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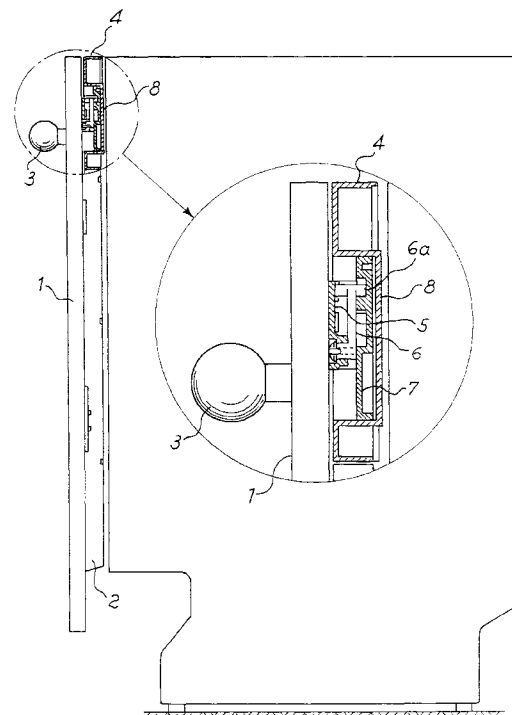
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(54) **Decorative panel provided with a device for sliding vertically along the closed door of a built-in appliance**

(57) A decorative panel (1) to be mounted on the door (2) of a built-in appliance is provided with coupling members suitable to allow the vertical sliding thereof along the door (2), as well as with a device which, when the door (2) is closed, allows to lock the sliding of the panel (1) alternatively in an upper position and a lower position through the interaction between a guide plate (7) and a support plate (5) on which a substantially T-shaped rod (6) is pivoted whose free end (6a) moves within a track formed in the guide plate (7). The support plate (5) is secured on the panel (1) and the guide plate (7) is embedded into a seat (8) formed in the upper portion of the door (2), the seat (8) having such a depth as to allow the mounting of the panel (1) on the door (2) with a very small play whereby the free end (6a) of the rod (6) always remains engaged in the track of the guide plate (7).

Fig.1



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## Description

The present invention relates to decorative panels which are mounted on the doors of built-in domestic appliances, and in particular to a panel provided with a device suitable to allow the vertical sliding thereof between two predetermined positions along the door in the closed position.

It is known that this type of decorative panel is used to camouflage a built-in appliance, typically a dishwasher, so that it blends with the kitchen furniture. This is achieved by applying to its door, with different means, a panel which has the same appearance of the other doors. In this way there is no visible element allowing to distinguish the appliance from the other members which make up the kitchen, its controls being accessible only when the door is open. This solution which is fully satisfactory from the aesthetical point of view however has the drawback that it is not possible to check the operating cycle of the machine, e.g. checking which washing phase has been reached or detecting possible visual indications. Moreover, it is not possible to modify the cycle without stopping the operation of the machine due to the opening of the door.

Actually, devices for mounting the decorative panel which also allow a vertical sliding thereof along the door are known from some time. However, this sliding consists of a lifting and/or moving away which occurs as a consequence of the opening of the door, with the purpose of preventing the interference of the panel with the plinth of the furniture while avoiding the modification of the plinth and/or the mounting of complicated hinge systems. These devices lead anyway to the complete covering of the door when it is in the closed position, thus giving rise to the above-cited drawbacks. Examples of such devices are disclosed in the German patents DE-2.937.404 and DE-3.304.142, and in the patent applications EP-0162028 and EP-0520963.

A partial overcoming of the above-cited drawbacks is achieved through another mounting device which allows the closure of the door while retaining the decorative panel in a lower position, whereby the upper portion of the door remains accessible. In this way it is possible to locate the control switchboard in said upper portion, so that it is accessible and visible also when the door is closed. Furthermore, it is then possible to raise the panel so as to hide the door completely, without interfering with the machine operation.

Also said device has nonetheless some limits of use. In fact, once the panel has been raised to the upper position it is not possible to lower it without opening the door. Since the lowering of the panel is possible only while the door is open, it results that the vertical sliding of the panel is not completely independent from the opened or closed position of the door on which it is mounted. Moreover, the lowering requires the simultaneous operation of two pushbuttons located on the sides of the door and is therefore not very easy.

Therefore the object of the present invention is to provide a panel suitable to overcome the above-mentioned drawbacks.

This object is achieved by means of a panel having the characteristics disclosed in claim 1.

The fundamental advantage of the panel with sliding device according to the present invention is the possibility of selecting the panel position at any time, so as to cover the door completely or to leave the controls in view for a subsequent check of the cycle and/or a possible change thereof, with no need to open the door. Therefore, the position can be repeatedly changed during the operating cycle without interfering therewith.

A further advantage of this panel is that of using the opening handle of the door as sliding control so that the aesthetical function of the decorative panel is not affected in any way, since no elements of the sliding device are visible when the door is in the closed position.

Still another advantage stems from the extreme operating simplicity of the sliding device, whereby it is possible to raise or lower the panel with a single hand and in a single movement.

These and other advantages and characteristics of the panel 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 lateral views, partially in section, of the panel mounted on the door of a built-in appliance, respectively in the upper and lower position;

Fig. 3 is a schematic top plan view, partially in section, showing the detail of a mounting element of the present panel; and

Fig. 4 is a schematic front view showing four operating positions of the sliding device of the above-mentioned panel.

Figs. 1 and 2 schematically illustrate a built-in appliance, typically a dishwasher, covered on the front by a decorative panel 1 coupled through mounting members, described hereafter, which engage corresponding seats formed in the door 2. In particular, an easy and balanced sliding of panel 1 is assured by four points of coupling to door 2, both at the top and at the bottom and along both the right and left side. Therefore, the following description concerning the mounting members on the right (looking frontally at the panel) can be applied specularly also to the members on the left.

The passage of panel 1 from the upper position of fig. 1 to the lower position of fig. 2 is controlled through the handle 3 for the opening of door 2, in the way which will be described later. Once it has been released, panel 1 slides downwards for a short length so as to make accessible the upper portion of the front plate 4 where the cycle display and the control switchboard, possibly of the push-pull type, are located. It should be noted that

the travel of panel 1 may be either the shortest travel required for the access to the controls and such as to allow the opening of door 2 even with panel 1 in the lower position, or a longer travel to make visible a higher portion of the front plate 4.

The device allowing the vertical sliding of panel 1 between said two positions consists of a support plate 5 on which a substantially T-shaped rod 6 is pivoted, whose free end 6a moves within a track formed in a guide plate 7. The support plate 5 is secured on the rear side of panel 1, while the guide plate 7 is embedded into a corresponding seat 8 formed in the upper portion of door 2. This seat 8, as clearly shown in figs. 1 and 2, has such a depth as to receive the whole sliding device so that panel 1 is mounted on door 2 with a very small play but sufficient for sliding panel 1 vertically. In this way, the free end 6a of rod 6 always remains engaged in the track of the guide plate 7.

Referring to fig. 3, there is seen that the coupling of panel 1 to door 2 is achieved through pegs 9 having an ogive-shaped tip extending rearwardly into a cylindrical body whose cross-section is reduced by a recess along a plane parallel to a vertical mid-plane, thus forming a vertical tooth on the rear of the tip. As mentioned above, peg 9 is introduced into a seat formed in door 2 with a vertically elongated rectangular shape. The height of said seat, together with the sliding device to be described further on, defines the sliding travel of panel 1 on door 2 (which may be indicatively of 15-20 mm to 40-50 mm).

A horizontal cylindrical bolt 10, of known type, whose inner end has a vertical abutment, projects inside the seat of peg 9. The coupling of peg 9 takes place through the axial sliding of bolt 10 in its own seat against the action of a spring 11, which prevents the subsequent uncoupling only made possible by using a specific tool.

With reference also to fig. 4, there is now illustrated the device which allows the vertical sliding and the locking of panel 1 between two alternative positions, an upper position and a lower position.

As clearly shown in the schemes of fig. 4, which depict a frontal view of the device, the guide plate 7 has an asymmetrical track 12 whose shape reminds a heart. This track is a bilateral restraint since it is made up of an outer perimeter 12a and an inner perimeter 12b. In particular, the outer perimeter 12a has a first "stop" 13 at the tip of the "heart", while the inner perimeter 12b has a similar "stop" 13' formed on the right edge of its upper side.

The support plate 5 is secured on panel 1 through six screws housed in suitable bores 14. The guide plate 7 has the same number of holes 15 to allow the fixing of the support plate 5 when holes 14 and 15 are aligned (position C). In this way, the sliding device can be assembled completely on panel 1 and then it can be coupled to door 2 by simply introducing frontally the guide plate 7 and pegs 9 into their respective seats.

The operation of said device is very simple and im-

mediately perceivable from the four operating positions schematized in fig. 4.

It is assumed to start from position A, wherein the end 6a of rod 6 abuts on the stop 13' on the upper side of the inner perimeter 12b. In this position, corresponding to fig. 1, panel 1 covers the front plate 4 and its weight is supported by rod 6. In order to move panel 1 to the lower position it is sufficient to raise it, through handle 3, so that end 6a slides rightwards along the overlying inclined plane which makes part of the outer perimeter 12b (position B). When end 6a abuts at the top of the guide plate 7, panel 1 is released and can move downwards to the lower stop 13 (position C). In this position, corresponding to fig. 2, the display and the control switchboard are accessible and the weight of panel 1 is still supported by rod 6 and/or by pegs 9 which have reached the lower end stop of their seats.

The movement to take back panel 1 to the upper position is opposite and substantially similar to the above-described movement for the lowering thereof. Panel 1 is raised so that the end 6a slides leftwards along the overlying inclined plane which makes part of the inner perimeter 12b, and then rightwards along the outer perimeter 12a, until it abuts at the top of the guide plate 7 (position D). From this position, panel 1 can move down and slide rightwards along the upper inclined plane of the inner perimeter 12b until it is back to the upper stop 13' (position A).

Therefore the objects are completely achieved of retaining the aesthetical functionality of panel 1, since the sliding device is not visible, while allowing the view of the control switchboard and display any time it is desired without interfering with the operating cycle of the machine. All of the above is achieved with a simple movement which can be carried out with a single hand.

Obviously, the same operation is also obtainable with a guide plate having a specular shape, in which case the rotation of end 6a along track 12 will be counterclockwise rather than clockwise as described above. Moreover, the function of vertical sliding between two alternative positions may also be achieved by adapting other known devices employed in other applications. An example of such a device could be that of the mechanisms for extending and retracting the point in ball-point pens, including a spring and a shaped bush with two stops at different heights.

It is also possible to form other intermediate stops between the two above-described end positions, so as to allow the selection of different heights of panel 1 on the closed door 2.

Therefore, it is clear that the above-described and illustrated embodiment of the panel with sliding device according to the present invention is just an example susceptible of various modifications. In particular, the shape of track 12 may somewhat changed and the device itself may be modified as long as it retains the function of vertical sliding between two or more alternative positions.

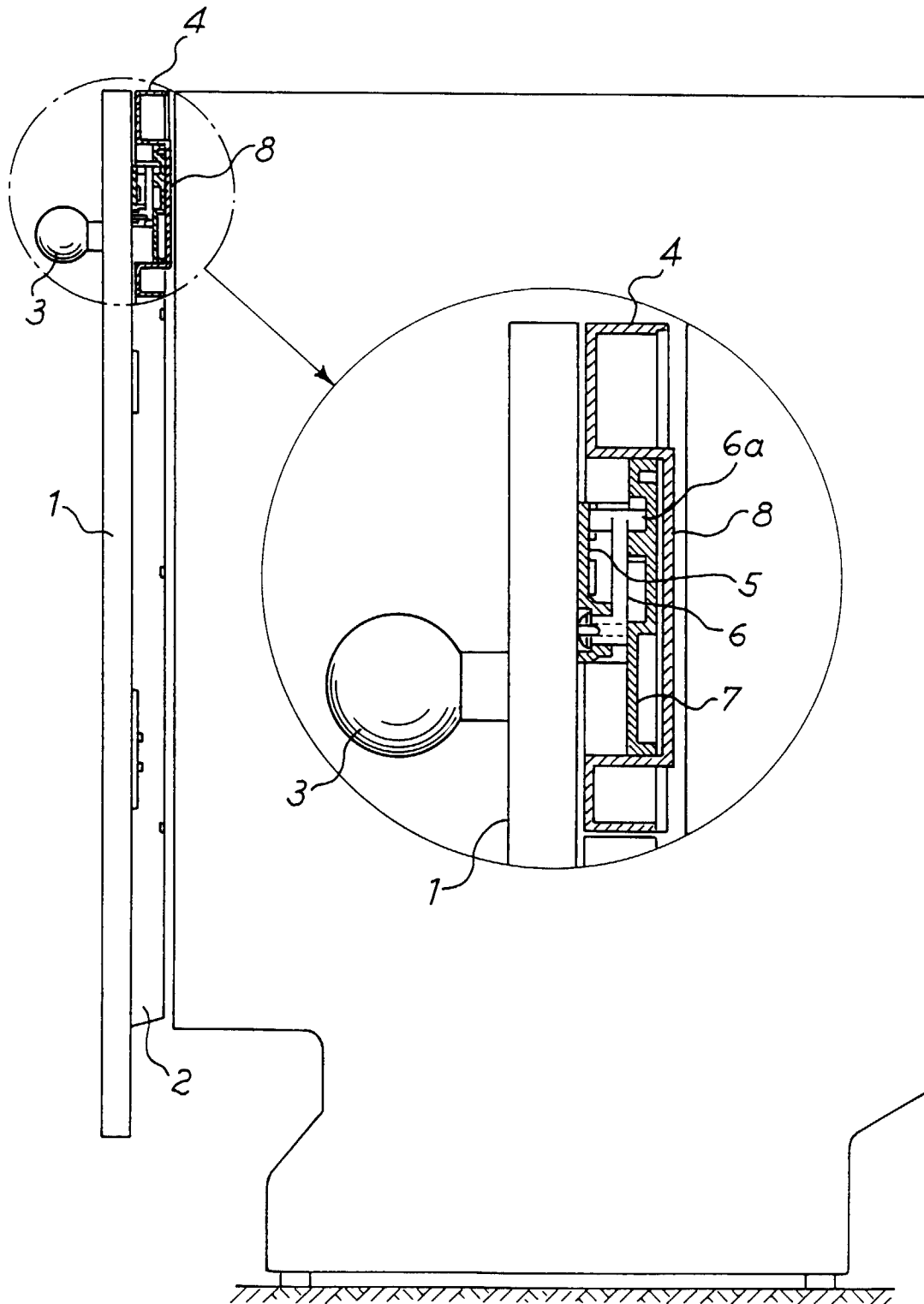
**Claims**

1. A decorative panel (1) to be mounted on the door (2) of a built-in appliance, provided with at least a pair of coupling members secured on the rear side of said panel (1) and engaged in corresponding seats formed on the front side of said door (2) so as to allow the vertical sliding of the panel (1), characterized in that it is provided on the rear side with a device which, when the door (2) is closed, is suitable to lock the sliding of the panel (1) alternatively in at least an upper position and a lower position through the interaction between at least a first member integral with the panel (1) and at least a second member integral with the door (2), said device being repeatedly operable and not visible.  
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2. A panel according to claim 1, characterized in that the device includes a support plate (5) on which a substantially T-shaped rod (6) is pivoted whose free end (6a) moves within a track (12) formed in a guide plate (7), said support plate (5) being secured on the panel (1) and said guide plate (7) being embedded into a corresponding seat (8) formed in the upper portion of the door (2), said seat (8) having such a depth as to allow the mounting of the panel (1) on the door (2) with a very small play whereby the free end (6a) of the rod (6) always remains engaged in the track (12) of the guide plate (7).  
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3. A panel according to claim 2, characterized in that the guide plate (7) has an asymmetrical track (12) suitable to be a bilateral restraint through an outer perimeter (12a) and an inner perimeter (12b), said outer perimeter (12a) having at least one stop (13) for the end (6a) of the rod (6) corresponding to the lower position of the panel (1), and the inner perimeter (12b) having at least one stop (13') corresponding to the upper position of the panel (1).  
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4. A panel according to one or more of claims 1-3, characterized in that the device includes one or more intermediate stops between the upper position and the lower position.  
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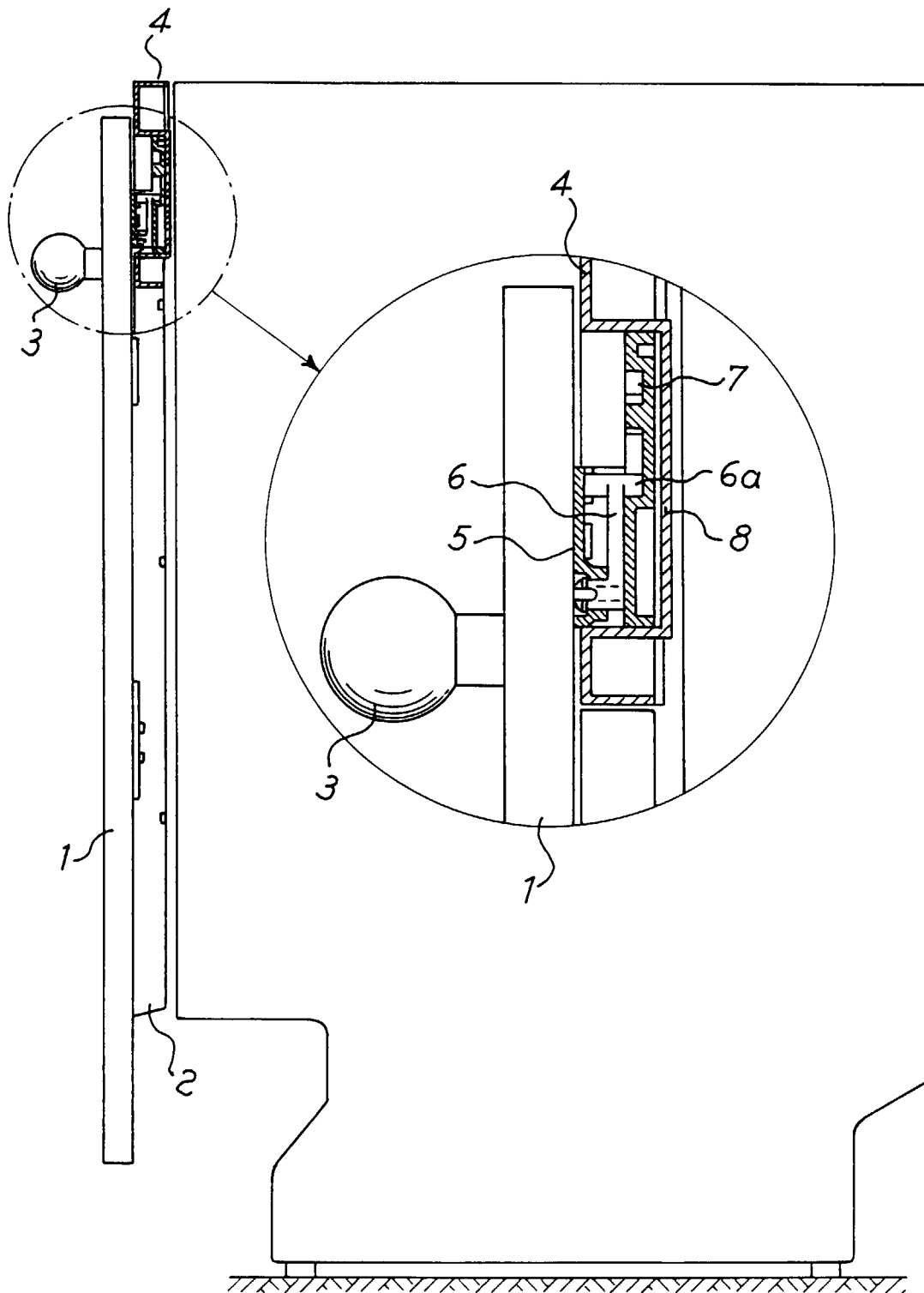
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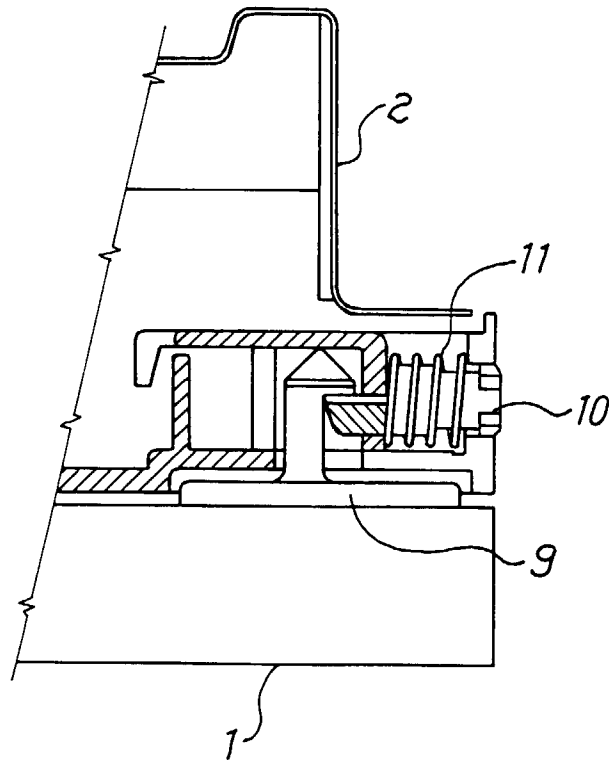
*Fig. 1*



*Fig. 2*



*Fig. 3*



**Fig. 4**

