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(54) Device for slidably mounting a decorative panel on the door of a built-in application

(57) A device for slidably mounting a decorative panel (P) on the door (5) of a built-in electric appliance so that the panel (P) can vertically slide between a raised position and a lowered position, in which the controls group (X) is accessible, includes a mechanism which blocks the sliding of one of the coupling dowels (A), while allowing it only upon activation of a release control which is not visible when the door (S) is closed, yet allowing the automatic locking of the panel (P) when it is moved from the lowered position to the raised position, even when the door (S) is closed. Said mechanism consists of a cylindrical horizontal latch (B) wherein the dowel (A) engages a plate (H) transversally fixed to said latch (B), whose rotation is prevented by a pin passing through a slot (R) formed in a transverse lug of the latch (B). One end of the pin sticks outside to form the release control, while the inner end has a head (T) which engages a corresponding seat located at the inner end of said slot (R).

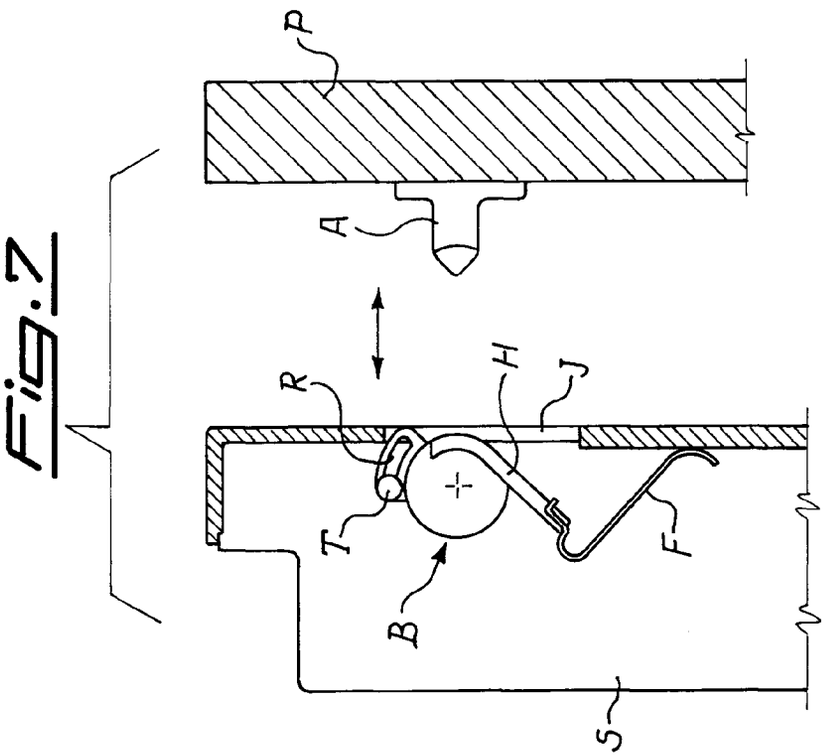

Fig.7

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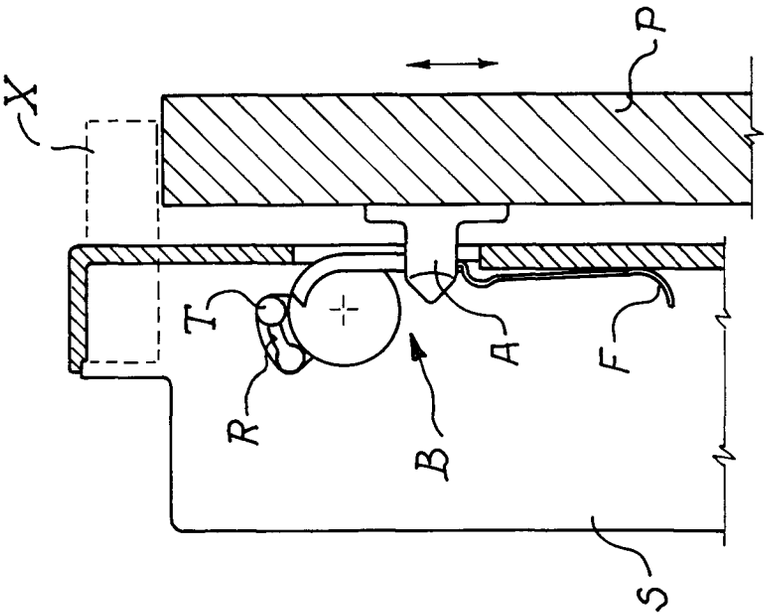
Fig.8



Description

The present invention relates to devices for mounting panels, and in particular to a device for mounting a decorative panel on the door of a built-in electric appliance, typically a dishwasher, such that said panel can vertically slide between two fixed positions.

It is known that a built-in appliance is often "camouflaged" in the kitchen furniture by applying on its door, with various systems, a decorative panel which reproduces the appearance of the other doors. In this way, no element which allows to distinguish the appliance from the other members making up the kitchen is visible, the controls being accessible only when the door is open. This solution is fully satisfactory from the aesthetical point of view but has the drawback that the operative cycle of the machine, e.g. the washing step reached, can not be checked. It is not even possible to intervene for modifying the cycle without interrupting the machine operation due to the opening of the door.

A device for mounting the panel is disclosed, for example, in EP-0261083 in the name of the same applicant. Said device, though very simple and effective, however does not allow to change the vertical position of the panel once it has been mounted on the door. Actually, there are other mounting devices which allow a vertical sliding of the panel. However, said sliding occurs as a consequence of the door opening in order to prevent the interference of the panel with the furniture plinth, thus avoiding the plinth modification and/or the use of complicated hinge mechanisms. In any case, these devices lead to a complete hiding of the door when it is in the closed position, whereby they have the same limits mentioned above. Examples of said devices are found in the German patents DE-2.937.404 and DE-3.304.142, and in the patent applications EP-0162028 and EP-0520963.

Therefore the object of the present invention is to provide a panel mounting device which overcomes the above-mentioned drawbacks. This object is achieved by means of a device having the characteristics cited in claim 1.

The first essential advantage of the device according to the present invention is the possibility of choice between starting the machine with the panel which completely hides the door or leaving the controls in view for a subsequent check and/or modification of the cycle, without having to reopen the door.

A further advantage of the present device is to allow the machine start with the panel in the lowered position so that the controls are in view, and then allowing at any moment the raising of the panel until the door is completely hidden, without interfering with the operation cycle.

Still another advantage of the present device is that it does not alter in any way the aesthetical functionality of the decorative panel, since no member of the device is visible when the door is in the closed position.

These and other advantages and characteristics of the device according to the present invention will be clear to those skilled in the art from the following detailed description of an embodiment thereof, with reference to the annexed drawings wherein:

Figs.1 and 2 are schematic, partially sectional, side views of the panel mounted on the door of a built-in appliance, in the raised and lowered position respectively;
Fig.3 is a schematic, partially sectional, side view which illustrates the detail of the lower member of the present mounting device;
Fig.4 is a schematic, partially sectional, front view taken along the line N-N of fig.3;
Fig.5 is a schematic, partially sectional, top plan view which illustrates the detail of the upper member of the present mounting device;
Fig.6 is a schematic, partially sectional, front view of the upper member of fig.5 with an enlargement of the release mechanism;
Figs.7 and 8 are schematic, partially sectional, side views of the upper member of figs.5 and 6 with the panel before the coupling and in the lowered position respectively.

Figs.1 and 2 illustrate in a schematic way a built-in appliance, typically a dishwasher, frontally hidden by a decorative panel P coupled to the dishwasher through a lower member, which engages a seat D formed in door S, and an upper member engaged with the control board V. It is clear that a smooth and balanced sliding requires that panel P be coupled to the dishwasher along both the right and left side. Therefore, the following description relating to the right device (in the front view) applies specularly to the left one too.

The motion of panel P from the raised position of fig.1 to the lowered position of fig.2 is controlled by lateral pushbuttons W in the way described further on. After the release, panel P slides downwards along a short travel so as to make accessible the upper portion of the control board V where the cycle display and the controls group X, possibly of the push-pull type, are located. It should be noted that the travel of panel P is the smallest required for the access to the controls and it allows anyhow the opening of door S even with panel P lowered, as indicated in fig.2.

Referring to figs.3, 4 and 5 there is seen that the coupling dowels A fixed on panel P have a shape substantially equal to the shape described in the above-mentioned patent EP-0261083, with the only difference that they are rotated through 90° to the vertical position. In fact, dowel A has an ogive-shaped tip which extends rearwards into a cylindrical body whose cross-section is reduced by a relief along a plane parallel to a vertical diametral plane, so as to obtain a vertical tooth on the rear of the tip.

As mentioned above, the lower dowel A engages a

seat D formed in door S and illustrated in figs.3 and 4. Said figures show that seat D has a rectangular shape elongated in the vertical direction, with a top width such as to allow the insertion of dowel A. The rest of seat D has such a width only in its rear portion, while having a reduced width in the front portion level with the surface of door S, thus resembling in the front view the shape of a "p" with a long stem. In this way, an inner vertical abutment K is obtained, along which the tooth of dowel A slides while keeping panel P close to door S. The height of seat D, together with the upper coupling member described hereunder, defines the slide travel L of panel P on door S (indicatively 15-20 mm).

Figs.5 and 6 show the coupling of the upper dowel A, through a slot J, to a horizontal cylindrical latch B, of known type, located inside door S near the upper right corner thereof. This coupling takes place through the axial sliding of latch B in its seat against the action of spring C which prevents the subsequent release, which is possible only through the use of a specific key G. More precisely, the tooth of dowel A engages a plate H provided with a lower strip F and integral with latch B at a position transverse to the axis thereof, as it will be better explained further on. In this way, panel P is level with control board V as shown in fig.1, with the lower dowel A engaged in seat D at the upper end of travel L (upper dashed position in figs.3 and 4).

As shown in the enlarged detail of fig.6 and in the following figs.7 and 8, the rotation of latch B around its axis is prevented by an upper pin E parallel thereto and passing through a slot R formed in a transverse lug of latch B. The end of pin E which sticks outside is the release pushbutton W, while the inner end has a head T which engages a corresponding seat located at the inner end of slot R and is retained therein by the action of a push spring M coaxial with pin E. In order to allow the rotation of latch B it is therefore necessary to slide pin E axially inwards by pressing the release pushbutton W so as to overcome the strength of spring M.

With reference to figs.7 and 8, there is seen that plate H, with which the upper dowel A engages, is fixed onto latch B along a plane substantially tangential thereto at the point of coupling with dowel A. A strip F, whose free end abuts against the inner surface of door S, is mounted at the lower end of plate H at 90° outwards. When head T is disengaged from the end seat of slot R so that the body of pin E can freely slide along said slot R, latch B rotates under the effect of the weight of door S acting along the inclined plane of plate H. The descent of panel P ends when the upper dowel A reaches the bottom of slot J and/or pin E reaches the outer end of slot R, or when the lower dowel A reaches the bottom of seat D, as previously mentioned. From the lowered position of fig.8, wherein it is possible to access the controls group X, panel P is taken back up by simply raising it so that strip F acts as a spring for the reverse rotation of latch B and spring M takes back head T of pin E into the corresponding seat at the inner end of slot R.

The object of retaining the aesthetical functionality of panel P is therefore fully achieved, since the release pushbuttons W located on the sides of door S are not visible when the door is closed, while the controls group and the display can be left in view if desired.

It is clear that the above-described and illustrated embodiment of the device according to the invention is just an example susceptible of various modifications. In particular, the shape of dowels A, and correspondingly of seat D, may be somewhat varied as long as it retains the vertical sliding function. Similarly, latch B may be replaced by another device for the coupling of the upper dowel A, yet retaining the control of the vertical sliding of said dowel through the release pushbutton W.

Claims

1. A device for slidably mounting a decorative panel (P) on the door (S) of a built-in electric appliance, including at least a pair of coupling members (A) fixed onto the rear side of said panel (P) and engaged in corresponding seats or slots (D, J) formed on the front side of said door (S) so that the panel (P) can vertically slide between a raised position and a lowered position, characterized in that it includes a mechanism suitable to block the sliding of at least one of said coupling members (A) from the raised position to the lowered position, said sliding being possible only upon activation of a release control which is not visible when the door (S) is closed.

2. A device according to claim 1, characterized in that said mechanism includes members for the automatic locking of the panel (P) when it is moved from the lowered position to the raised position, even when the door (S) is closed.

3. A device according to claim 2, characterized in that said mechanism consists of a cylindrical horizontal latch (B) wherein the coupling member (A) engages a plate (H) transversally fixed to said latch (B) along a plane substantially tangential thereto at the point of coupling with said member (A), a strip (F) whose free end abuts against the inner surface of the door (S) being mounted at the lower end of the plate (H) at 90° outwards, the rotation of the latch (B) around its axis being prevented by a pin (E), parallel thereto and passing through a slot (R) formed in a transverse lug thereof, one end of which sticks outside to form the release control (W) while the inner end has a head (T) which engages a corresponding seat located at the inner end of said slot (R) and retained therein by the action of a push spring (M) coaxial with the pin (E).

Fig.2

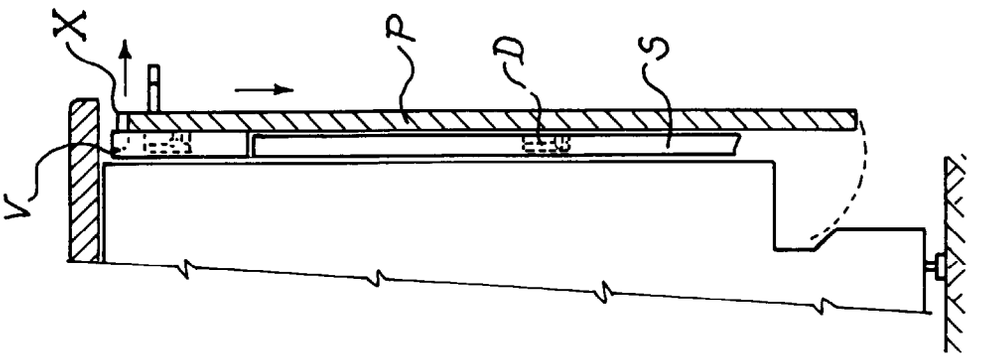


Fig.1

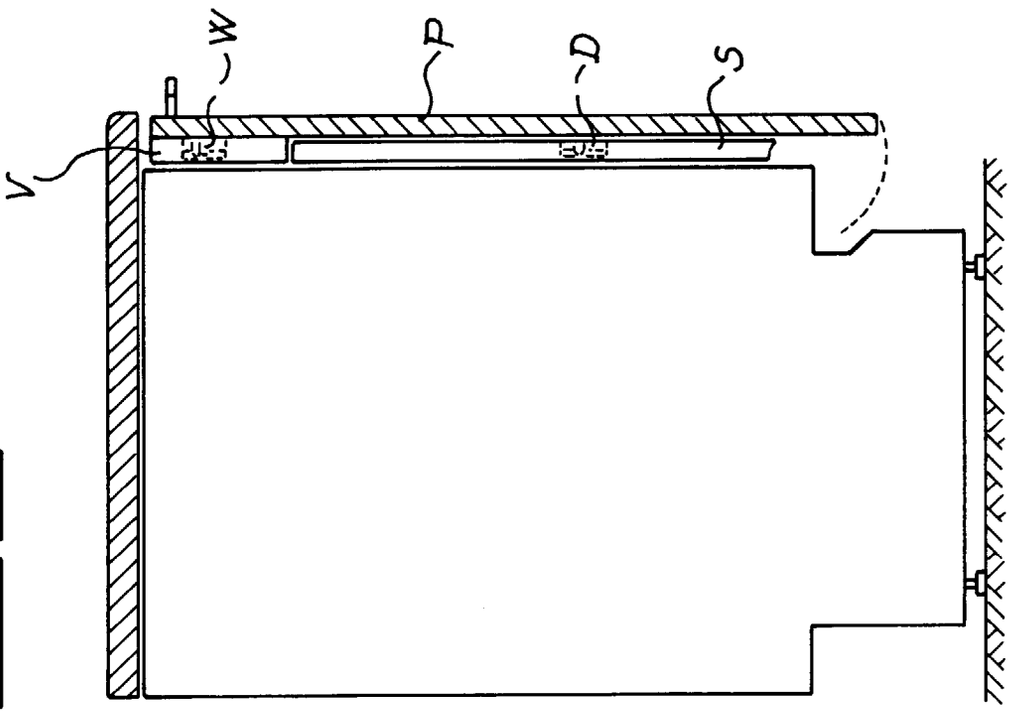


Fig.4

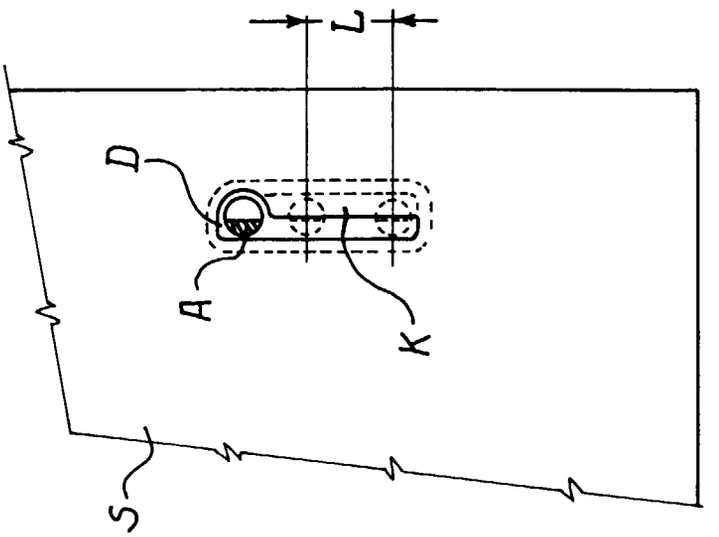


Fig.3

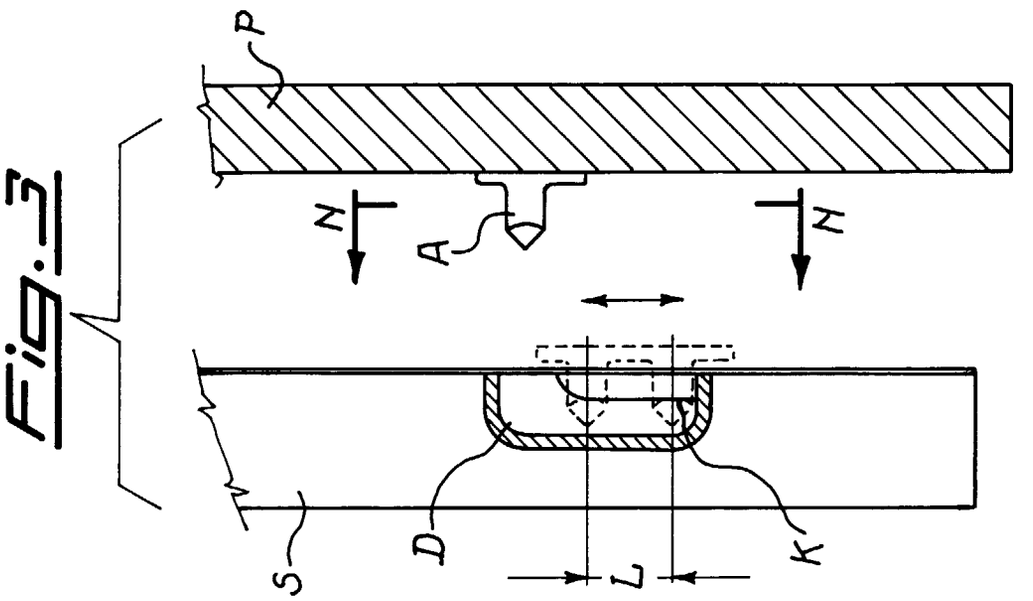
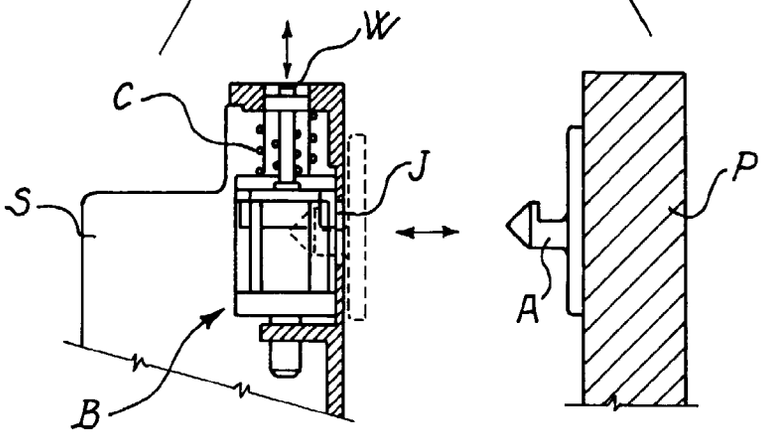


Fig.5



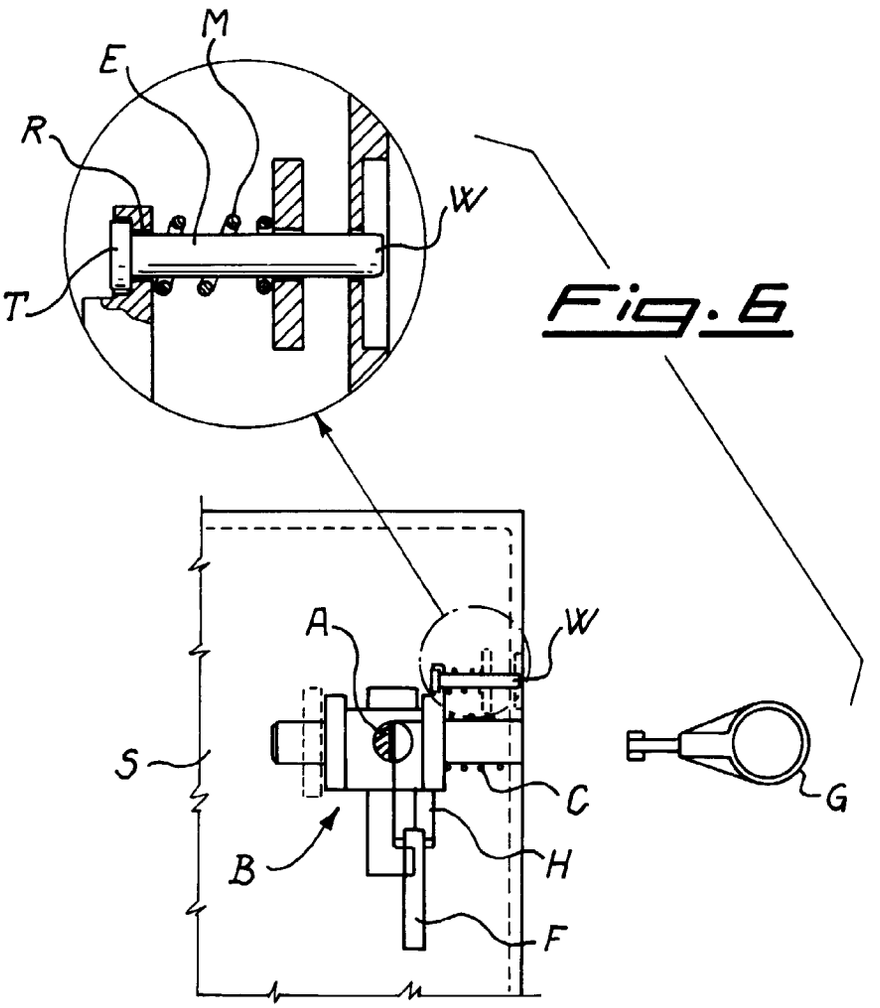


Fig.6

Fig.8

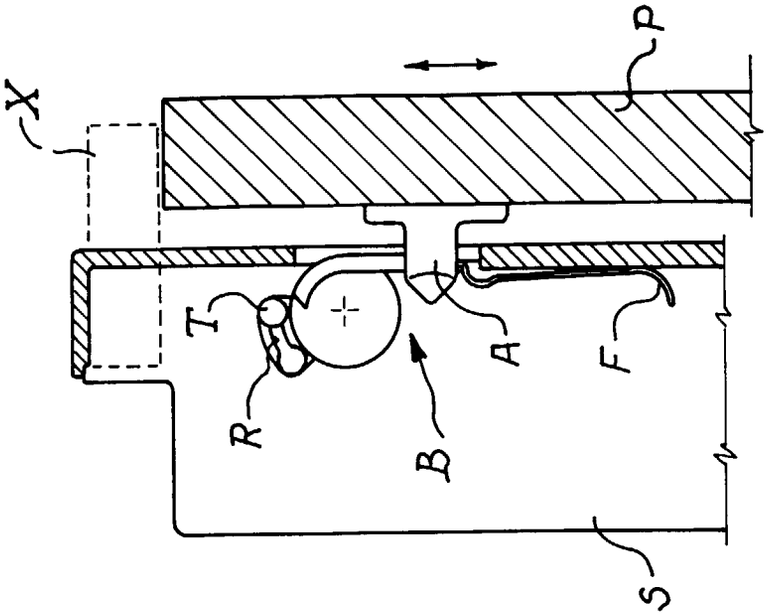
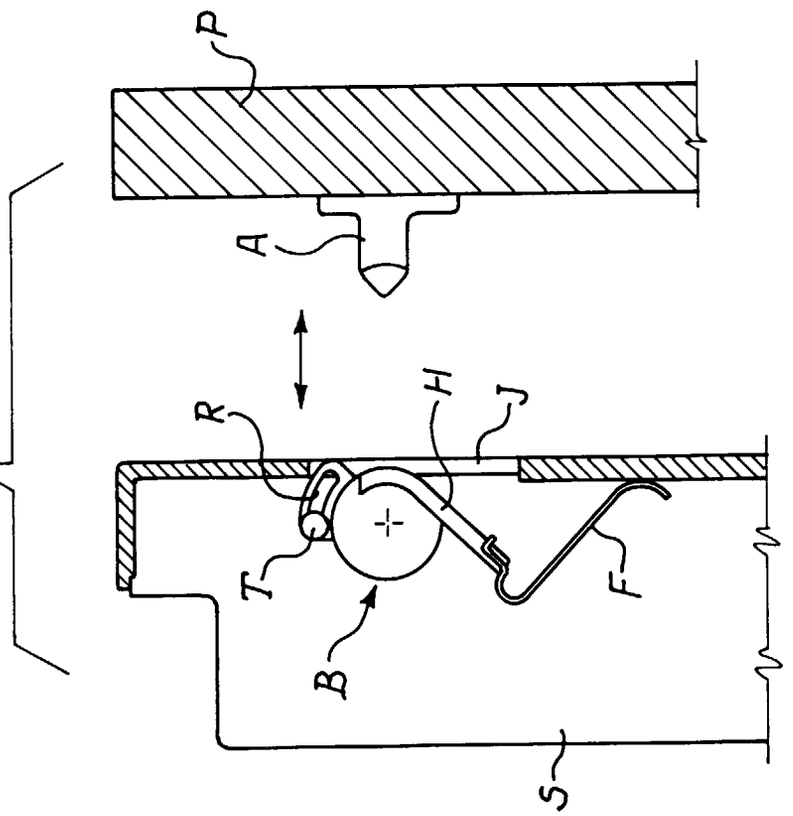


Fig.7



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EUROPEAN SEARCH REPORT

Application Number
EP 96 83 0294

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.6)
A,D	EP-A-0 520 963 (SMEG SPA) * abstract *	1	A47L15/42
A,D	EP-A-0 261 083 (SMEG SPA) * abstract *	1	
A,D	DE-A-33 04 142 (MIELE & CIE GMBH) * claims; figures *	1	
A	DE-B-29 37 413 (BOSCH-SIEMENS HAUSGERAETE GMBH) * column 3, line 40 - column 4, line 66; figures *	1	
A,D	EP-A-0 162 028 (ELECTROLUX AB) * page 2, line 27 - page 4; figures *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12 August 1996	Vanmol, M

CATEGORY OF CITED DOCUMENTS

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