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(54) Floor and wall engagement means.

(57) The edge of a side wall (23) of a cabin is brought into engagement with a floor (25) or roof (16) and retained there by extrusions (35, 36), one (35) of which is secured to the floor, while the other (36) – secured to the edge of the side wall (23) – slides up a ramp (48), over a plateau (38), and into a valley (59) formed on the one extrusion. In the engaged position (Figure 9), there is horizontal location [possibly using an added stop (43)] and only limited freedom of relative vertical movement by virtue of cooperating hooked portions (45, 46) on the two extrusions. A shelf (47) opposes entry of moisture.

The engagement means, and the hinge of Figures 4–6 enable a cabin to be bult from pre-formed panels by hinging and pivoting.

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FLOOR AND WALL ENGAGEMENT MEANS

This invention relates to an engagement means between a floor and a slidable vertical wall, and has particular although not exclusive application to folding cabins and houses in which when unfolded and opened out a side wall moves over a floor into a final position. A similar situation arises where a folding partition is used to divide a large room in a permanent house into two smaller rooms.

The general practice in the past has merely been to slide the vertical wall into position and locate it by bolts so that there is no vertical location between the floor and the side wall, and no means for preventing draughts and moisture from passing underneath the side wall.

According to the present invention, an engagement means between the floor and a slidable vertical wall comprises a pair of extrusions or other sections, one having a portion for engaging the floor, and the other having a portion for engaging the bottom of the wall, the extrusions having co-operating surfaces.

The co-operating surfaces may for example be for sealing against draughts or moisture flowing between the floor and the lower edge of the wall, and/or they may be for providing horizontal location between the floor and the wall.

Preferably the co-operating surfaces are undulating surfaces which require a little vertical movement to bring them into engagement, but after which they remain in close co-operation by the weight of the vertical wall.

In a preferred form of the invention each of the extrusions has a 'C' shaped portion for hooking with its counterpart on the other extrusion to limit the amount of permissible relative vertical movement between the floor and the wall. Of course if, as in a folding cabin, a roof comes into position over the top of the side wall after the side wall is in position, the weight of the roof may well be sufficient to effectively eliminate vertical movement of the side wall.

Although the co-operating undulating surfaces may provide sufficient horizontal location in the final position, in many cases it will be desirable to provide a stop for engaging the floor and preventing disengagement movement of the wall.

According to another aspect of the invention, a cabin comprises a floor, roof, and side panels, some of which are hinged together at their meeting edges while others lock together where an edge of one panel meets the side surface of another, whether by engagement means as defined or by a bolt or the like.

According to a further aspect of the invention a cabin comprises a main section and an extension section and the extension section comprises end and side walls which can fold about vertical axis hinges to be generally against the side wall of the main portion or in an extended position, and a floor and/or a roof which are foldable about horizontal axes to be either generally against the side of the main portion, preferably outside the folded side and end walls, or in an extended position respectively below and above the side walls.

According to another aspect of the invention, in a method of making a cabin, panels for constituting floor, walls, and possibly roof, are assembled

together by bringing at least one panel to another at meeting edges, and by engaging the edge of at least one panel with the surface of another by engagement means as defined.

The invention may be carried into practice in various ways, and one embodiment will be described by way of example, with reference to the accompanying drawings, of which:

FIGURE 1 is a sketch of a folding house including a base and a folding side wall;

FIGURE 2 is a diagrammatic end view of a part of the house of FIGURE 1;

FIGURE 3 is a diagrammatic plan view of the same part of the house;

FIGURES 4, 5, and 6 are views of a hinge which can be used for some of the joints in the house of FIGURE 1;

FIGURE 7 is a section through a pair of extrusions used for locating a side wall in relation to the base in the house of FIGURE 1;

FIGURE 8 is a view corresponding to FIGURE 7 showing the two extrusions in the process of being located together;

FIGURE 9 is a view similar to FIGURE 8 but with the two extrusions in engagement;

FIGURE 10 shows how the extrusions of FIGURE 7 can be made to support a roof at the top of a vertical wall; and

FIGURES 11 and 12 are respectively an end view and a side view of a portable cabin which can be built using the hinges and locking means shown in FIGURES 4 - 10.

In the folding house shown in FIGURE 1, there is a central box like portion 13 consisting of a floor 14, end walls 15, and a roof 16, which is mounted on an under-carriage 17 to be capable of being transported by road. In use the desired width of the house is greater than the width of the box-like portion 13, which has a width capable of being transported by road.

On arrival at the site it is desirable to extend the house to its full width as easily as possible.

The components of the extension portion consist of extension end walls 21 hinged to the box portion at 22, extension sides 23 hinged to the extension ends at 24, an extension floor 25 hinged to the box portion at 26, and an extension roof 27 hinged to the box portion at 28. The arrangement of the hinges and of those components in the folded condition for transport is shown diagrammatically in FIGURES 2 and 3, and from those figures it can be seen that to erect the extension the extension roof 27 is raised about its hinge 28, and then the extension floor 25 is lowered about its hinge 26. In that condition it is supported horizontally on adjustable jacks 31 and then the extension sides 23 and the extension ends 21 are folded about the axes 24 and 22 to bring them into the position shown in solid lines to FIGURE 1.

All the hinges indicated at 22, 24, 26 and 28 may be of the kind, the subject of British Patent Specification No. 2077321, published in January, 1982, and reproduced as FIGURES 4,5, and 6 in this application. Each hinge is built up from two extrusions, each of which fits over the edge of one of the panels concerned, which hinges can be assembled together by longitudinal sliding and can be turned easily with some play about the relatively slidable members, but do define definite limiting positions of hinging in which the two hinged panels are respectively in line with each other and at right angles to each other, as shown repectively in FIGURES 4 and 6.

The present invention is particularly concerned with the method of engaging the bottom of an end wall extension 21, or a side wall 23, with the floor 14 or

25 in the fully erected position, and for that purpose there are provided a pair of co-operating aluminium extrusions, as shown in FIGURES 7, 8, and 9, one of which 35, is screwed around the three outer edges of the floor 25 while the other 36 is screwed along the bottom edges of the end wall extension 21 and the side wall 23.

The extrusions are of uniform cross-section and each has a flat surface 37 or 41 for abutting and securing to the floor 25 or wall 23 by screws 38 in countersunk holes, which can be drilled at appropriate spacings along the extrusions and screwed into the material of the floor or wall.

The extrusion 35 has an upstanding hook portion 45 and the extrusion 36 has a co-operating hook portion 46, the precise nature of which can be easily seen from FIGURE 7. The extrusion 37 also has a generally horizontal shelf 47 of corrugated form which locates the bottom of the wall 23 and in the engaged position of FIGURE 9 extends beyond the extrusion 35 to provide protection against the entry of moisture which will drop from the lower ridges 42 defined by the corrugation.

The horizontal part of the extrusion 35 has an upwardly inclined lead-in portion 48 leading up to a plateau 49 in which the holes are drilled for the screws 38. In a alternative arrangement the holes can be drilled in a gently curved valley 51 on the plateau.

FIGURE 8 shows that as the side wall and end wall extension are slid over the floor 25 towards the solid line positions of FIGURE 1, the hooked bottom 46 of the extrusion 36 rides over the upper surface of the floor, until it encounters the edge of the portion 48 of the extrusion 35. The curved leading part of the hook 46 enables the extrusion 36 to ride up the surface 48

as the side wall is pushed into position, until it reaches the plateau - or the heads of the screws 38- over which it slides horizontally until it drops into a valley 51 defined by the hooked portion 45 of the extrusion 35, which has a corresponding shape to the external lower surface of the end portion 46.

In that condition, as shown in FIGURE 9, there is positive location of the side wall 23 downwards in relation to the floor 25, and also to the left. There is a limited amount of permissible upward movement before the two hook portions 45 and 46 engage positively, whereas movement of the side wall 23 to the right in FIGURE 9 requires the extrusion and side wall to be lifted up to the plateau so that a fairly substantial push is required.

The interacting convoluted nature of the hook portions 45 and 46 of the two extrustions, in combination with the action of the corrugated shelf 47, substantially eliminates the entry of moisture or of draught between the bottom of the side wall 23 and the surface of the floor 25. The permitted relative vertical movement between the floor and the side wall may be about a quarter of an inch.

The arrangement of the two extrusions is a great advantage over previous proposals, according to which a vertical wall was merely slid into position on the floor and engaged by bolts. In such an arrangement although there was horizontal location, there was no vertical location between the floor and the wall and no kind of seal between them.

In the position shown in FIGURE 9 the side wall is located laterally because it needs to be lifted before reverse movement can take place in order to climb from the valley 51 to the plateau, but it is also possible to provide positive location by means

of a stop 43 screwed to the floor 25 by screws 44 extending through holes in the stop and the extrusion 35.

FIGURE 10 shows how the same two extrusions can be used to locate the pitched roof 27 to the top of the side wall 23. The relative angle between the two extrusions is not the same as in FIGURES 7-10, but as the side wall moves out - to the right in FIGURE 10 - the hooked portions 45 and 46 engage and form a positive stop, permitting only limited relative vertical movement. Again, the stop 43 can be fitted if necessary.

FIGURES 11 and 12 show another way in which the extrusions of FIGURES 4, 5, and 6 , and 7 and 8 can be used in building a small portable cabin quickly from six panels.

A floor 91 , roof 92, and side walls 93 are quickly assembled by using hinges 94 at three of the corners, which hinges are as shown in FIGURES 4,5, and 6, being engaged by longitudinal sliding.

The right-hand side wall 93 in FIGURE 11 is engaged at the bottom with the edge of the floor 91 using extrusion lock of FIGURES 7 to 9. Since the locking movement has to be from left to right in FIGURE 11, it may be necessary to take advantage of the flexibility of the material to lift the bottom edge of the extrusion 36 on the wall 93 inwardly over the hook 45 on the lower extrusion before the lock is engaged.

Then end walls 95, can be hinged to further hinges 94 at the ends of the roof 92, and pivoted downwardly into vertical positions to close the cabin being then maintained in place by stop 43. Access to the cabin could be had merely by lifting one of the end walls,

as shown in FIGURE 12. That end wall could have and extrusion, such as shown at 97 at its lower edge for engagement with the corresponding edge of the floor 91.

With all six panels in position, the cabin will be rigidly assembled.

The hinge of FIGURES 4-6 and the extrusion connection of FIGURES 7-10 also enable one to erect a complete cabin from e - cut panels as now described with reference to FIGURES 13 and 14.

The cabin is generally as shown in FIGURE 1 and description of its erection will start with the floor 14 having been correctly positioned with the extensions 25 properly supported. The floor is shown in the plan view of FIGURE 14 by the arrows 14.

The first step is to erect the central portion of the roof with two intermediate walls 101, 102, which are hinged to the floor at their bottom edges at 103 using hinges as shown in FIGURES 4-6, which can be assembled by simple longitudinal sliding. The walls are parallel with the ridge . The two roof panels 104, are hinged together at the ridge 105, and hinged to the tops of the walls 102, again using the hinges of FIGURE 4.

Assembly of these panels is easier if the walls are hinged to the dashed portions in FIGURE 13 where the roof panels do not have to be lifted higher than a man can stand. Then the whole assembly is pivoted to the central (solid line) position with the walls 101, 102 vertical.

It will be noted that the hinges can be arranged so that they only have to move between 90° and 180° limiting positions of FIGURES 6 and 4.

Although the walls only extend through a little more than a half of the length of the cabin, the roof panels 104 extend for the full length.

An end wall 106 is hinged to the edge of the floor at 107 using the same hinges, and while it is horizontal, part side walls 108 are hinged at each end of the wall 106, at 109.

The assembly of walls 106 and 108 is hinged upwards so that the wall 106 fits under the roof 104 and the end wall 106 butts against the edges of the inner walls 101, 102, where it can be retained by the connection of FIGURES 7 to 9. The part side walls 108 are pushed in against the walls 101 as shown at a dashed line 108.

An intermediate transverse wall 111 shown in chain lines in FIGURE 14 is hinged to the floor at 112 and pivoted up to the vertical position, where it abuts the edges of the walls 101, 102, where it is retained by the connection of FIGURES 7 to 9.

Similarly, the other end wall 114 with its hinged part side walls 115 is pivoted up to close the end of the cabin under the roof.

The roof may be merely made up from the panels 104 already lifted and hinged at the ridge, but if extension roof panels 27 are used, they are now hinged to the edges of the panels 104, after which the part side walls 108, 115, are all pushed out from the position equivalent to the dashed position 108 in FIGURE 14 and engaged with the underside of the roof or roof extension in this manner shown in FIGURE 10.

Kitchen and sanitary fittings and other additions are included as required.

It should be noted that any of the panels can be formed with doors and/or windows.

CLAIMS

1. An engagement means suitable for connecting a slidable vertical wall of a folding cabin with the floor or roof comprising a pair of extrusions or other sections (35, 36) one having a portion (41) for engaging the edge of the wall (23), and the other having a portion (37) for engaging the floor (25) or roof (16) in which one of the sections has a valley (51) for engaging a corresponding part (46) of the other section to provide horizontal location when the sections are engaged.

2. An engagement means as claimed in Claim 1 in which one of the sections has a ramp (48) up which the other section can be slid as the surfaces come into engagement.

3. Engagement means as claimed in either of the preceding claims in which each of the sections has a hooked shaped portion (45, 46) for hooking with its counterpart on the other section to limit the amount of permissible relative vertical movement between the floor and the wall.

4. Engagement means as claimed in any of the preceding claims including a locking piece (43) for providing a positive stop against disengagement movement of the sections.

5. Engagement means as claimed in any preceding claim in which when engaged the engagement surfaces prevent or restrict movement of draughts or moisture flowing between the floor and the lower edge of the wall.

6. A cabin in which a wall panel is held with its edge engaged with the surface of another panel by engagement means as claimed in any preceding claim.

7. A cabin comprising a floor, roof, and side panels, some of which are hinged together at their meeting edges while others lock together where an edge of one frame meets the side surface of another by engagement means as claimed in any of Claims 1 to 5.

8. A cabin comprising a main section and an extension section, the extension section comprising end and side walls which can fold about vertical axis hinges to be generally against the side wall of the main portion or in an extended position, and a floor and/or a roof which are foldable about horizontal axes to be either generally against the side of the main portion, or in an extended position respectively below and above the side walls.

9. A method of making a cabin, in which panels for constituting a floor, walls, and possibly a roof, are assembled together by hinging at least one panel to another at meeting edges, and by engaging the edge of at least one frame with the surface of another by engagement means as claimed in any of Claims 1 to 5.

10. A pair of extruded sections (35,36) for coupling an edge of a panel (23) to a surface (25) at a substantial angle to the surface of the panel, in which each extrusion has a face (37,41) for securing to a surface, and the extrusions have co-operating engagement means enabling one extrusion to be slid in relation to the other into an engagement position, from which direct release is opposed

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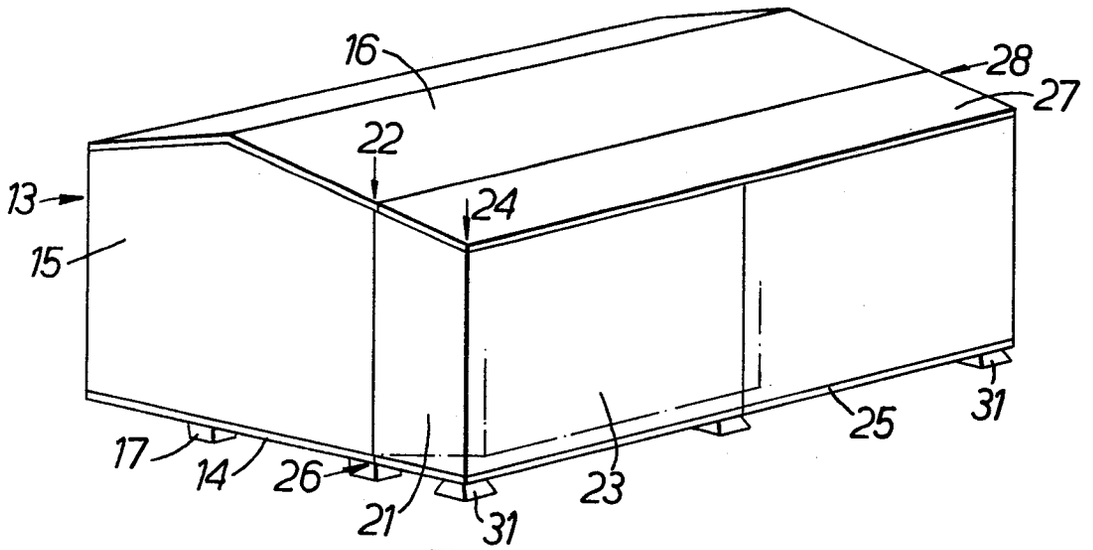

FIG. 1.

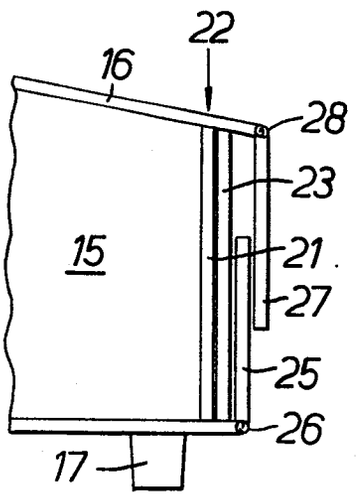

FIG. 2.

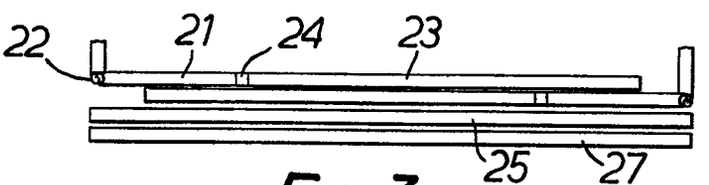

FIG. 3.

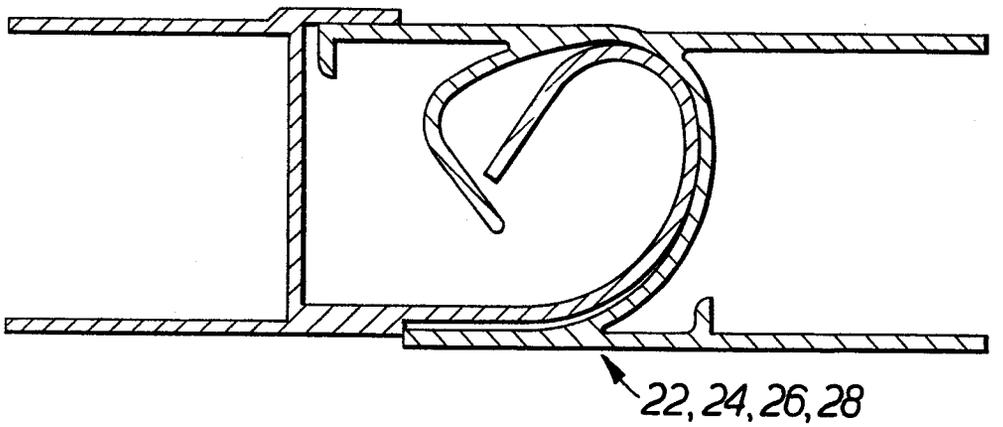

FIG. 4.

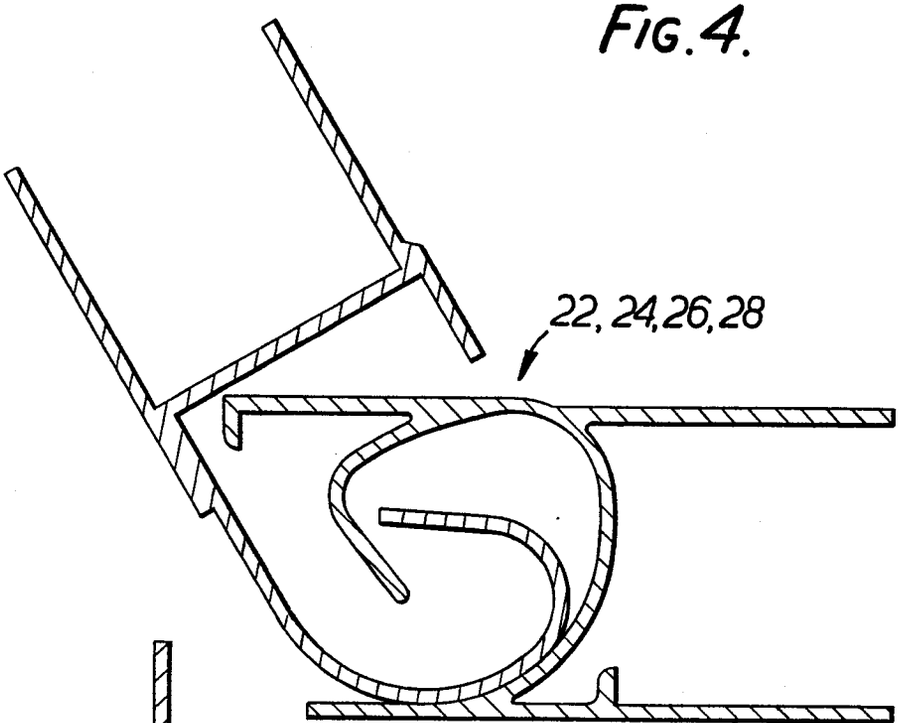

FIG. 5.

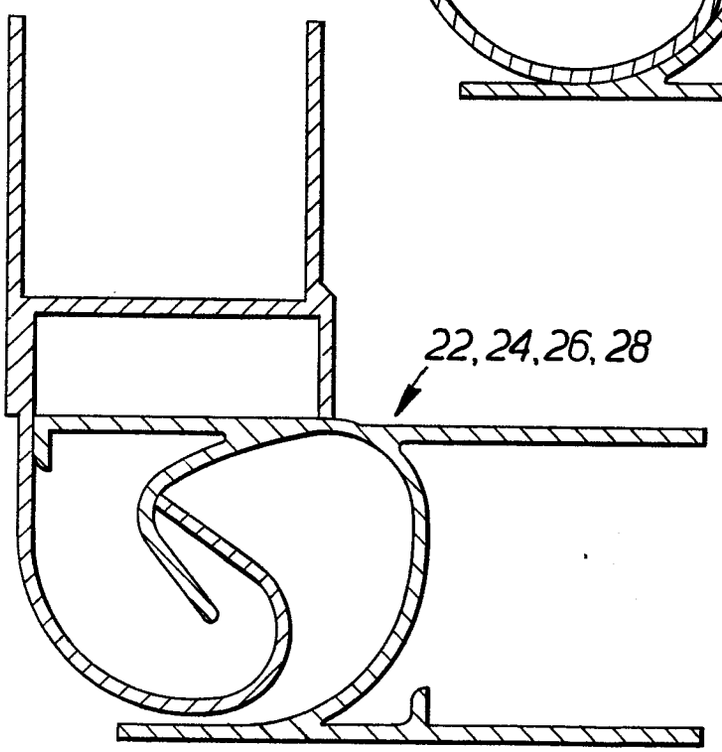

FIG. 6.

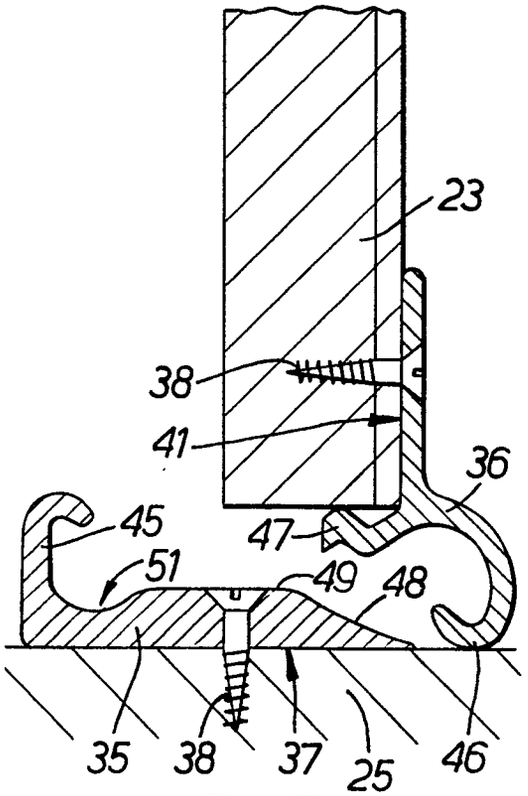

FIG. 7.

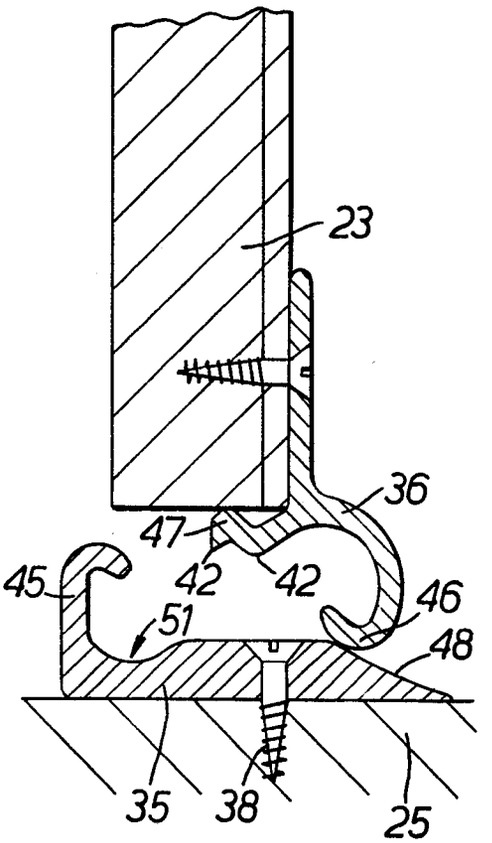

FIG. 8.

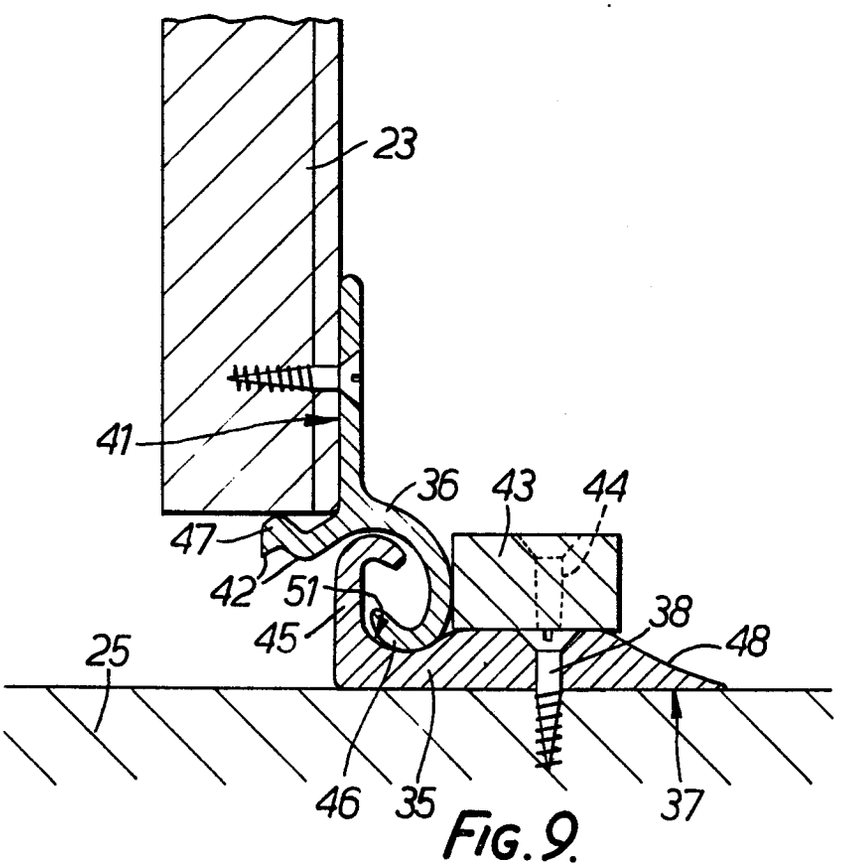

FIG. 9.

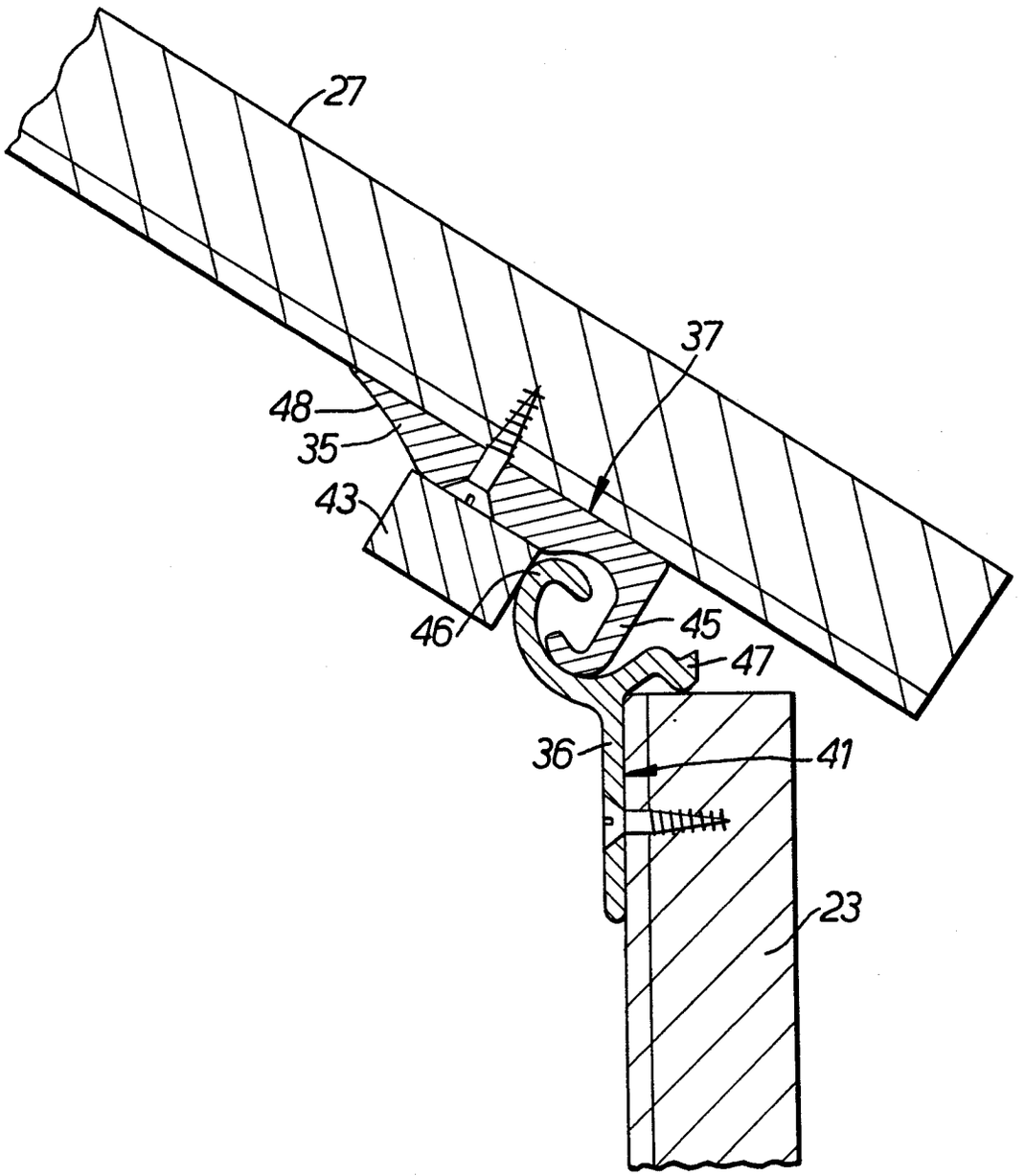

FIG. 10.

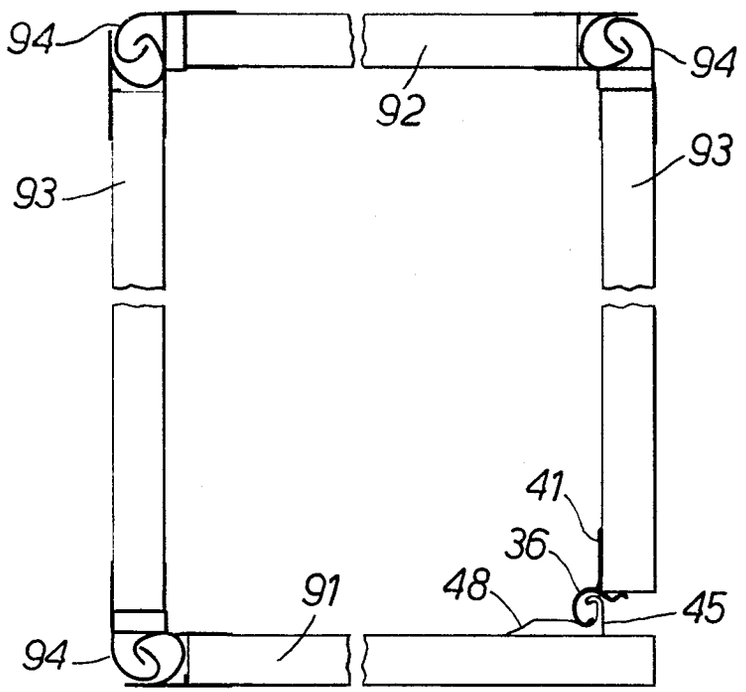

FIG. 11.

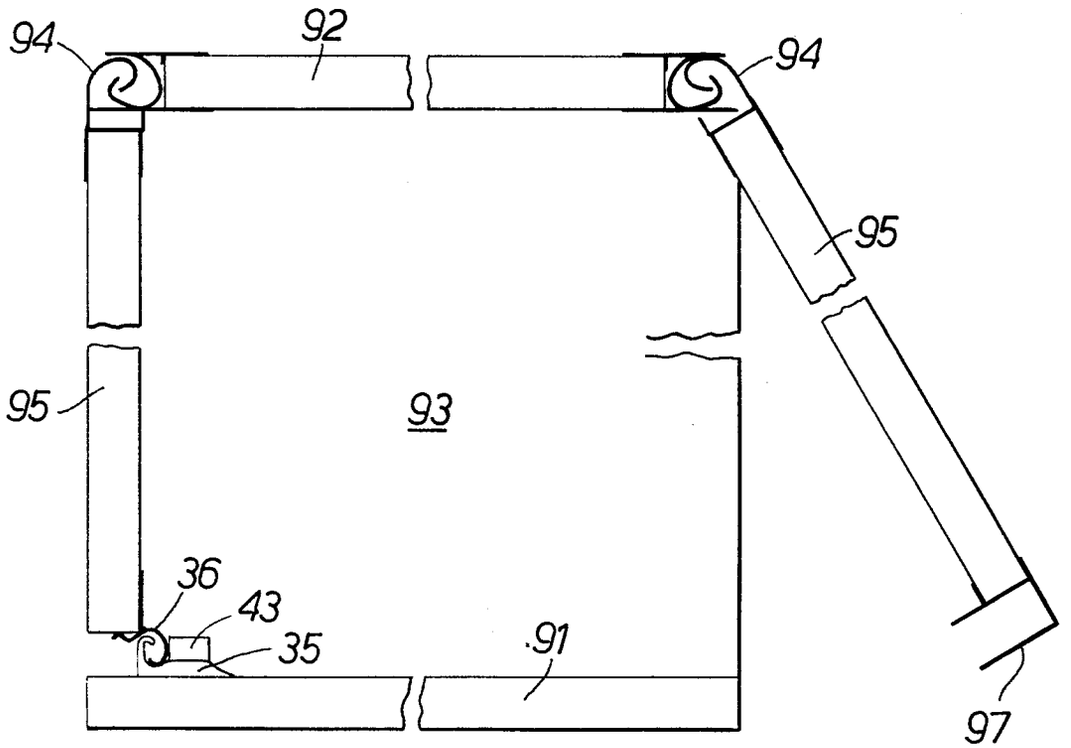

FIG. 12.

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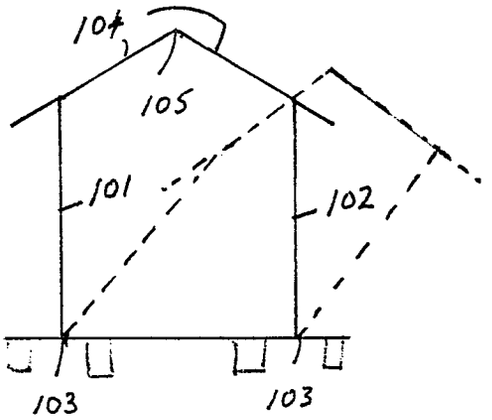

FIG. 13

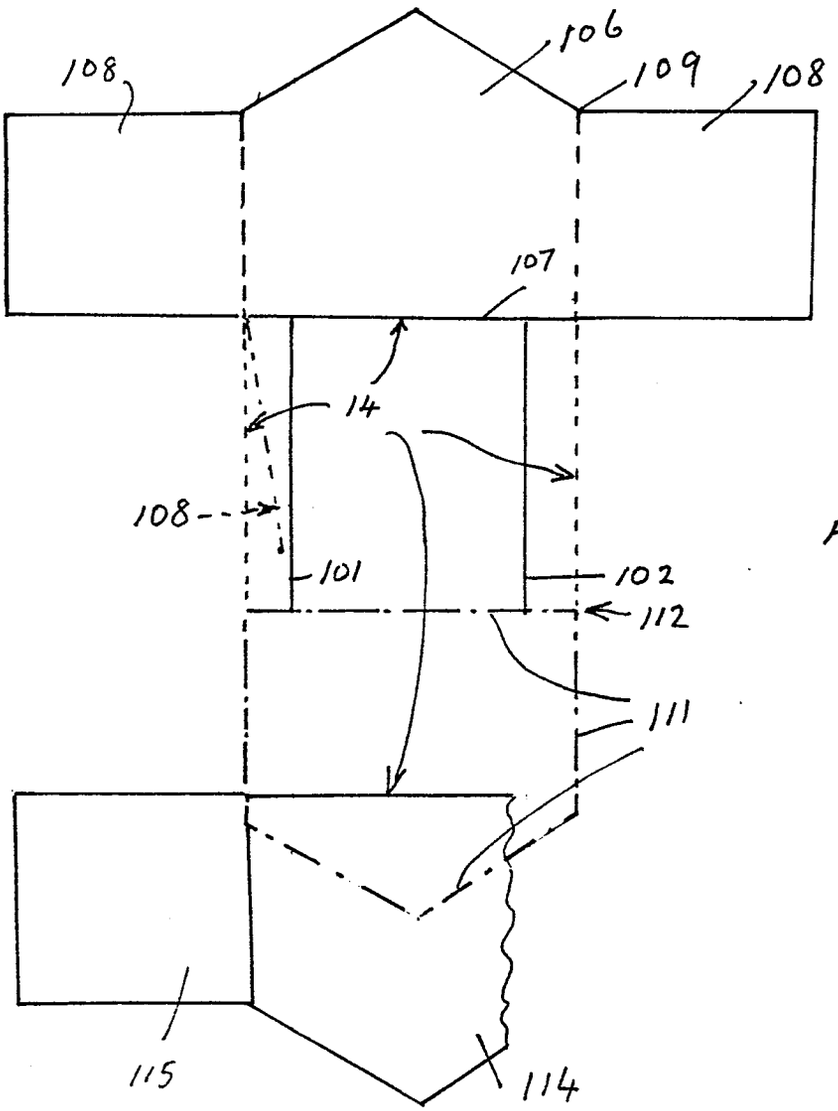

FIG. 14.