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(54) Screen assembly

(57) A screen assembly (1) comprising a panel (2) mounted between two extrusions (4) and a covering (5) extending over one side of the panel (2), wherein two opposed ends of the covering (5) are clamped to the extrusions (4).Preferably the covering (5) is clamped between a portion (8) of the extrusion (4) and a clamping element (9). The portion (8) of the clamping element (4) preferably comprises a channel and the clamping element is preferably received within the channel to clamp the covering (5). Alternatively the portion (8) of the extrusion (4) may comprise a projection, in which case the clamping element is received over the projection to clamp the covering (5). The clamping element (9) may extends the length of an extrusion (4), however the clamping element (9) may be shorter than this so that two or more clamping elements can be received within the same channel. Either the portion (8) of the extrusion or the clamping element (9) may be made from flexible material so that the covering (5) is compliantly clamped. In a preferred embodiment the panel (2) comprises two opposing spaced boards with a covering (5) on each side of the panel (2), the extrusions (4) having two channels (8), one for each covering (5).

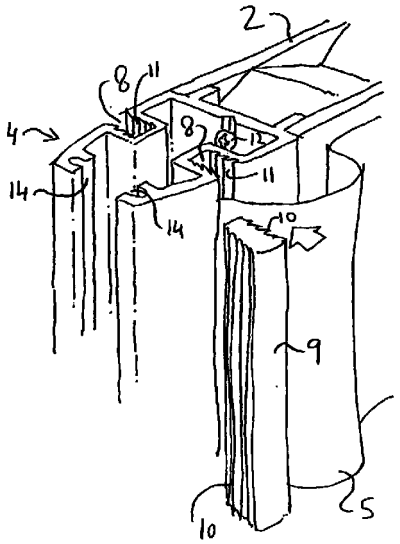

Fig. 2

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Description

[0001] The present invention relates to screens and screen assemblies for use in e.g. offices, public places or the like.

[0002] The use of screens to divide a space into a number of different areas is well known. The screens may for example be used to provide individual workstations, reception areas, meeting areas, and the like.

[0003] The screens may be floor-mounted and extend fully to the ceiling or only to a set height, or may be desk-mounted to separate desk working areas.

[0004] A typical screen system is modular in design with a number of screens being connected together to provide a desired division of a space. It generally provides an inexpensive, attractive and versatile method of defining a work area in a space.

[0005] A screen of such a system generally comprises a panel of e.g. particle board, cut to a required size, onto which a veneer or other laminate may be glued, or onto which a fabric may be stapled. The panel may be mounted within a frame of extruded elements, and a trim may be provided about the extrusions to provide a pleasing finish.

[0006] The present invention aims to provide an improved screen which has significant advantages over the prior art.

[0007] The present invention provides a space-dividing screen assembly/room divider comprising a panel mounted between two or more extrusions and a covering extending over the panel, the covering being clamped to the extrusions at least along two of its opposed ends.

[0008] The invention provides a quick and simple method of covering the panel of a screen. By mounting the covering, e.g. fabric, in a clamping manner, the fabric may be easily replaced when worn, e.g. soiled or torn. Further, by clamping the covering to the extrusions, the screen retains its versatile nature, the panels, extrusions and coverings being able to be cut to desired lengths as required for any particular situation.

[0009] Also, the means for clamping the covering, e.g. clamping channels in the extrusions, may easily be formed in the extrusions by appropriately shaping the die through which the extrusions are drawn, and so no extra production steps are required in making the clamping elements.

[0010] The invention has significant advantages over the traditional method of stapling the fabric to the panel. For example, the labour content of manufacture and upkeep is significantly reduced, as the clamping of the fabric along the edges of the panel reduces the time taken to upholster, and the skills of an upholsterer are not required. Furthermore, the present invention allows re-upholstery to occur on-site, without the need to remove the screen to a workshop, and with minimal disruption to the end user.

[0011] The ease with which the covering may be removed and attached allows the user to change the fabric more frequently, and so change colours, advertising or the like, as and when desired.

[0012] Screens according to the invention are particularly advantageous in areas in which there is a high level of wear and tear, e.g. within offices and public areas, and especially in airports where there is a large throughput of people with luggage, etc.

[0013] The invention also extends to a screen extrusion which includes clamping means for clamping the screen covering thereto, as well as to an unassembled kit of parts for making the screen, and to a method of making a screen in which coverings for the screen are clamped in place on extrusions surrounding the screen.

[0014] Any suitable means may be used to clamp the covering in place. Preferably, the covering is held within one or more channels provided on the extrusions. The covering may be clamped in place in the channel or channels by one or more clamping bars that push into the channels.

[0015] The clamping bar or bars may be solid, in which case the channels may flex slightly to accommodate them. Alternatively or additionally, the clamping bars may flex or deform slightly to allow their insertion into the channels. The bars may for example be made of a suitably compliant material or may be suitably shaped, e.g. they may be of U-shaped cross-section along their length with the legs of the bar being pressed together on insertion into the channel. The clamping bars may be extrusions, and may be made from e.g. aluminium, rigid plastic, semi-rigid plastic, flexible plastic, silicone, wood, mild or high tensile steel or any other material that would retain fabric in the channel.

[0016] The edges of the covering which are to be clamped may be placed loosely in the clamping channels of the screen extrusions, before the clamping bars are inserted into the channels. Alternatively, the edges of the covering may be attached to the bars, e.g. by being threaded through a slot in the bars. The bars and attached covering may then be inserted into the clamping channels.

[0017] The clamping bars need not be separate from the rest of the screen components, and could for example form a part of a trim which fits over a screen extrusion. In this situation, the fitting of the trim to the screen could also provide the clamping action.

[0018] The cutting to length of the screen extrusions automatically cuts the clamping means (e.g. channels) to length, and the clamping bars if extending the full length of the extrusion can also be cut to length. Alternatively, a number of shorter lengths of clamping bar could be used, e.g. one at each end of the clamping channel and one or more situated from the centre of the channel outwards.

[0019] The channels and/or bars may have side surfaces which increase the clamping action and/or connection between the two and/or the grip on the covering. For example, either or both may include serrated

surfaces which may increase the engagement between the two, and/or increase the hold on the edges of the coverings there between.

[0020] The clamping channels may be provided on the screen extrusions in any suitable position and at any suitable angles.

[0021] In one embodiment, the channels are provided along the sides of the screen extrusions, whilst in another embodiment, the channels are provided along the top surface of the extrusions.

[0022] Side channels are particularly advantageous in situations in which a screen extends to the ground or connects to another screen, as a top-surface channel of a bottom extrusion or a side extrusion would not then be accessible whilst the screen was in its installed position, and would require the removal of the screen. A side channel can, however, still be easily accessible and need require no movement of the screen to replace the fabric covering.

[0023] A screen may comprise a single panel or may comprise two opposed channels spaced apart either by a spacer element between the two panels (e.g. around their edges) or by being mounted along their edges in spaced channels of the screen extrusions.

[0024] Whether the screen comprises one or two panels, it will generally be necessary to cover both sides of the screen with a covering. Thus, two clamping channels may be provided on each screen extrusion, one for the covering for one side of the screen and one for the covering of the other side of the screen.

[0025] Alternatively, the edges of both coverings may be placed in the same clamping channel. This then requires the use of only one clamping bar. Two channels however can be less awkward to use, especially when only one of the coverings is to be replaced, as for example may occur when only one side of a screen is subjected to heavy wear.

[0026] The screen covering may be clamped at two opposed ends which may correspond with side extrusions, e.g. end posts, of the screen or with top and bottom extrusions of the screen. In either case, only the two relevant extrusions need to include the clamping means. The other two edges of the covering need not be fastened, and may be covered in use by e.g. flange portions of the other extrusions or by trim. It would also be possible to clamp the covering along all four edges.

[0027] Instead of having a clamping channel in the screen extrusion, it would be possible to have one or more protrusions extending from the extrusion, over which the coverings may be clamped by any suitable means, e.g. by one or more U-shaped clamping bars/spring clips.

[0028] Padding may be provided between the panel and the covering, e.g. a foam backing for providing soundproofing.

[0029] The screen extrusions may be configured for connection with other extrusions to link screens together and so provide e.g. an enclosed space or office workstation, and may include channels or other formations for engagement with connection strips or connection extrusions.

[0030] The screen extrusions may be made from any suitable materials, including e.g. metals or plastics, and are preferably made from aluminium.

[0031] The panels may also be made from any suitable materials, and may be e.g. of particle board, plastic sheet, steel, honeycomb panels, insulation board, pinnable board or the like.

[0032] The covering may be of any suitable material, and in a preferred form is a fabric covering.

[0033] Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a cutaway perspective view of a screen in accordance with one embodiment of the present invention;

Fig. 2 is a detail of the top portion of a side extrusion of Fig. 1;

Fig. 3 is a detail of the cutaway top extrusion of Fig. 1;

Figs. 4-6 show sectional views of a side edge portion of a screen made in accordance with a second embodiment of the present invention at various stages of construction;

Fig. 7 shows the in-line connection of two screens constructed according to the method of Figs. 4-6;

Fig. 8 shows an angled connection of two screens constructed according to the method of Figs. 4-6;

Fig. 9 is a sectional view of a top portion of a screen constructed using an extrusion according to a third embodiment of the present invention;

Fig. 10 is a sectional view of a bottom portion of a screen constructed using an extrusion as in Fig. 9; and

Fig. 11 is a sectional view of a side portion of a screen according to a fourth embodiment, constructed using an extrusion as in Fig. 9.

[0034] Referring to Figs. 1-3, a screen 1 is constructed from a rectangular honeycomb panel 2 mounted within top and bottom extrusions 3 and side extrusions 4. In order to provide a pleasing appearance, the screen 1 is provided with a fabric covering 5 on each side of the panel 2, and trim, such as end caps 6 (and possibly side trim, if required), may be clipped onto or over the side extrusions 4.

[0035] The screen 1 may be used by itself or in connection with other screens to define e.g. a working area or office, within a larger space.

[0036] The invention lies in the fastening of the fabric covering 5 onto the screen 1. This is achieved by clamping the fabric covering 5 in a channel 8 in each of the side extrusions 4 using a clamping bar 9.

[0037] In order to construct the screen 1, the side extrusions 4 are firstly mounted on the panel 2, and a

fabric covering 5 is placed over one side of the panel 2. The edges of the covering 5 are then placed loosely within a channel 8 of each of the side extrusions 4, and are clamped in place by inserting a clamping bar 9 into each channel 8. This is repeated for the fabric covering for the other side of the panel 2.

[0038] The clamping bar 9 may be of a material which deforms slightly, e.g. flexible PVC or a co-extruded plastic extrusion, so as to provide a firm clamping action on insertion into the channel 8, and may have serrations 10 along its sides to ensure a firm engagement with the channel 8 (which may also have serrations 11 along its sides). The serrations 10,11 also ensure that the fabric covering 5 is held firmly in place between the channel 8 and clamping bar 9.

[0039] After this, the top and bottom extrusions 3 are mounted on the panel 2, and are connected to the side extrusions 4 by screws 12 (see Fig. 2) which engage with screw fixing portions 13 (see Fig. 3). The top and bottom extrusions 3 have flange portions 3a which extend over the top and bottom edges of the fabric covering 5 on each side of the panel 2 so as to provide a neat finish.

[0040] The end caps 6 are clip-mounted to the extrusions 4 to complete the screen 1.

[0041] The side extrusions 4 also have engagement portions 14 which allow the screen 1 to be attached to further such screens via a suitably shaped linking extrusion (not shown).

[0042] The resulting screen 1 of Fig. 1 contrasts markedly with prior art screens in which the coverings are attached to the screens using staples and glue. The present screen assembly allows the coverings 5 to be replaced quickly and easily and without the need for a skilled upholsterer or for the removal of the screen.

[0043] All that is required is to unclamp the current covering 5 and replace it with another covering (the upper and lower edges of the covering 5 may slip easily under the flanges 3a of the top and bottom extrusions 3). It should be noted that by having the clamping channels 8 at the sides of the side extrusions 4, the bars 9 are easily accessible without the need necessarily to remove the screen 1 from its installed position (If side trim is provided, then it too should be removable from the screen in situ, to allow access to the clamping bars 9 or should expose the bars 9).

[0044] This simplicity of installation and replacement significantly reduces costs, and can be especially important in situations such as airports, where the area to be screened is large, and where the screen coverings are subject to a high degree of wear and so require frequent replacement.

[0045] Furthermore, the ease with which the coverings 5 may be replaced provides the opportunity to change their colour or pattern more often and/or to have frequent changes of e.g. advertisements and the like printed on the coverings.

[0046] The coverings themselves may be made of any suitable materials, and could be for example fabric, or similar material, or vinyl with printed graphics or the like.

[0047] Figs. 4-6 show a cross-section through the side extrusion 4' of a screen 1 made in accordance with a second embodiment at various stages of the screen's construction, with similar features being given the same reference numerals as in the first embodiment.

[0048] In this case, the screen 1 is constructed from a pair of opposed e.g. rectangular panels 2 of e.g. hardboard, between which are mounted spacer elements 14 of e.g. ply, chipboard or MDF (one along each edge of the screen, or at least along two opposite edges of the screen).

[0049] The panels 2 are held together by the side extrusions 4' which may be e.g. of aluminium.

[0050] Foam padding 15 is provided on the front face of each panel 2 for soundproofing, and the fabric coverings 5 are provided over the front of the panels 2 and padding 15 for decoration.

[0051] Referring to Fig. 5, in order to construct a screen 1, first the two panels 2 are placed opposite one another and the spacer elements 14 are fixed between them by staples, one along each side edge of the panels.

[0052] The foam padding 15 is then glued onto the front of each panel 2. The padding 15 is cut shorter than the panels 2, so that it does not reach the edges of the panels. This leaves space for panel retaining flanges 16 of the extrusions 4', the extrusions 4' being mounted along the edges of the panels 2 by being screwed onto the spacer elements 14.

[0053] As can best be seen in Fig. 5, each side extrusion 4' of the screen 1 (i.e. the vertical end posts of the screen) includes the clamping channels 8 for holding the coverings 5.

[0054] The top and bottom extrusions of the screen, not shown, may also be of the same form as the side extrusions 4'. They do not however need the channels 8, and so may take a simpler form if desired, e.g. as in Fig. 3, and may be held in place by screw mounting directly to the ends of the side extrusions 4'.

[0055] Once the side extrusions 4' are in place, the fabric coverings 5 may be added. Firstly, the coverings 5 are cut to size. Next, as shown in Fig. 6, they are placed on the panels 2 with their edges 5a placed loosely within the channels 8. The edges 5a are then clamped in position by inserting a clamping extrusion 9' of e.g. PVC into each channel 8.

[0056] In this case, the clamping extrusions 9' may be of U-shaped cross-section, so that the legs 9a' are pressed towards one another on insertion of the extrusions 9' into the channels 8, to provide a firm clamping action. The extrusion 9' and channels 8 may also have the serrations 10,11 along their sides as in the first embodiment.

[0057] Clamping of the coverings 5 may occur along any two opposed edges of the screen, or along all

four edges. Thus, instead of the two side edges discussed above, clamping may alternatively or in addition take place along the top and bottom edges of the screen as well.

[0058] Fig. 7 shows two screens 1 attached to one another by connector elements 17, which are strips of aluminium or plastic extrusion having a "dumbbell" cross-section. Each longitudinal end of the strip connector 17 is mounted in one of a number of correspondingly shaped connection channels 18 in the extrusions 4'. The provision of a number of differently angled connection channels 18 allows for different angles of connection between the screens, and e.g. the right-angled connection shown in Fig. 8. Thus, the arrangement of Fig. 7 may be found along a wall portion of a screened area, whilst the arrangement of Fig. 8 may be found at a corner.

[0059] The extrusions 4' are multi-purpose. They mount the coverings 5, allow the screens 1 to connect to one another, and hold the panels 2 and spacer elements 14 together.

[0060] In use, trims may be provided over the extrusions 4', so as to provide a pleasing aesthetic effect. The trims may take any desired shape, and an example of a trim is shown in the following, third, embodiment of the present invention.

[0061] In the third embodiment of the present invention, as shown in Figs. 9 and 10, the extrusions used to clamp the coverings 5 are top and bottom extrusions 3' of the screen 1, rather than side extrusions 4 or 4'.

[0062] Further, these extrusions 3' have the clamping channels 8 mounted on their end face rather than at their sides, and use solid clamping bars 9" to wedge the coverings 5 in position.

[0063] The extrusions 3' also differ from those of the previous embodiment in that they include channels 19 for mounting the panels 2, so that the spacer elements 14 are not required.

[0064] The space between the panels 2 may be filled e.g. by soundproofing material 20.

[0065] Fig. 9 shows a top trim element 21 mounted on the top extrusion 3' to provide an aesthetically pleasing finish to the screen 1. The trim element 21 is fixed onto the extrusion 3' by a christmas tree connector 22 which pushes into a central fixing channel 23 on the extrusion 3'.

[0066] In this embodiment, the fabric coverings 5 cover the sides of the extrusion 3', and so the trim 21 may be of a shallower depth than would be used in the prior art, where the trim would need to extend over the whole of the extrusion 3'.

[0067] Fig. 10 shows the extrusion 3' of Fig. 9 used as a bottom extrusion of the screen 1, and with a suitable bottom trim 24 mounted thereon.

[0068] Fig. 11 shows a fourth embodiment of the invention in which the extrusion 3' of Fig. 9 is used as a side extrusion 4" (so that clamping of the coverings 5 takes place between the side extrusions of the screen), and shows a possible side trim 25.

[0069] The above are only some embodiments of the present invention, and variations and modifications of the above are also possible. For example, the clamping extrusion or bar could take any other suitable form, and could comprise a number of clamping channels and/or bars spaced along the screen extrusion, rather than a continuous channel or bar. Also, the clamping action could be provided by one or more protrusions along an extrusion, with one or more clamping elements clipping over the protrusion(s) to clamp an edge of the screen covering therebetween. Further, a single clamping channel 8 might be used for the coverings 5 of both sides of the screen 1, or only one covering on one side might be necessary. The channels could also face any suitable direction other than from the side or from the top face, and for example could be at 45° to the side and face channels mentioned above. Also, the edges 5a of the coverings 5 which are to be clamped may be attached to the clamping bars 9, e.g. by being threaded through a slot in the bars, before the bars are inserted into the clamping channels 8.

Claims

1. A screen assembly (1) comprising a panel (2) mounted between two extrusions (4) and a covering (5) extending over one side of the panel (2), wherein two opposed ends of the covering (5) are clamped to the extrusions (4).

2. The screen assembly (1) according to claim 1 wherein at least a part of the covering (5)is clamped between a portion (8) of an extrusion (4) and a clamping element (9).

3. The screen assembly (1) according to claim 2 wherein the portion (8) of the extrusion (4) comprises a channel and the clamping element (9) is receivable within the channel to clamp the covering.

4. The screen assembly (1) according to claim 3 wherein the clamping element (9) comprises an elongate bar.

5. The screen assembly (1) according to claim 2 wherein the portion (8) of the extrusion (4) comprises a protrusion and the clamping element (9) is receivable over the protrusion to clamp the covering (5).

6. The screen assembly (1) according to claim 4 wherein the clamping element (9) comprises a clip.

7. The screen assembly (1) according to any of claims 2 to 6 wherein either the portion (8) of the extrusion (4) or the clamping element (9) are flexible to compliantly clamp the covering (5).

8. The screen assembly (1) according to any of claims 2 to 7 wherein the clamping element (9) extends substantially the length of the extrusion (4).

9. The screen assembly (1) according to any of claims 2 to 8 wherein more than one clamping element (9) is receivable by the portion (8) of the extrusion (4).

10. The screen assembly (1) according to any of claims 2 to 9 wherein the covering (5) is attached to the clamping element (9).

11. The screen assembly (1) according to any of claims 2 to 10 wherein the clamping element (9) or the portion (8) of the extrusion (4) is formed with formations (10) which increase the grip on the covering (5).

12. The screen assembly (1) according to any preceding claim wherein two coverings (5) are provided, one for each side of the panel (2), and wherein at least a part of each covering (5) is clamped between a portion (8) of an extrusion (4) and a clamping element (9).

13. A screen assembly (1) comprising a panel (2), an extrusion (4) attached to an edge of the panel (2), and a covering (5), wherein the covering (5) is clamped between a portion (8) of the extrusion (4) and a clamping element (9).

14. A screen extrusion (4) including clamping means for clamping a screen covering (5) thereto.

15. A kit for making a screen comprising a panel (2), two or more extrusions (4), a covering (5) and clamping means (8, 9) for clamping the covering (5) to the screen.

16. A method of making a screen in which coverings (5) for the screen are clamped in place on extrusions (4) surrounding the screen.

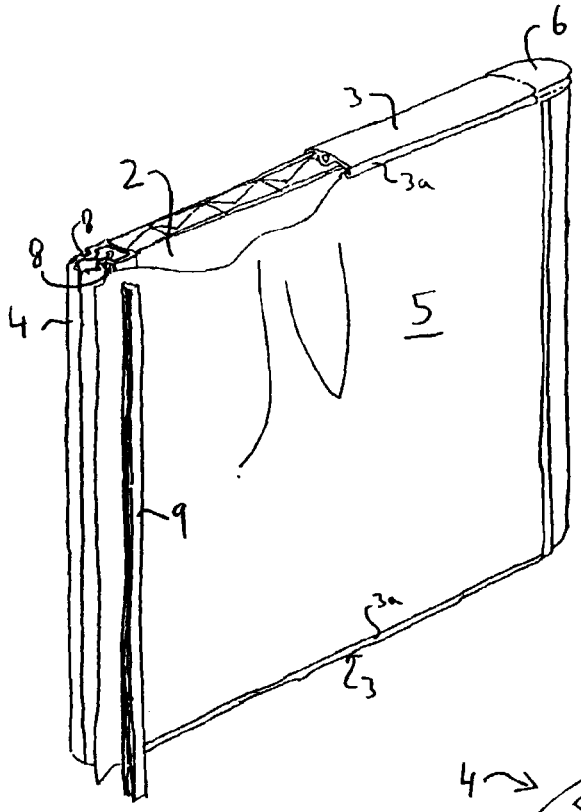

Fig. 1

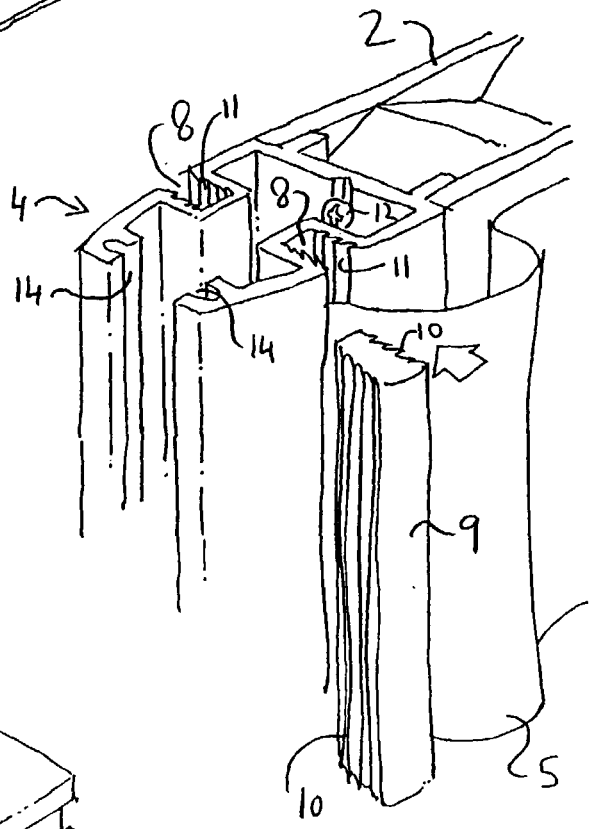

Fig. 2

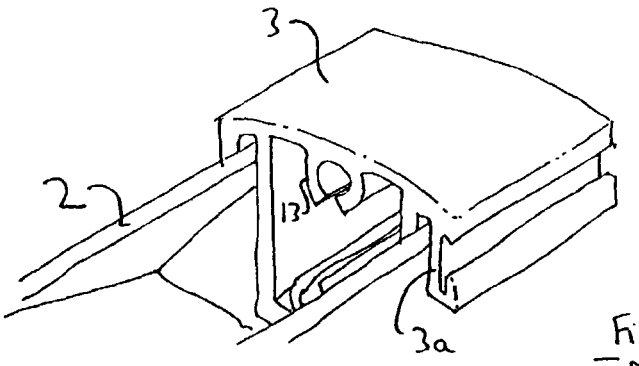

Fig. 3

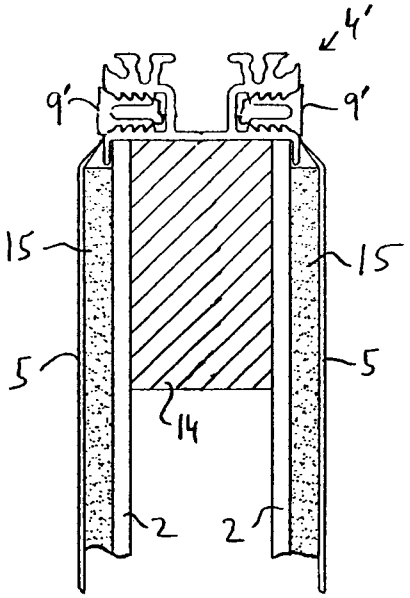

Fig. 4

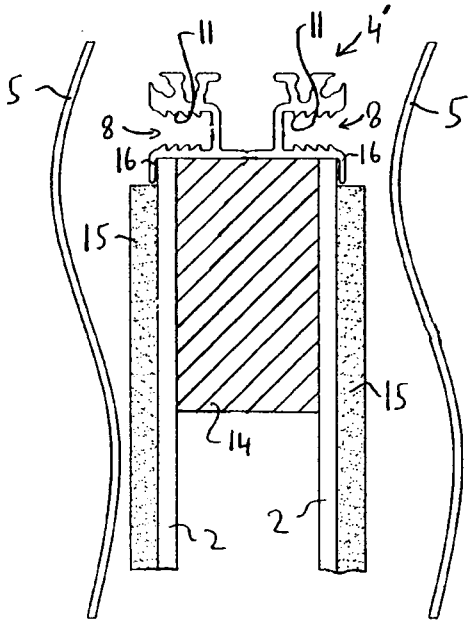

Fig. 5

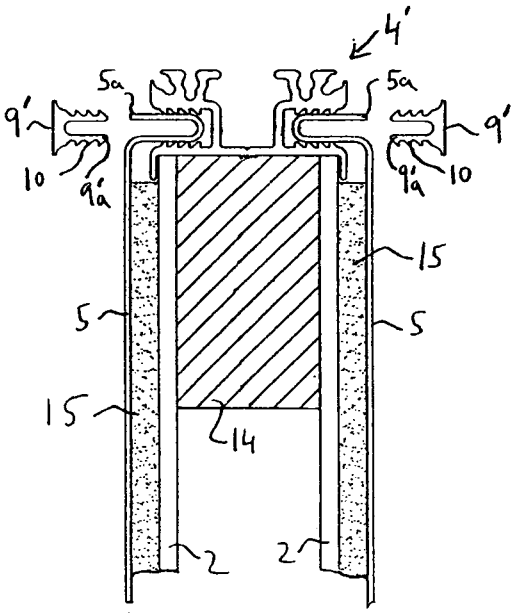

Fig. 6

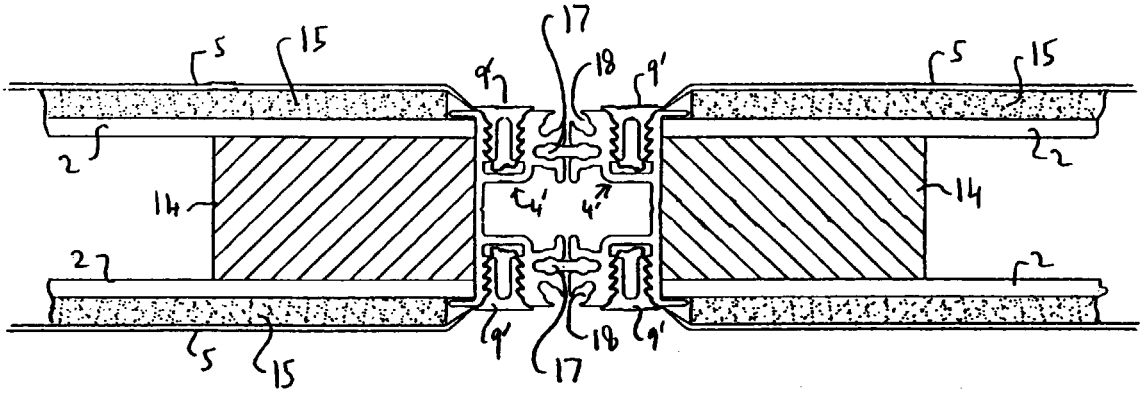

Fig. 7

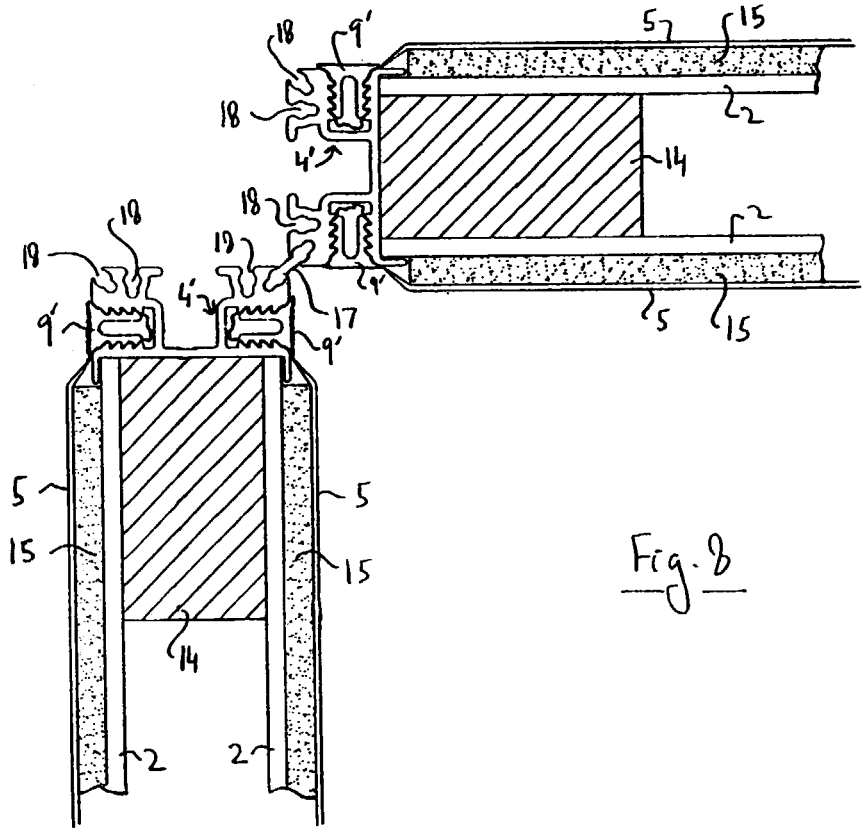

Fig. 8

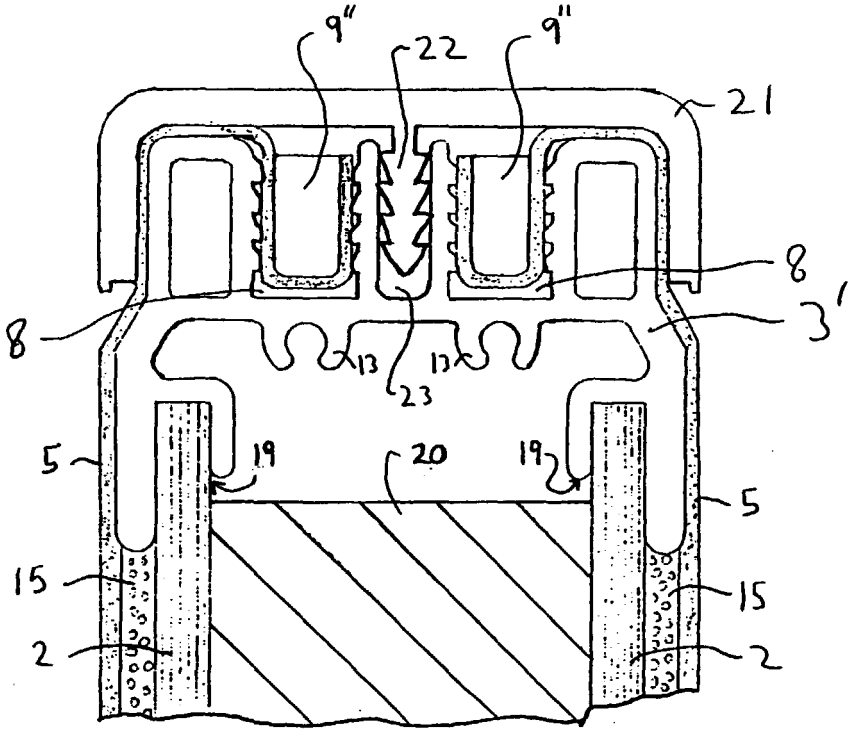
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Fig. 9

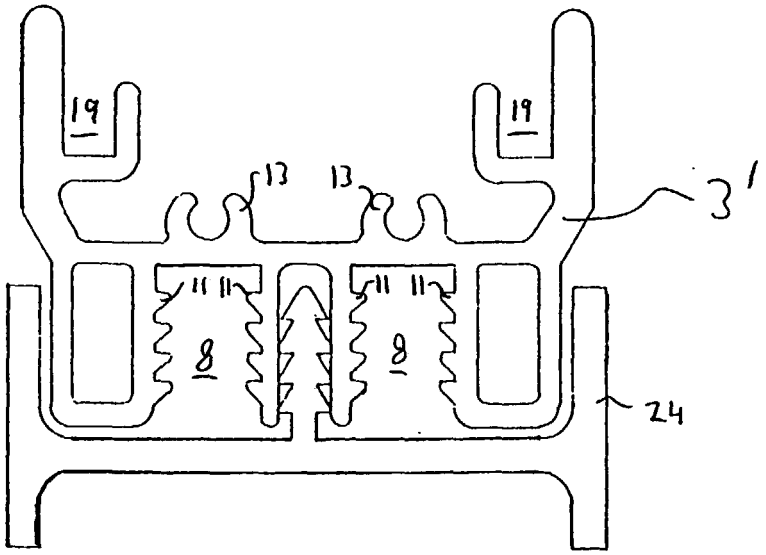
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Fig. 10

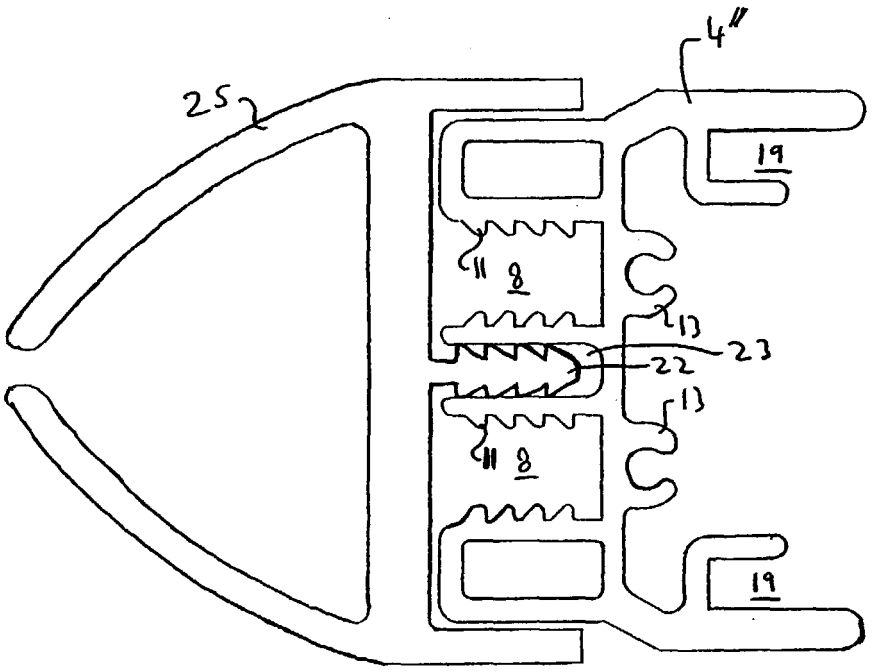

Fig. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 30 0445

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.7)
X	FR 2 637 631 A (CHENEL GUY) 13 April 1990 (1990-04-13) * page 5, line 11 - page 6, line 1; figures 4,5 *	1-4,7,8, 12-16	E04B2/74
Y		11	
X	US 5 086 606 A (FINSES GREGORY R) 11 February 1992 (1992-02-11) * column 3, line 1 - line 23; figures 5-7 *	1-4,7,9, 12-16	
Y	FR 2 668 520 A (TEC AB ;BAUER ALAIN (FR)) 30 April 1992 (1992-04-30) * page 3, line 7 - line 18; figure 1 *	11	
X	EP 0 826 842 A (STEELCASE STRAFOR) 4 March 1998 (1998-03-04) * column 4, line 38 - column 5, line 12; figures *	1-4,6,8	
A	US 4 215 765 A (HARRIS DAVID A) 5 August 1980 (1980-08-05)		TECHNICAL FIELDS SEARCHED (Int.Cl.7) E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	4 April 2000	Kriekoukis, S

CATEGORY OF CITED DOCUMENTS

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04-04-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2637631 A	13-04-1990	NONE	
US 5086606 A	11-02-1992	NONE	
FR 2668520 A	30-04-1992	NONE	
EP 0826842 A	04-03-1998	DE 69600845 D DE 69600845 T ES 2124621 T	26-11-1998 08-07-1999 01-02-1999
US 4215765 A	05-08-1980	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82