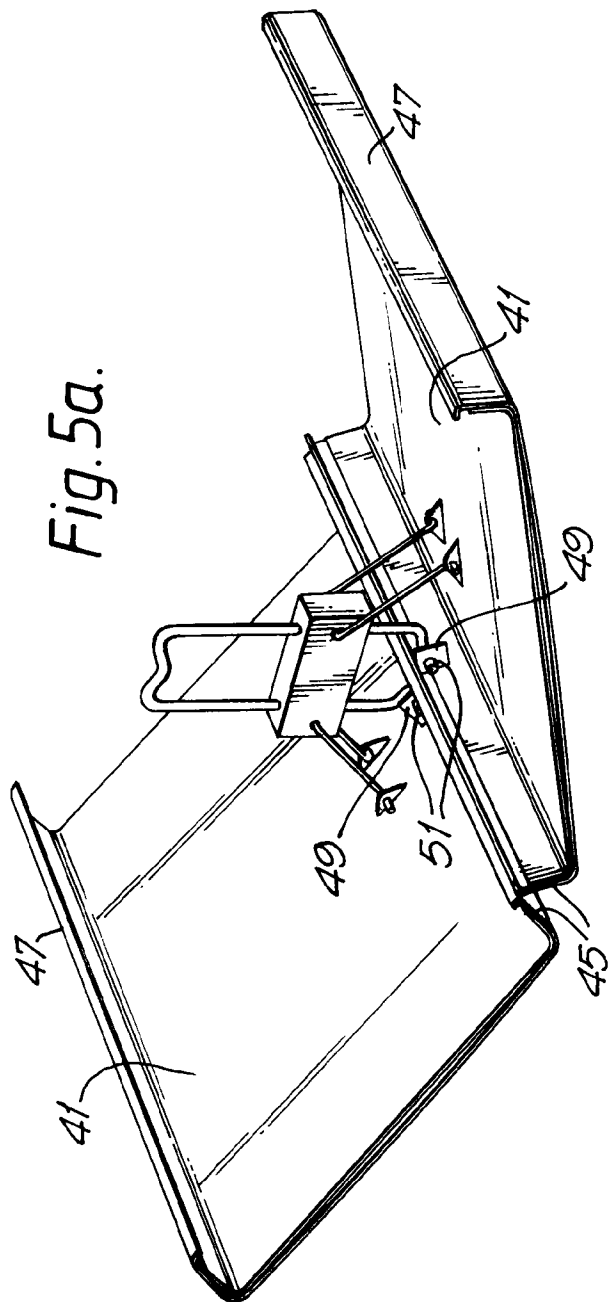


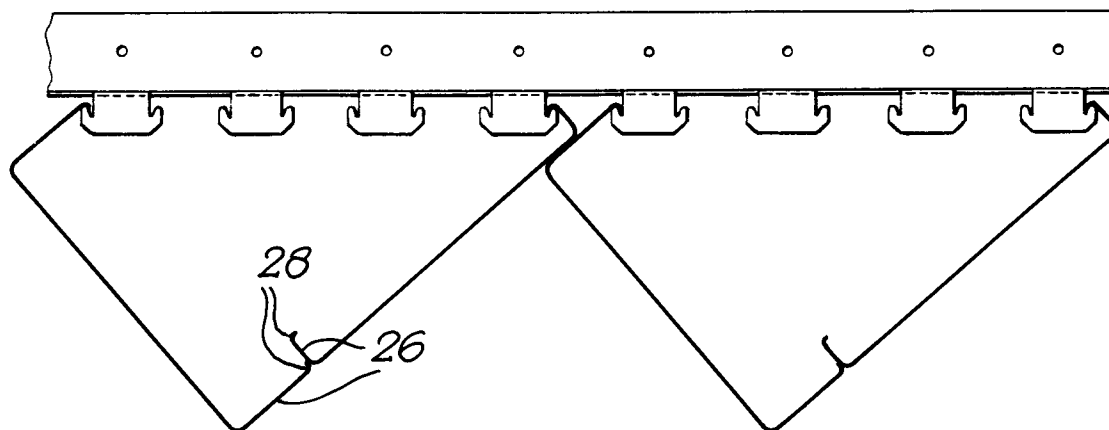
Fig.5.



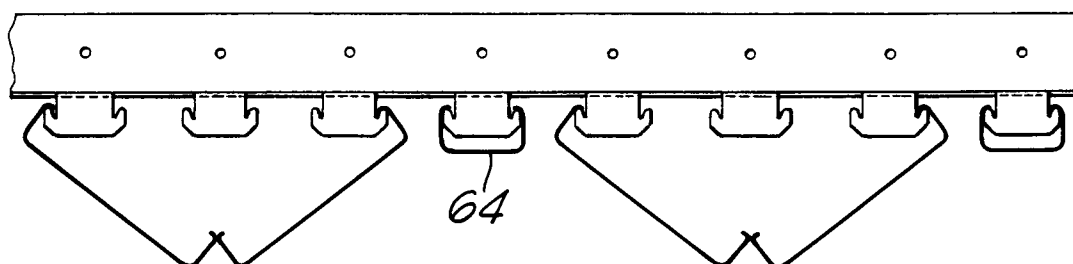




*Fig. 7.*



*Fig. 8.*



*Fig. 9.*

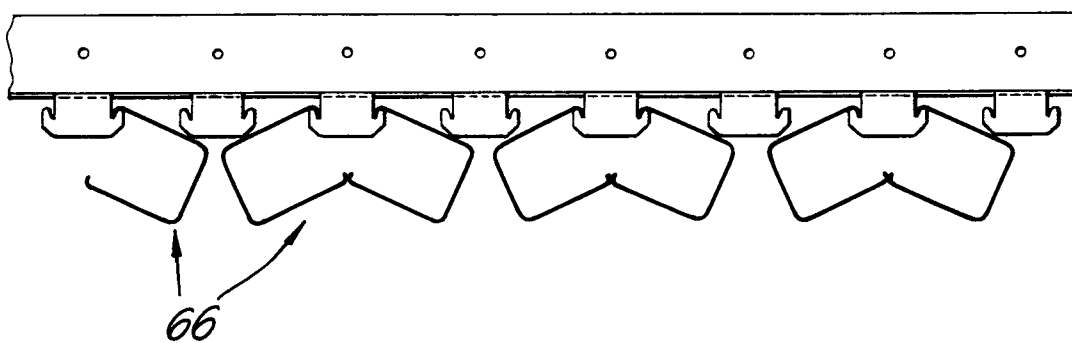
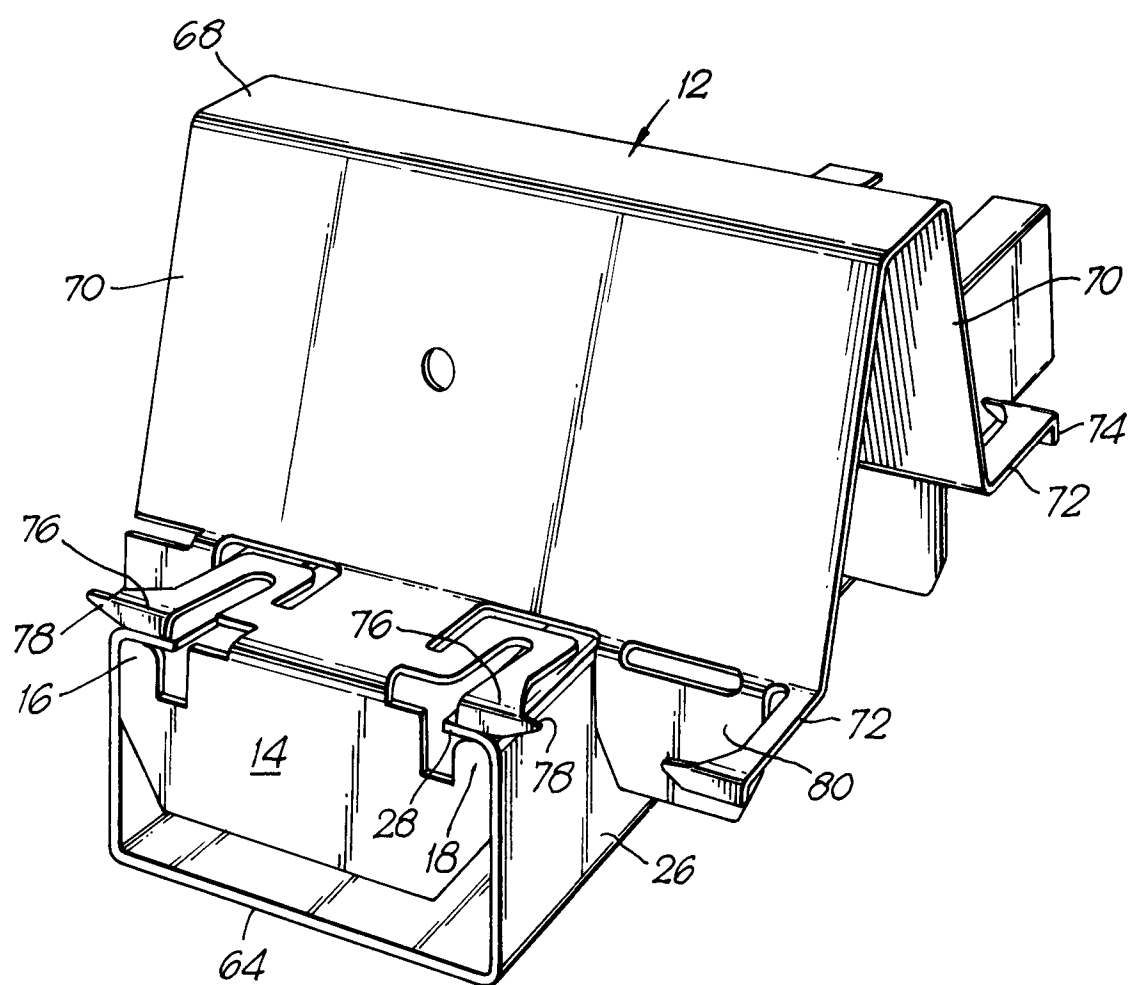
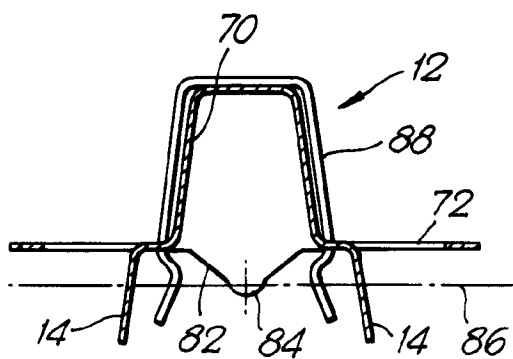


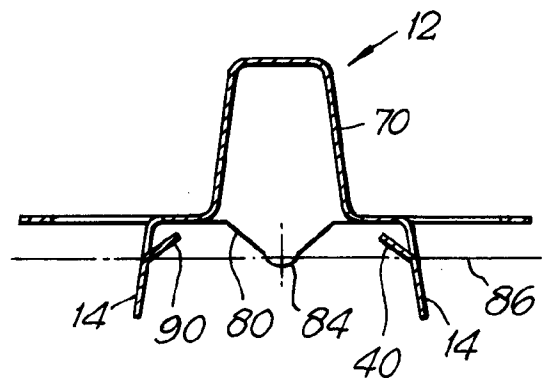
Fig. 10.



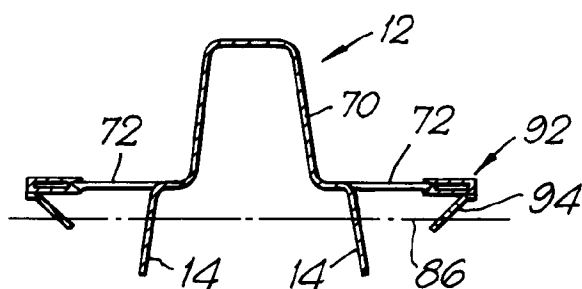
*Fig. 11.*



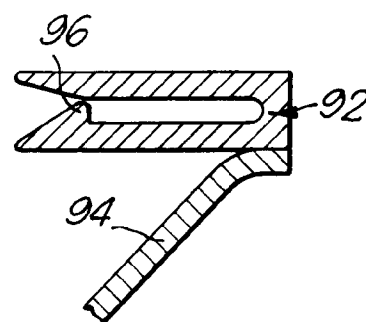
*Fig.12.*



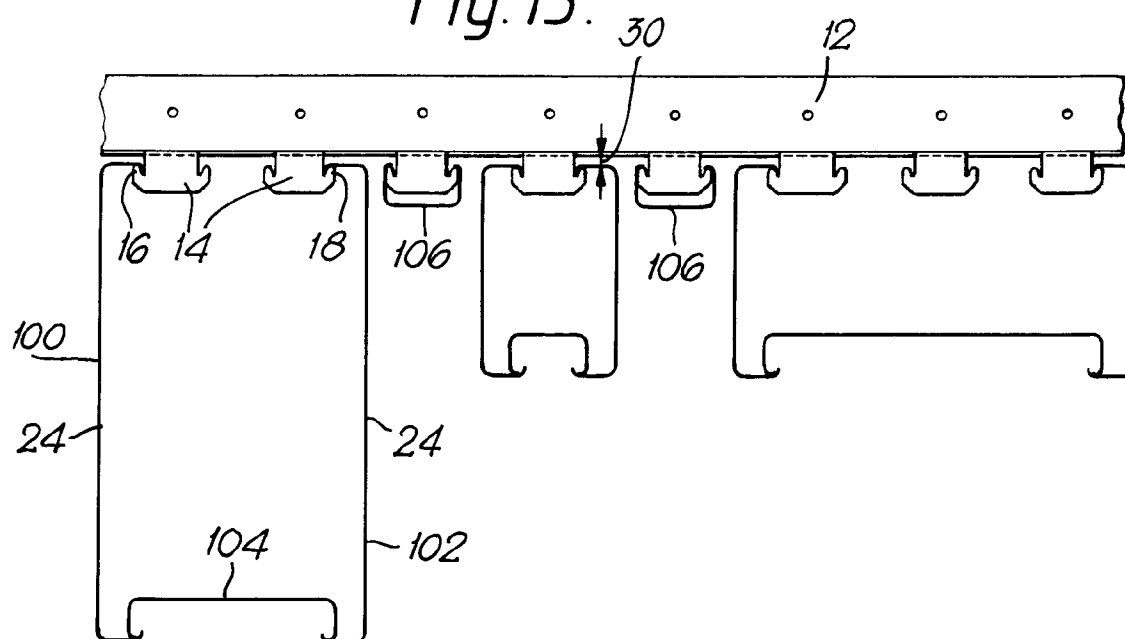
*Fig. 13.*



*Fig.14.*



*Fig. 15.*





European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 94 30 0213

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
Y	NL-A-8 203 259 (BROVO-PLAFONDS) * page 3, line 1 - page 3, line 24 * * page 3, line 30 - page 4, line 13 * * figures 1-4 *	1	E04B9/26 E04B9/36
Y	EP-A-0 357 290 (HUNTER DOUHLAS INDUSTRIES) * column 2, line 24 - column 3, line 17 * * column 3, line 29 - column 3, line 31 * * figures 1-3 *	1	
A	DE-A-19 29 652 (GEMA AG) * page 4, paragraph 3 - page 5, paragraph 2 * * figure 4 *	2	
A	FR-A-2 458 640 (REYNOLDS ALUMINIUM FRANCE) * page 3, line 26 - page 3, line 37 * * figure 3 *	4,6	
A	GB-A-974 181 (RALSTON ENGINEERING) * page 2, line 75 - page 2, line 91 * * figures 5,6 *	4	TECHNICAL FIELDS SEARCHED (Int.Cl.5)
A	FR-A-1 440 464 (FIRMA HUNTER DOUGLAS)		E04B E04F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18 April 1994	Examiner Hendrickx, X
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