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(54) Frame arrangements.

(57) There is provided a door frame arrangement 10 comprising a primary frame 15 which is secured to a wall 13 and a secondary frame 16 which engages the primary frame using groove 28. The secondary frame 16 is then secured to the primary frame 15.

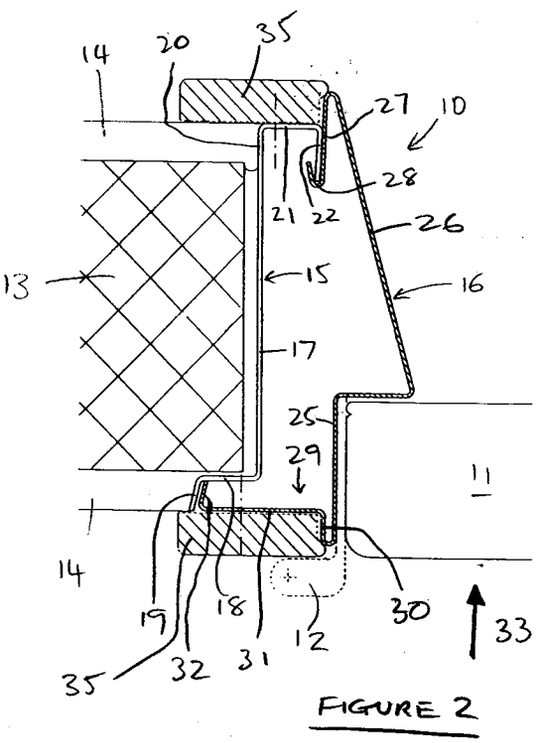

FIGURE 2

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This invention relates to frame arrangements for doors and windows.

According to a first aspect of the present there is provided a frame arrangement for a door or window opening in a structure, which frame arrangement comprises a primary frame which in use is secured to the structure and a main frame which in use is secured directly to the primary frame.

In preferred arrangements the primary frame comprises primary metal sections and each primary metal section has a generally constant cross section along its length.

Another preferred feature is that the main frame comprises main sections and each main section has a constant cross section along its length. Preferably the main sections slide from one side of the structure in a direction perpendicular to the general plane of the opening into engagement with the corresponding primary metal sections and are then secured together. In a preferred arrangement means are provided to prevent unauthorised withdrawal of the main sections.

Conveniently each primary metal section is generally s-shaped and has a planar part for lying generally against a flat surface of the structure facing into the opening, a first side part at an angle relative to said planar part so as to extend around the edge of said flat surface and a second side part at an opposite angle to said planar part so as to extend away from the structure.

With a preferred embodiment the end of said first side part is angled away from the structure and may constitute a plaster stop. In one arrangement the end of second side part is angled back so as to constitute a tongue for engaging a cooperating groove formation on the main section.

Preferably each main section provides a right-angled recess for receiving the door/window and also an oblique face extends from the vicinity of said recess to said groove formation.

It is envisaged that the frame sections could be made from a number of materials such as metal, wood, plastics and materials.

According to another aspect of the present invention there is provided a main frame for attachment to a primary frame secured to a structure.

Preferably the main frame is a metal section having a constant cross-section along its length and provides a right-angled recess for receiving the door/window, an oblique face extending from the vicinity of said recess to a groove formation by which in use it engages said primary frame.

Various embodiments of the invention will now be described in more detail. The description makes reference to the accompanying diagrammatic drawings in which:

Figure 1 is a section through a frame arrangement according to the present invention,

Figure 2 is an enlarged view of part of Figure 1,

Figure 3 is a section through another frame arrangement according to the present invention,

Figure 4 is an enlarged view of part of Figure 3,

Figures 5, 7, 8, 9, 10, 11 and 12 are sections through other frame arrangements according to the present invention, and

Figure 6 is an enlarged view of part of Figure 5.

Figures 1 and 2 show a door frame arrangement 10 and a door 11 attached to the frame arrangement 10 by means of a hinge 12. The hinge is shown in broken lines because it could of course be on either upright edge of the door. It will also be appreciated that the door frame arrangement 10, which comprises two parallel jambs and a top cross member, could easily be adapted to be a window frame arrangement by simple provision of a bottom cross member. Also, the door or window need not be quadrilateral but could with suitable modification be any suitable shape e.g. triangular, hexagonal. Other door forms such as double doors and doors with fixed or hinged side panels are also possible.

This frame arrangement 10 is disposed between two walls 13 which in this case have a layer of plaster 14 on each side. The plaster could of course be replaced by drylining or another suitable covering if desired.

The frame arrangement 10 comprises primary sections 15 and main sections 16. Each primary section 15 is attached to the wall by any suitable means such as screws or bolts through the planar part 17 before the plaster 14 is applied to the wall. The side part 18 of the section 15 is bent back at right angles so as to extend around the corner of the wall 13 and the extreme end 19 is bent outwardly. The end 19 then acts as a plaster stop when the wall 13 is subsequently plastered. The planar part 17 extends at 20 beyond the edge of the wall 13 and again acts as a subsequent plaster stop. The side part 21 of the primary section 15 is bent away from the wall so as to form a U-shape with parts 20 and 22. The provision of plaster stops mean it is possible to control both the finished wall thickness and the relationship of the frame to the wall surfaces.

It will be appreciated that primary sections 15 and indeed the main sections 16 have the same cross-section throughout their length and are preferably made of steel although other metals, wood and plastics materials could also be suitable. The sections could be pre-assembled into a door frame shape or could be connected together on site. In addition the wall could also be built around the primary frame so that the primary frame acts as a template for the door opening in the wall.

The main frame can then be positioned and secured. The main frame comprises, for a door,

three main sections 16 and these may be pre-connected with or without the door 11 connected or assembled on the primary frame on site. Each section 16 has a right angled recess 25 for receiving an edge of the door 11, and an oblique section 26 extending from the recess 25 to an end portion 27 which provides a lengthwise groove 28. The other side 29 of the main section 16 is bent back on itself at 30, back at right angles at 31 and back inwards at 32.

The oblique section provides a pleasing "lead-in" for the door. It also allows more space than conventional frames for operating the door handle and so reduces the chances of damaging the hand. It has been found that the triangular frame shown is very stable especially in a fire where the frame would have a tendency to expand into the structural opening. However, this shape of section is by no means limiting. For example the lead-in may be convex or concave or may even be dispensed with entirely. Alternative lead-ins are shown in figure 13 which can be coupled to either type of end formation shown. Others are of course possible.

The main sections 16 are engaged with the corresponding primary sections 15 by simple movement in the direction of arrow 33. The end 22 of the primary section 15 is received in groove 28 so preventing further movement of the main frame in the direction 33. The two sections 15, 16 are then secured together for example by self-tapping screws between side part 18 of the primary section 15 and angled part 31 of the main section 16. Once all of three sections 16 are in place the door 11, if not already attached, can be hung on the frame. Architraves 35 can then be attached either by adhesive or nails or other suitable method so as to cover the joins between the sections 15, 16, which gives added security and easier cleaning. The control provided by the plaster stops ensures that the main frame and architraves fit accurately with no uneven gaps.

In figures 3 and 4 a slightly modified arrangement is shown, like parts being given like reference numerals. In this application the door 11 and door frame 10 are mounted in a corridor situation between walls 13. The primary frame 15 is this time secured to spacer blocks 50, which might be a steel or other metal section or, if fire rating is not a concern, wooden, secured to the walls 13. Assembly is conducted in exactly the same way except that parts 19 and 20 of the primary section 15 do not act as plaster stops.

In figures 5 and 6 a slightly modified arrangement again is shown, like parts being given like reference numerals. In this application the door 11 and door frame arrangement 10 are mounted in a thick wall 13 or possibly the end of a corridor. The end part 19 of the section 15 again forms a plaster stop as in the figures 1 and 2 arrangement but this time side part 21 forms a plaster stop on the other side of the frame. No architrave 35 is provided on this other side because the join between the plaster 14 and the primary section 15 is hidden by the extremity of the main section 16 when attached.

In figure 7, like parts have again been given like reference numerals. In this arrangement however a conventional plaster stop 60 is used on the closing side of the door.

In figure 8 there is shown a modified arrangement in which many parts are similar to those described above and so have been given like reference numerals. The wall 13 is provided at the opening with a C-stud 80 to which is attached an optional spacer 81. The primary frame 15 may be attached to this spacer 81 or through the spacer to C-stud 80. The primary frame is S-shaped in section and has welded to it at intervals nuts 82. Brackets 83 carrying spacers 85 are also welded to the secondary frame 16 at positions corresponding to the nuts 82.

The secondary frame 16 is manouvered into engagement with the primary frame and is attached thereto by bolts 86 which pass through the secondary frame 16 in the door recess and into engagement with the nuts 82. The secondary frame has a lower portion 31 which extends beyond the primary frame and presents a quality surface which takes the place of the architrave although no securing means or joins are visible.

In figure 9 the figure 8 arrangement is shown in an end corridor situation. Such situations are particularly well suited to the present arrangements where the frame is assembled from one side only. This effectively maximises the possible door width in a given corridor situation.

Door frames, often together with the door, are at present generally installed before plastering and painting has occurred.

Plasterers, painters and other finishing trades therefore either get amounts of their materials on to the factory finished frames and doors or they have to exercise undue care around windows and doors which wastes valuable time. Also, the frames are susceptible to damage because of the amount of work continuing around them.

The described arrangements however have a primary frame which is accurately secured in the door or window opening. The plasterers and painters can then work quickly around them without excess care because the primary frames are not factory finished due to their being unseen in the end. The main frames together with doors or windows, and architraves can then be installed in the final stages of the building programme so they have a clean, undamaged appearance. This final installation is also quick and easy because the

fitting of the primary frame has been totally accurate so as to make up for any building tolerances. The end result is of excellent quality because the main frame, together with door or window are factory finished and assembled.

This delay in completion of construction also gives the future occupier a greater time to choose the final doors or windows, for example style or colour. This is because the stock primary frame is adapted to receive any number of main frames. These main frames could also be stock items or made to order items. Also door and window furniture could be chosen and attached in factory.

There are of course further advantages. Steel or other metal doors are often specified for a building for a number of reasons but primarily because they are more secure and are good fire doors. These doors and conventional wooden fire doors are best mounted on steel, or other metal, frames. Such frames obviously provide structural stability and durability. They are also free from dimensional instability, such as swelling due to moisture absorption, and are more hygienic because cracks, breeding sites for mould and bacteria, are very unlikely. They also require little maintenance. The described arrangements are of course readily suitable to construction from steel or other metal sections either rolled or even extruded. Also the primary frame can extend around the edge of the wall which enhances stability.

Also the hollow nature of the frames could constitute a conduit for electrical wiring and other like services.

In figure 10 there is shown a modified arrangement which could be used in any of the envisaged-arrangements. A spring clip 70 is attached to the primary frame 15 in this case by the bolt 71 which secures the primary frame 15 to the wall 13. The spring clip could of course be formed integrally with the primary frame 15 or be attached by means independent of the wall fixing arrangement.

In the arrangement shown the free end of the main frame 16 is modified at 72 by being bent back on itself. When the main frame 16 is moved into engagement with the primary frame 15, the end 72 deforms the spring clip 70 which returns when the end 72 has passed. Should an attempt be made to remove the main frame 16 from the direction it was inserted by removing the architrave and say unscrewing the frame connection, the spring clip will engage the end 72 to prevent removal of the main frame 16.

Means may of course be provided to enable the main frame to be removed after it has been connected. In its simplest form access to the spring clip 70 could be provided, inside of the door, whereby the spring clip 70 can be deformed so as to allow the end 72 to pass when the main frame 16 is withdrawn.

It will be apparent that the other suitable means could be provided. For example the end may not need to be modified at 72 if the spring clip 70 projects far enough into the opening.

The secondary frames described above lock into the primary frames along their full length by virtue of the hook and lip engagement between the two frames. This provides a very stable and strong box structure. This is advantageous from a security point of view because the two frames are difficult to force apart along their entire length and from a fire safety point of view because the two frames would tend to brace together if heated thereby improving stability.

Figure 11 shows a still further arrangement where the frame looks similar on both sides of the door without the use of architraves. In this embodiment however the two frames 15, 16 are inserted from different sides of the wall 13. This has the advantage of allowing visible corners to be mitred and factory welded but, as shown, does not provide the advantage of a separate unfinished primary frame to act as a finish template. However, it is possible to achieve this by adapting the system to a three-part, instead of a two-part, frame as illustrated in figure 12.

Claims

1. A frame arrangement for a door or window opening in a structure, which frame arrangement comprises a primary frame which in use is secured to the structure and a main frame which in use is secured directly to the primary frame.

2. A frame arrangement as claimed in claim 1 wherein the primary frame comprises primary metal sections.

3. A frame arrangement as claimed in claim 2 wherein each primary metal section has a generally constant cross-section along its length.

4. A frame arrangement as claimed in claim 3 wherein the main frame comprises main sections.

5. A frame arrangement as claimed in claim 4 wherein each main section has a generally constant cross-section along its length.

6. A frame arrangement as claimed in claim 5 wherein the main sections slide from one side of the structure into engagement with the corresponding primary metal sections.

7. A frame arrangement as claimed in claim 6 wherein each primary metal section is generally S-shaped and has a planar part for lying generally flat against a flat surface of the structure facing into the opening.

8. A frame arrangement as claimed in claim 7 wherein each primary metal section has a first side part at an angle relative to said planar part so as to extend around the edge of said flat surface and a second side part at an opposite angle to said planar part so as to extend away from the structure.

9. A frame arrangement as claimed in claim 8 wherein the end of said first side part is angled away from or towards the structure so as to constitute a plaster stop.

10. A frame arrangement as claimed in claim 7 wherein the end of said second side part is angled back so as to constitute a tongue for engaging a cooperating groove formation on the main section.

11. A frame arrangement as claimed in any one of claims 4 to 10 wherein each main section provides a right angled recess for receiving the door/window.

12. A frame arrangement as claimed in claim 11 wherein the recess provides the location for means securing the main section to the primary section.

13. A frame arrangement as claimed in claim 12 wherein nuts are welded to the primary frame at spaced intervals and countersunk bolt means are provided at corresponding intervals in the recess.

14. A frame arrangement as claimed in any one of claims 11 to 13 wherein an oblique face extends from the vicinity of said recess to said groove formation.

15. A frame arrangement as claimed in any one of claims 4 to 14 wherein the main sections are made from metal or plastic or wood.

16. A main frame section for attachment to a primary frame section secured to a structure, the main frame having a generally constant cross-section along its length and providing a right-angled recess for receiving a door/window, an oblique face extending from the vicinity of said recess to a groove formation by which, in use, the main frame section engages said primary frame section.

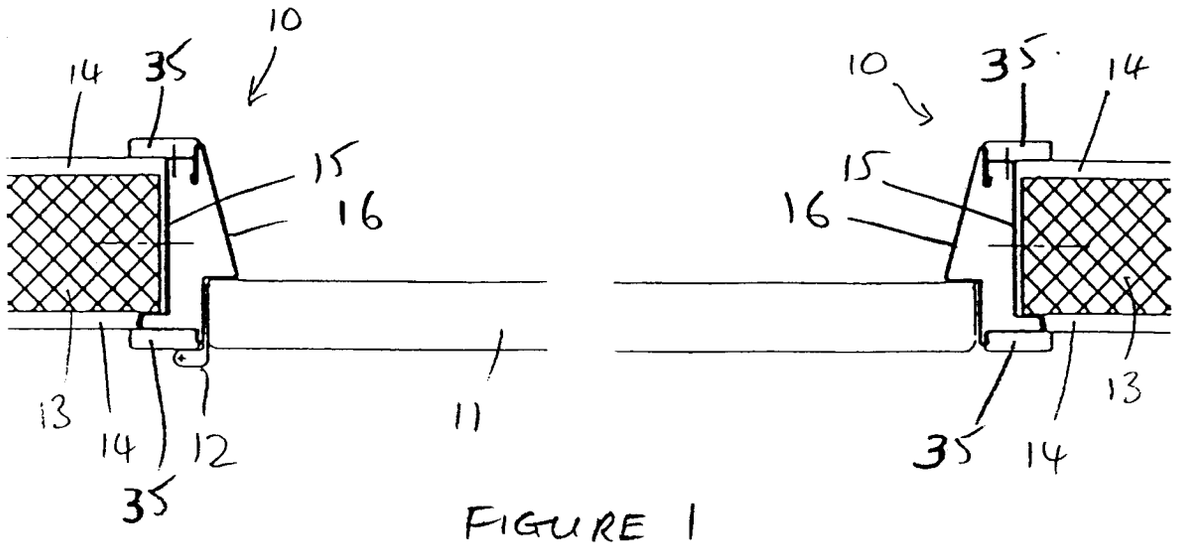

FIGURE 1

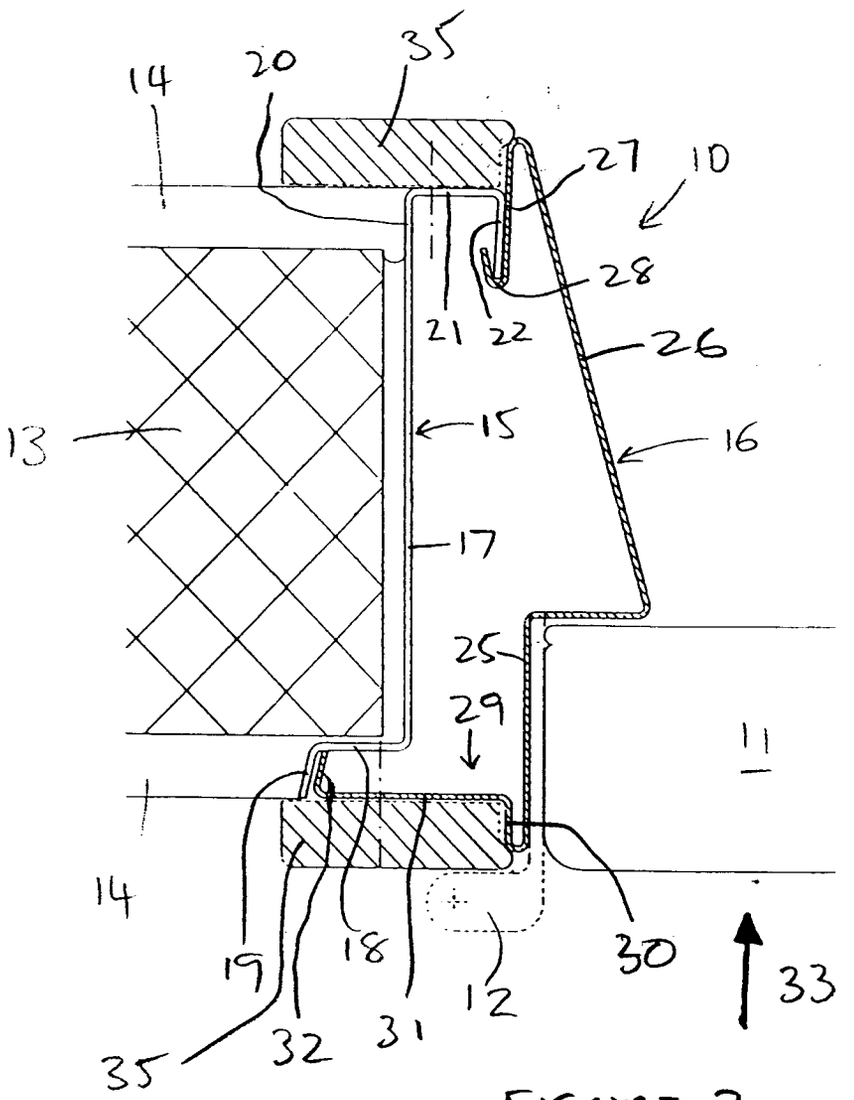

FIGURE 2

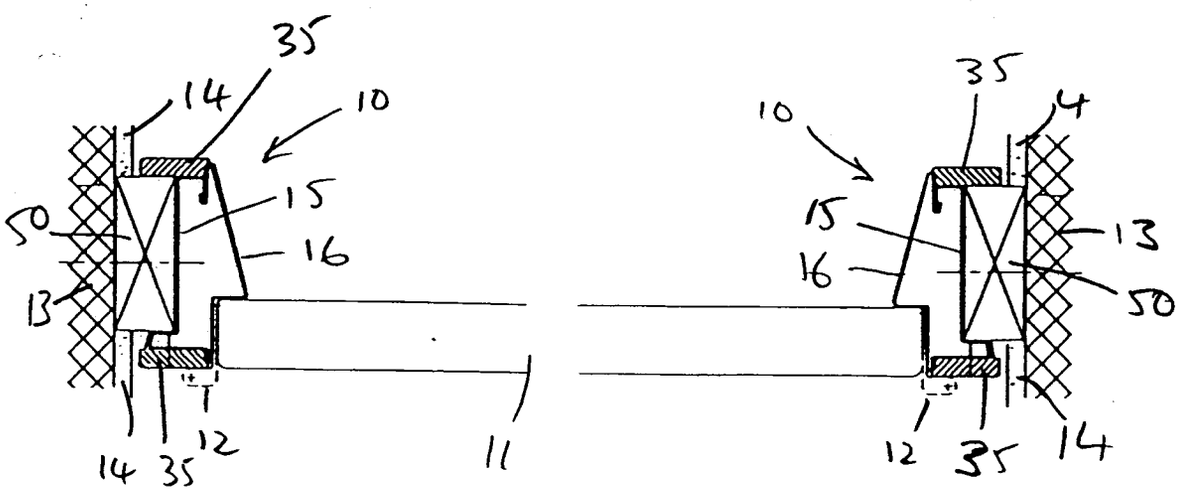

FIGURE 3

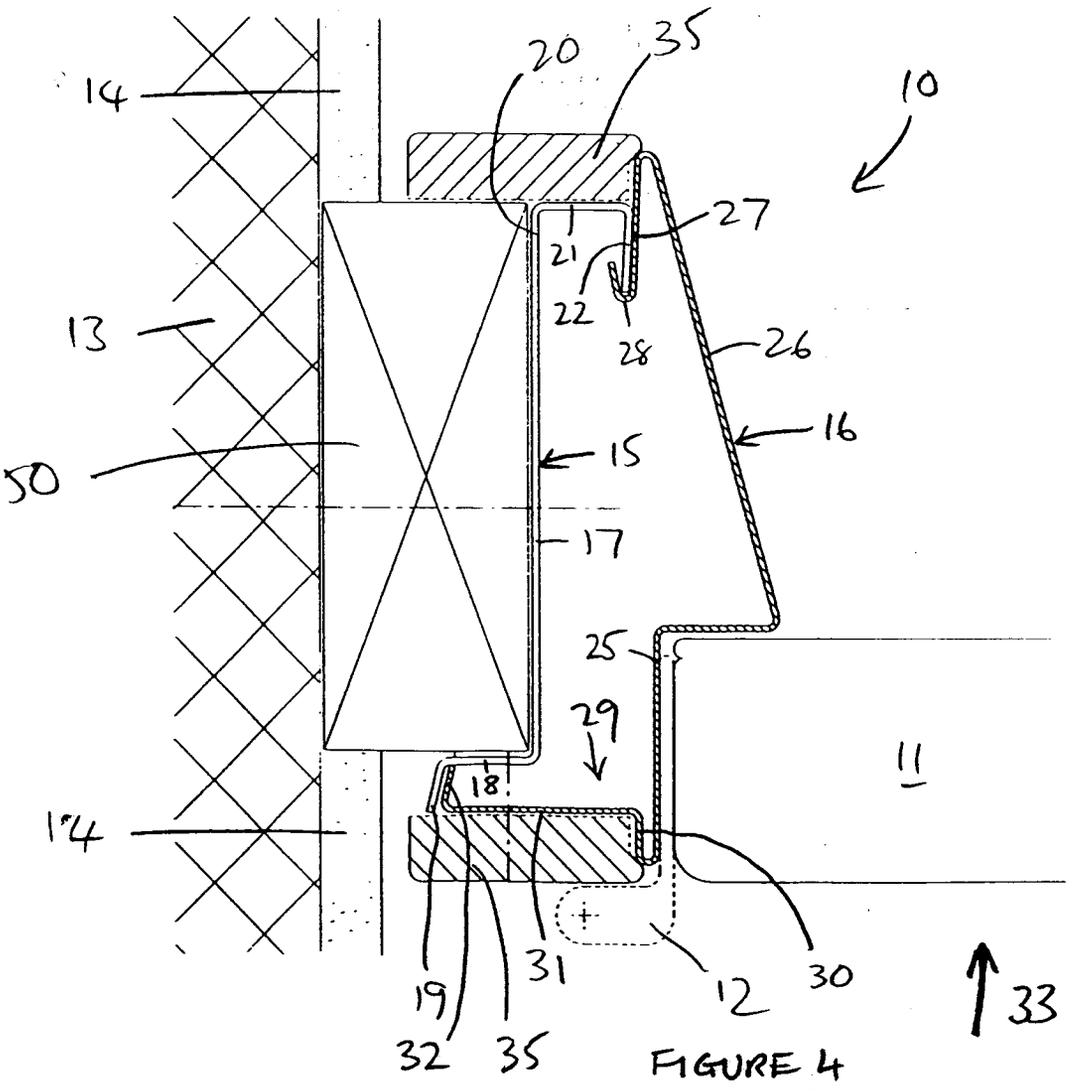

FIGURE 4

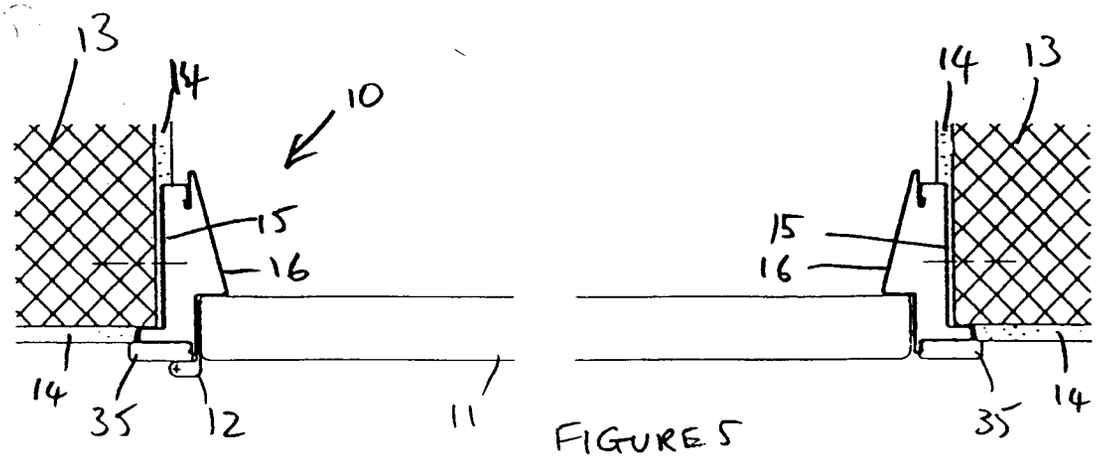

FIGURE 5

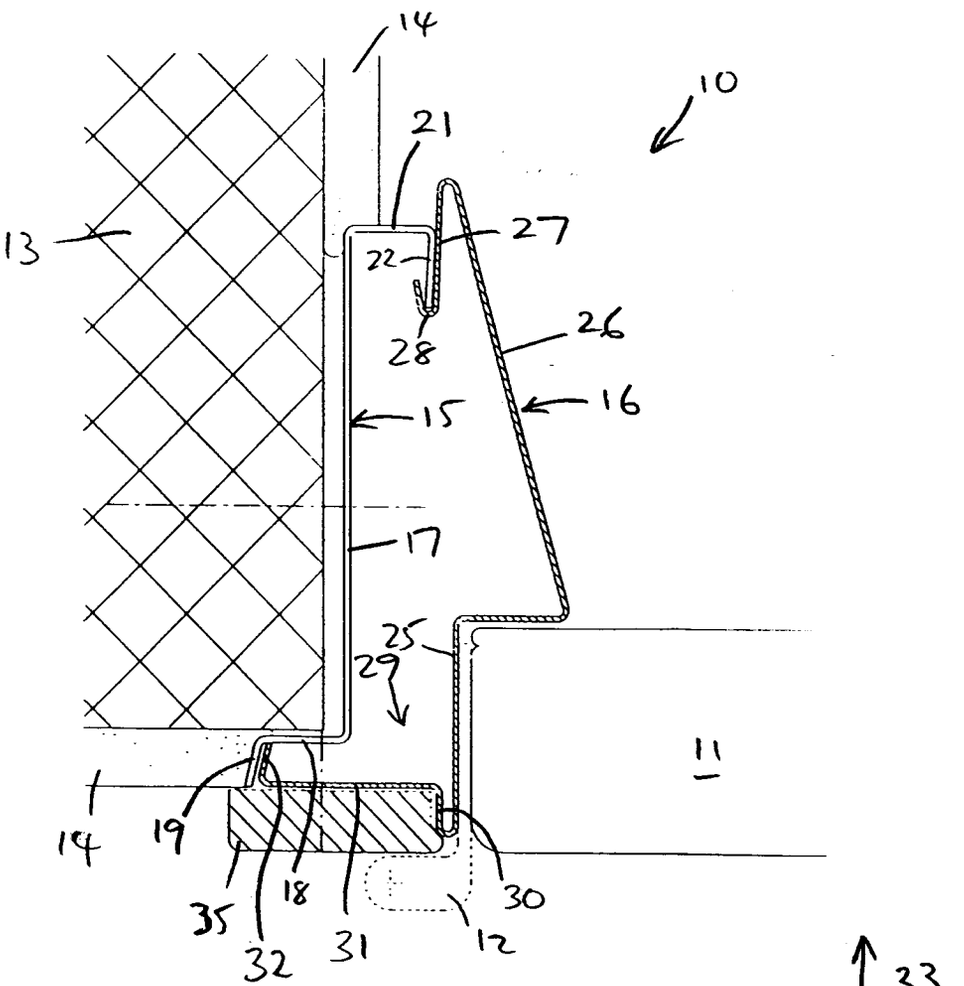

FIGURE 6

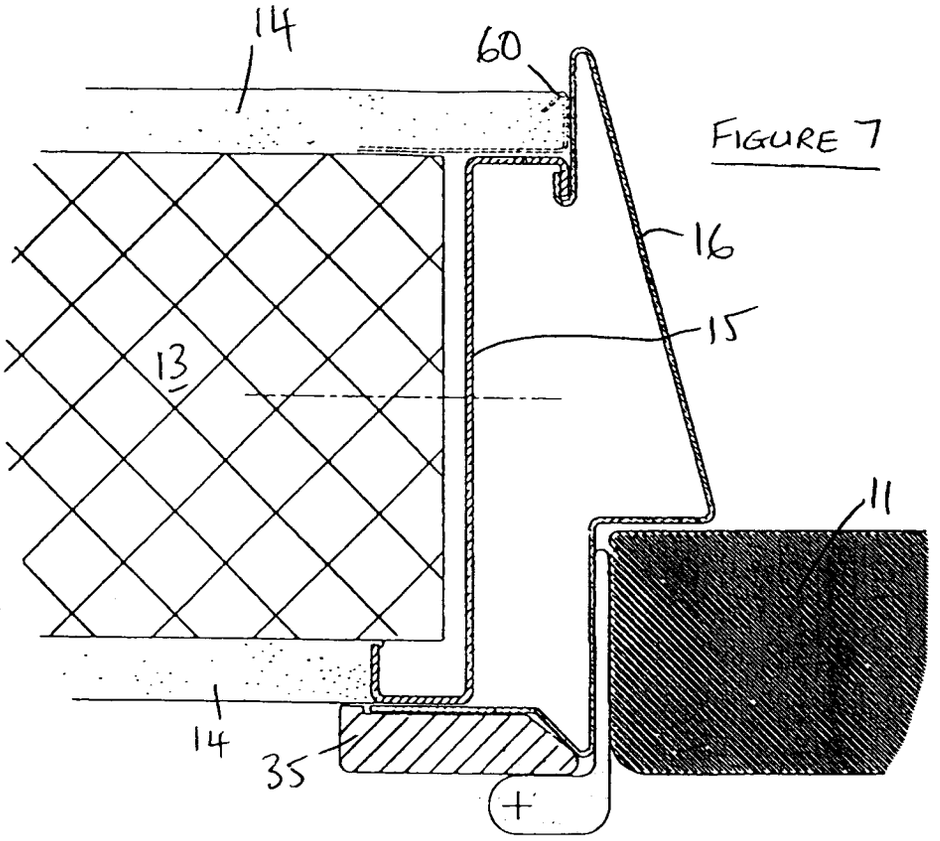

FIGURE 7

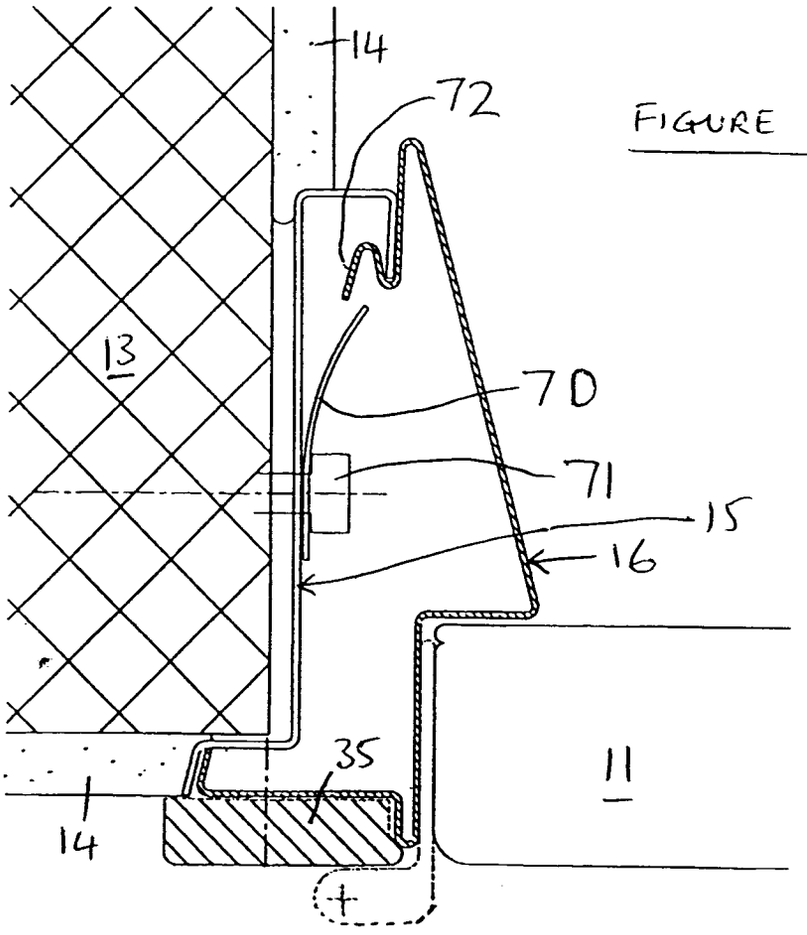

FIGURE 10

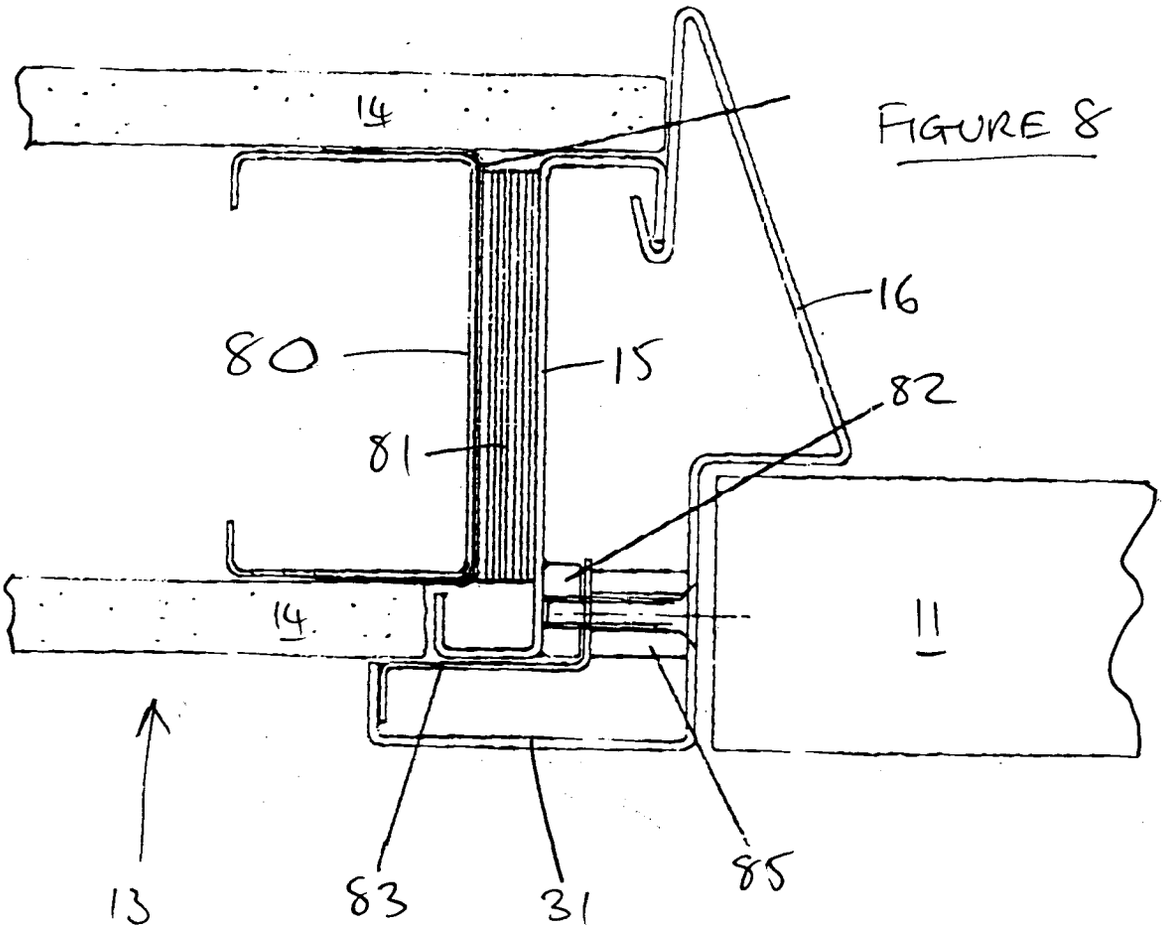

FIGURE 8

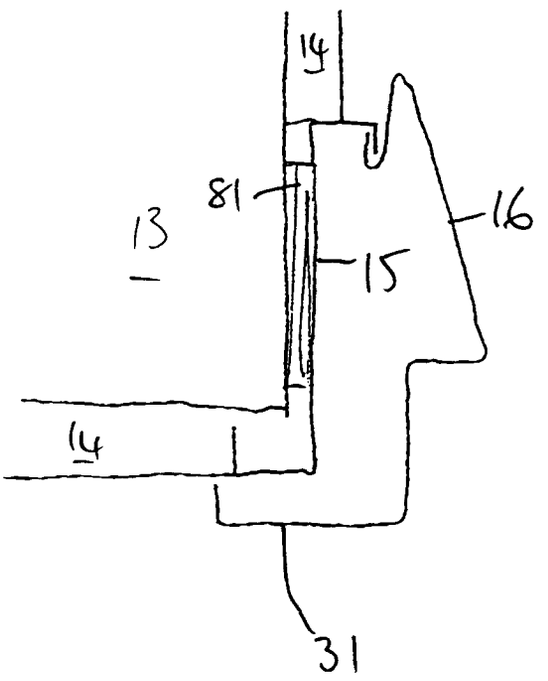

FIGURE 9

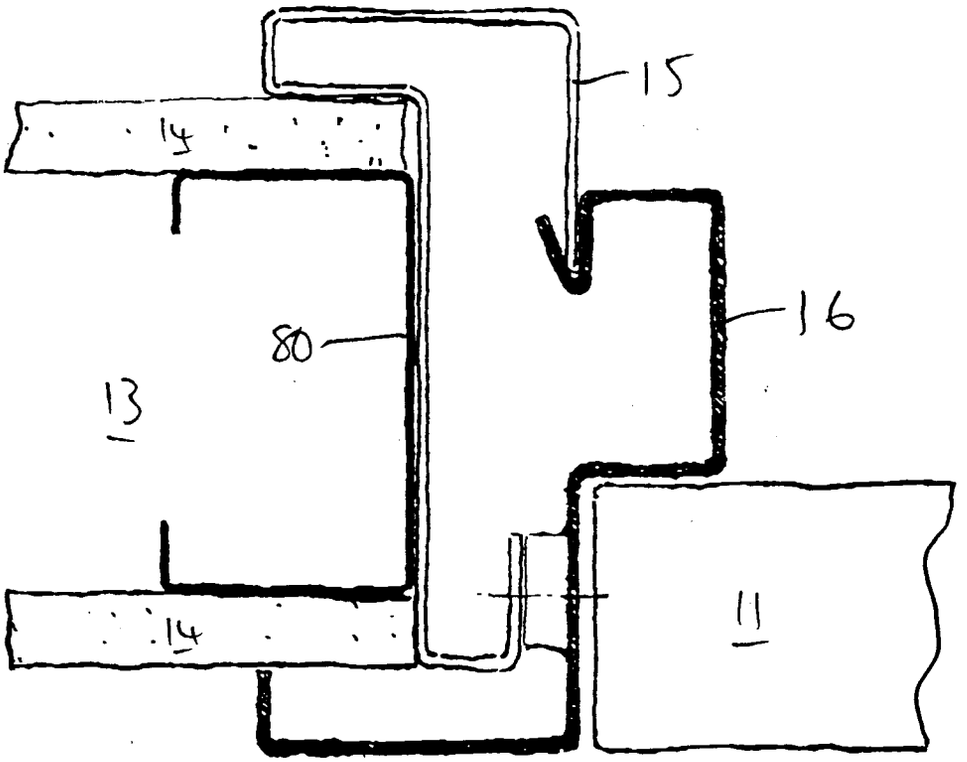

FIGURE 11

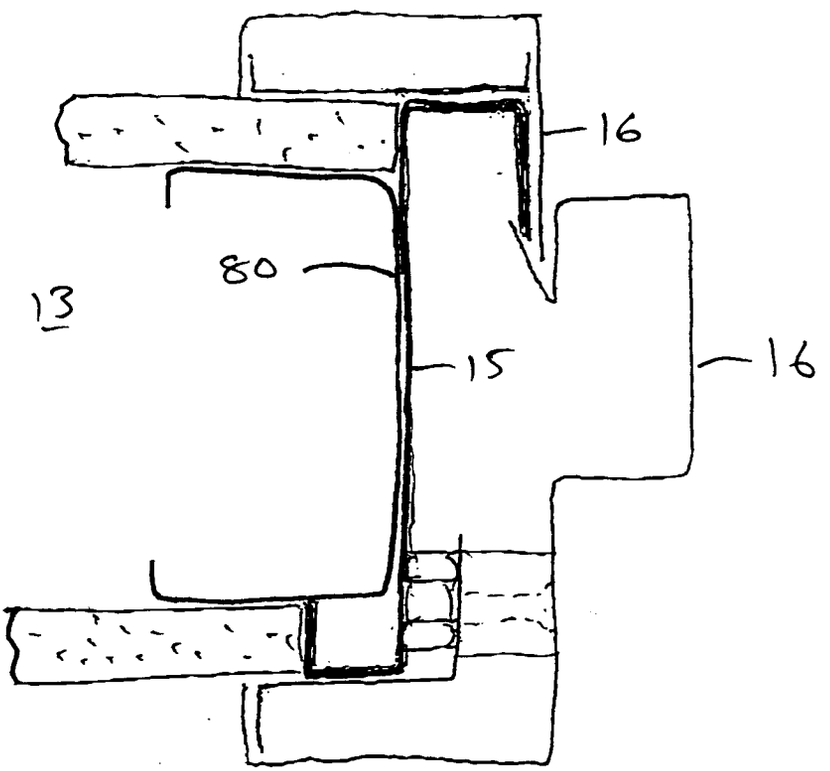

FIGURE 12

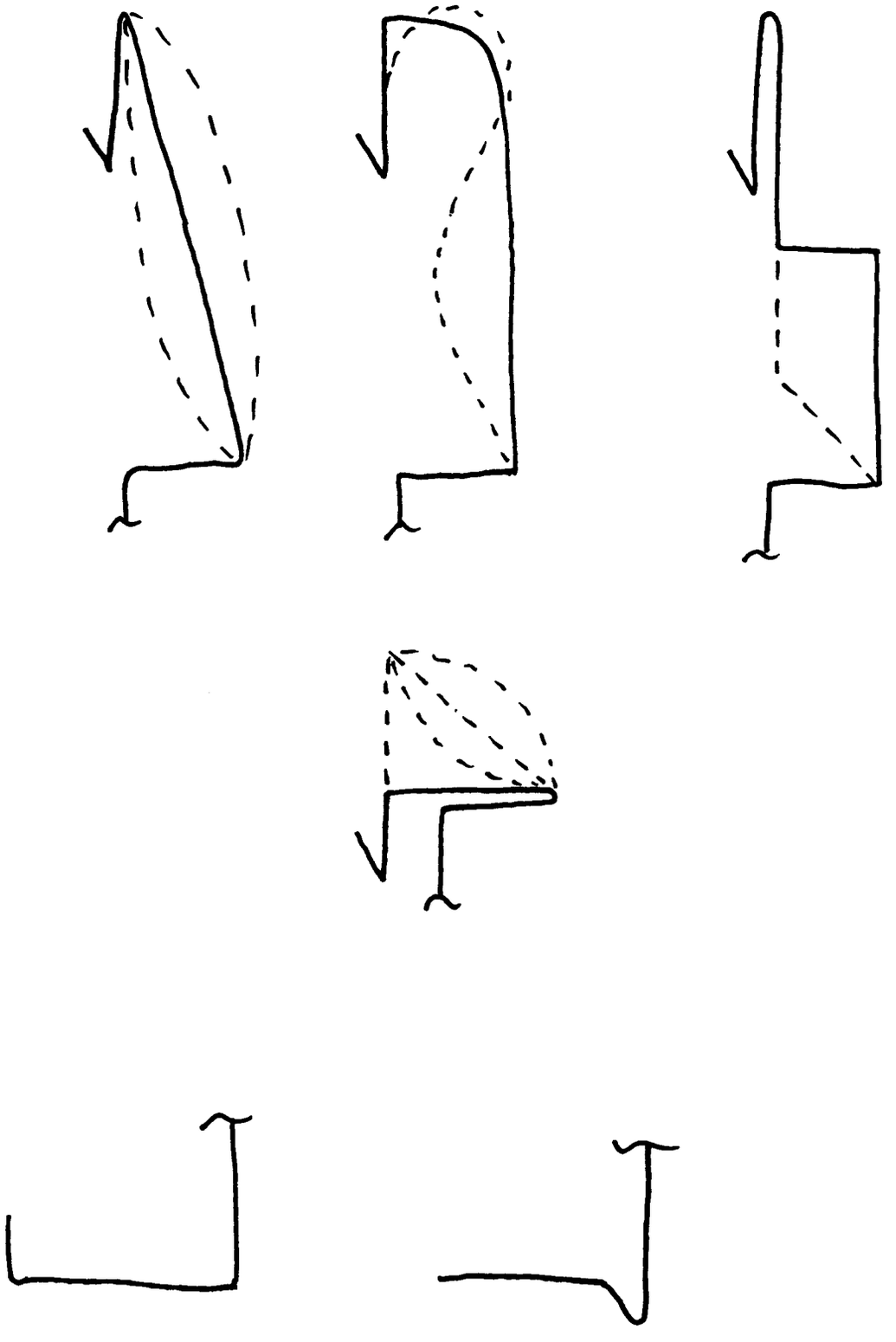

FIGURE 13

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EUROPEAN SEARCH REPORT

Application Number

EP 91 31 1938

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)
X	DE-A-2 221 988 (GEBRÜDER UHL)	1-9,11, 15	E06B1/02
Y	* page 5, paragraph 4 * * figures *	10	
X	DE-A-2 003 009 (HELLBERGS INDUSTRIER)	1-8,11, 15	
	* page 4, line 18 - page 5, line 5 * * page 6, paragraph 4 -paragraph 5 * * figures 1,6 *		
X	DE-A-2 111 476 (TERRA TECHNIK)	1-6,11, 15	
Y	* page 4, paragraph 1 -paragraph 3 *	10,12, 14,16	
	* page 5, paragraph 4 -paragraph 5 * * figure 2 *		
Y	FR-A-1 525 388 (BIGIO)	12,14,16	
A	* page 1, left column, paragraph 11 - page 2, right column, paragraph 1; figures *	1,4-6, 11,15	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	GB-A-1 427 074 (UNILOCK-TENON INTERNATIONAL)	1-5,7, 10,11, 14-16	E06B
	* page 1, line 61 - line 79; figures *		
A	US-A-2 856 040 (DANSEREAU)	13	
	* column 2, line 47 - line 70; figure 2 *		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	09 APRIL 1992	DEPOORTER F.

CATEGORY OF CITED DOCUMENTS

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