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Patents Act 1990

669491

NOTICE OF ENTITLEMENT

We, **CARROLL PRODUCTS AND DESIGNS LIMITED** of Unit 3, IDA Enterprise Centre, Pearse Street, Dublin 2, Republic of Ireland state the following in connection with Australian Application No. 27861/92:

1. We are the nominated person.
2. The nominated person is the assignee of the actual inventor.
3. The nominated person is the applicant of the basic application listed in the declaration under Article 8 of the PCT.
4. The basic application is the application first made in a Convention country in respect of the invention.

Dated: 21 April 1994

By **PHILLIPS ORMONDE & FITZPATRICK**
Patent Attorneys for the Applicant
By:

..... *David B Fitzpatrick*

To: The Commissioner of Patents

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Our Ref: 366340

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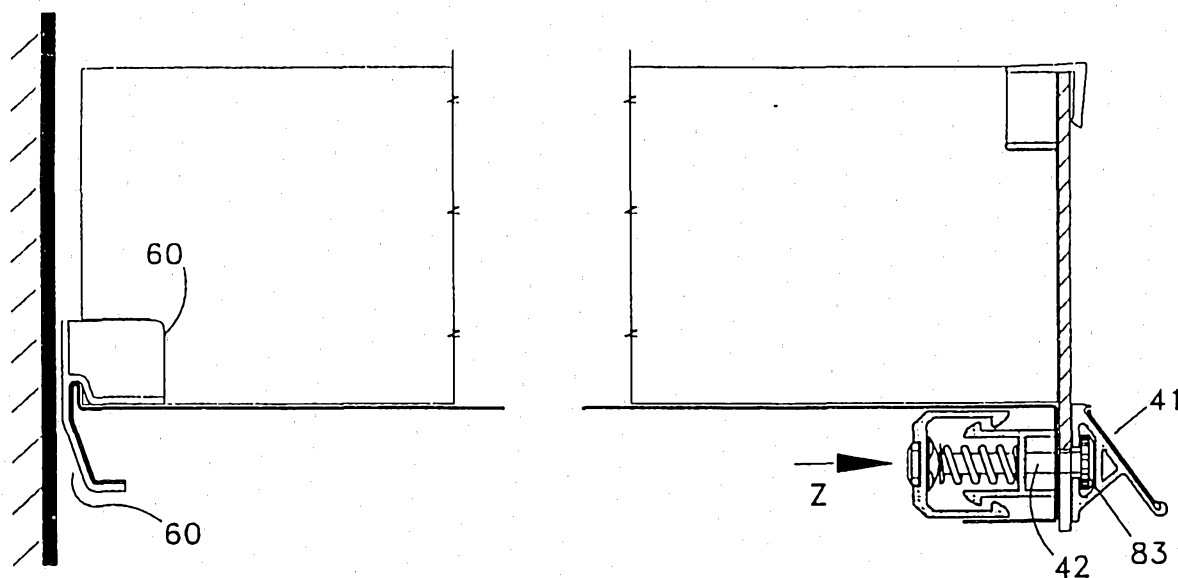
1. An elongate gripping member for a shelf having a planar surface, including means for securing the gripping member to an edge of the shelf, means for moving the gripping member from the edge and biasing means for urging the gripping member towards the edge, wherein the means for moving the gripping member allows the gripping member to be extended from the shelf, whereby the gripping member may be extended from the shelf to accommodate a riser and/or other element and released to grip the element between the edge of the shelf and the gripping member.



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(54) Title: IMPROVEMENTS TO SHELVING



(57) Abstract

The shelving system comprises a shelf (10), risers (20) and dividers (30). At the front of the shelf is a spring loaded gripping member (40) for accommodating the riser (20) which is provided with a number of slots (22) which engage about rods or shanks (42) of the gripping member (40). The rear face of the shelf is provided with an up-stand (50) which provides a low rear wall for the shelf and provides a means to retain connector clips (60) in position. A gripping and fascia element (41) is located on the heads (83) of the rods (42). The gripping member (40) has springs (43), which are contained in the housing formed by elements (44 and 45). To operate the gripping member (40), pressure is applied in the direction of arrow (Z). On release of the pressure, the assembly returns to its closed position.

- 1 -

IMPROVEMENTS TO SHELVING

The present invention relates to shelving, particularly to modular metal shelving for use in retail outlets to display and merchandise consumer products for general use throughout the retail industry. Such shelving is used in ambient and refrigerated conditions.

A necessary feature of such shelving is the provision of means to accommodate shelf sub-division elements known in the industry as 'risers and dividers' which are used to subdivide a shelf into separate areas to hold different types of goods in isolation, prevent the goods from mixing and in the case of sloping shelves from falling off the shelves.

These risers and dividers can be made of many materials but generally are of either glass, transparent plastics materials or wire construction in the form of a flat grid, all of which allow the product displayed on the shelf to be seen through the risers/dividers. By definition the 'risers' are the sub-divider elements fixed to the front and back of the shelf while the 'dividers' are the adjustable sub-divider elements which run from the front to the back of the shelf and are connected to, and supported by, the riser elements by means of various connectors.

Prior art shelves have been designed in numerous different ways to accommodate the fixing and supporting of riser elements of the various materials described above. Two solutions have emerged which dominate the retail metal shelving markets viz:

Type A: Shelving with recessed narrow channels formed

- 2 -

along the front and back of the shelves to accommodate the riser elements (see prior art Figure A)

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Type B: Shelving with small holes or slots punched along the front and back of the shelves at close intervals in lines parallel to and close to the edges of the shelf to accommodate pins fixed to or forming part of the risers. In this case, it is also necessary to provide a second perforated landing under the shelf proper to accept the pins and give the riser stability not provided by the thin metal of the shelf (see prior art Figure B)

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A variation of the type A shelf is disclosed in DE-B-1102545 in which a biasing clip is included in the front and rear channels.

20

Shelf types 'A' and 'B' constitute the vast majority of all modular metal shelves produced commercially and the remaining shelf types either have no means to accommodate risers and dividers or feature variations of the retaining shelf types 'A' or 'B'.

25

There are a number of disadvantages associated with the prior art shelving namely:

30

(a) Type 'A' shelves, of necessity, are manufactured with channels of predetermined width and cannot be altered to accommodate risers of different thicknesses which may be more suitable or economical to use.

(b) Type 'A' shelves are considered a potential health hazard when used to display food products by providing a place for food particles to lodge and bacteria to incubate. Health Authorities have already banned the use of this type of shelf in some instances.

SUBSTITUTE SHEET

- 3 -

- 5 (c) Type 'B' shelves are ideally suited for wire grid
risers which can easily incorporate projecting wire
pins to support risers but this type of riser is no
longer visually acceptable to most retailers as the
visible wire construction detracts from the
presentation of products on display. This shelf
cannot easily accommodate glass risers as there is no
practical way to connect projecting pins to glass and
the alternative solution of a metal sub-structure is
10 most unsatisfactory and expensive. Risers
manufactured from transparent plastics material can
more easily be accommodated but at additional expense
over type 'A' shelf risers.
- 15 (d) Perforated holes in type 'B' shelves are also now
considered to be a potential health hazard when used
to display food products particularly meat and
similar products having a high liquid content.
Health Authorities have also banned this type of
20 shelf in some instances.
- 25 (e) Type 'B' shelves with perforated holes/slots at the
back and front are, of necessity, very wasteful of
shelf space taken up by the distance from shelf edge
to the centre line of the perforations, thus reducing
the effective depth of the shelf. Where back risers
are used this waste space is doubled.
- 30 (f) Type 'B' shelves have perforated holes/slots at close
centres at back and front of shelves and duplicated
underneath as described. Consequently, an average 1m
shelf would have as many as 80 small holes/slots
punched in its surface. The cost of providing and

maintaining tooling for this punching operation, particularly in modern mechanised production, is very expensive and adds considerably to the set up and production costs of same.

- 5 (g) Shelving types 'A' and 'B' both fail to provide a means to accommodate all accepted forms of risers in various materials and thickness as chosen by the end user for considerations of material efficiency, visual attractiveness and suitability for the product to be displayed.
- 10 (h) Both types of shelves require the provision of a back riser element merely to support the divider element at the rear. This back riser has no function other than to support the dividers and is very wasteful of material and cost.

It would be desirable to provide a shelf design which alleviates one or more of the
15 disadvantages of prior art shelving and offers new advantageous features to the shelving manufacturer, shopfitter and retailer alike.

According to an aspect of the present invention there is provided an elongate gripping member for a shelf having a planar surface, including means for securing
20 the gripping member to an edge of the shelf, means for moving the gripping member from the edge and biasing means for urging the gripping member towards the edge, wherein the means for moving the gripping member allows the gripping member to be extended from the shelf, whereby the gripping member may be extended from the shelf to accommodate a riser and/or other element and
25 released to grip the element between the edge of the shelf and the gripping member.

In at least one preferred embodiment, the gripping member includes an elongate gripping element, a housing for the biasing means and a plurality of rods
30 extending between the housing and the gripping element, one end of each rod being fixed to the housing and the other end of each rod being removably



4a

engaged with the gripping element which is movable between a pair of travel stops under and against the action of the biasing means.

5 According to another aspect of this invention, there is provided a shelf having a planar surface and a longitudinal gripping member as described above provided along at least one edge of the shelf.

10 In at least one preferred embodiment, the edge of the shelf is provided with a depending skirt along which are provided a plurality of orifices, and the gripping member includes an elongate gripping element and a plurality of rods each of which extends through an orifice in the skirt and is engaged with the elongate gripping element which is movable between a pair of travel stops under and against the action of the biasing means located beneath the planar surface of the shelf and adjacent the skirt.

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Particularly advantageous embodiments of the present invention provide:

- 20 (a) a homogeneous top surface which is unbroken by e.g. channels, holes or slots.
- (b) accommodation of a front riser of any material or thickness.

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- 5 -

- (c) the possibility of closing and sealing the front riser gap when not in use.
- (d) accommodation of ticket and EPOS (bar coded) strips in different forms including electronic strips.
- (e) accommodation of many additional beneficial elements to the shelf edge, e.g. point of sale material.
- (f) the elimination of a back riser element.
- (g) the elimination of waste shelf space associated with the traditional use of risers.
- (h) the ability to remove easily the shelf facia element to facilitate thorough cleaning of the shelf structure.
- (i) a solution to the hygiene problems associated with prior art shelving in relation to food merchandising.
- (j) a means to manufacture shelving more economically by eliminating expensive perforations, channels, etc.

The invention will hereinafter be more particularly described with reference to the accompanying drawings which show, by way of example, a number of embodiments according to the invention. In the drawings:

Figure 1 is a partially exploded perspective view of a shelf according to the invention showing a riser and three dividers with Figures 1a and 1b showing more

- 6 -

details of the rear and front of shelf respectively;

Figure 2 is a cross-sectional side view through an assembled shelf including a grilling member and Figure 2a
5 shows a different detail of the rear of the shelf;

Figure 3 is a plan view of the shelf;

Figures 4, 4a and 4b are cross-sectional detailed views
10 of the gripping member having different heights and thicknesses of risers contained therein;

Figure 5 is an exploded view of components of the gripping member;
15

Figures 6, 6a, 6b and 6c are four progressive views showing the assembly of the gripping member;

Figures 7, 7a, 7b, 7c and 7d are cross-sectional side
20 views through the external portion of the gripping member showing alternative one piece and two piece extrusions and pressings for use as a gripping element and front facia;

25 Figures 8, 8a, 8b, and 8c are cross-sectional views through four different variations of gripping members showing alternative shelf details required to accommodate these variations;

30 Figure 9 is a perspective view of the shelf with the gripping member engaging a shelf extension element;

Figure 9a is a perspective view of the shelf with the gripping member engaging a sign display element;

- 7 -

Figures 10 and 10a are perspective views of the gripping member showing two variations of coupon carriers engaged with the member;

5 Figure 11 is a perspective view of a plurality of shelves according to the invention mounted on a support system and showing various applications of the invention;

10 Figure 12 and 12a are a side view and a perspective view of typical point of sale items applied to embodiments of shelves according to the invention; and

15 Figure 13 is a cross-sectional view through a further embodiment of shelf assembly according to the invention and Figures 13a and 13b are two series of three progressive views showing the assembly of components of the embodiment.

20 In the drawings, the shelving system comprises a shelf 10 a riser 20 and three dividers 30. The shelf may of course be of any length and may have as many dividers or risers as required. At the front of the shelf is a spring loaded gripping member 40 for accommodating the riser 20 which is provided with a number of slots 22
25 which engage about rods or shanks 42 of the gripping member 40. The rear face of the shelf is provided with an up-stand 50 which provides a low rear wall for the shelf and provides a means to retain connector clips 60 in position. This up-stand 50 has an additional
30 advantage as a shelf limiter and spillage controller preventing accidental product spillage, particularly liquid, from running down the back of the shelves where cleaning is most difficult. A number of clips 60 are

- 8 -

- provided at the rear of the shelf which engage on to the shelf and are held in position by the resilience of the clips and the shape of the shelf member itself. As shown in Figure 1a, each clip 60 accommodates the lower rear corner of a divider 30 in a grip 62. Two pips 64 in the grip 62 engage in an optional slot 32 of the divider 30. The front upper corner of each divider 30 is provided with a connector 70 which fits about the riser 20. (Similar clips 60 and connectors 70 are disclosed in the specification of our Irish Patent Application No. 90/88 and the corresponding U.K. published Application No. 2241878A the disclosure of which is included herein by reference).
- Referring to Figures 4 to 6c, the gripping member 40 includes a gripping and facia element 41 which is also provided with a channel 85 which a user slides longitudinally in a generally horizontal direction over the front caps of the rods 42. In the embodiments shown, the travel possible of the facia 41 from the front wall of the shelf unit 10 is approximately 10 mm. This way it can accommodate risers of any thickness from 1 to 10 mm. Of course it is possible to construct a mechanism to give further travel if required, to suit the circumstances.
- The bias of the gripping member 40 is provided by a spring 43 which is located about the rod 42. The rear head of the rod 42 engages a first extrusion 44 which cooperates with a second extrusion 45 to form a housing. Separation of the elements 44 and 45 is prevented by the ends of the two extrusions engaging by means of the formations 47 provided thereon. The rods 42 are spaced apart approximately 250-300 mm. between centres along the depending skirt 11 of the shelf 10. The extrusions

- 9 -

44 and 45 may be of plastic or metal and are housed within the U-shaped profile 12 provided on the edge of the shelf 10. To operate the gripping member 40, pressure is applied to the underside of the shelf as shown by arrow 2 indicated in Figure 2. On release of the pressure, the assembly, under the action of the spring 43, returns to its closed position sealing the gap created. If required, the gripping and facia element 41 may be removed in which case all that is visible at the front of the shelf are the front caps 83 of the rods 42. In this way, there are no concealed areas in which food or any other product may accumulate. The rods 42 and rod ends may advantageously be manufactured from hygienic moulded plastics material.

Referring to Figures 5 and 6, the mechanism for the gripping member 40 is shown therein. Each rod 42 is first fitted into the extruded U-shaped element 44 and held in position by a captive washer 81 retaining the head 82 of the rod 42 against the extruded element 44. A spring 43 is then fitted over the rod 42 followed by a H-shaped extruded element 45 which when pressed home against element 44 engages projections 47 on each of elements 44 and 45 thus completing the spring loaded assembly as shown in Figure 6. A retaining press on/screw off cap 83 engages the end of the rod 42 through an orifice 13 provided in the depending skirt 11 of the metal shelf. The gripping and facia element 41 then engages the rod 42 about the cap 83 by means of the channel 85 provided thereon.

The travel stops of the gripping member are provided by the ends of the extruded element 45 engaging the inside of the extruded element 44 and by the gripping element 41

- 10 -

engaging the depending skirt 11 or a retained riser 20x, 20y or 20z or any other elements retained therein.

Further variations of the gripping element and facia design are shown in Figures 7, 7a, 7b, 7c and 7d. In Figure 7 the gripping element and facia 75 is a one piece extrusion and has a flap 76 to accommodate a ticket strip. The flap 76 is biased into a closed position and can be bent outwards to replace or insert an EPOS ticket strip or similar. Flap 76 is also at an angle for ease of viewing of the customer. The edges 77 of the extrusion are feathered to blend in to the shelf profile and close off any areas where foreign matter might collect.

In Figure 7a, the gripping element and facia 85 includes a seal 87 which prevents any liquid coming between the shelf and the element. The gripping element and facia 85 also have a flap 86 similar to flap 76.

Facia 95 shown in Figure 7b is a two piece assembly comprising a gripping element 96 of extruded aluminium for strength and stiffness and an edge strip 97 of extruded plastic fitted over the element 96. The edge strip 97 can be of many different forms to suit end user requirements in terms of size, angle, open or closed flaps to retain ticket strips, etc. The facia element 105 shown in Figure 7c is also a two piece construction with a gripping element 106, in the form of a metal pressing, provided with a plastics extruded edge strip 107 which engages about the element 106. The metal element 106 is slotted to coincide with the rods 42 and snapped into position over the heads of the rods.

- 11 -

The combined gripping element and facia 115 shown in Figure 7d is a one piece extrusion which can be opened to allow the back leg of the extrusion to be slotted to coincide with gripping element rods 42 thus allowing the facia to be slid into position using a vertical rather than a horizontal motion.

Figures 8, 8a, 8b and 8c illustrate four different methods of securing the spring loaded rods 42 to the shelf. In Figure 8, the housing element 120 is fixed in position by spot welding 123 and a compression spring 124 provides the biasing action.

In Figure 8a, the housing element 130 is movable and the spring 134 is retained by a washer 135.

In Figure 8b, the profile of the shelf is continued to provide an upstand 141 parallel to the skirt of the shelf. An orifice 142 is provided in the upstand to accommodate the shank. Spring 144 engages against the upstand 141.

The embodiment of gripping member 150 shown in Figure 8c has a fixed shank 152, a compression spring 154 and a substantially U-shaped metal pressing or extrusion 156 which is a gripping element having a channel 157 to accommodate a riser. A separate facia element 159 clips over the front wall 158 of the gripping element 156.

The gripping member 40 may be used to accommodate other items as shown in Figures 9 and 9a and 10 and 10a of the drawings. In Figure 9, a shelf extension 120 is engaged with the gripping member 40 and may be used for special product displays etc. In Figure 9a, a holder 130 for a

- 12 -

point of sale (POS) sign is engaged with the gripping member 40. This holder can be of any material or combination of materials normally used for signage.

- 5 Two variations of coupon book holders 140, 145 are shown in Figures 10 and 10a, respectively. These are also engaged with the gripping member 40 and provide a means for supporting tear-off coupons R and S as used in special offers and the like in retail displays.

10

- In the embodiment of shelf assembly shown in Figure 13, a clip 60 is shown supporting the rear corner of divider 30. A separate connector clip 160 is provided at the front of the shelf held in position by the gripping member 40. The clip 160 is similar to the clip 160, except that it has a straight leg 162 and grips the front corner of the divider 30. In this embodiment, no riser is provided on the shelf and this can be used in situations where there is no necessity for a riser.

20

- As may be appreciated from Figures 11, 12 and 12a the shelf of the invention has universal application in the retail industry. The simple shelf profile of the invention provides significant cost saving for the shelving manufacturer in set up and production costs over prior art designs involving complicated channel edge details or multiple edge perforations merely and solely to accommodate specific riser/divider elements. The independent spring loaded shelf edge assembly of the invention provides the means to retain riser/divider elements of any material or thickness while also providing the means to support an infinite variety of ticket strips, POS displays, extension shelves, coupon dispensers, etc. The entire assembly or parts thereof

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- 13 -

can be sourced independent of the shelf manufacturer, if required, and fitting can be easily affected on site by shopfitter or retailer. This aspect affords the shelf manufacturer with economy of scale in mass producing
5 simple standard shelf units which offer an infinite variety of options to the end user without edge detail and assembly complications in production. Numerous variations of material can be used in the manufacture of the spring loaded assembly 40 for example, plastics,
10 aluminium, metal and/or combinations of same.

Electronic shelf edge labelling for prices and other information can also be incorporated into the facia element of the gripping member of the shelving system of
15 the invention. It can also act as a conduit for any cabling, if required, to provide a power supply to these displays. Light or radio activated or similar power sources can also be accommodated.

20 To accommodate the customer who does not require the spring loaded assembly, the shelf manufacturer can fit fixed rods or pins onto the skirt of the metal shelf, with the heads of the rods being at, e.g. 6 mm or whatever desired distance from the skirt so that the
25 slots of the riser can engage about the rods. A fixed facia element can be fitted over the heads of the pins to finish off the shelf. When the riser is removed, a slight gap remains between the facia and edge of the metal shelf. Such shelves can be used in non-critical
30 applications.

It is to be understood that the invention is not limited to the specific details described herein, given by way of example only and that various modifications or alterations

- 14 -

are possible without departing from the scope of the invention as defined in the appended claims.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An elongate gripping member for a shelf having a planar surface, including means for securing the gripping member to an edge of the shelf, means for
5 moving the gripping member from the edge and biasing means for urging the gripping member towards the edge, wherein the means for moving the gripping member allows the gripping member to be extended from the shelf, whereby the gripping member may be extended from the shelf to accommodate a riser and/or other element and released to grip the element between the edge of the shelf and
10 the gripping member.
2. An elongate gripping member as claimed in claim 1, including an elongate gripping element, a housing for the biasing means and a plurality of rods extending between the housing and the gripping element, one end of each rod being fixed to the housing and the other end of each rod being removably
15 engaged with the gripping element which is movable between a pair of travel stops under and against the action of the biasing means.
3. An elongate gripping member as claimed in either claim 1 or 2, in which the housing includes a pair of co-operating housing elements having complementary engagable formations which allow the shaped elements to
20 engage but which prevent separation of the elements.
4. A shelf having a planar surface and a longitudinal gripping member as claimed in claim 1, provided along at least one edge of the shelf.
5. A shelf as claimed in claim 4, in which the edge of the shelf is provided with a depending skirt along which are provided a plurality of orifices, and the
25 gripping member includes an elongate gripping element and a plurality of rods each of which extends through an orifice in the skirt and is engaged with the elongate gripping element which is movable between a pair of travel stops under and against the action of the biasing means located beneath the planar surface of the shelf and adjacent the skirt.
- 30 6. A shelf as claimed in claim 5, in which the travel stops are provided about the rods and one end of each rod is removably engaged with the elongate gripping element so that the rods are movable with the gripping element.



7. A shelf as claimed in claim 5 or claim 6, in which the depending skirt of the shelf is provided with a return so as to form a substantially U-shaped profile at the edge of the shelf and the rods extend through a housing located within the U-shaped profile, said housing having at least one of the travel stops.

5 8. A shelf as claimed in claim 7, in which the housing includes a pair of co-operating housing element having complementary engagable formations which allow the housing elements to engage but which prevent separation of the elements.

9. A shelf as claimed in any one of claims 5 to 8, in which the gripping
10 member is provided along a front edge of the shelf and an upstand is provided at the rear edge of the shelf so as to provide a low rear wall.

10. A shelf as claimed in any one of claims 5 to 9, in which a resilient connector clip is removably provided along at least one edge of the shelf, the clip having means for securing thereto a portion of a divider positioned on the surface
15 of the shelf.

11. A shelf as claimed in any of claims 5 to 10, in which the gripping element is provided with a channel for accommodating heads of the rods of the gripping member.

12. A shelf as claimed in any one of claims 4 to 12, in which an outer facia
20 element is removably attached to the gripping member.

13. A shelf as claimed in claim 12, in which the outer facia element includes a retainer for merchandising matter.

14. An elongate gripping element substantially as herein described with reference to any one of the embodiments illustrated in the accompanying
25 drawings.

15. A shelf substantially as herein described with reference to any one of the embodiments illustrated in the accompanying drawings.

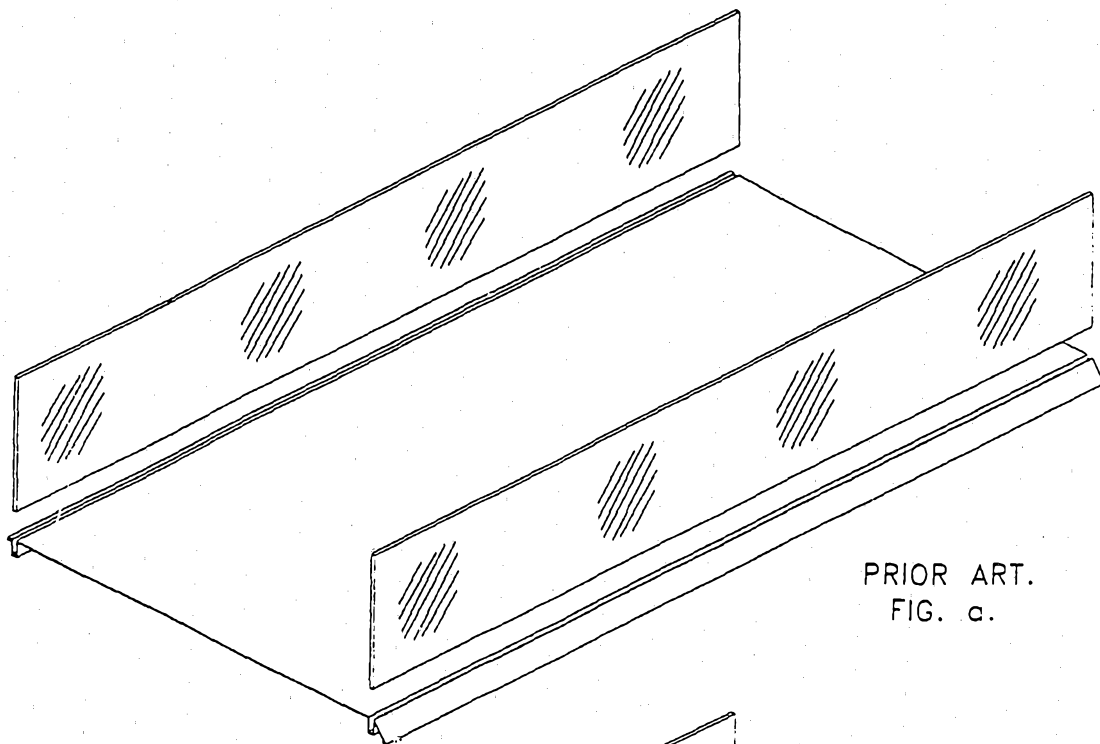
DATED: 16 March, 1995

30 PHILLIPS ORMONDE & FITZPATRICK
Attorneys for:
CARROLL PRODUCT AND DESIGNS

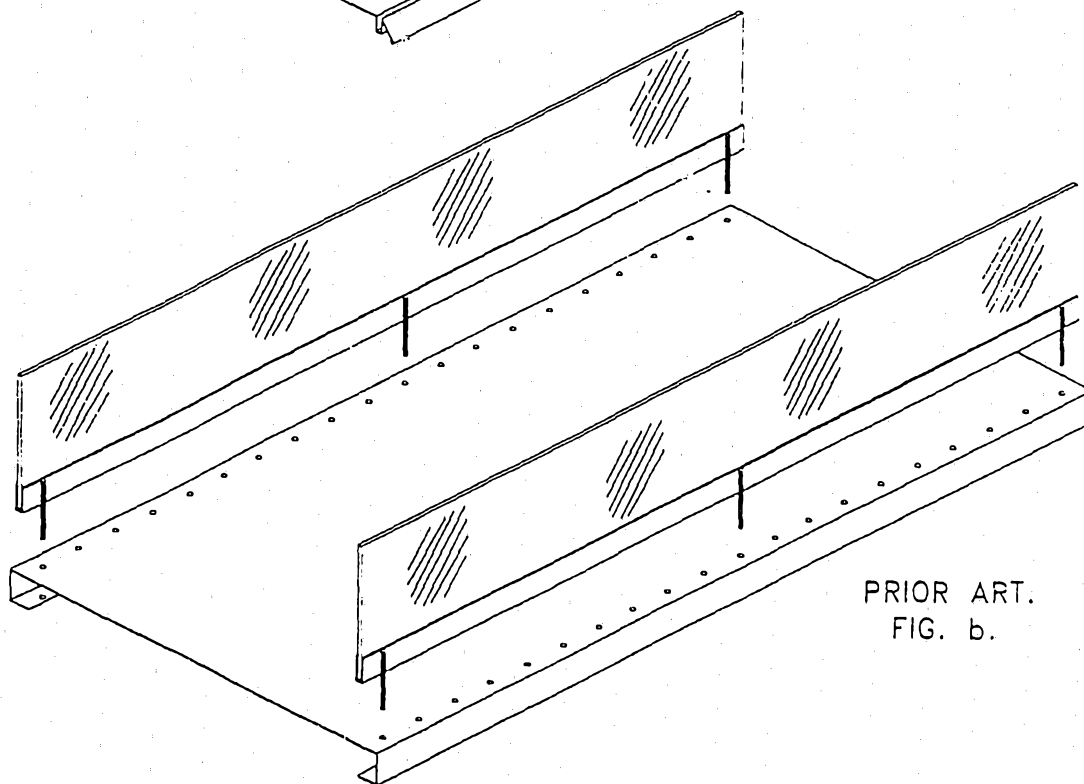
David B Fitzpatrick



1/8



PRIOR ART.
FIG. a.



PRIOR ART.
FIG. b.

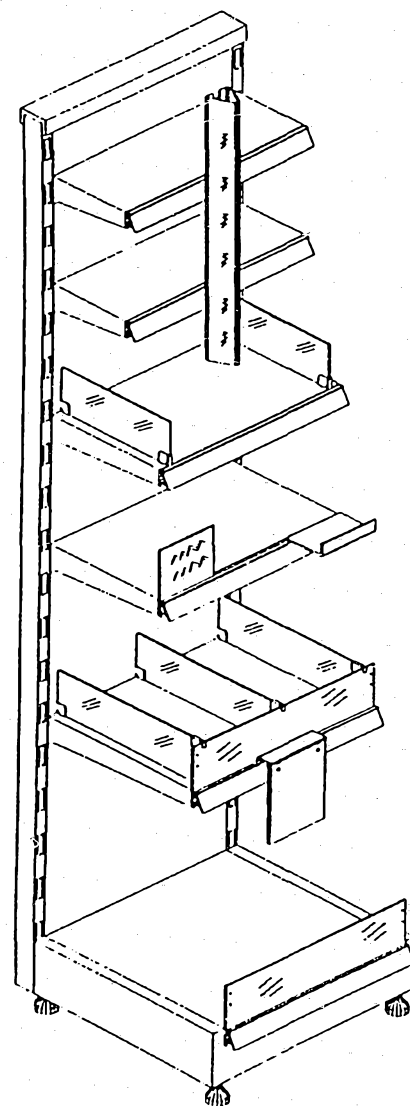


FIG. 11

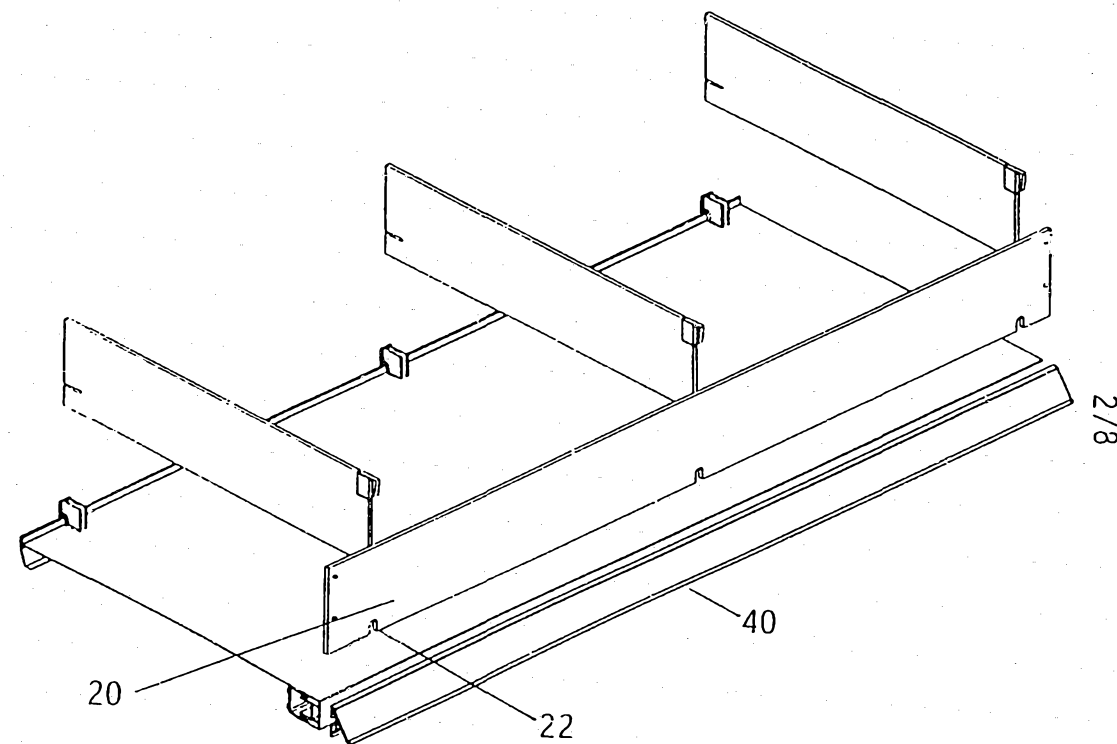


FIG. 1

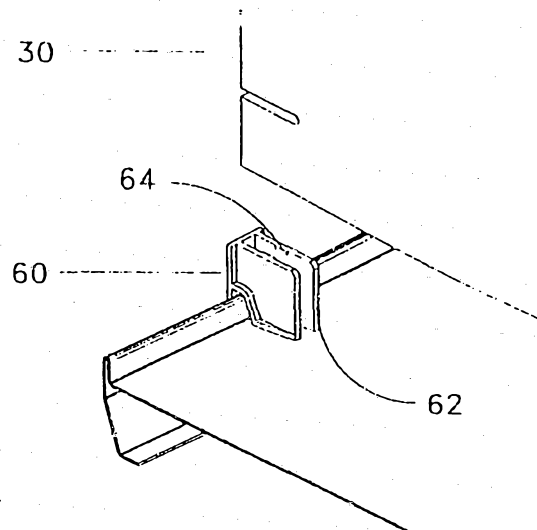


FIG. 1 a.

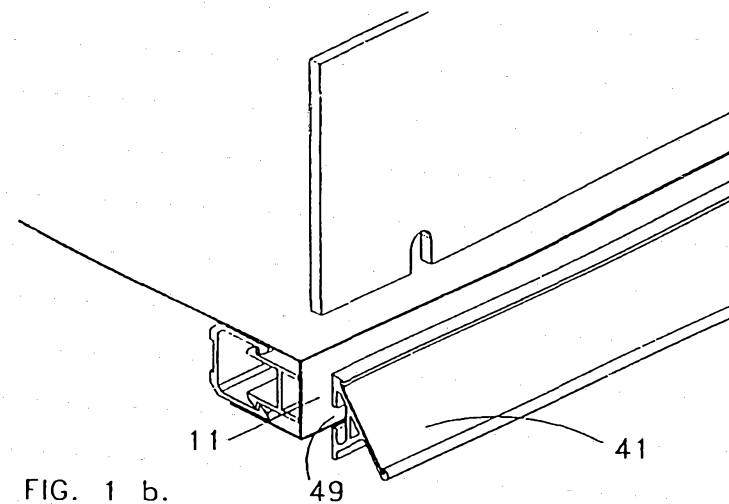


FIG. 1 b.

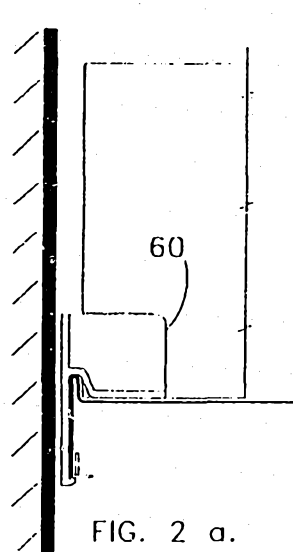


FIG. 2 a.

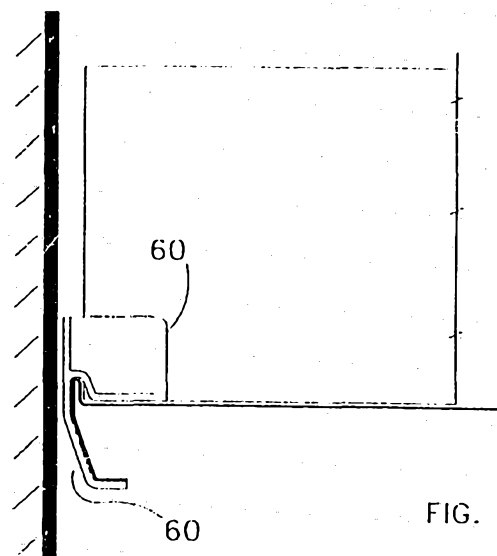
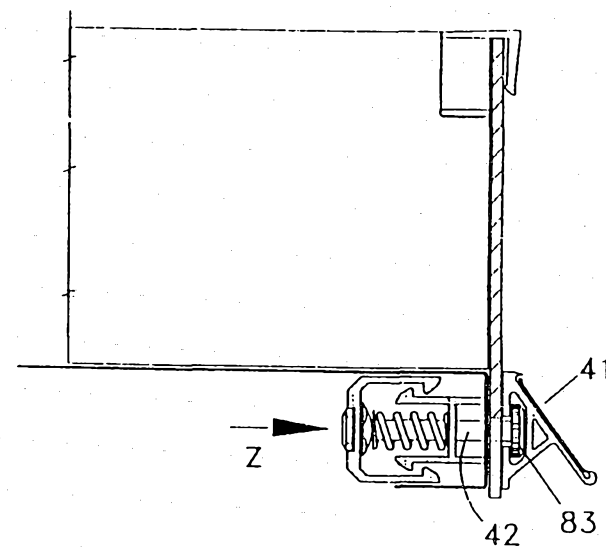


FIG. 2.



3/8

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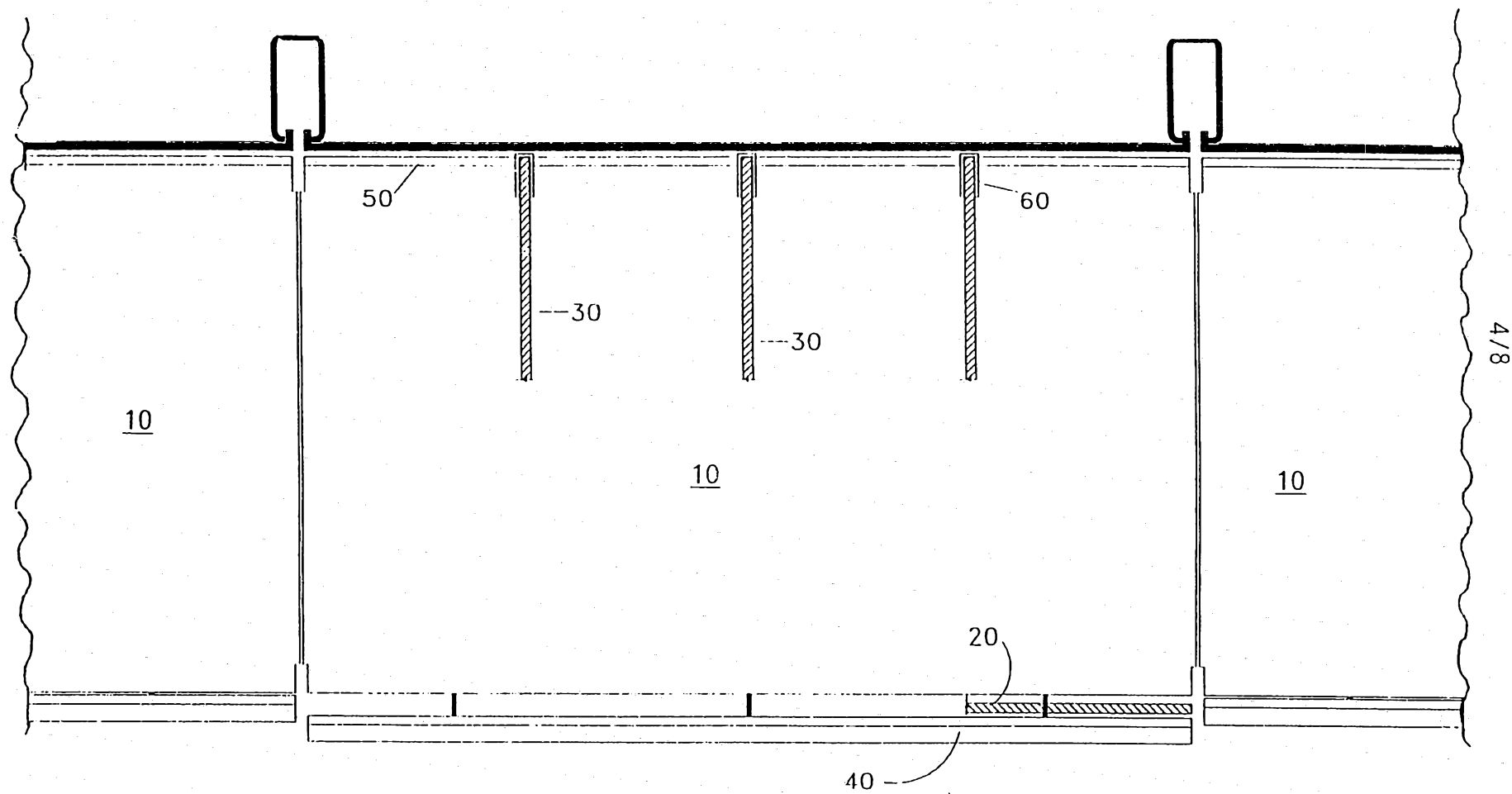


FIGURE 3.

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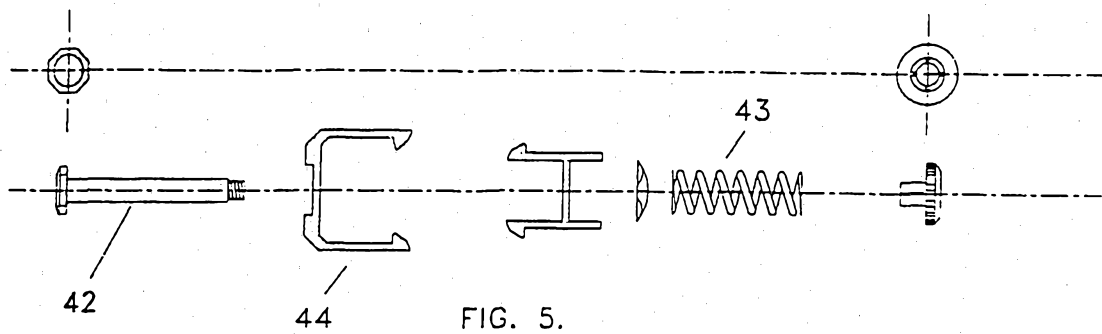


FIG. 5.

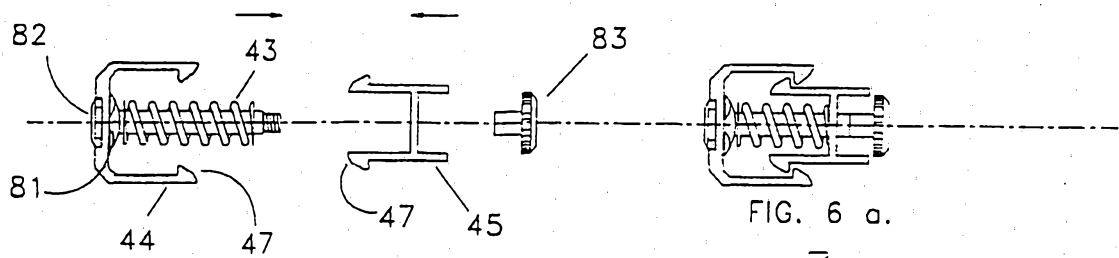


FIG. 6 a.

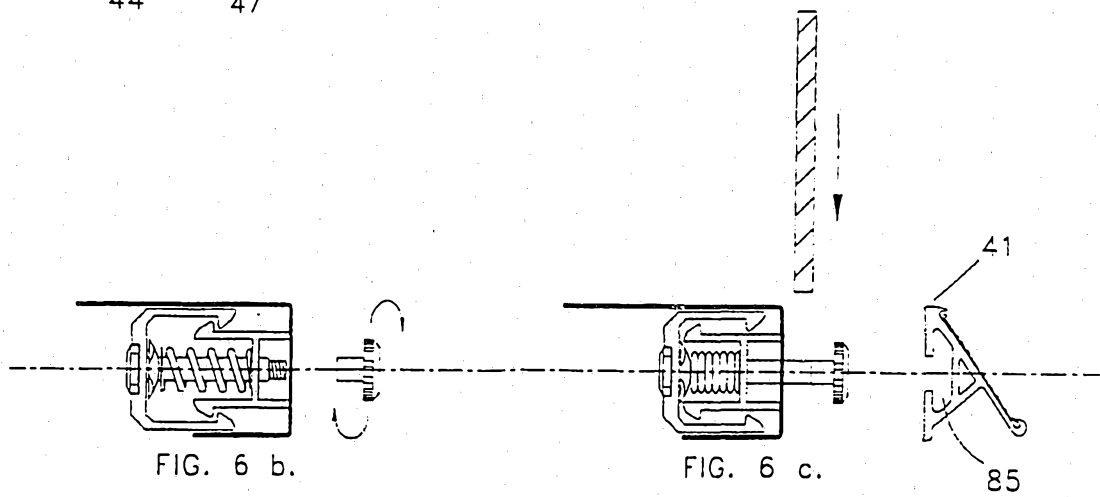


FIG. 6 b.

FIG. 6 c.

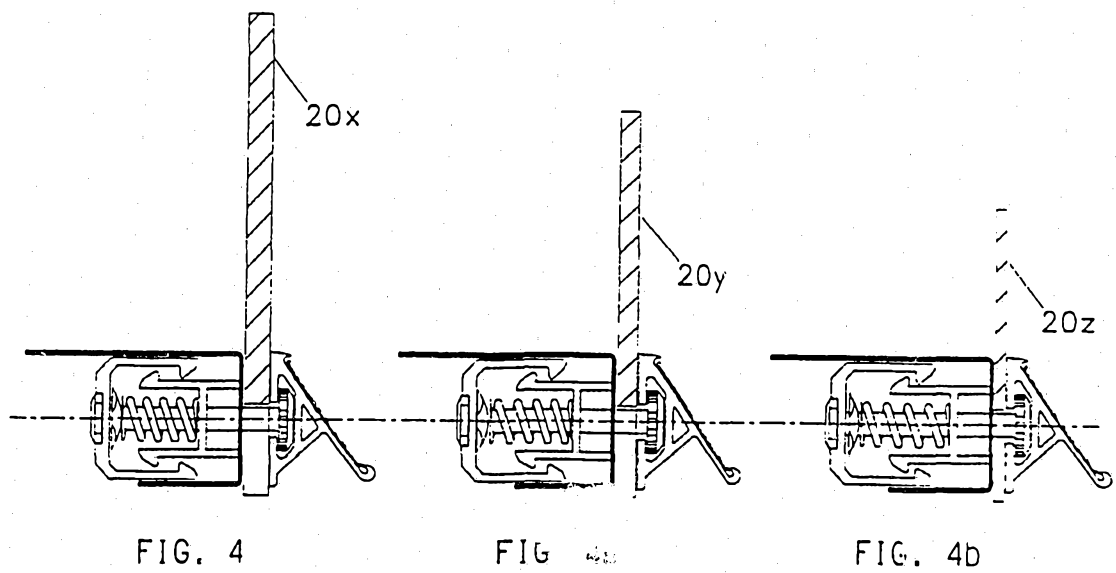


FIG. 4

FIG. 4a

FIG. 4b

6/8

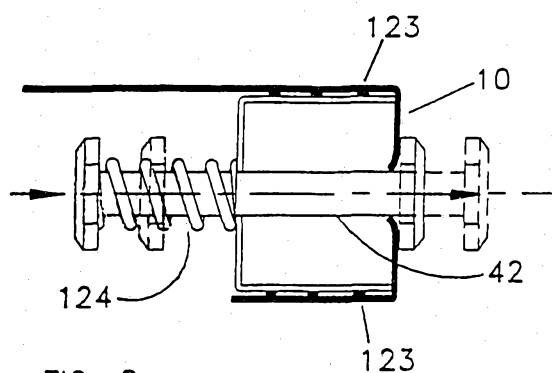


FIG. 8.

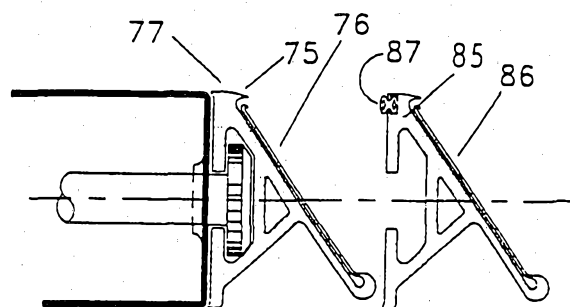


FIG. 7.

7 a.

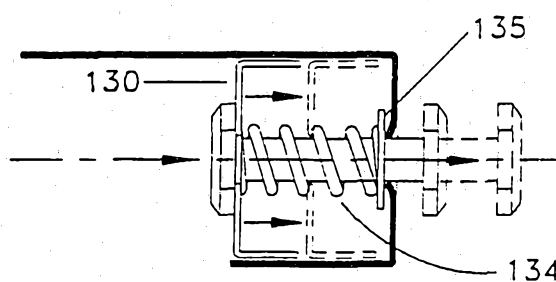


FIG. 8 b.

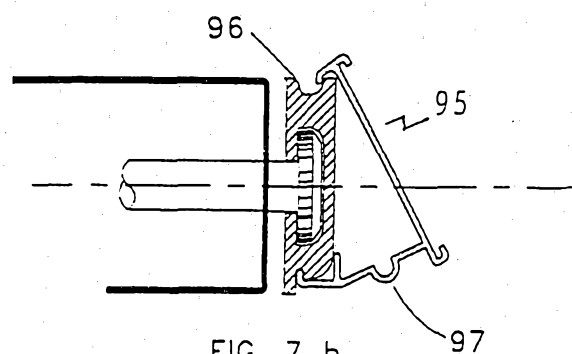


FIG. 7 b.

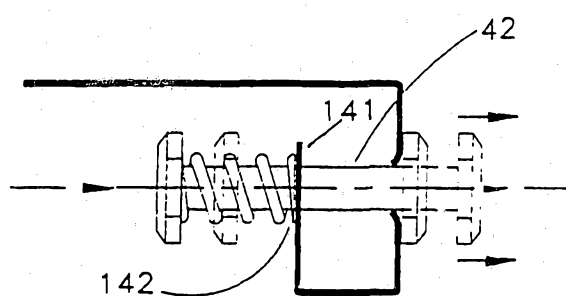


FIG. 8 b.

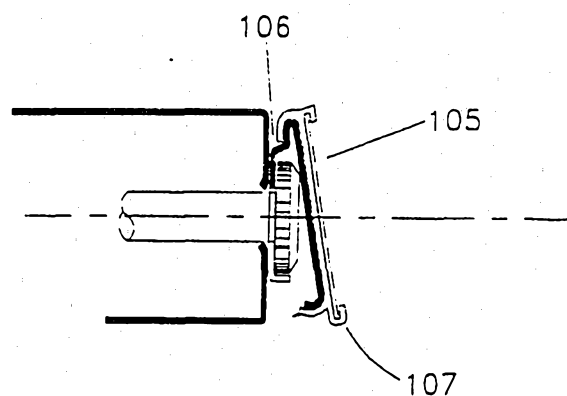


FIG. 7 c.

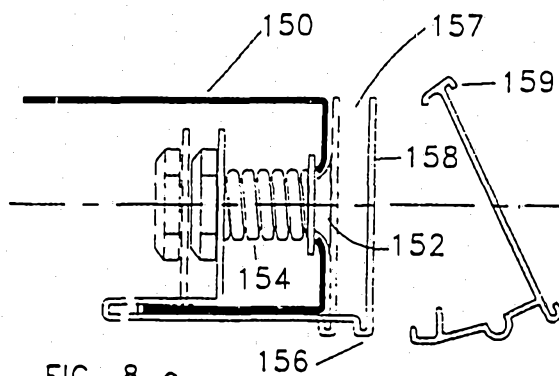


FIG. 8 c.

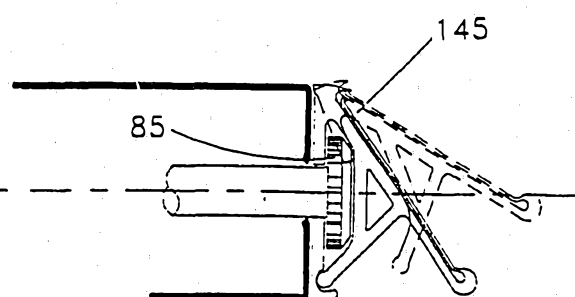


FIG. 7 d.

7/8

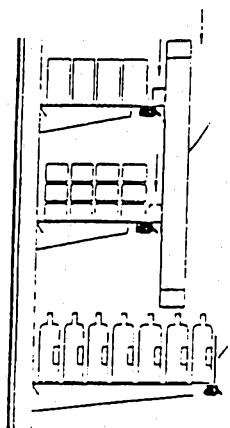


FIG. 12

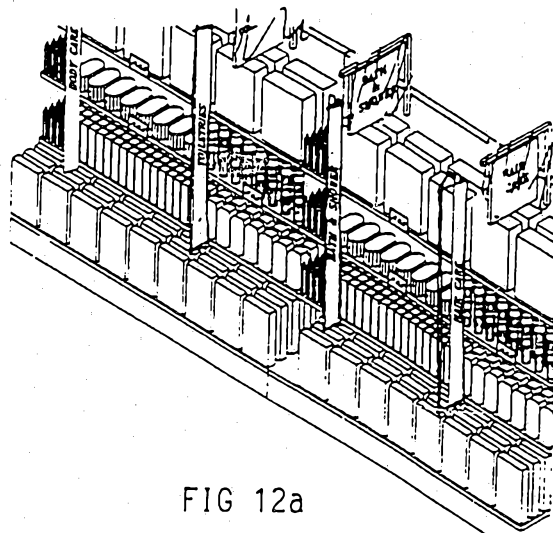


FIG. 12a

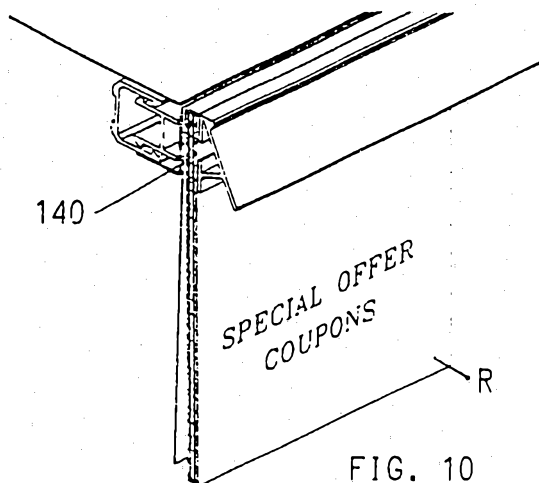


FIG. 10

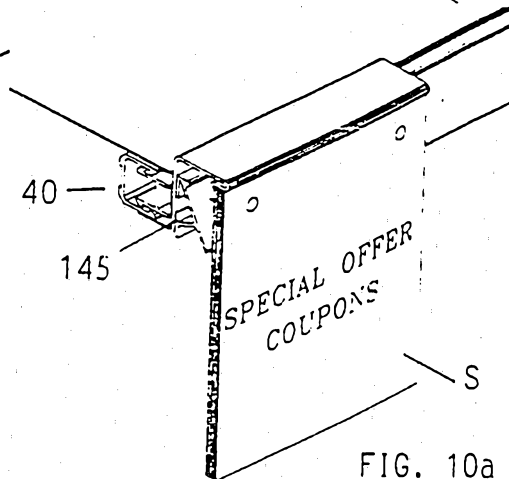


FIG. 10a

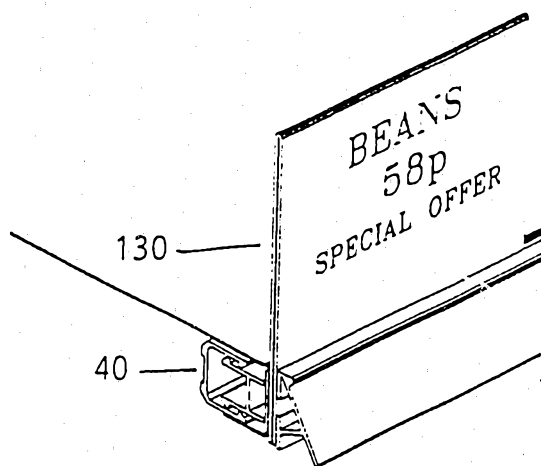


FIG. 9a

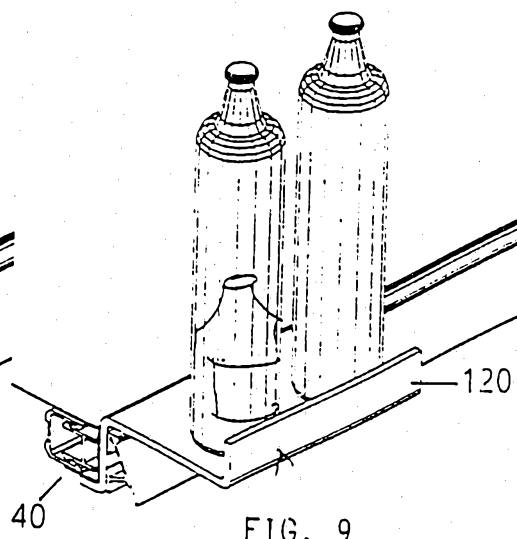
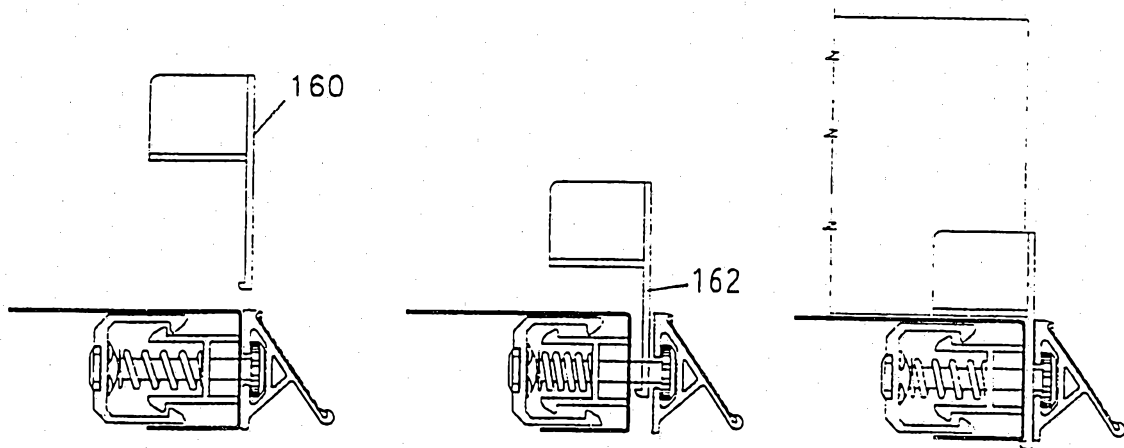
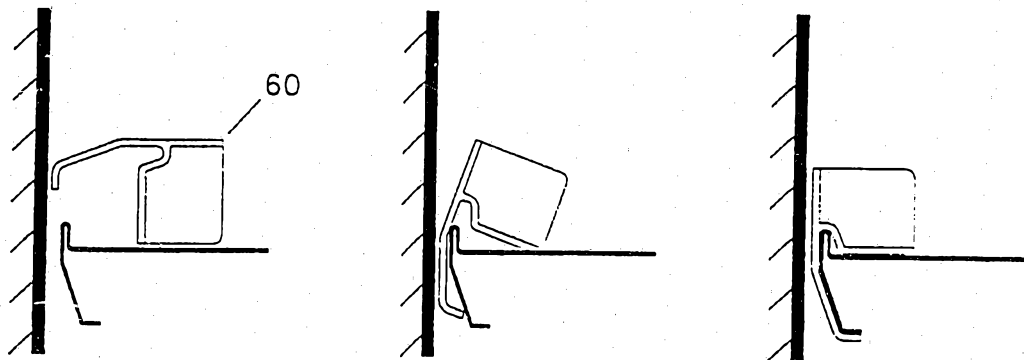
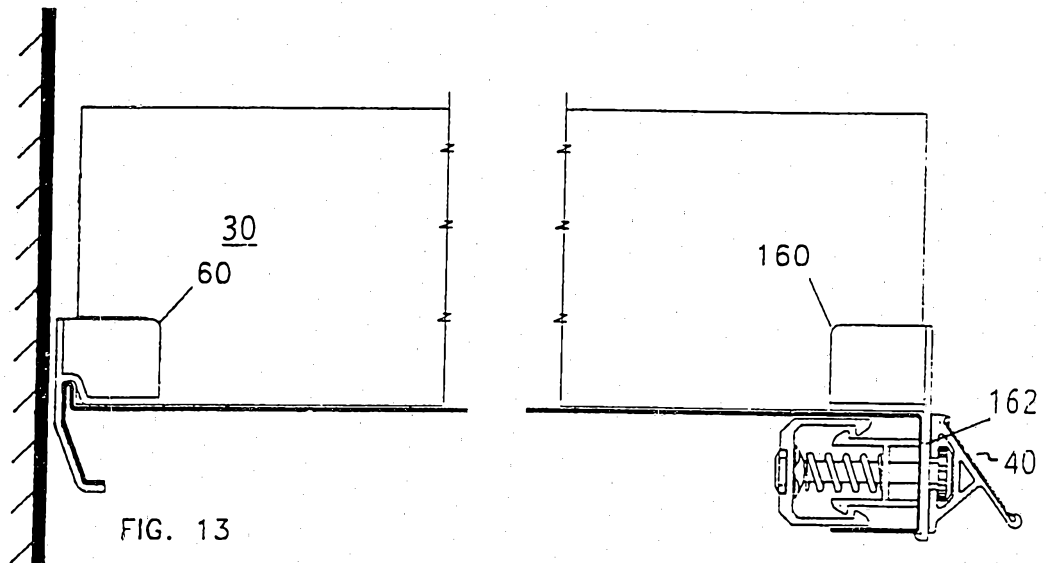


FIG. 9



INTERNATIONAL SEARCH REPORT

PCT/IE 92/00018

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 A47F5/00		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	A47F ; G09F	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	DE,B,1 102 545 (AWESO-WERKE) 30 May 1958 see column 1, paragraph 1; figures 5,6,7,8 see column 3, line 44 - line 48 ---	1,6,7,11
A	EP,A,0 205 780 (LINDE-AKTIENGESELLSCHAFT) 30 December 1986 see abstract see page 7, paragraph 2 -paragraph 3; figures 1,2 ---	2,4,9,10
A	DE,B,1 020 860 (MICHELS) 3 September 1952 see claim 1; figures 1,2,5,6 see column 4, line 17 - line 26 -----	1
⁹ Special categories of cited documents: ¹⁰ "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "A" document member of the same patent family		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
04 FEBRUARY 1993		22. 02 93
International Searching Authority		Signature of Authorized Officer
EUROPEAN PATENT OFFICE		JONES C.T.

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

IE 9200018
SA 66543

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04/02/93

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-B-1102545		None	
EP-A-0205780	30-12-86	DE-A- 3513199	16-10-86
DE-B-1020860		None	