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(54) Improved bracket for the door of a built-in refrigerator

(57) Bracket for fastening an outer panel to the door of a built-in refrigerator, provided to be attached to the inner wall of said panel and the upper portion of the door, and comprising at least a plane appendix extending orthogonally to said bracket, protruding from said bracket and capable of being temporarily associated to at least a template provided with two parallel surfaces, whose distance from each other is adjustable; these are connected to each other by an adjustment rod, and one of said surfaces, whose distance is adjustable, is provided with a slot-like aperture capable of engaging against said at least one plane appendix. Said two parallel surfaces are arranged on the opposite sides with respect to said adjustment rod.

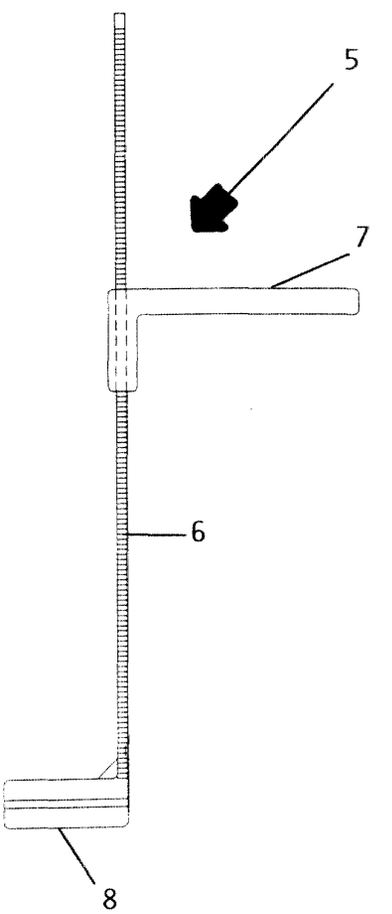

FIG. 1

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Description

[0001] The present invention refers to an improved type of bracket for connecting the outer wall of a door of a refrigeration appliance installed inside an appropriate kitchen or similar cabinet, ie. in a typical form of installation that is generally known as "built-in" in the art, with a door of said cabinet that closes the compartment containing said refrigeration appliance.

[0002] For reasons of greater comprehensibility, use will solely be made hereinafter of the term "door panel", or simply "panel", to identify or mean the door of the outer cabinet to be connected to the door of the refrigeration appliance, which will on the contrary keep being identified by the general term of "door".

[0003] For such a kind of appliances, a number of methods and means are generally known and used in the art for applying the door panel of an appropriate cabinet to a respective door of a refrigeration appliance installed therein; the great majority of such prior-art solutions, however, share a common drawback deriving from the fact that, usually, the surface of the door panel is quite obviously larger than the surface of the door and in particular, to the actual purposes of the present invention, the upper edge of the door panel must be positioned at a higher level than the upper edge of the door, wherein such a requirement is practically dictated by the need for the entire aperture of the compartment containing the appliance to be actually closed, wherein said compartment is obviously extending from a lower bottom, onto which the base of the appliance comes to rest, to a compartment ceiling that is of course higher than the upper portion of the same appliance.

[0004] Furthermore, according to the general experience and common practice the need arises for the door panel to have its upper edge appropriately fitting, in the sense of becoming perfectly aligned frontally, also with the lower edge of either another, possibly movable door panel or the stationary vertical wall situated exactly above the panel closing the compartment containing the refrigeration appliance.

[0005] Generally, the door panel of the cabinet can only be aligned correctly with respect to the other outer elements of the cabinet when the door of the refrigeration appliance is closed. In this case, however, it is practically not possible for said panel to be attached to the door of the refrigeration appliance itself.

[0006] The problem therefore lies in creating the possibility for the cabinet panel to be successfully aligned with the door of the appliance when the latter is still open, through the use of appropriate mutual engagement means.

[0007] A prior-art technique in this connection is described in the patent publication DE 44 43 852. However, the solution proposed by this patent appears to have a number of drawbacks, which are on the other hand exhaustively explained in the introductory part of the patent publication DE 197 48 679, so that, for reasons of brevity, they shall not be dealt with here any further.

[0008] The above mentioned publication DE 197 48 679 actually illustrates an undoubtedly interesting solution introducing certain improvements over the state of the art; during the practical use of such a solution, however, some drawbacks eventually emerged, which can be summarized as follows:

[0009] The first such drawback refers to the fact that an angular retaining member:

a) is first attached provisionally on to the upper side of the door of the appliance to be built in;

b) that said angular retaining member is then removed from said door in order to undergo some adjustments; and

c) said angular retaining member itself is finally attached definitively on to the upper side of the door of the appliance intended for building in.

[0010] It can readily be appreciated that such a double, identical assembly operation and the resulting intermediate removal operation that must be performed on said angular retaining member call necessarily for a number of respective tasks to be carried out and represent a definite amount of extra charges that should on the contrary be desirably eliminated, considering that the first assembly operation is then practically nullified by the subsequent removal operation.

[0011] - The second drawback derives from the fact that, upon such an angular retaining member having so been accurately positioned on the panel, the rule-shaped templates find themselves with a portion thereof abutting against the upper edge of the same panel. As a result, in order to remove said rule-shaped templates the need arises for an appropriate tool, even a common screw-driver, to be used by inserting it between said portions and said upper edge of the panel, so as to let it act like a lever between said component parts and be so able to separate and move said rule-shaped templates away.

[0012] It has however been found that such an operation quite often and most easily causes said upper edge of the door panel to suffer some kind of visible damages which then remain permanently exposed to the view and, as a result, impairs the overall aesthetic result.

[0013] It therefore would be desirable, and is actually a purpose of the present invention to provide a connection device between the door panel of a cabinet and the door of a built-in refrigeration appliance with the smallest possible number of operations and without any possibility for the cabinet panel to become damaged, by means of techniques that are as fast and simple as possible, but anyway reliably effective.

[0014] According to the present invention, such an aim is reached in a particular type of fastening bracket

associated to a particular type of adjustment template, both of which are described below by way of nonlimiting example with reference to the accompanying drawings, in which:

- Figure 1 is a side view of a template capable of being associated to a bracket according to the present invention;
- Figure 2 is a side cross-sectional view of the same template when engaged with respect to both the cabinet and the refrigeration appliance during a utilization phase;
- Figure 3 is a side cross-sectional view of the same template as engaged on the bracket, during a different utilization phase;
- Figure 4 is a front view of the bracket according to the present invention, as associated to two adjustment templates;
- Figure 5 is a side cross-sectional view of the same template as applied on to the bracket, in which said template and said bracket are associated to the panel of the cabinet according to a different utilization phase;
- Figure 6 is a front view from the inside of the template/bracket/panel assembly in the association illustrated in Figure 5;
- Figure 7 is a perspective view of the combination of elements illustrated in Figure 2;
- Figure 8 is a perspective view of a method for associating a template and a bracket according to the present invention;
- Figure 9 is a perspective view of the combination of elements illustrated in Figure 6;
- Figure 10 is a simplified perspective view of an intermediate phase in the assembly of the bracket according to the present invention;
- Figure 11 is a cross-sectional view of a bracket according to the present invention, in the final utilization position thereof.

[0015] According to a preferred embodiment, a fastening bracket according to the present invention consists of a substantially plane base plate 1 adapted to be joined on a face thereof, using generally known means, to the inner surface of a door panel 2. This plate is provided with at least a plane appendix 3 protruding orthogonally therefrom, on the opposite face with respect to the face to be joined to the panel. This appendix is in turn provided with a through-hole 4, the use of which shall be explained in greater detail further on.

[0016] Capable of being associated to said bracket there is provided at least a template 5, which is best illustrated in Figures 1 and 5 and is composed of a rectilinear rod 6 and two plane members 7, 8, of which at least one 7 is slidably engaged on said rod and the other one 8 is permanently fixed at an end portion thereof.

[0017] The planes on which said plane members 7 and 8 are arranged are parallel, although the member 7 is adapted to take different position with respect to said rod. Furthermore, said members 7 and 8 lie on opposite sides with respect to said rod 6.

[0018] The member 8 permanently fixed to the rod 6 is provided within its thickness with a slot 9, which is adapted to removably engage said plane appendix 3.

[0019] The method for using this bracket is as follows:

- First of all (Figures 2, 7), the template 5 is leant between the upper edge 10 of the door 12 of the refrigeration appliance and the lower edge 13 of the panel 14 lying above said panel 2; the sliding member 7 is leant against said upper edge 10, and the stationary member 8 is pulled out or moved away from the member 7 until it eventually abuts against said lower edge 13.

  By performing this operation, the distance between the refrigerator door and the upper panel is determined on the template 5 which represents the distance at which the upper edge 20 of the panel must rise with respect to the upper edge of the door in order to enable the upper edge of the panel to come very close to, without interfering with, the lower edge 13 of the panel 14 thereabove.

- In the second place (Figures 3, 4, 8), the template 5 is applied, upon having being rotated, on to said bracket.
- In the third place (Figures 6, 9), the bracket-template assembly is associated to said panel, in such a manner as to enable the adjustable member 7 to come to rest against the upper edge of the panel 2; the bracket is then fastened with known means to the panel, while the template (or templates) 5 is (or are) subsequently removed from said bracket.
- In the fourth place (Figure 10), the panel is "hanged" on to the door by laying said appendix 3 of the bracket on the upper edge 10 of the door 12 of the refrigeration appliance.
- Finally, the whole process is concluded by firmly and positively joining the bracket to the door by means of said through-hole 4 of said appendix 3 by letting it engage, with the use of known means, appropriate threaded bolts 44 protruding thereabove, at appropriate locations, from said upper surface 10

of the door of the refrigeration appliance.

[0020] Upon completion of this final operation, the door-panel-bracket assembly is organized as illustrated in a vertical cross-sectional view in Figure 11.

[0021] The present invention brings about some advantageous improvements:

- A first improvement is connected with said rod 6: in order to prevent said sliding member 7 from being able to slide in an accidental, uncontrolled manner respect to said rod 6, the latter is provided along its edges 16 with a regular knurled pattern, while said sliding member 7 is in turn provided, at the portion thereof that is adapted to slidably engage said rod, with a hollow guide whose inner sides intended to slide along said edges 16 are similarly provided with respective knurled patterns. As a result, the mutual engagement of the knurled patterns on the rod and said member 7 is such as to ensure a substantial stability of said member, which can therefore be only displaced if an intentional, albeit moderate effort is made to actuate it.

- A second improvement relates to the number of said appendixes and, of course, the corresponding templates. In order to ensure a correct relative arrangement of the panel and the door, in the sense of preventing a possible angularity from being created between said members, it has been found advantageous for said appendixes to be provided in the number of two, substantially similar to and appropriately spaced from each other.

Claims

1. Bracket for fastening an outer door panel to the door of a built-in refrigerator, and adapted to be attached in an appropriate position to both the inner wall of said outer door panel and the upper portion of the refrigerator door, **characterized in that** it comprises at least a plane appendix (3) protruding from said bracket, and is capable of being temporarily associated to at least a template (5) provided with two parallel surfaces (7, 8), whose distance from each other is adjustable.

2. Fastening bracket according to claim 1, **characterized in that** said adjustable surfaces are connected to each other by an adjustment rod (6), and one of said surfaces, whose distance is adjustable, is provided with a slot-like aperture (9) capable of engaging against said at least one plane appendix (3).

3. Fastening bracket according to claim 2, **characterized in that** said two parallel surfaces (7, 8) are arranged on the opposite sides with respect to said adjustment rod.

4. Fastening bracket according to claim 3, **characterized in that** said at least one plane appendix is adapted to engage against the upper edge (10) of said refrigerator door.

5. Fastening bracket according to claim 4, **characterized in that** one (8) of said adjustable surfaces is firmly joined with said adjustment rod.

6. Fastening bracket according to any of the preceding claims, **characterized in that** said at least one appendix extends on a plane that is orthogonal to said plate.

7. Fastening bracket according to any of the preceding claims, **characterized in that** said appendixes (3) are in the number of two and each one of them is capable of being associated to a respective template.

8. Fastening bracket according to any of the preceding claims, **characterized in that** the surfaces (16) of said rod and the portion of said sliding member (7) that engage each other slidably are provided with respective knurled patterns adapted to prevent any accidental sliding.

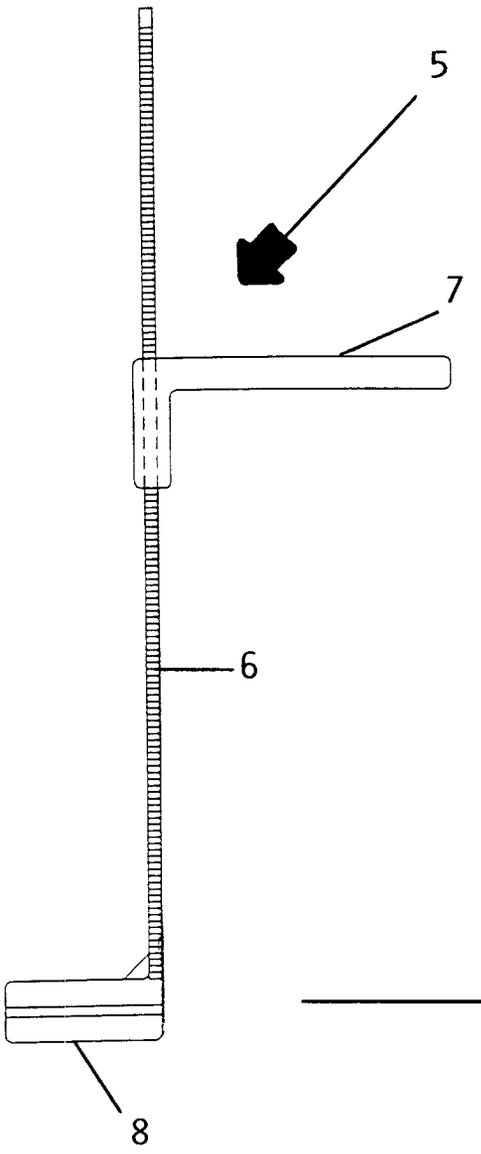

FIG. 1

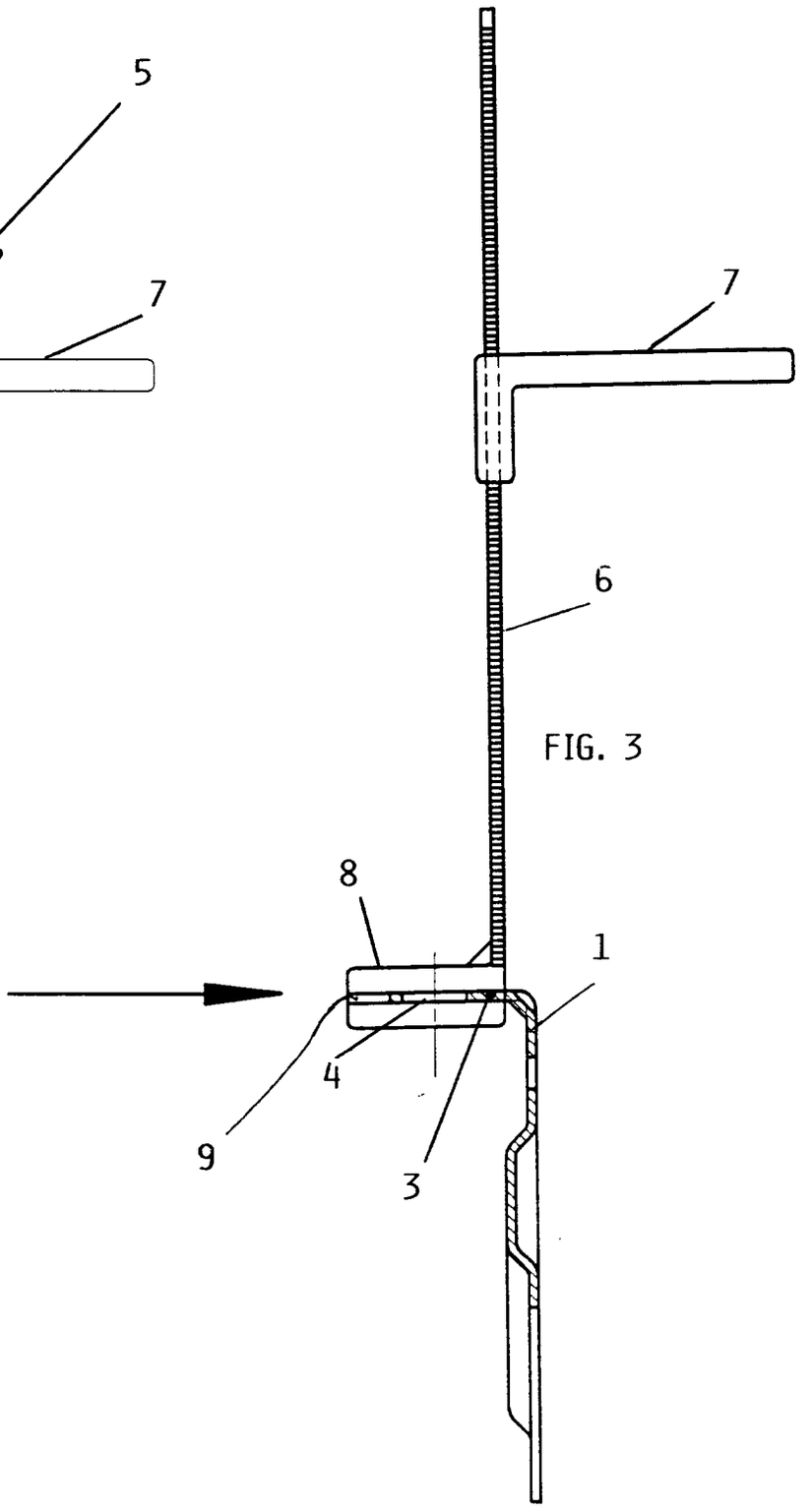

FIG. 3

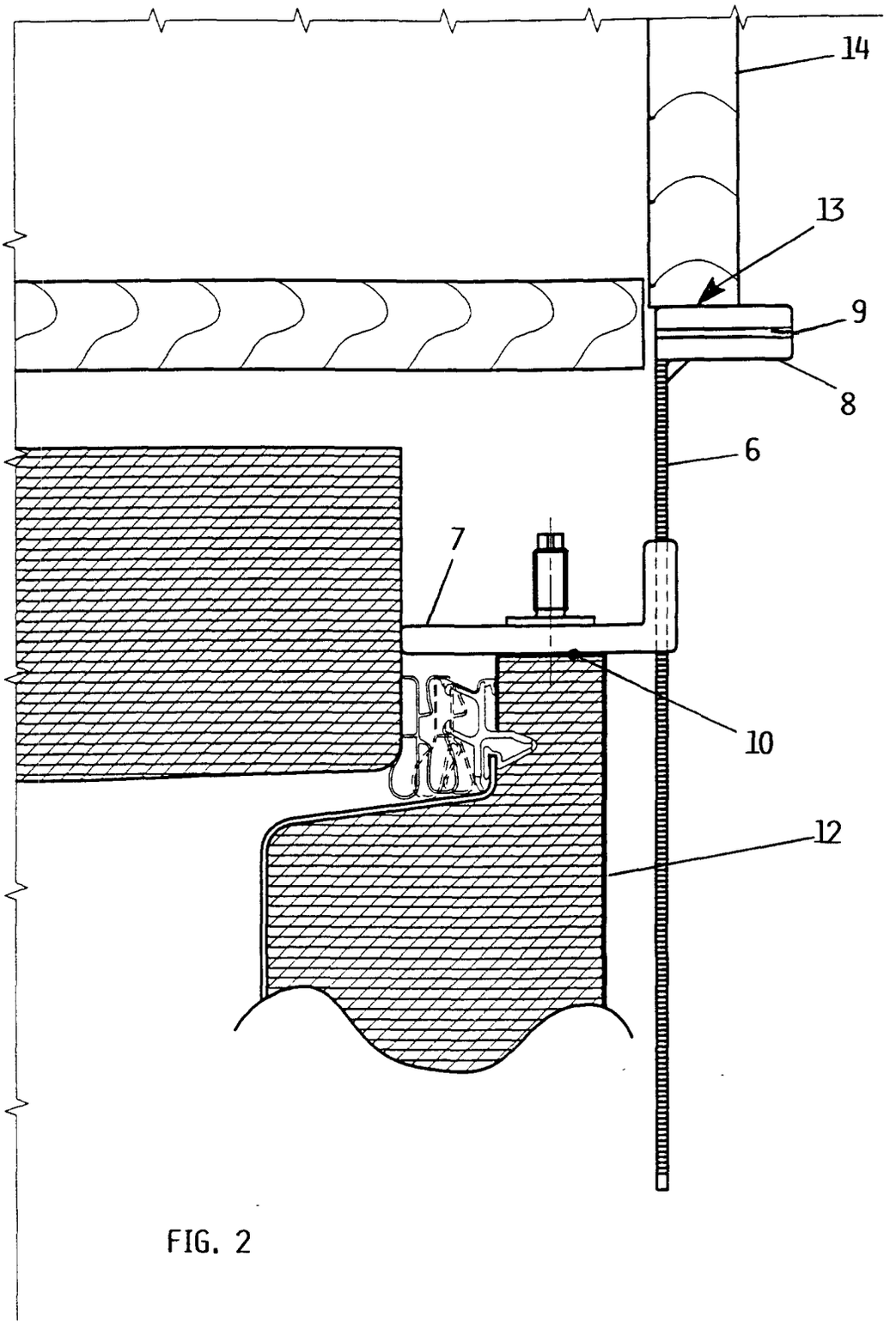

FIG. 2

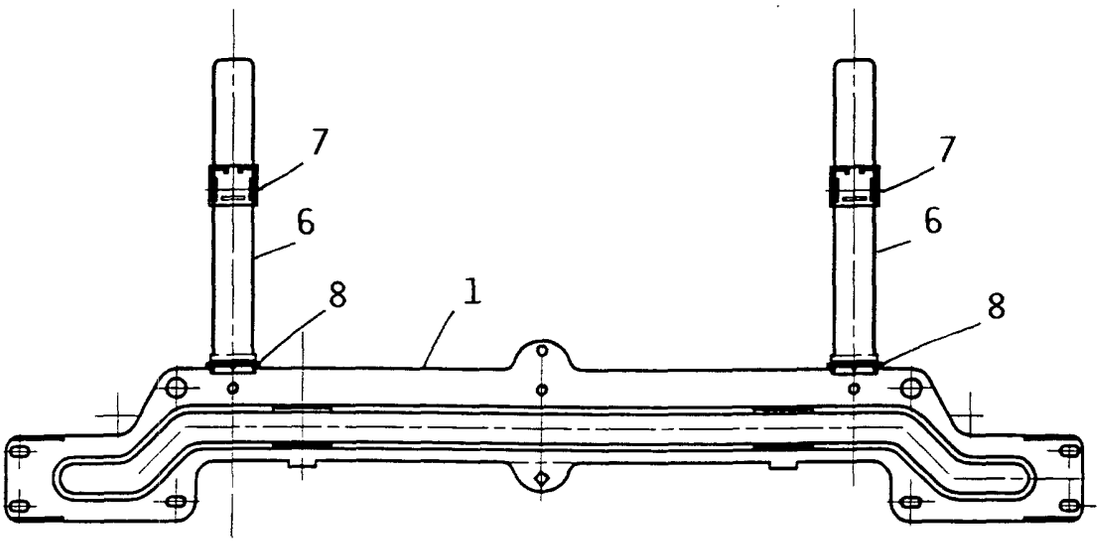

FIG. 4

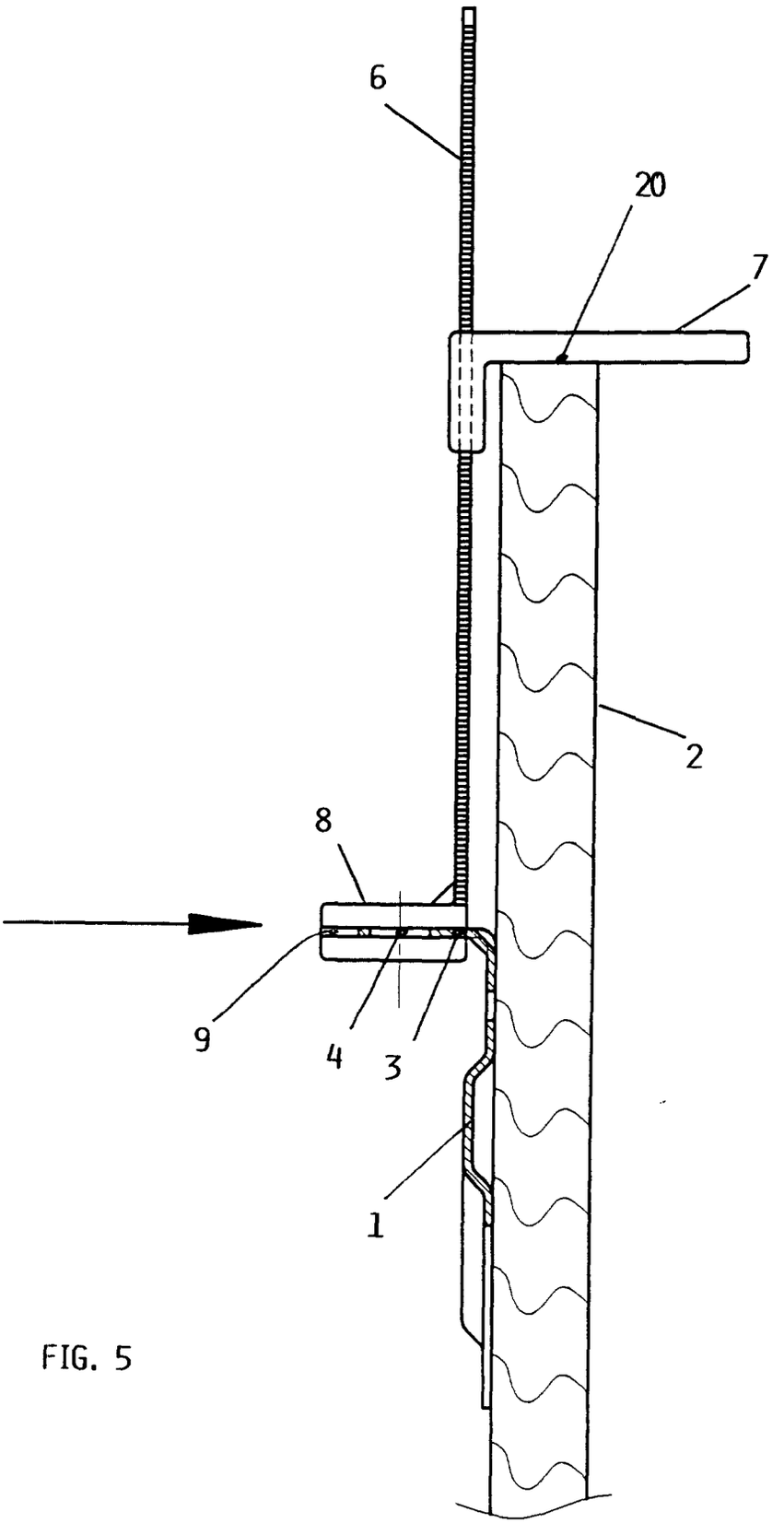

FIG. 5

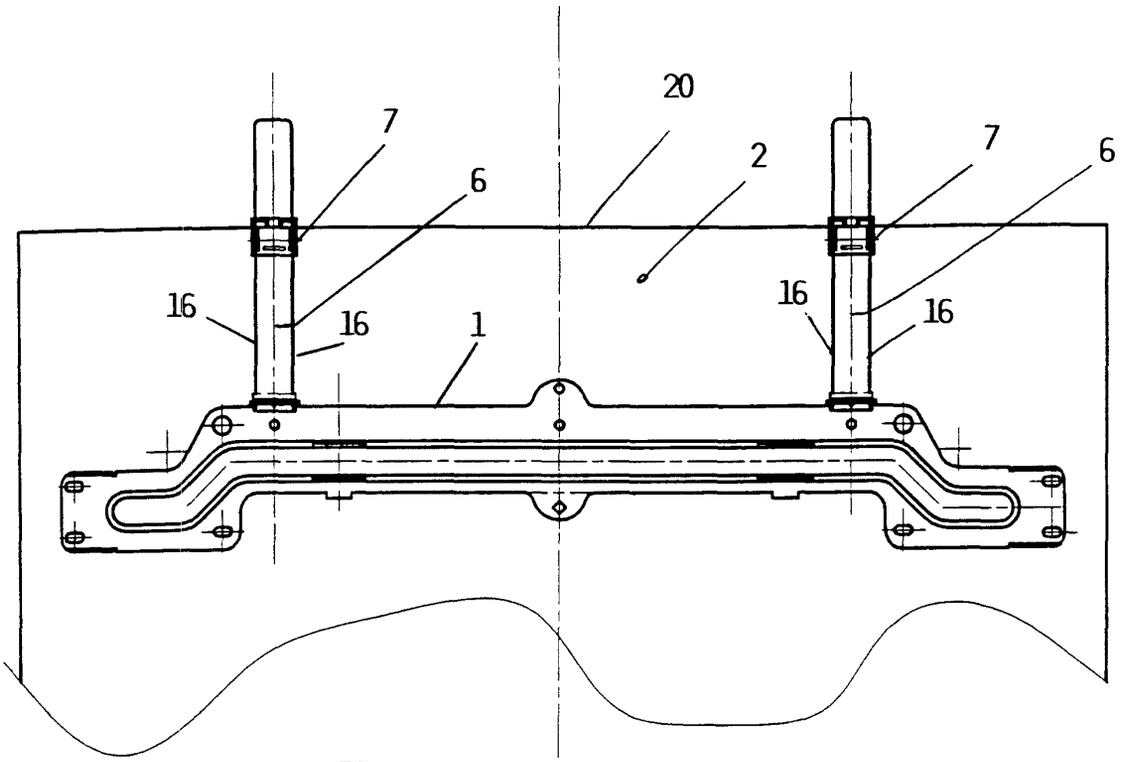

FIG. 6

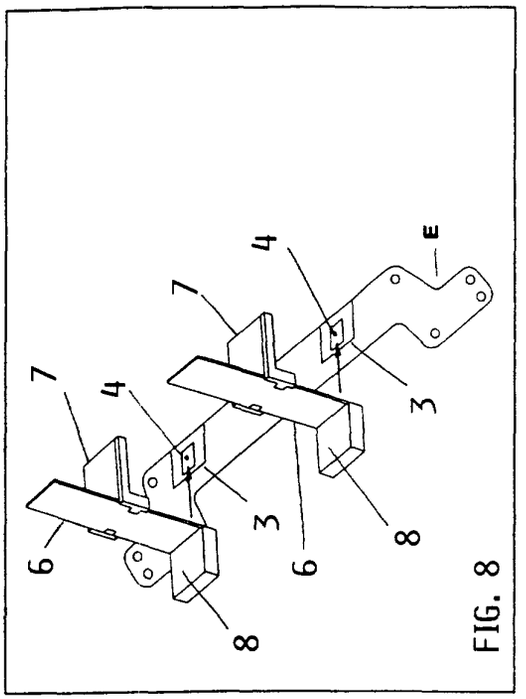

FIG. 8

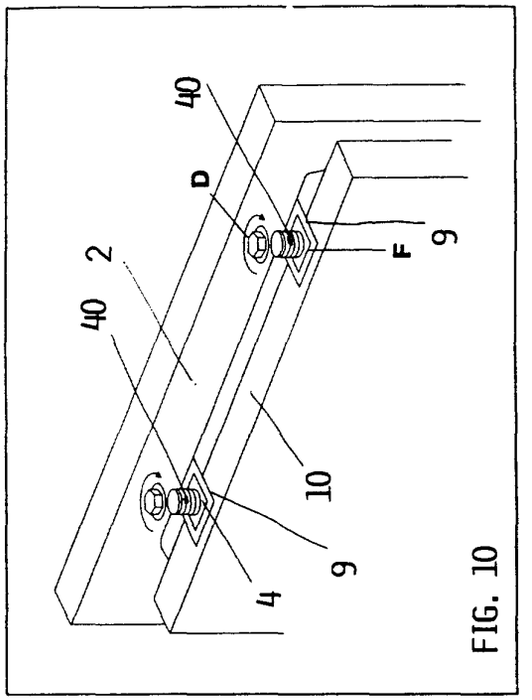

FIG. 10

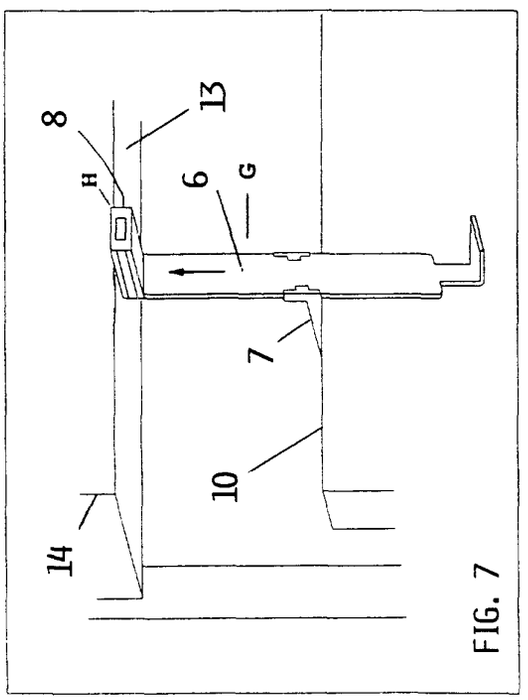

FIG. 7

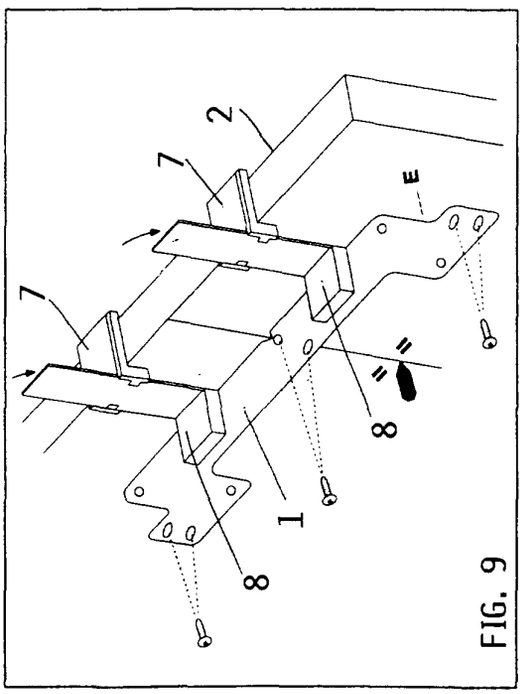

FIG. 9

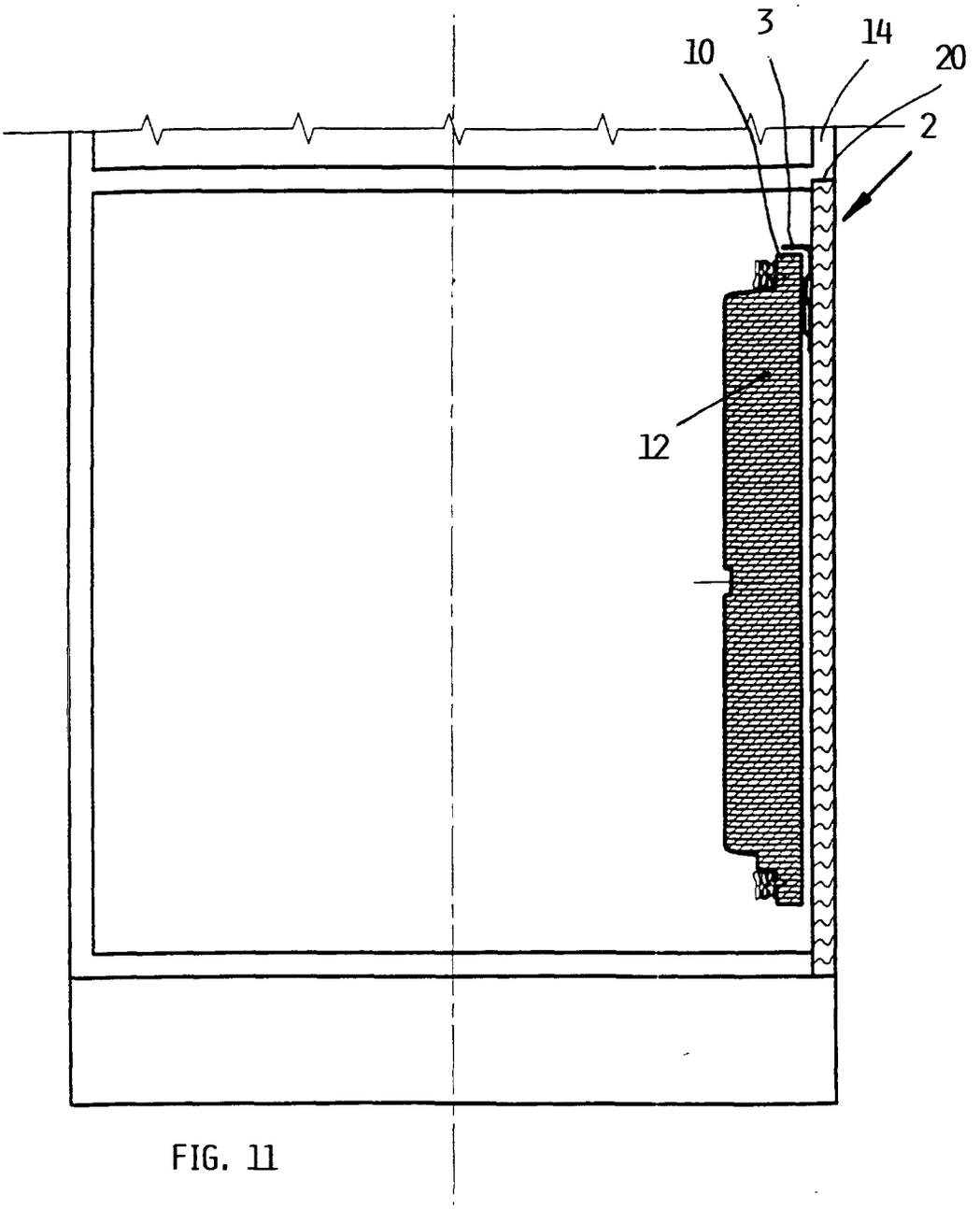

FIG. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 01 10 3945

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.7)
X	EP 0 647 821 A (BOSCH SIEMENS HAUSGERAETE) 12 April 1995 (1995-04-12) * abstract * * column 4, line 42 - column 9, line 54 * * figures 1-4 *	1,6,7	A47B77/08 F25D23/02 F25D23/10
A		4	
X	EP 0 877 215 A (BOSCH SIEMENS HAUSGERAETE) 11 November 1998 (1998-11-11) * abstract * * column 3, line 31 - column 5, line 13 * * figures 1,2 *	1,6,7	
A		4	
A	EP 0 108 677 A (THOMSON BRANDT) 16 May 1984 (1984-05-16) * abstract; figures *	1,6,7	
A		4	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A47B F25D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	1 August 2001	Ottesen, R

CATEGORY OF CITED DOCUMENTS

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