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71 Applicant: **GENERACELL CORPORATION**
1945 Corvair Avenue
Columbus Ohio 43207(US)

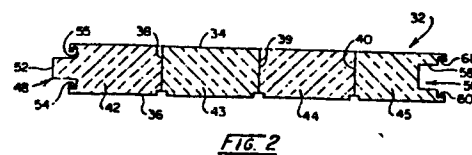
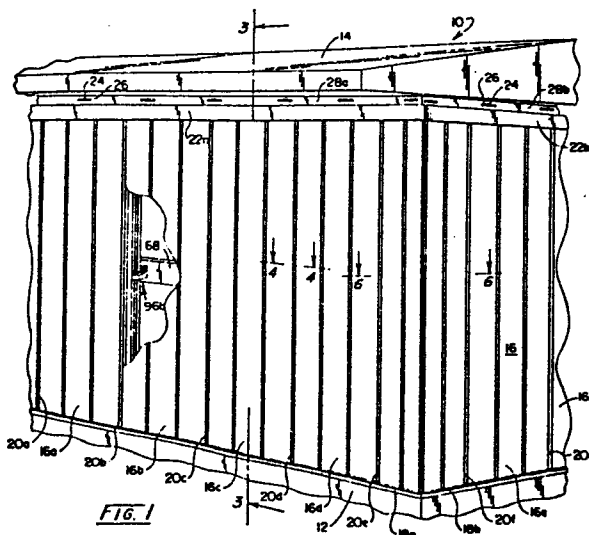
72 Inventor: **Aschinger, William T.**
585 Haversham Court No.
Gahanna Ohio 43230(US)

74 Representative: **Weydert, Robert et al,**
OFFICE DENNEMEYER S.à.r.l. P.O. Box 1502
L-1015 Luxembourg(LU)

54 Multi-panel wall assembly.

57 A multi-panel wall assembly wherein relatively light panels (16a - 16f; 32) are fashioned of an extruded shell of polyvinyl chloride having internal web components (38, 39, 40) therein for retaining externally disposed skins (34, 36) in proper geometry while providing compartments (42-45) for

receiving a rigid foam. The panels (32) are mutually interconnected by a tongue and groove union (48, 50) permitting lateral expansion and contraction. Fasteners (96) slideably retain the panels (16a-16f) in a vertical orientation such that they stand in a compressive state.



MULTI-PANEL WALL ASSEMBLY

Background of the Invention

Insulated, interior/exterior wall panels are widely used - in the construction of low-rise (i.e. under three stories) commercial buildings, and many other structures. These panels typically are formed of spaced-apart inner and outer steel panels which are coupled together at their laterally disposed edges, as well as by internally disposed structuring formed as webs or the like. The hollow interior of the panels is filled with a rigid foam which serves a principal function of providing insulation between the inner and outer surfaces. Experience with the panels over the years of their use has brought to light a variety of problems. For example, the panels tend to corrode, notwithstanding efforts at coating them with any of a variety of weather resistant substances. In effect, simple scratching of the panels will destroy the efficacy of such coating. Additionally, the metal surface panels have no elastomeric memory to the extent that they dent and become unsightly as the building with which they are employed ages and is subject to the vagaries of environment. Further, it has been found that the panels tend to delaminate, the inner and outer metal surfaces moving apart due usually to a rupture in the mechanical coupling of their inner surfaces with the supporting webs. These webs, for example, may be coupled to the inner and outer surfaces by rolled seams or spot welding or the like.

Where repairs are attempted with metal panels, the procedure has been to remove the dented portion of the external surface of the panel and to rivet or otherwise connect a patch piece of metal over the opening so formed. The patch may then be painted, however, the matching of the patch paint with the existing and usually weathered surrounding panel paint is difficult if not impossible. Thus, patching becomes unsightly.

When the conventional steel sandwich panels are installed, for the most part, it has been necessary to employ some form of lifting mechanism such as a crane to position them for attachment due to the weight involved. For example, the panels may be about 4 feet in width and are from 10 to about 22 feet in height. Attachment to a building frame is carried out by positioning each panel at its proper location and securing them tightly in place using any of a variety of fasteners. Generally, these fasteners provide support of the panels along their peripheries such that they are "hung" along their lengthwise extents.

Another aspect involved in the erection of these wall panel building structures is involved with the provision of corner components. Usually, separate and elaborate tooling is required to develop a corner member which mates with the adjoining flat panels of intersecting walls. Because of this requisite dedicated form of corner component manufacture, the overall cost of providing the panels for a given building project is increased.

In view of the foregoing, it may be observed that a building panel which is immune to the corrosive effects of the atmosphere, exhibits a "memory" rendering it resistive to unsightly marring due to dents and the like and which is relatively lighter and thus less costly to erect will find acceptance in the marketplace.

Summary

The present invention is addressed to a multi-panel wall assembly employing panels having a thin polyvinyl chloride or other polymeric shell structure, the inner and outer skin components of which are joined internally by integrally formed thin webs and extend to oppositely disposed connector components preferably fashioned to provide a tongue and groove union between adjacent panels. The web components serve to very reliably retain the inner and outer skins from outward movement and also to define elongate cavities or compartments which retain a rigid filler material, e.g. a foam insulated support. The shell structure is extruded as one piece from an extruding apparatus into a vacuum calibrator serving to effect the cooling of the plastic while closely maintaining the dimensional tolerances of the panel skin geometry. The rigid foam is developed in situ within the cavities of the panels. The panels advantageously exhibit high tolerance to corrosion and environmental phenomena such as dents and the like, while remaining advantageously light in weight to permit their facile erection.

To accommodate for the relatively higher thermally induced expansion and contraction attendant with plastic materials, , the panels are mounted such that essentially their entire weight is supported from their lowermost edges and additional (lateral only) support is provided by intermittently positioned fasteners which retain the panels in a vertical orientation while permitting their slideable movement vertically. These fasteners are coupled at one side only of each panel such that horizontal expansion and contraction may be accommodated for by the tongue and groove union between adjacent panels.

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A corner panel is provided for the arrangement, in one embodiment by the removal of a V-shaped portion of material from a panel and subsequent bending of the panel into a right angular cross-sectional configuration. The latter bending is available in consequence of the thin dimension of the supporting shell structure. Alternatively, an unfoamed panel may be "bent" longitudinally over a heated rod in the manner of a radius break and subsequently filled with foam.

Other aspects of the invention will, in part, be obvious and will, in part, appear hereinafter.

The invention, accordingly, comprises the apparatus and method possessing the construction, combination of elements, and arrangement of parts which are exemplified in the following detailed disclosure. For a fuller understanding of the nature and objects of the invention, reference should be had to the following Detailed Description taken in conjunction with the accompanying drawings.

Fig. 1 is a perspective view of a building incorporating a multi-panel wall assembly according to the present invention, portions of the panel assemblies being broken away to reveal mounting technique;

Fig. 2 is a sectional view of one panel of the panel assembly of the invention;

Fig. 2A is an enlarged fragment of the panel of Fig. 2 showing the relative thinness of the hollow-shell structure thereof;

Fig. 3 is a sectional view through the plane 3-3 of Fig. 1 showing building framing structures and the association thereof with panel assemblies according to the invention;

Fig. 3A is an enlarged fragmentary view of the bottom edge of the retainer and panel features of the invention shown in Fig. 3;

Fig. 4 is a sectional view taken along the plane 4-4 of Fig. 1 showing the interconnection of two adjacent panels;

Fig. 5 is a perspective view of a fastener employed with the instant invention;

Fig. 6 is a sectional view taken along the plane 6-6 in Fig. 1 showing a corner member according to the invention;

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Fig.7 is a sectional view of the panel structure according to the invention showing a removal of material for the purpose of forming a corner component according to the invention; and

Fig.8 is a perspective view showing the bending formation of a corner component according to the invention.

5 Referring to Fig. 1, a portion of a building is represented generally at 10 which incorporates a wall panel assembly according to the invention. Building 10 is shown having a lower support surface which may be the periphery of a ground level concrete floor or knee wall fashioned of concrete block or the like. A roof structure is shown at 14 and between the
10 foundation or lower support surface and the roof structure 14 is a multi-panel wall assembly represented generally at 16. The individual panels of the assembly 16 are vertically oriented and individually rest in a compressive state upon the lower support surface 12 by virtue of their slideable positioning within lower channel-form retainers as shown at 18a and 18b.
15 The individual panels as shown at 16a-16f have a width of about two feet and are slideably joined together along their lengthwise dimensions by elongate connector junctions represented, respectively, at 20a-20g. The upper ends of the panels 16a-16f are received in upper channel retainers 22a and 22b shown positioned beneath roof 14 and vertically oriented above
20 respective lower retainers 18a and 18b. Note that the upper channel form retainers 22a and 22b are fastened to the building structure by bolts or suitable connectors, typically shown at 24, which extend through slots shown, for example at 26, formed within an upstanding connector flange as represented at 28. This mounting arrangement accommodates for the
25 coefficient of linear expansion of the preferred material (polyvinyl chloride) forming the retainer 30. Also shown in Fig. 1 is a corner component positioned at the point of tangency of two adjacent wall panel assemblies.

Each of the panels 16a-16f are relatively light and are formed having outer skins of polyvinyl chloride or the equivalent thereof which is immune
30 from the corrosive effects of environment and exhibits an elastic memory such that the panels are substantially resist typically encountered damage which otherwise would cause dents and the like. Their structural geometry is arranged such that delamination effects and the like are avoided and the compressive state mounting of them considerably simplifies the
35 requirements of their attachment to the structural components of the building 10.

Looking to Fig. 2, a cross-section of a panel according to the invention is revealed generally at 32. Panel 32 is formed having an elongate polyvinyl chloride or other rigid (i.e. self-supporting) polymeric material (e.g. PVC copolymers, polypropylene, various acrylics, optionally filled or fiber reinforced, etc.) hollow shell structure which includes an elongate, thin inner skin 34 and a correspondingly elongate outer skin 36 spaced therefrom. Extending between the inner skin 34 and outer skin 36 are a plurality of integrally formed elongate, thin webs 38-40 which extend along with skins 34 and 36 from the top edge to the bottom edge of each pane 32. Thus, elongate cavities or compartments 42-45 are formed in each panel 32. The earlier-noted connector assemblies as described at 20a-20g also are integrally formed with each panel and are shown positioned between the inner and outer skins 34 and 36 at the laterally outwardly disposed boundaries thereof as a tongue 48 and groove 50 arrangement. The tongues 48 and corresponding grooves 50 extend between the top and bottom edges of the panel 32 to complete the outer cavity structures 42 and 45. Cavities 42-45 are filled with a filler material which, for example, may be selected as foamed polyurethane or, urea, expanded polystyrene, or like material, which may be insulative. This filler material may be rigid (i.e. one-piece) or may be packed pieces of material which is effectively rigid for preventing the shell from collapsing inwardly. Generally, the panel 32 will have a thickness of about 3 inches and the thickness of the components forming the shell structure thereof will be quite small. For example, the respective inner and outer skins 34 and 36 have a thickness of about 0.050 inch, while each of the webs as at 38-40 has a thickness of about 0.042 inch. Preferably, connector structures 48 and 50 are formed of the same thickness as skins 34 and 36. Thus, each of the panels 32 is of light weight. In the latter regard, a panel having a width of 2 feet and a height of about 25 feet will weigh slightly over 100 pounds.

To achieve structural integrity, the shell assembly including inner skin 34, outer skin 36, connector components 48 and 50 and webs 38-40 are integrally formed (as an extrudate) by an extrusion process. Apparatus providing the process is available, for example, through Reifenhauer-Van Dorn Company of Springfield, Vermont. The procedure for extruding the polyvinyl chloride or other polymeric shell further includes the use of a vacuum calibrator which is a form of sizing equipment which receives the hot extruded part or extrudate and has a precisely dimensioned and aligned

upper and lower surface which couples by vacuum to inner skin 34 and outer skin 36 to retain the shell assembly in properly toleranced orientation until cooling of the polyvinyl chloride material is completed. Upon such cooling completion, elongate tubular probes are maneuvered simultaneously into the
5 cavities 42-45 and in situ foam is applied as venting occurs through the open probe-accessed end of the shell. Following curing of the internally disposed foam and truing of the top and bottom ends thereof, the panel 32 is ready for installation. Other means for filling the cavity with filler material may be used in conventional fashion as is necessary, desirable, or convenient.

10 The foam within cavities 42-45 functions to assure the structural integrity of the skin components 34 and 36 with respect to inward deflection, while the web components 38-40 provide structural integrity with respect to outward bowing, delamination effects and the like. The plastic shell assembly exhibits the thermally induced expansion and contraction characteristics of a selected polyvinyl chloride which, for example,
15 typically is considered to have a coefficient of linear expansion for a desired polyvinyl chloride, of 3.5×10^{-5} in./in./°F. Thus, the amount of thermally induced movement expected will be about four times that of steel. In accordance with the instant invention, this greater expansion is
20 accommodated by providing a self-supported panel as at 32 which rests upon its lower edge essentially in a compressive state and which then is slideably supported at its laterally disposed borders by relatively simple C-shaped connectors. The panel thus is permitted to expand upwardly to accommodate the greatest amount of anticipated thermal expansion, i.e.
25 that expansion along its lengthwise extent. Because of their relatively narrower widthwise extent, the panels 32 will have a much smaller thermally induced expansion in a horizontal or widthwise direction; and, of course, their expansion in terms of thickness is dismissible.

Fig. 2 further reveals that the tongue connector portion of panel 32 is
30 comprised of an outwardly extending protrusion or tongue 52 located at the mid point of the thickness of panel 32. Oppositely disposed slots 54 and 55 are located adjacent the internal sides of respective skins 34 and 36 and are provided to receive a connector functioning to maintain the vertical alignment of the panel when installed such that it remains in a compressive
35 state. In similar fashion, the groove component 50 of the connector at the opposite end of panel 32 is provided as a recess 58, the entrance portion of

which is configured having two outwardly depending slots 60 and 61 which correspond and are identically dimensioned with slots 54 and 55.

Turning to Fig. 3, a sectional view of panel 16c is revealed in sectional cut-away fashion, the figure showing exaggerated skin thickness in the interest of clarity. Additionally, the components of panel 16c, as well as associated connected panel 16b, are represented with the numeration of Fig. 2 combined with the alphabetical designations of Fig. 1. The figure shows a column 64 supporting roof 14 from the foundation slab 12. Attached to the column 64 is a horizontally disposed eave girt 66 as well as a corresponding horizontally disposed intermediate girt 68. The panel 16c stands vertically in a state of compression upon the slab or lower support 12 and is retained against inward and outward movement thereupon by a channel-formed lower retainer, represented generally at 18a, the retainer 18a is held in place by suitable concrete fasteners, one of which is revealed at 70 which extend through a hole in the retainer which is formed as an elongate slot to accommodate for thermal expansion and contraction. Looking additionally to Fig. 3A, the retainer 18a is revealed in enhanced detail along with the bottom edge of panel 16c. Note that the retainer is formed having a front flange 72 and a relatively high, i.e. about 4 inches rear flange 74. The bottom of member 18a is shown at 76 being configured having a rearwardly disposed elevated platform portion 78 as well as integrally formed spacers 80-82. An elevated or stepped-up forward portion 84 of the bottom 76 is configured having a drain hole 86. The slotted opening for connector 70 is shown at 88. With the arrangement shown, it may be observed that inner skin 34c of panel 16c rests upon the platform portion 78, while the transversely oriented webs of the panel (not shown) as described at 38-40 in Fig. 2, will rest upon the spacers 80-82. The panel 16c is constrained from movement inwardly or outwardly by the flanges 72 and 74 and slideably rests upon platform 78 and spacers 80-82. The latter spacers along with the platform 78 position the panel 16c about 1/4 inch above the interior surface of bottom 76 so as to avoid its contact with water which may otherwise collect in the assembly. In this regard, moisture may collect on the inward side of forward flange 72 and this moisture will drain through opening 86. Rear flange 74 is higher or of greater extent than flange 72 such that it may serve as a form of vapor barrier for phenomenon often encountered in such installations in the spring or fall months of the year. In this regard, moisture tends to move toward building heat and the flange 74 is of

• sufficient height to prohibit the such liquid from moving in to the interior of the building. Note, that the panel 16c is slideably engaged within the retainer 18a, thus permitting its thermally induced movement or expansion and contraction therewithin. Preferably, the retainer is formed of a rigid polyvinyl chloride or other suitable resin using an extrusion process. The elongate slots as at 88 assure that the retainer is permitted to expand and contract with changes in temperature.

Returning to Fig. 3, the upper end of panel 16c is shown being received in a channel-form upper retainer 22a having a front flange 88, a top 90, rear flange 92, and the earlier-described connector flange 28a. The top of panel 16c is represented at 94 which may be observed to be located well downwardly of the top 90 of retainer 22a. This spacing along with the sizing of front flange 88 and rear flange 92 accommodates for thermal contraction and expansion of the panel 16c. In effect, the panel rests upon its lower edge and is permitted to expand upwardly therefrom while residing in compression.

Because essentially the entire weight of the panel 16c is supported from its lower edge at retainer 18a, only a relatively minor amount of securement is required to retain it in its vertical orientation. Thus, that securement may be one which is slideable in nature to thus permit the panel to expand the greater amount necessarily encountered with the use of resin panel structures, inasmuch as the connection arrangement need not carry the weight of the panel.

The fastener by which sliding engagement is made with select points at one side of each panel is shown in general in Fig. 3 at 96c as coupled with girt 68 and 98c as coupled with girt 66. Looking additionally to Fig. 4 and 5, the connector 96 employed at the connection identified generally at 20d is revealed in enhanced detail. The fastener is shown (Fig. 5) having a base portion 98 with a slot 100 formed therein for receiving a bolt and nut connector as shown at 102 in Fig. 4. Extending perpendicularly outwardly from the base portion 98 is a C-shaped coupling portion 104, the outer stem 106 of which is dimensioned for slideable insertion with a slot of either connector 48 or 50 of a panel. Formed, for example, of reinforced nylon, the connector 96 is simply installed, serves the function of retaining the panels 16 in a vertical orientation while the weight thereof is resting upon lower retainer 18 and functions to permit thermally induced panel movement. The retainers as shown are found to be adequate for architectural

and structural engineering design standards. This adequacy is of sufficient nature to eliminate the need for the upper connectors as at 22a. In this regard, the roof structure 14 can be designed such that the connectors 22a are not present and the upper ends of the panels extend into the roofing configuration. However, the connectors 22a are employed advantageously during the panel erection process. In this regard, the connectors hold the panels in their necessary vertical orientation prior to tightening of the fasteners. To permit horizontal or lateral thermally induced displacement of the panels 16, the connectors as at 96 are used in conjunction with only one side of each panel. Preferably, that side is the one configured as a groove as represented in general at 50 in Fig. 2. Fig. 4 shows the intended union of two adjacent panels. That figure also reveals a butyl rubber strip or gasket 108 which may be employed to minimize wind incursions through the joint. It has been determined that a clearance, of about 1/4 inch is sufficient between the slot 50c and tongue as at 52d for a given juncture of two panels.

Due principally to the very thin thickness of the inner and outer skins 34 and 36 of the panels of the instant system, a corner structure is readily developed inexpensively and without resort to significant tooling investment. Fig. 6 reveals this corner structure 30 in section. Corner structure 30 is shown mounted about a corner of the framing of building 10 defined by intermediate girt 68 and a second intermediate girt 110 positioned in tangency therewith. The corner structure 30 is simply a panel as at 32 which has had a "V" section removed therefrom and which has been bent into a right angular cross-sectional shape. Looking additionally to Fig. 7, a corner panel 30 is revealed having a portion 112 of triangular cross-section disposed along its lengthwise extent at its center removed. To facilitate the description, components in common with the panel 32 shown in Fig. 2 are reproduced in Fig. 7. Fig. 8 shows that the corner component 30 is formed by bending the two sides of the thus-modified panel together to form a right angle. The inner skin edges as at 114 and 116 may be fused together by conventional PVC fusion technique and the corner device then is mounted in place. A connector as shown at 96f in Fig. 6 holds the corner component in its position by virtue of coupling with the intermediate girt 110. Note, as before, that only one side of the corner component is thus secured to permit thermal expansion. While the removal of the material 112 may be considered labor intensive to a certain extent, it must be recalled that there

are relatively few corners in any given commercial building structure. Thus, the corner formation technique shown is quite economical and avoids the necessity for expensive tooling and the like.

As an alternate arrangement, corner components can be formed from the non-foam filled shell structures using a hot, elongate rod and employing radius break techniques. With such technique an empty panel is positioned over a heated rod of desired radius and the inner skin and web formation is thermally collapsed as a 90° angular form is developed. Following such formation, the structure is filled with foam.

Generally, employing the materials discussed above, the panels of the invention will exhibit a class C fire rating as well as a flame spread rating of less than 25 feet. The fireproofing of the panels may be enhanced by appropriate coatings and the like applied to the interior skin 34.

To carry out a repair of the exterior surface of the panels, a replacement or patch portion of the skin 36 may be fuse welded into place by using conventional techniques. In most instances, a small portion of the interior skin 34 which might extend above the ceiling level of the appropriate floor of the building can be used for this patch. This approach would enhance color matching for the patch.

The erection of the multi-panel wall assembly may vary considerably with the situation at hand in view of the advantageously light weight of the individual panels. For the arrangement shown, generally, the upper channel-formed retainers as described at 22a, 22b as well as the lower retainers 18a, 18b, are mounted in place. Recall that the lower retainers as well as the upper retainers are mounted to permit thermal expansion and contraction. Generally, corner structures are installed initially. The panels are installed by raising them or inserting them in the upper retainers and then aligning them with the lower channels and permitting them to drop. They are then slid laterally to an appropriate position adjacent an interpanel union and the fasteners are located at desired positions upon the eave and intermediate girts. Initial connection of the fasteners is preferably loose such that final panel position may be achieved relatively easily. The bolted connections of the fasteners then are tightened.

Since certain changes may be made in the above-described apparatus and method without departing from the scope of the invention herein involved, it is intended that all matter contained in the description thereof

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or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

CLAIMS

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1. A multi-panel wall assembly for attachment with a support frame having a lower support surface and an upper frame assembly comprising:

10 a plurality of interlocked vertically oriented elongate wall panels, each said panel including an elongate hollow shell structure having spaced-apart elongate thin inner and outer skins extending from a top edge to a bottom edge, thin, elongate web means extending therebetween for restraining the mutually outwardly disposed movement thereof and defining elongate cavities, and elongate connector means positioned between said
15 inner and outer skins at the laterally outwardly disposed boundaries thereof and extending between said top and bottom edges, for effecting slideable engagement between adjacent said panels to an extent effective to accommodate thermally induced lateral movement thereof, each said connector means having an internally disposed elongate channel, said inner and outer
20 skins, said web means and said connector means being integrally formed polymeric extrudates, and a filler material disposed within each said elongate cavity;

channel-form lower retainer means attached to said lower support surface for slideably receiving the said bottom edges of said panels
25 and effecting the compressive state support of the weight thereof; and

fastener means rigidly coupled with said support and slideably engaged with one said channel of each said panel for retaining each said panel in said vertical orientation while permitting said bottom edge support and thermally induced expansion and contraction movement of said panels
30 along the vertical, lengthwise extent thereof.

2. The multi-panel wall assembly of claim 1 in which said elongate connector means comprises:

35 an elongate recessed end structure at one said lateral boundary having a groove extending a predetermined distance internally within said panel intermediate said inner and outer skins; and

an elongate protruding end structure at the opposite said lateral boundary having a tongue extending a predetermined distance externally outwardly from said inner and outer skins and slideably nestable within the
40 said groove of a next adjacent said panel.

3. The multi-panel wall assembly of claim 1 in which said inner and outer skins have a thickness of about 0.050 inch.

5 4. The multi-panel wall assembly of claim 3 in which said web means has a thickness of about 0.040 inch.

10 5. The multi-panel wall assembly of claim 1 in which said fastener means includes a base portion connectable with said support frame and a generally C-shaped engaging portion extending outwardly from said base and havng an inwardly depending stem slideably engageable with a said connector means channel.

15 6. The multi-panel wall assembly of claim 5 in which said fastener means is formed of fiber reinforced nylon.

7. The multi-panel wall assembly of claim 1 in which said channel-form lower retainer means comprises:

an elongate base portion havng a longitudinal extent;

20 means for connecting said base member with said lower support surface such that said base member is slideable thereover only along said longitudinal extent;

25 spacer means extending upwardly from said base member for supporting said enner skin and web means of said wall panels at the bottom edges thereof;

front flange means integrally formed with said base member and extending upwardly therefrom for restraining each said panel bottom edge from outward movement;

30 rear flange means integrally formed with said base member extending upwardly therefrom a predetermined distance and spaced from said front flange means for retaining upwardly migrating moisture; and

drainage means in said base member for draining moisture entering from above said front flange means.

35 8. The multi-panel wall assembly of claim 7 in which said base portion, said spacer means, said rear flange means and said front flange means are an integrally formed polyvinyl chloride extrudate.

9. The multi-panel wall assembly of claim 1 in which said assembly includes corner structure means formed as a said panel having an elongate portion of material including an elongate rectangular portion of one of said inner and outer skins and filler material, said portion being sufficient to bend said panel into a right angular end configuration so as to derive said corner structure.

10. The multi-panel wall assembly of claim 1 in which said elongate connector means comprises:

an elongate recessed end structure at one said lateral boundary having a groove extending a predetermined distance internally within said panel intermediate said inner and outer skins;

an elongate protruding end structure at the opposite said lateral boundary having a tongue extending a predetermined distance externally outwardly from said inner and outer skins and slideably nestable within the said groove of a next adjacent said panel; and

in which said inner and outer skins have a thickness of about 0.050 inch.

11. The multi-panel wall assembly of claim 10 in which said fastener means includes a base portion connectable with said support frame and a generally C-shaped engaging portion extending outwardly from said base and having an inwardly depending stem slideably engageable with a said connector means channel.

12. The multi-panel wall assembly of claim 11 in which said channel-form lower retainer means comprises:

an elongate base portion having a longitudinal extent;

means for connecting said base member with said lower support surface such that said base member is slideable thereover only along said longitudinal extent;

spacer means extending upwardly from said base member for supporting said inner skin and web means of said wall panels at the bottom edges thereof;

front flange means integrally formed with said base member and extending upwardly therefrom for restraining each said panel bottom edge from outward movement;

5 rear flange means integrally formed with said base member extending upwardly therefrom a predetermined distance and spaced from said front flange means for retaining upwardly migrating moisture; and

drainage means in said base member for draining moisture entering from above said front flange means.

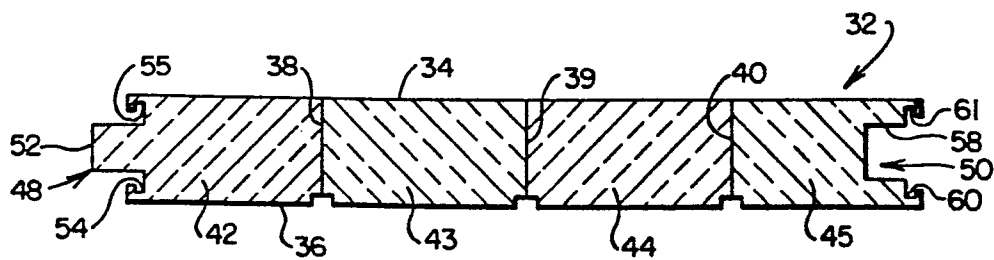
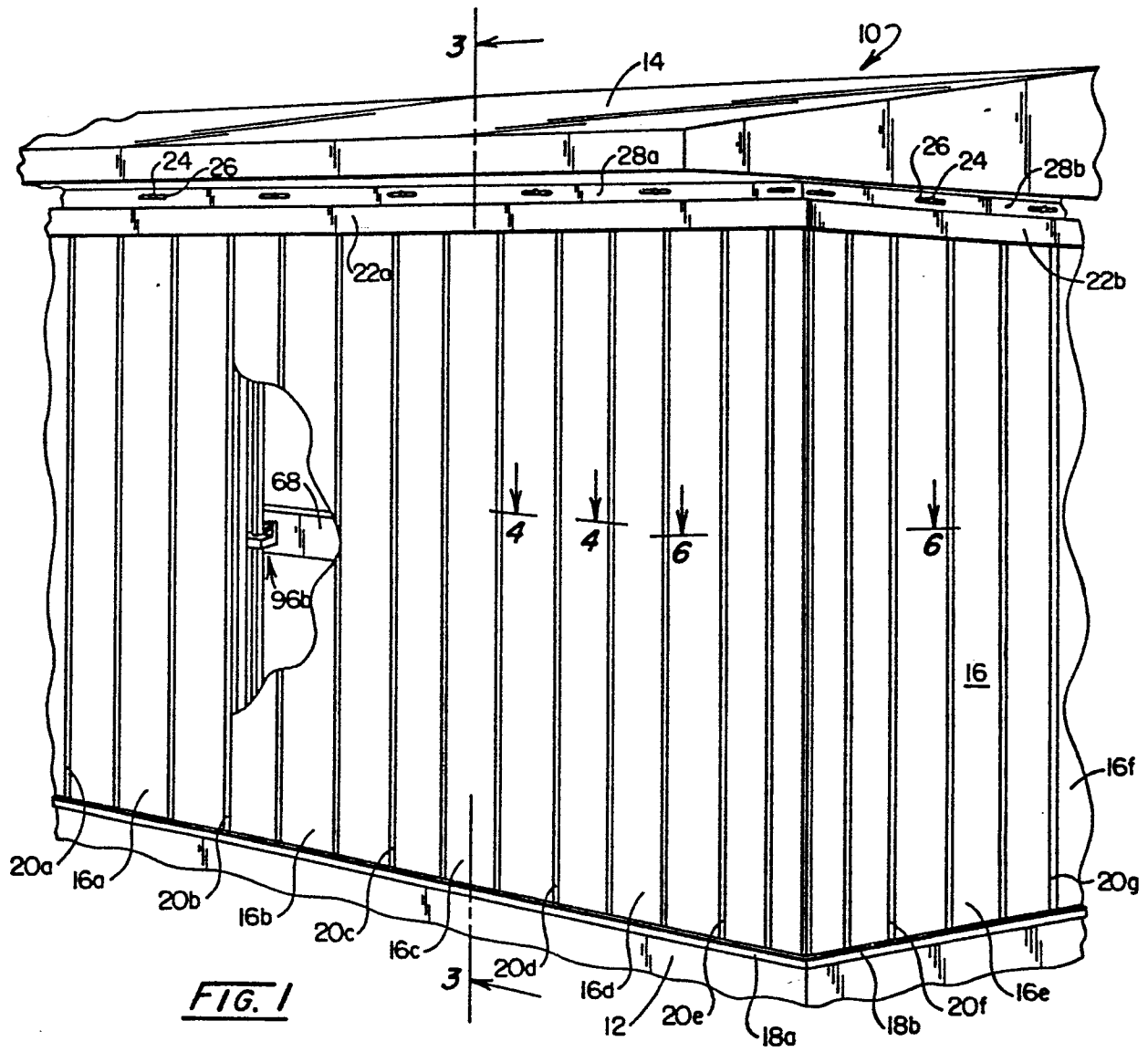
10 13. The multi-panel wall assembly of claim 12 in which said web means has a thickness of about 0.040 inch.

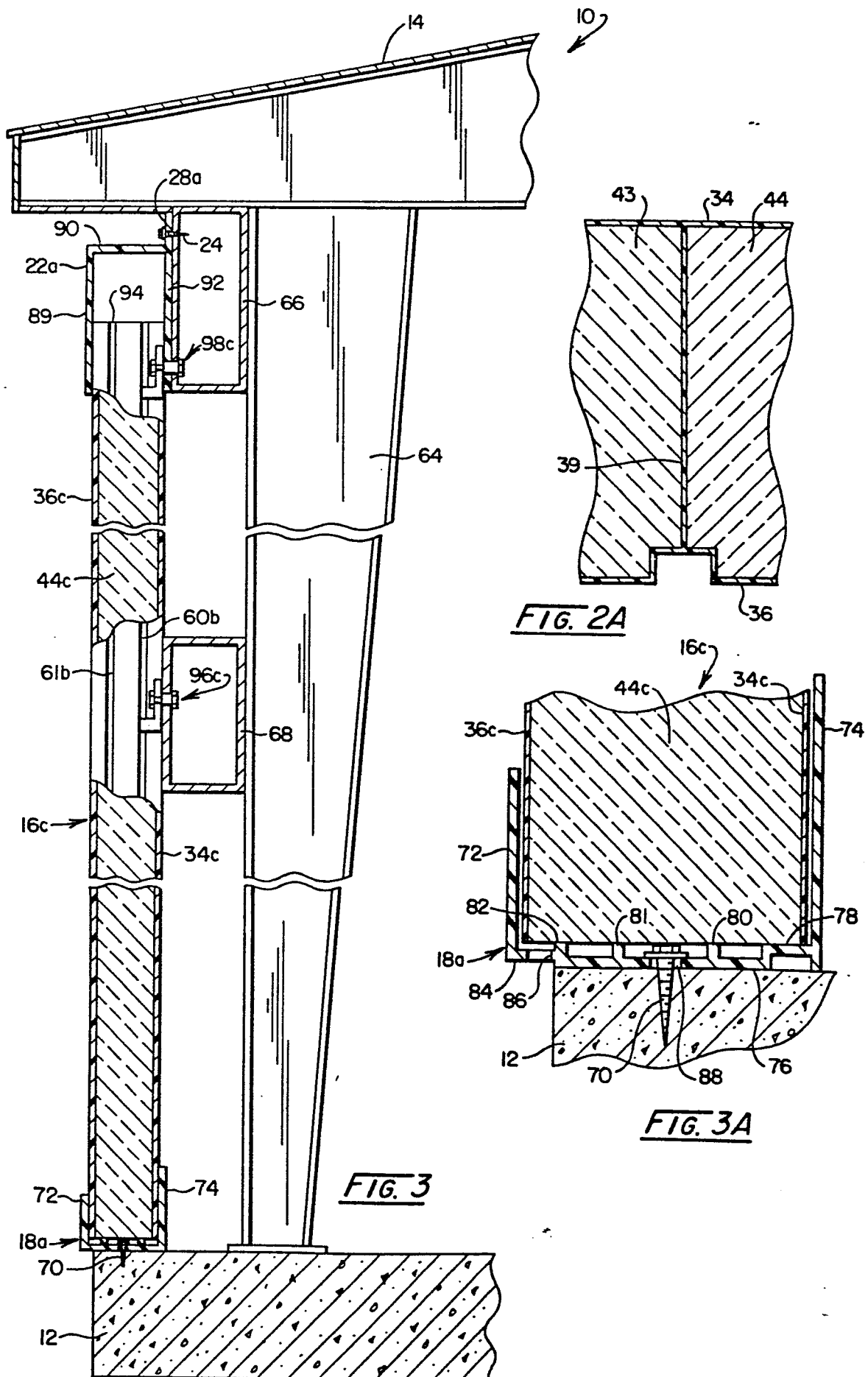
15 14. The multi-panel wall assembly of claim 10 in which said assembly includes corner structure means formed as a said panel having an elongate portion of material including an elongate rectangular portion of one of said inner and outer skins and foamaceous material, said portion being sufficient to bend said panel into a right angular end configuration so as to derive said corner structure.

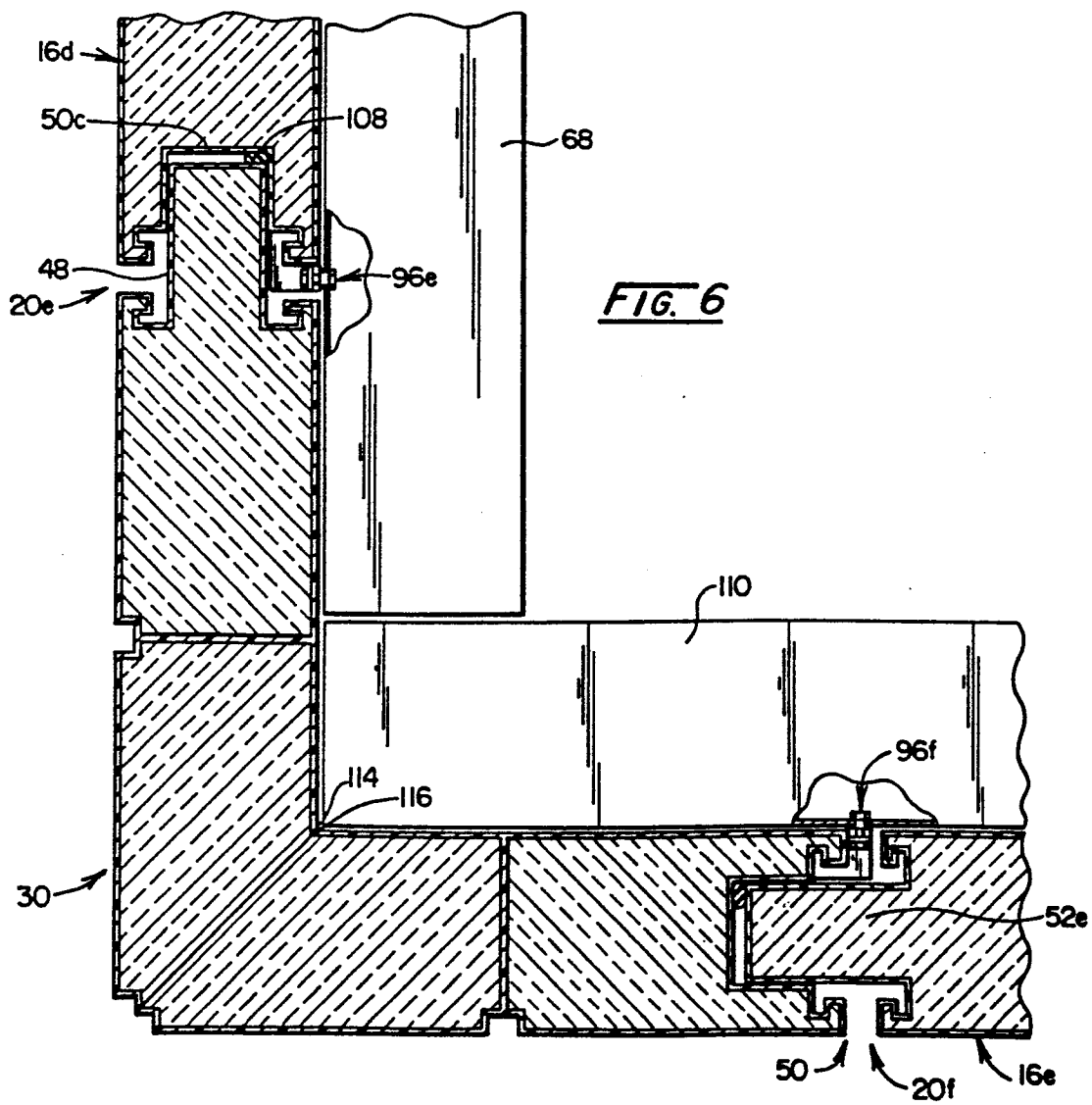
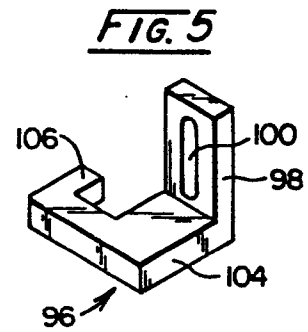
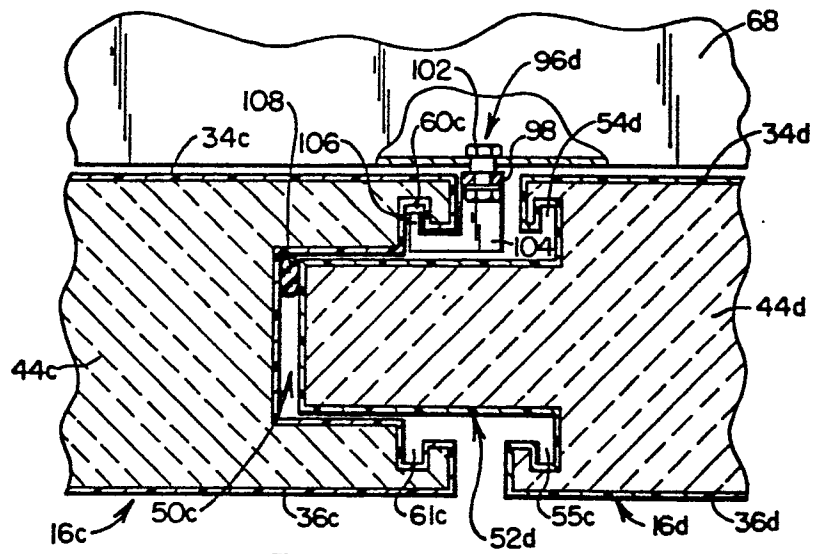
20 15. The multi-panel wall assembly of claim 1 wherein said polymeric extrudates comprise a polyvinyl chloride extrude.

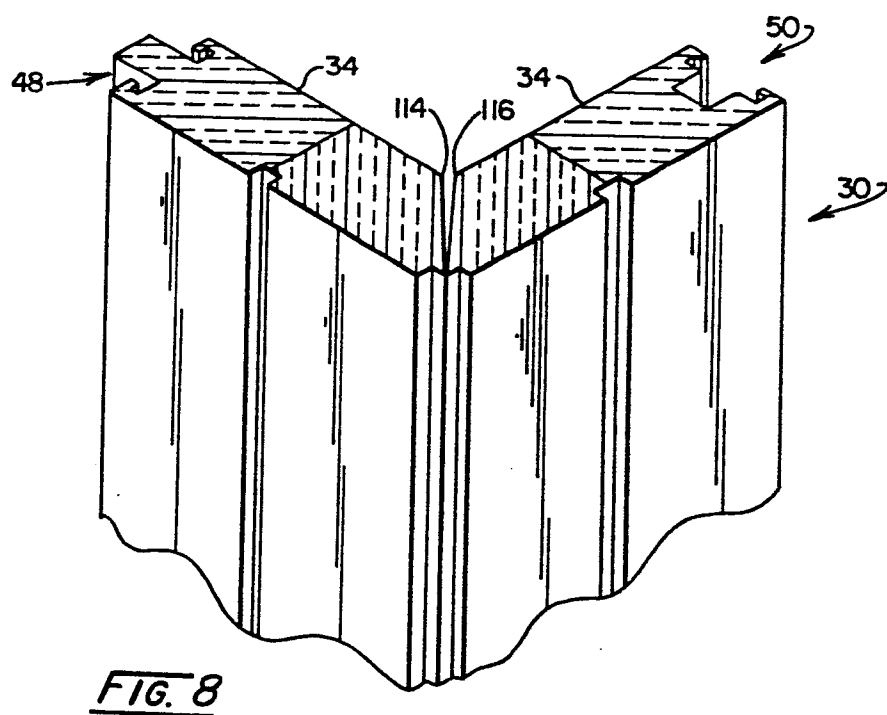
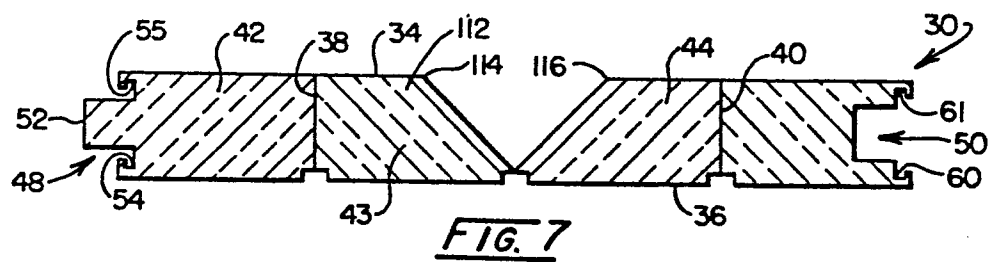
25 16. The multi-panel wall assembly of claim 1 wherein said filler material is foamaceous.

17. The multi-panel wall assembly of claim 16 wherein said foamaceous material comprises foamed polyurethane or foamed polyurea.









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European Patent
Office

EUROPEAN SEARCH REPORT

Application number

EP 86 63 0159

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. 4)
A	FR-A- 910 884 (BIGARD) * Whole document *	1	E 04 B 2/72
A	DE-A-2 719 448 (TOOS) * Page 6, lines 4-11; page 6, line 33 - page 8, line 21; figures 1-5 *	1	
A	DE-A-2 657 106 (NAITO) * Claims 1,6; figures 1-9 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			E 04 B E 04 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20-03-1987	Examiner CLASING M.F.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			