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54 **Bracket assembly.**

57 A bracket assembly comprises a tubular upright (1) having a plurality of elongated slots (3) aligned in a vertical row in the wall of the upright, and a bracket member (6) of substantially flat construction mountable in the upright in cantilever fashion. The bracket member has an anchoring portion which engages in the upright and a contiguous portion for supporting a load. The anchoring portion includes undercut projecting tongues (7) each of which engages a slot in the upright. Each tongue is of such a length that when it is fully located in the slot the undercut (16) receives a wall portion of the upright adjacent the lower end of the slot and the free end face (14) of the tongue abuts the inner surface of the wall of the upright opposite to that containing the slot.

**EP 0 004 196 A1**

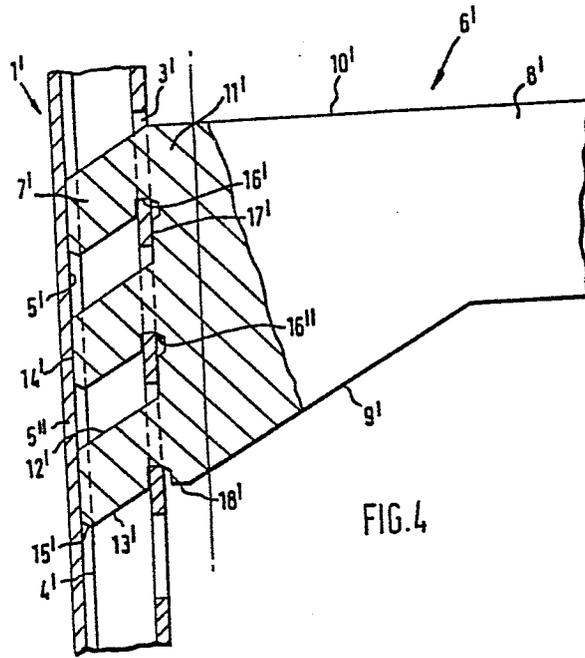


FIG. 4

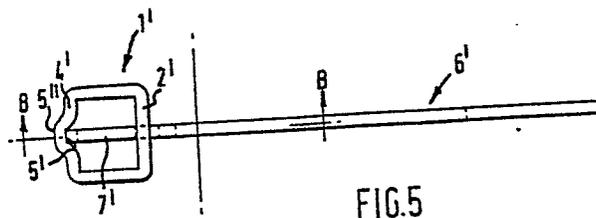


FIG. 5

This invention relates to a bracket assembly, more particularly for supporting cabinets, shelves or the like, of the general kind comprising a tubular upright having in its walls a plurality of elongate slots aligned in a vertical row, and a bracket member of substantially flat construction having at one side anchoring means in the form of tongues which upon insertion into appropriately spaced apart of said slots, anchor the bracket on the upright in a substantially cantilever fashion.

Such an assembly provides for easy vertical adjustability of the bracket with pre-determined locations. However, owing to the fact that the tongues formed on the bracket are held in the slotted upright only by engaging the wall portions adjacent the ends of said slots, these wall portions are subjected, upon loading of the bracket, to forces which tend to bend or wear these portions when a pre-determined load on the bracket is exceeded. Consequently, unless the slotted upright is made of a robust construction, which is often undesirable from the point of view of cost and weight considerations, the admissible loading on the bracket is somewhat limited and the anchoring of the bracket in the slotted upright lacks the desired stability.

The invention aims at providing an improved bracket assembly of the foregoing general kind both with regards to strength and stability whilst retaining a pleasing appearance of the assembly.

Accordingly, the present invention consists in a bracket assembly comprising a tubular upright (as herein-defined) having a plurality of elongate slots aligned in a vertical row, and a bracket member of substantially flat construction having an anchoring portion engageable in said upright and a contiguous portion for supporting a load, said anchoring portion including at least one undercut projecting tongue which engages a slot in said upright, said tongue being of such a length that when it is fully located in said slot said undercut receives a wall portion of the upright adjacent the lower end of said slot and the free end face of the tongue abuts the inner surface of the wall of the upright opposite to that containing the slot, the end face of the bracket member extending downwardly from said undercut abutting the outer surface of the upright below the lower end of said slot.

The term "tubular upright" used herein is intended to denote not only a single tubular member of circular or substantially rectangular cross-section but also an assembly of two or more of such members joined together along their longitudinal walls, as well as a member having a substantially S-shaped cross-section. In the latter case the slotted walls are constituted by the two outer horizontal limbs of the S-shape.

By virtue of the construction in accordance with

the invention the load applied, in use, to the bracket, is to a great extent taken up by the wall of the upright against which the free end face of the tongue abuts, whilst the wall portion adjacent the lower end of the slot, which portion is engaged by the tongue undercut, serves substantially as a fulcrum for the bracket and is therefor subjected to a reduced loading in comparison to the known arrangement.

The said contiguous portion of the bracket member for supporting a load may be in the form of an elongate substantially rectangular arm.

In order that the invention may be more readily understood, reference is made to the accompanying drawings which illustrate diagrammatically and by way of example embodiments thereof, and in which:-

Fig. 1 is a cross-section on the line A-A of Fig. 2 of one embodiment of the bracket assembly in accordance with the invention,

Fig. 2 is a top plan view of the bracket assembly,

Fig. 3 is a partial perspective view of the bracket member of the assembly shown in Figs. 1 and 2,

Fig. 4 is a cross-section on the line B-B of Fig. 5 of another embodiment of the bracket assembly,

Fig. 5 is a top plan view of the bracket assembly illustrated in Fig. 4,

Fig. 6 is a top plan view of a further embodiment of

-5-

the bracket assembly,

Fig. 7 is an exploded perspective view of the bracket assembly of Fig. 6 with the bracket arms omitted, and

5 Fig. 8 shows a modified construction of the bracket arm to provide for vertical adjustability of the load supporting part of the bracket arm relative to the anchoring part and relative to the upright.

Referring to the drawings, the bracket assembly  
10 ullustrated in Figs. 1 to 3 comprises an upright 1 which is in the form of a steel section having an S-shape cross-section. The two outer horizontal limbs 2 of the S-shape are provided with a plurality of elongate slots 3 which are aligned in a vertical row. Each wall 4 of the upright  
15 1 which is contiguous to the respective slotted wall 2 is unslotted as is a central common wall 5 joining the respective pairs of contiguous walls 4.

A bracket member 6 of substantially flat elongate construction and having a thickness substantially corresponding to the width of the slots 3 is formed at one  
20 end with three projecting tongues 7 which respectively engage three adjacent slots 3 in the upright 1 and by means of which the bracket member 6 is releasably anchored in the upright 1 to project in cantilever fashion from  
25 the slotted wall 2 thereof. Starting from its free end the bracket member 6 has a rectangular shape substantially

along half its length 8, whereafter the bottom edge  
flares outwardly at 9 at an angle of  $30^{\circ}$  to the hori-  
zontal to form with the straight upper edge 10 of the  
bracket member 6 a widened portion which terminates  
5 in an anchoring portion 11 from the end face of which  
the three tongues 7 project. The upper and lower edges  
12;13 of each tongue 7 are parallel to one another and  
extend downwardly at an angle of  $30^{\circ}$  to the horizontal  
upper edge 10 of the bracket member 6, that is they are  
10 parallel to the oblique edge 9 of the widened portion 11.  
The free end face 14 of each tongue 7 is vertical with  
the bottom corner 15 slightly chamfered horizontally to  
provide a lead-in surface facilitating insertion of the  
tongue 7 into the slot 3.

15 Each tongue 7 is provided in its lower edge 13, at  
the juncture with the adjacent end face of the anchoring  
portion 11, with an undercut 16 which is in the form of  
a rectangular recess the width of which corresponds  
substantially to the thickness of the slotted wall 2 of  
20 the upright 1 and which receives the edge portion of  
the lower end of the respective slot 3 engaged by the  
tongue 7. For ease in manufacture, the undercut 16 in  
the tongue 7 is enlarged by a semi-circular recess 16"  
formed in the adjacent end face 17 of the anchoring  
25 portion 11, the radius of said semi-circular recess being  
slightly smaller than the width of the recess in the

tongue 7. The free end of the semi-circular recess merges with the end face 17 of the anchoring portion 11 which end face extends downwardly a distance substantially corresponding to the spacing between two adjacent slots 3 in the upright 1 and then merges with the upper oblique edge 12 of the adjacent lower tongue 7. The latter and the third tongue 7 are formed in a similar manner to that of the upper tongue 7 with the free end of the semi-circular recess of the lowermost tongue 7 merging with the remaining portion of the end face 17 of the anchoring portion 11, which remaining portion merges with the oblique edge 9 of the widened portion 11, preferably via a short horizontal chamfer 18.

Whilst in the embodiment described the bracket member 6 is formed with three projecting tongues 7 it will be appreciated that more than three such vertically aligned tongues may be provided depending solely on the particular application for which the bracket is intended. Alternatively, a "light duty" bracket of narrower width may be formed with only two or even one anchoring tongue 7.

On assembly the bracket member 6 held in a substantially horizontal position is first aligned by the end faces 14 of the projecting tongues 7 with three adjacent slots 7 in the slotted wall 2 of the S-shaped upright 1 and is then pushed in that position against the upright 1, whereby the three projecting tongues 7 slide into the

-8-

three slots 7 on the three lower end edges thereof until the recesses forming the undercuts 16 in the tongues 7 come to lie with their horizontal walls on said end edges and substantially simultaneously the free end faces 14  
5 of the tongues 7 come to abut against the central un-slotted wall 5 of the upright 1. Since the tongues 7 engage the slots 3 with a sliding fit sufficient lateral support for the tongues 7 is provided by the longitudinal walls of the slots 3. When a load is applied to the elongate portion 8 of the bracket 6, only a very slight pivotal  
10 movement of the bracket 6 is sufficient firmly to brace the bracket member 6 against the central wall 5 by way of the end faces 14 of the tongues.

The slotted upright 1 which in the described embodiment has an S-shaped cross-section is, in use, preferably  
15 covered on its two unslotted sides by cladding panels 19 of sheet metal which are suitably attached, for example by adhesive bonding to the outer surfaces of the two unslotted walls 2 contiguous with the central wall 5.  
20 These cladding panels 19 are advantageously provided along their longitudinal edges with either inwardly or outwardly directed flanges 20 which in the attached condition of the panels 19 come close to the longitudinal edges of the slots 3 in the upright 1 and thus laterally  
25 bound the adjacent load-supporting portion 8 of the bracket member 6 providing a datum line 21 on the one

side of which only the plane part 8 of the bracket member 6 is visible and on the other side of which substantially only the cladding 19 is visible. Such arrangement enhances the pleasing appearance of the bracket assembly by substantially masking the slotted upright together with the portion of the bracket member engaging the slots in said upright. The bracket member 6 and the cladding panels 19 may conveniently be chromium plated or provided with coloured enamel coating.

In the embodiment of Figs. 4 and 5 the bracket assembly comprises a tubular upright 1' having a substantially rectangular cross-section. In a wall 2', which for convenience sake will be referred to hereinafter as "the front wall", are provided a plurality of elongate slots 3' which are aligned in a vertical row. The opposite wall, i.e. the rear wall 4', is provided with a continuous longitudinal indentation 5' having a flat bottom the width of which substantially corresponds to that of the slots 3'. As a result of the indentation 5' a longitudinal bead 5" is formed on the outer surface of the rear wall 4'. The rear wall indentation and the slots 3' have a common centre line, i.e. they face one another in parallel relationship.

A bracket member 6' of substantially flat elongate construction and having a thickness substantially corresponding to the width of the slots 3' is formed at one

end with three projecting tongues 7' which respectively engage three adjacent slots 3' in the upright 1' and by means of which the bracket member 6' is releasably anchored in the upright 1' to project in cantilever fashion from the slotted wall 2' thereof. Starting from its free end the bracket member 6' has a rectangular shape substantially along half its length 8', whereafter the bottom edge flares outwardly at 9' at an angle of  $30^{\circ}$  to the horizontal to form with the straight upper edge 10' of the bracket member 6' a widened portion which terminates in an anchoring portion 11' from the end face of which the three tongues 7' project. The upper and lower edges 12';13' of each tongue 7' are parallel to one another and extend downwardly at an angle of  $30^{\circ}$  to the horizontal upper edge 10' of the bracket member 6', that is they are parallel to the oblique edge 9' of the widened portion 11'. The free end face 14' of each tongue 7' is vertical with the bottom corner 15' slightly chamfered at an angle to the horizontal to provide a lead-in surface facilitating insertion of the tongue 7' into the slot 3'.

Each tongue 7' is provided in its lower edge 13', at the juncture with the adjacent end face of the anchoring portion 11', with an undercut 16' which is in the form of a rectangular recess the width of which corresponds substantially to the thickness of the slotted wall 2'

of the upright 1' and which receives the edge portion of the lower end of the respective slot 3' engaged by the tongue 7' is enlarged by a trapezoidal 16" recess formed in the adjacent end face 17' of the anchoring portion 11, the width of said trapezoidal recess being slightly smaller than the width of the recess in the tongue 7. The free end of the trapezoidal recess merges with the end face 17' of the anchoring portion 11' which end face extends downwardly a distance substantially corresponding to the spacing between two adjacent slots 3' in the upright 1' and then merges with the upper oblique edge 12' of the adjacent lower tongue 7'. The latter and the third tongue 7' are formed in a similar manner to that of the upper tongue 7' with the free end of the trapezoidal recess of the lowermost tongue 7' merging with the remaining portion of the end face 17' of the anchoring portion 11', which remaining portion merges with the oblique edge 9' of the widened portion 11', preferably via a short horizontal chamfer 18'.

Whilst in the embodiment described the bracket member 6' is formed with three projecting tongues 7' it will be appreciated that more than three such vertically aligned tongues may be provided depending solely on the particular application for which the bracket is intended. Alternatively, a "light duty" bracket of narrower width may be formed with only two or even one anchoring tongue 7'.

The bracket assembly of Figs. 4 and 5 is assembled in a manner similar to that already described with reference to the embodiment of Figs. 1 to 3. The indentation 5' formed in the rear wall 4' of the upright 1' constitutes, in the assembled condition, a locating means for the free end face 14' of each tongue 7' to prevent lateral movement of the bracket member 6' relative to the upright 1' and thus provide increased rigidity when the bracket assembly is in use.

10 The embodiment of Figs. 6 and 7 utilizes two uprights 1', used in the embodiment of Figs. 4 and 5, to form a substantially box-section upright 1" in which the uprights 1' are joined together so as to contact one another along their longitudinal walls 4' provided with the indentations 5'. The two uprights 1' are held together in the juxtaposed position by means of two identical spring clips 22 which engage the pair of uprights 1' from two opposite sides so as substantially to embrace them, and leaving only a comparatively narrow gap 23 substantially corresponding to the width of the slots 3' which gap is defined by outwardly flaring lugs 24, two of which are formed at each end of the two clips 22. Similar to the embodiment of Figs. 1 to 3, the composite upright 1" is, in use, covered on its two unslotted sides by cladding panels 19' of sheet metal which are provided along their longitudinal edges with inwardly directed flanges 20' which

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are engaged by the lugs 24 of the clips 22 to retain the panels 19' in position. In the assembled condition the flanges 20 come close to the longitudinal edges of the slots 3' in the upright 1" and thus laterally bound the adjacent load-supporting portion 8' of the bracket member 6' and provide the datum line 21. The bracket members 6' are constructed and mounted in the upright 1" in a manner similar to that as already described with reference to Figs. 4 and 5.

In the embodiment of Fig. 8 the bracket member is made of two main parts 25 and 26 which are movable relative to one another in a vertical plane to vary the position of the load supporting portion 25 of the bracket member relative to the anchoring portion 26 and the upright (not shown) and which portions are securable together in an adjusted position. For this purpose the widened portion 11" of the bracket member is modified by having a plane end face (i.e. without projecting tongues) which has a curved portion 27 at its lower end and which merges with the oblique edge 9" of the widened portion 11". A plate member 26 having the shape of a substantially isosceles triangle is pivotally secured adjacent the apex of the triangle to the widened portion 11" to lie in a first position (solid lines) flat thereon with one equal side of the triangular plate 26 flush with the adjacent oblique edge 9" of the widened portion 11".

The base of the triangular plate 26 has three projecting tongues 7' described with reference to Figs. 4 and 5.

The plate member 26 has, starting from the apex, three tapped holes 28, 29 and 30 adjacent the other equal side of the triangle. Hole 28 serves as fulcrum for a locating hole 31 or 32 provided in the part 25. Holes 29 and 30 serve as locating holes for six holes 34 arranged in an arcuate slot 33. Two screws 35;36 secure the two main parts 25;26 of the bracket member together. In the position shown in solid lines (part 25 horizontal), the locating hole 31 of the part 25 is in register with the tapped hole 28 of the part 26 and one of the holes (upper end hole) 34 in the slot 33 is in register with the tapped hole 30 of the part 26. In the position shown by chain-dotted lines (part 25 inclined downwardly) the fulcrum 28;31 remains the same but a fourth hole 34 from the top is in register with the locating hole 30 of part 26. In the upwardly inclined position of part 25 (broken lines) the locating hole 32 of part 25 is in register with the tapped hole 28 and one hole 34 (second from top) is in register with the tapped hole 29 of part 26.

Instead of the tapped holes and locating holes the two cooperating main parts 25;26 of the bracket member may be provided with detent means (not shown) for securing an adjusted position of the bracket arm. In order that the part 25 lies in one plane with the tongues 7' of

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-15-

the part 26 the latter is suitably cranked along a line adjacent the recesses 16' in the part 26.

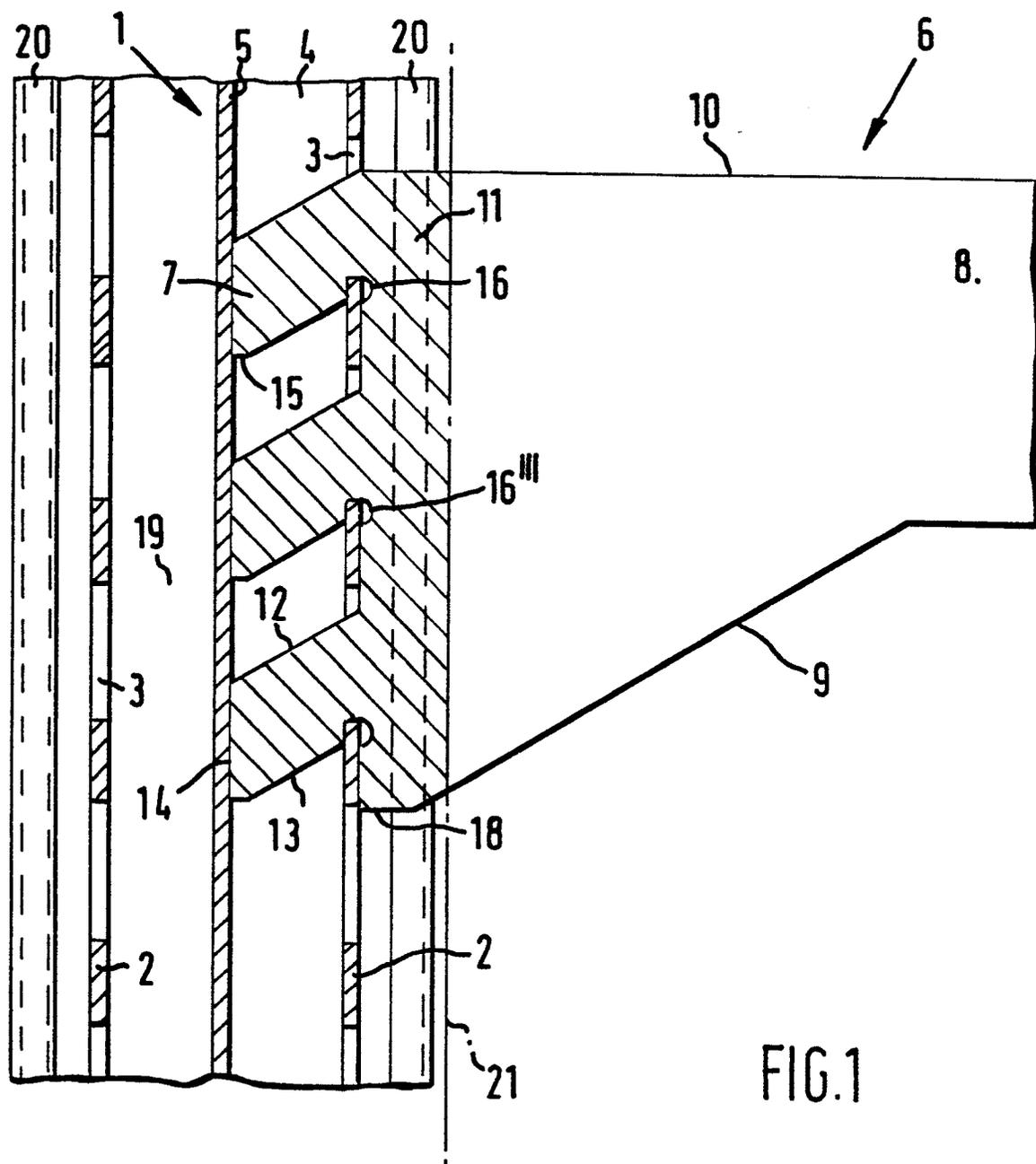
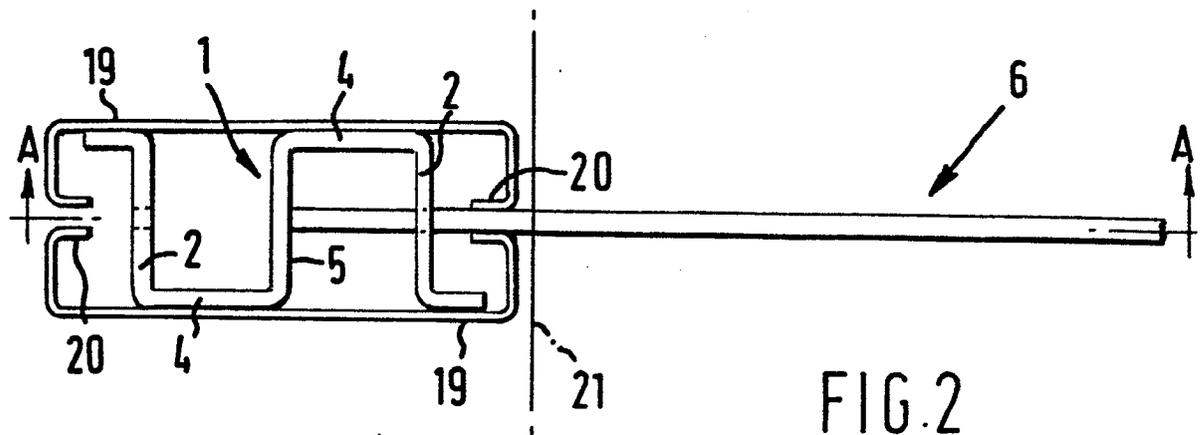
1. A bracket assembly comprising a tubular upright (as hereinafter defined) having a plurality of elongated slots aligned in a vertical row, and a bracket member of substantially flat construction having an anchoring portion engageable in said upright and a contiguous portion for supporting a load, said anchoring portion including at least one undercut projecting tongue which engages a slot in said upright, said tongue being of such a length that when it is fully located in said slot said undercut receives a wall portion of the upright adjacent the lower end of said slot and the free end face of the tongue abuts the inner surface of the wall of the upright opposite to that containing the slot, the end face of the bracket member extending downwardly from said undercut abutting the outer surface of the upright below the lower end of said slot.
- 5.
- 10.
- 15.
2. A bracket assembly as claimed in claim 1, wherein said contiguous portion of the bracket member is in the form of an elongated substantially rectangular arm.
3. A bracket assembly as claimed in claim 1 or 2, wherein said upright has a substantially S-shaped cross-section and said elongated slots are formed in the two outer horizontal limbs of the S-shape.
- 20.
4. A bracket assembly as claimed in claim 3, wherein the S-shaped upright is covered on its two unslotted sides by respective cladding panels of sheet metal.
- 25.
5. A bracket assembly as claimed in claim 4, wherein the sheet metal cladding panels are attached by adhesive

bonding to the outer surfaces of the two slotted walls of the S-shaped upright.

5. A bracket assembly as claimed in claim 4 or 5, wherein each cladding panel is provided along its longitudinal edges with either inwardly or outwardly directed flanges which extend close to the longitudinal edges of the slots in the upright and laterally bound the adjacent load-supporting portion of the bracket member.
7. A bracket assembly as claimed in claim 1 or 2, wherein
10. said tubular upright has a substantially rectangular cross-section, one wall of the tube has continuous internal indentation extending longitudinally of the tube, and the longitudinal slots are provided in the opposite wall of the tube.
15. 8. A bracket assembly as claimed in claim 7, wherein the indentation and the row of longitudinal slots have a common centre line, and the free ends of said tongues are retained in said indentation to prevent lateral movement of the bracket arm relative to said upright.
20. 9. A bracket assembly as claimed in claim 1 or 2, wherein said tubular upright comprises two interconnected tubular members, each said tubular member has a substantially rectangular cross-section, one wall of each tubular member has a contiguous internal indentation extending longitudinal
25. of the tubular member, and the longitudinal slots are provided in the opposite wall of each tubular member.

10. A bracket assembly as claimed in claim 9, wherein the two tubular members contact one another along their walls provided with the indentations and are held together in position by means of at least one pair of identical spring clips, each clip of a pair engaging the tubular members on one side thereof.
11. A bracket assembly as claimed in claim 10, wherein the upright is covered on its two unslotted sides by respective cladding panels of sheet metal, each said panel being provided along its longitudinal edges with inwardly directed flanges which are engaged by outwardly extending lugs formed at each end of each spring clip to retain said panels in position.
12. A bracket assembly as claimed in any of the preceding claims, wherein the or each undercut tongue of the bracket member has an upper and a lower edge, said edges extending parallel to one another and at an acute angle in relation to an upper longitudinal edge of the bracket member.
13. A bracket assembly as claimed in claim 12, wherein the undercut of the or each said tongue is in the form of a rectangular recess the width corresponds substantially to the thickness of the slotted wall of the upright.
14. A bracket assembly as claimed in claim 13, wherein the rectangular recess is enlarged by a semi-circular or trapezoidal recess formed in the adjacent wall portion of the bracket member.

15. A bracket assembly as claimed in claim 1, wherein the bracket member comprises two main parts which are moveable relative to one another in a vertical plane, one part constituting said anchoring portion and the other
5. part constituting said load-supporting portion, the two parts being adjustably joined together by securing means to maintain said parts in the adjusted portion.



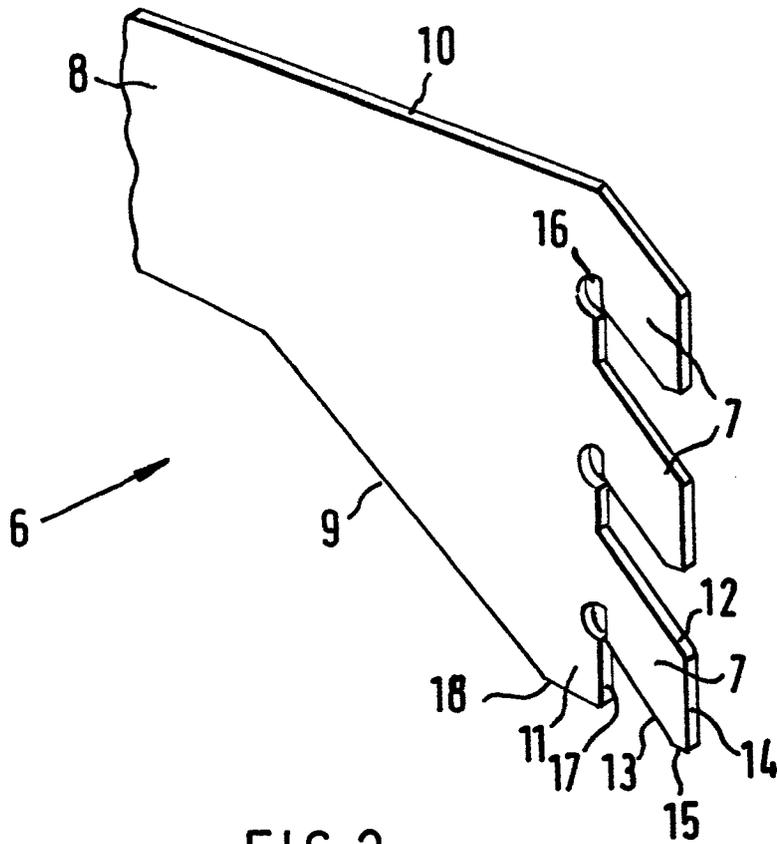


FIG. 3

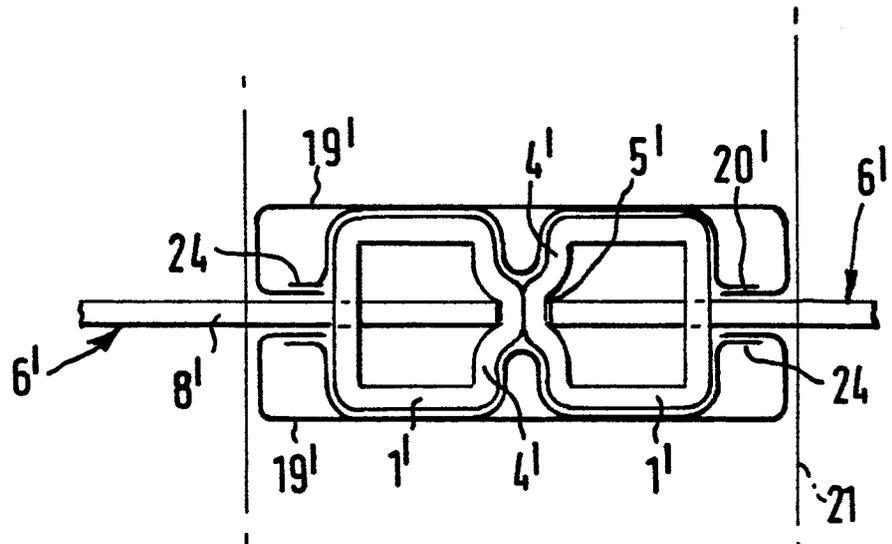


FIG. 6

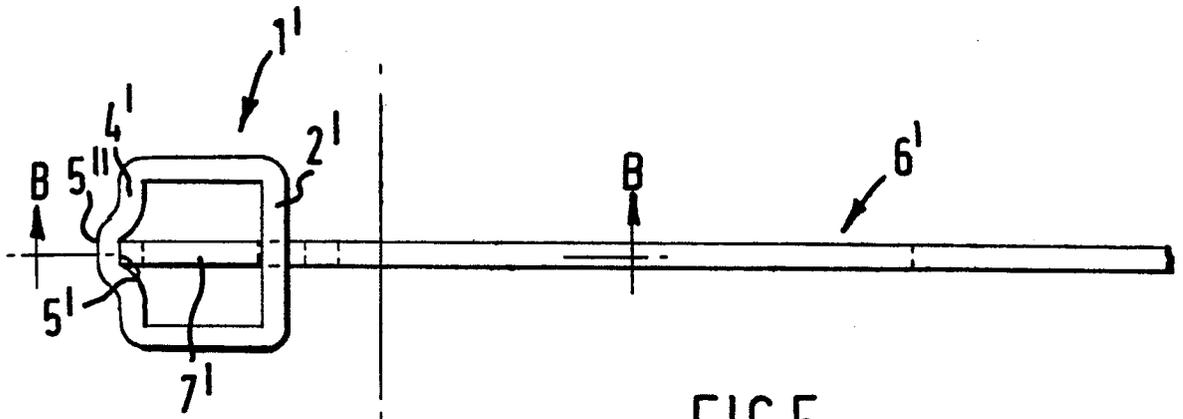


FIG. 5

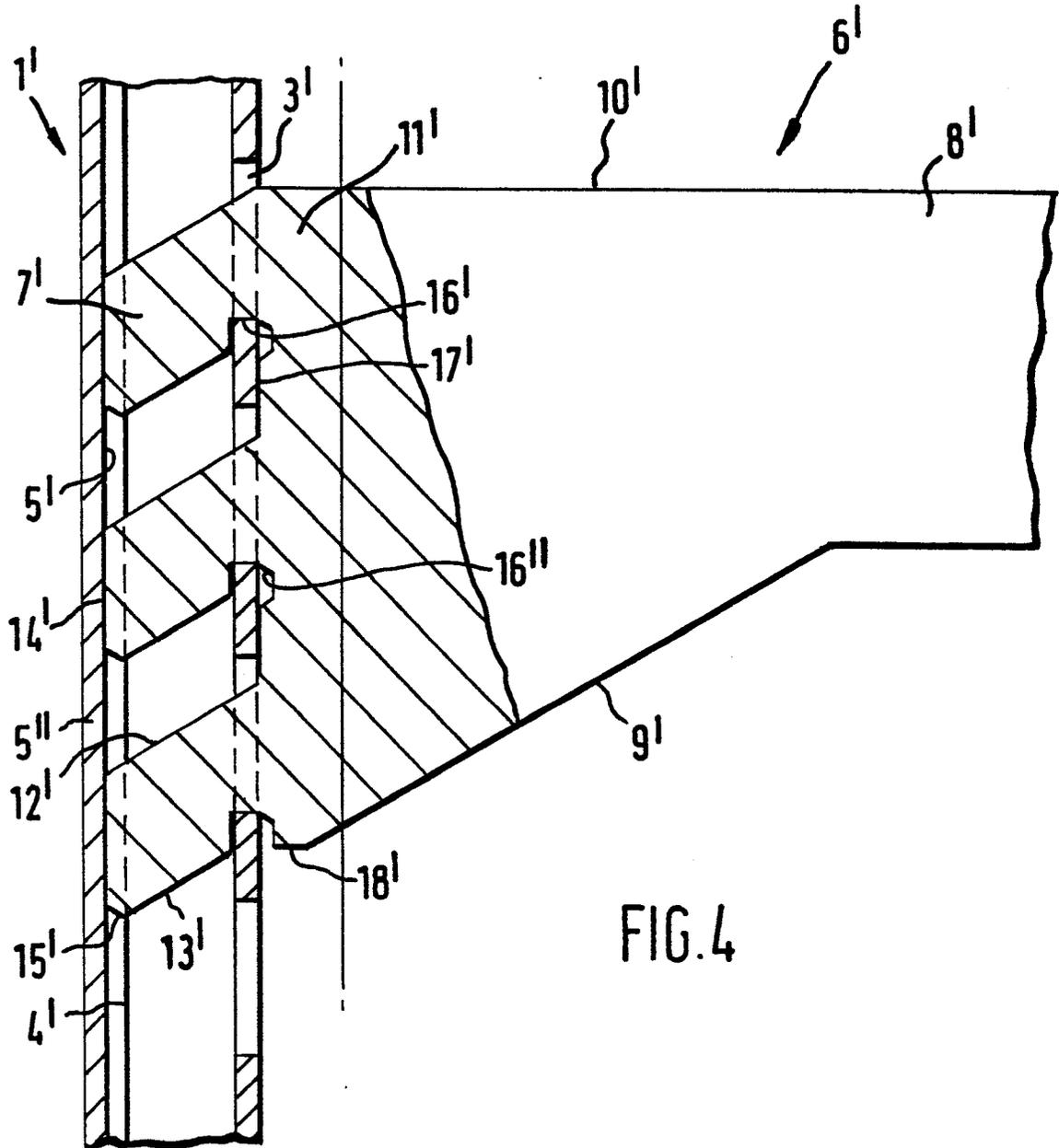


FIG. 4

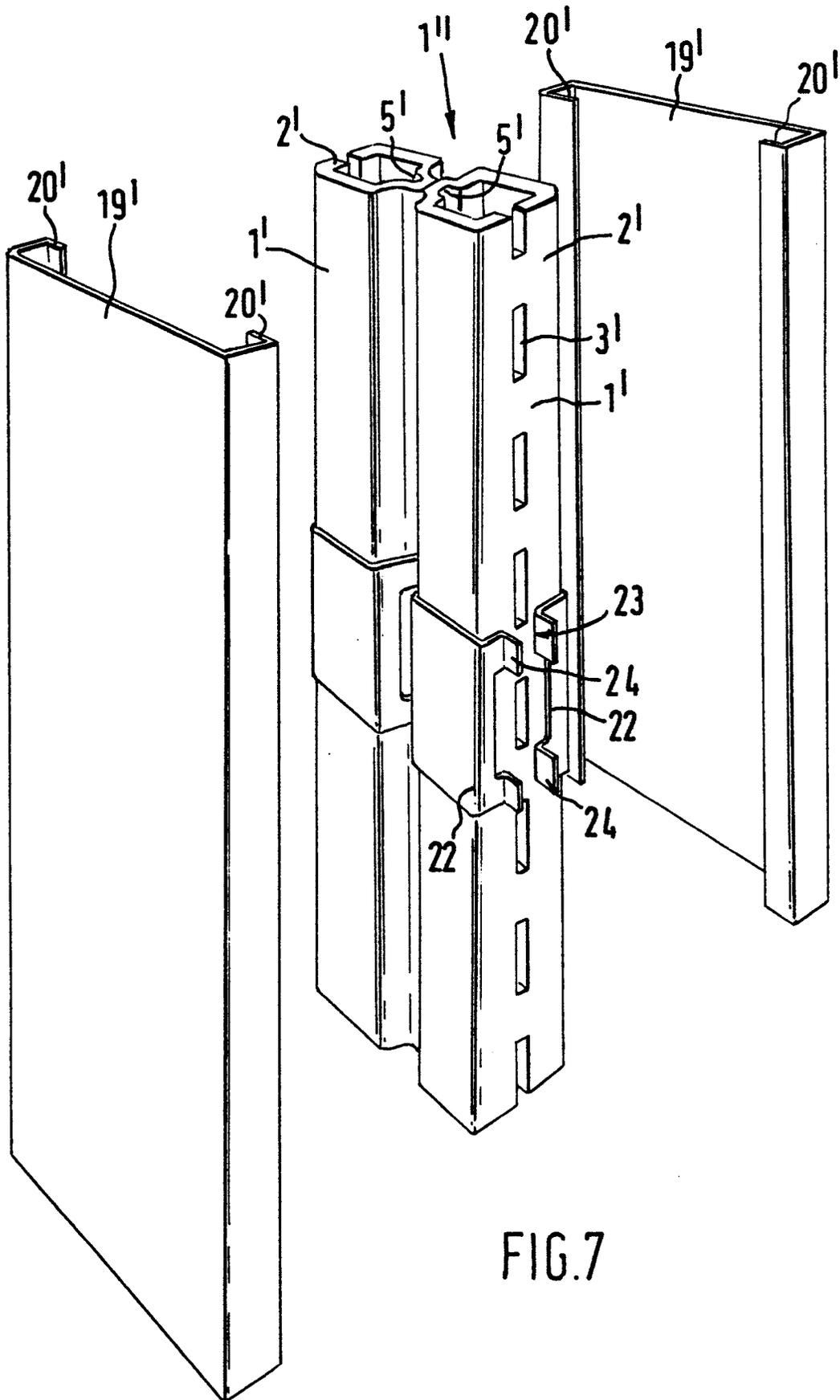


FIG. 7

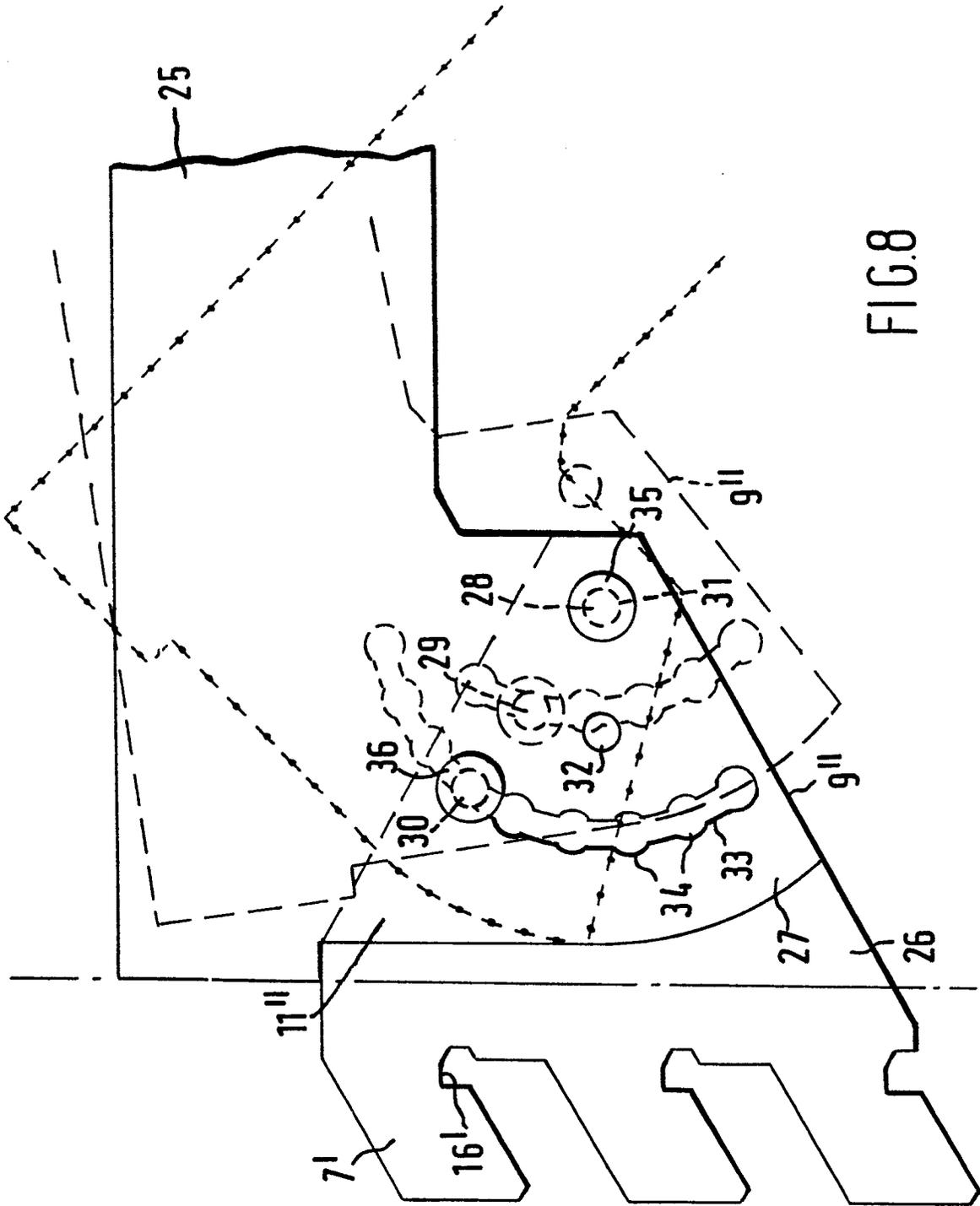


FIG. 8



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. <sup>2</sup> )
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>AU - A - 479 592 (GRANSTON)</u> * Page 4, line 21 - page 5, line 15; page 6, lines 5-20; page 7; figures 1,3B,4A * -- <u>CH - A - 465 171 (SHELL)</u> * Claims; figures 1,2 * --	1,7,8 13,14	A 47 B 96/12
X	<u>US - A - 2 956 688 (GALASSI)</u> * Column 2, lines 36-52; column 3, lines 50-56; column 4, lines 26-30; figures 1,6,13 * -- <u>US - A - 2 691 502 (JONES)</u> * Column 3, lines 55-57; column 4, lines 18-53; figures 21,24,5,8 * -- <u>US - A - 3 757 485 (VINCENS)</u> * Column 13, lines 55-68; column 14, lines 8-42; figures 7,8 * -- <u>US - A - 3 282 016 (DENNERY)</u> * Claim; figures 1-4 * -- <u>FR - A - 2 047 509 (ELECTROLUX)</u> * Page 3, lines 1-10; figure 4 * --	1,2, 3,4	TECHNICAL FIELDS SEARCHED (Int.Cl. <sup>2</sup> )  A 47 B
A	<u>FR - A - 1 589 143 (GRAETER)</u>	2	CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons  &: member of the same patent family, corresponding document
<input type="checkbox"/> The present search report has been drawn up for all claims			
Place of search	The Hague	Date of completion of the search	08-08-1979
		Examiner	SCHMITTER