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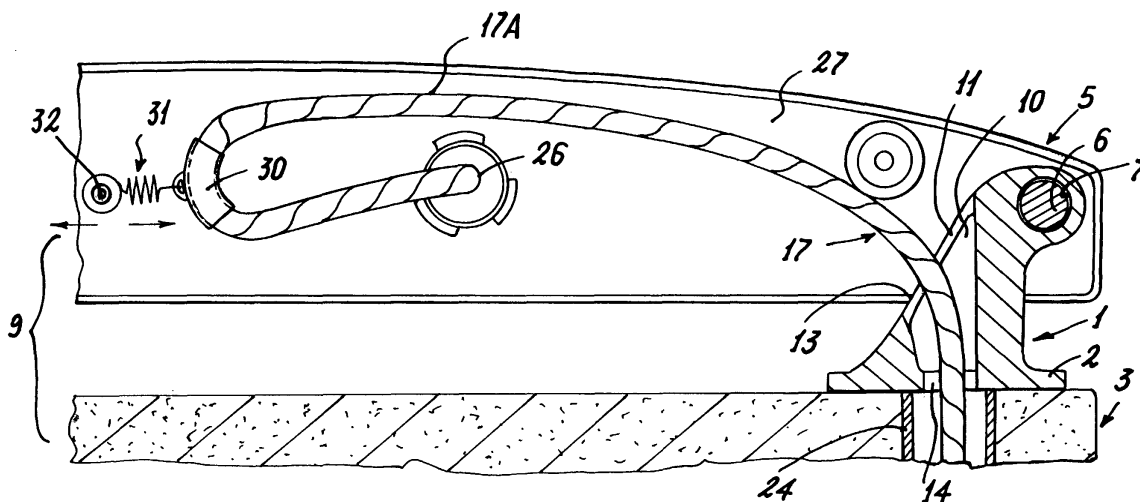
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(54) **For a household electrical appliance, a hinge provided with a passage for electric cables or tubes**

(57) A hinge for connecting a fixed structure or casing (3) of a household electrical appliance (9) to a movable part (5) of this latter, such as a refrigerator door, a dishwasher door or the like, said movable part supporting a user device such as an electrical member or a drink dispenser, said hinge comprising a body (1) provided with a base (2) to be fixed to one chosen from said structure (3) and said movable part (5), said body (1) being

provided with a seat (7) for a hinge pin (6) associated with the other of said structure (3) and said movable part (5). The hinge body (1) is provided with an internal cavity (10) and comprises on one side (13) an elongate aperture (11) opening into said cavity (10), this latter communicating with a through hole (14) provided in the hinge base (2), there passing through said hole (4) and said aperture (11) at least one electric cable or pipe (17) connected to said user device.



**FIG. 5**

## Description

**[0001]** The present invention relates to a hinge for household electrical appliance in accordance with the introduction to the main claim.

**[0002]** It is known that a household electrical appliance can present user devices or controls positioned on a part movable relative to its structure or fixed casing. For example, refrigerators are known provided with drink dispensers positioned on a door openable away from the insulated fixed structure; refrigerators are also known having their controls for user devices or for the entire appliance positioned on the door; dishwashers are known in which the electrical controls are positioned on the door movable relative to the fixed structure carrying the wash tub. In all these arrangements, the user devices or controls positioned on the movable part of the appliance are connected by wires (in the case of electrical controls or user devices) or pipes (in the case of drink dispensers) to a source of electricity, or to a vessel containing water or the drink to be dispensed and situated within the appliance fixed structure, or to the water main.

**[0003]** An object of the present invention is to offer a hinge to be used for connecting the fixed structure of a household electrical appliance to its movable part and which enables electric cables and/or connection pipes to pass between user devices positioned in and/or on the movable part and controlled members present in the fixed structure or hydraulic and/or electrical fixed main supply sources.

**[0004]** Another object is to provide a hinge of the stated type which enables electric cables and/or pipes to pass in such a manner that these are not visible from the outside of the appliance or on opening the movable part.

**[0005]** These and other objects which will be apparent to an expert of the art are attained by a hinge in accordance with the accompanying claims.

**[0006]** The present invention will be more apparent from the accompanying drawing, which is provided by way of non-limiting example and in which:

Figure 1 is a perspective view of a hinge according to the invention;

Figure 2 is a view of the hinge of Figure 1 from above in its position of use;

Figure 3 is a partial section through a household electrical appliance provided with the hinge of Figure 1;

Figure 4 is a view of part of a variant of the appliance of Figure 1; and

Figure 5 is a partial view of the appliance of Figure 1 from above.

**[0007]** With reference to said figures, a hinge of the invention comprises a body 1 provided with a fixing base 2 to be connected to a fixed structure 3 of a household

electrical appliance, for example a refrigerator 9. On this structure, which is provided with an internal preservation compartment 4 for food, there is movable a door 5 (provided with door liner 5A) carrying a pin 6 inserted into the hinge body 1. This seat is distant from the region in which the base 2 is connected to the structure 3.

**[0008]** The body 1 is internally hollow at 10; the cavity 10 communicates with the outside via an elongate aperture or slot 11 provided in a flat edge 13 of the body 1, and via a hole or slot 14 provided in the fixing base 2. Through the hole 14 and aperture 11 there pass a conduit and/or an electric cable for feeding a user device 16, for example a drink-containing vessel 18, positioned on or within the door 5. In detail, the figures show a conduit 17 connected to the user device which in the figures is represented by the vessel 18; this conduit could however also feed the vessel 18 with a drink contained in a second vessel located in a suitable position within the preservation compartment 4 of the refrigerator 9.

**[0009]** The vessel 18 is connected to a dispenser 20 (shown schematically in Figures 3 and 4 as a cock) of known type which can be positioned on the outer face 21 of the door 5 or within a compartment 22 provided in said door and closed by an openable flap 23.

**[0010]** The conduit 17 is inserted through a channel 24 provided in the fixed structure 3 and is provided with a usual non-return valve 25. It is inserted into the door 5 through a hole 26 provided in the upper surface 27 of this latter; the conduit 17 is covered frontally by a preferably removable upper end portion 28 of said door.

**[0011]** It should be noted that a suitable portion 17A of conduit 17 of predetermined length lies above the surface 27 when the door 5 is closed onto the compartment 4. This conduit portion 17A cooperates with a curved support element 30 connected by a spring 31 to a fixed pin 32 connected to the surface 27 of the door 5. In this manner, when the door 5 is opened, the conduit 17 is able to move within the aperture 11 (arrows K of Figure 1) to take up the greater distance between the hole 26 and the (fixed) fixing base arising with the movement of the door. This is achieved by the elongation of the spring 31; during closure, this spring returns the conduit 17 into the position of Figure 5.

**[0012]** The aforescribed hinge can also contain a through plurality of conduits or electric cables 17 for feeding a liquid or electric power to various user devices positioned on the door 5 or within it. These cables can also enable the entire household electrical appliance to be controlled via an interface positioned on the door 5 and connected by the said cables to the operational members of the appliance.

**[0013]** An embodiment has been described in which the hinge base is fixed to the fixed structure 3. The invention also includes the case in which the hinge is fixed to the movable part 5 of the appliance 9 and rotates about a pin carried by the fixed structure.

## Claims

1. A hinge for connecting a fixed structure or casing (3) of a household electrical appliance (9) to a movable part (5) of this latter, such as a refrigerator door, a dishwasher door or the like, said movable part carrying a user device which is electrically powered or which dispenses a drink, said hinge comprising a body (1) provided with a base (2) to be fixed to one chosen from said structure (3) and said movable part (5), said body (1) being provided with a seat (7) for a hinge pin (6) associated with the other of said structure (3) and said movable part (5), **characterised in that** the hinge body (1) is provided with an internal cavity (10) and comprises on one side (13) an elongate aperture (11) opening into said cavity (10), this latter communicating with a through hole (14) provided in the hinge base (2), there passing through said hole (14) and said aperture (11) at least one electric cable or pipe (17) directed towards the user device associated with said movable part.
 

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2. A hinge as claimed in claim 1, **characterised in that** each cable or pipe (17) is connected to extension take-up means (30, 31, 32) enabling said cable or pipe to follow the movement of the movable part (5) relative to the fixed structure (3) when said part is opened.
 

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3. A hinge as claimed in claim 2, **characterised in that** the extension take-up means are a member (30) secured to a portion (17A) of each cable or pipe (17) external to the fixed structure (3) and to the movable part (5), an elastically deformable member (31) associated at one end with said member (30), and, rigid with the movable part (5), a fixed pin (32) to which the other end of the elastically deformable member (31) is fixed.
 

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4. A hinge as claimed in claim 3, **characterised in that** the portion of cable or pipe external to the fixed structure (3) and to the movable part (5) is superposed on this latter and is concealed by a protection element (28).
 

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5. A hinge as claimed in claim 1, **characterised in that** the pipe (17) is connected to a liquid vessel (18) positioned within the movable part (5) and connected to a dispenser (20) positioned on an outer face (21) of said part.
 

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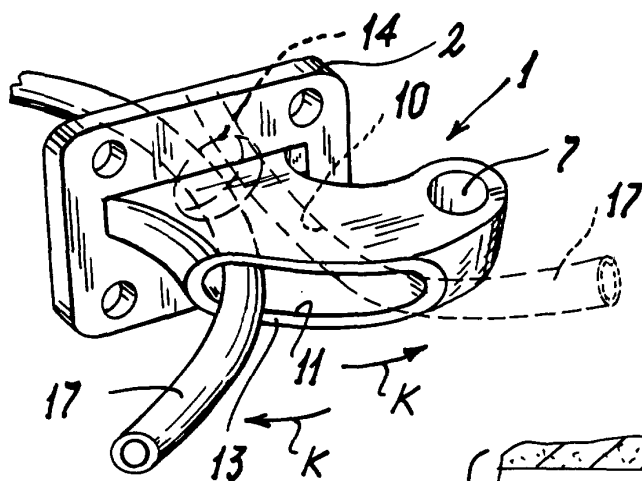


FIG. 1

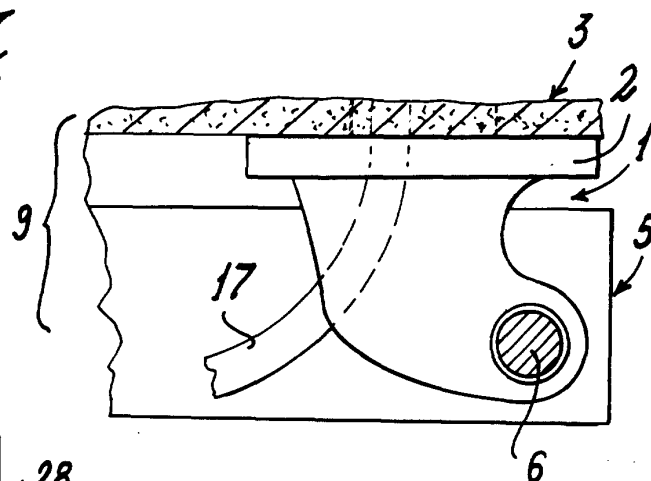


FIG. 2

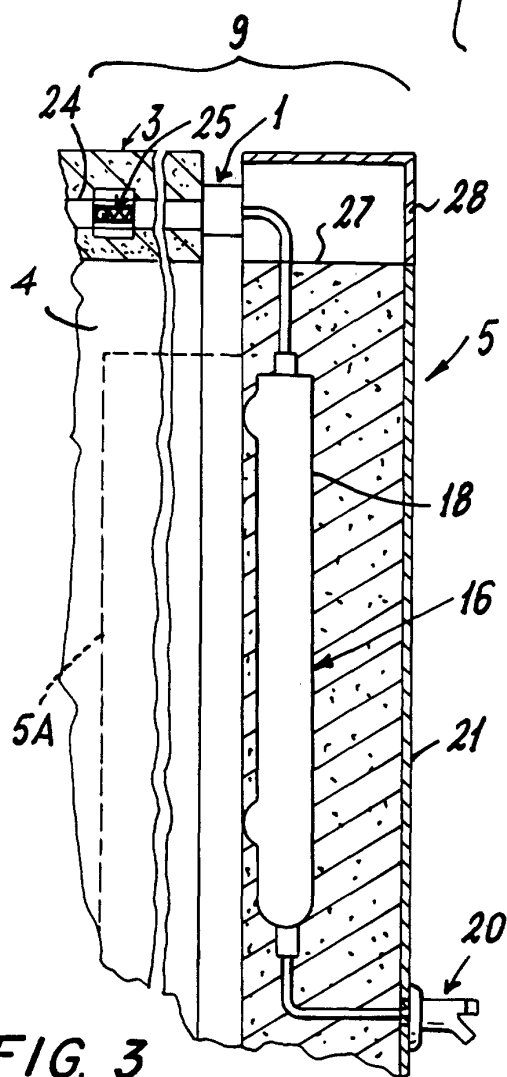


FIG. 3

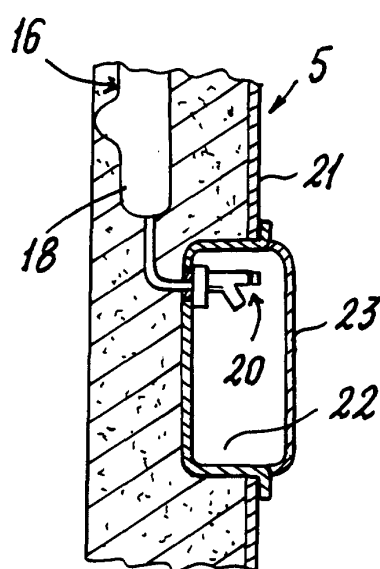


FIG. 4

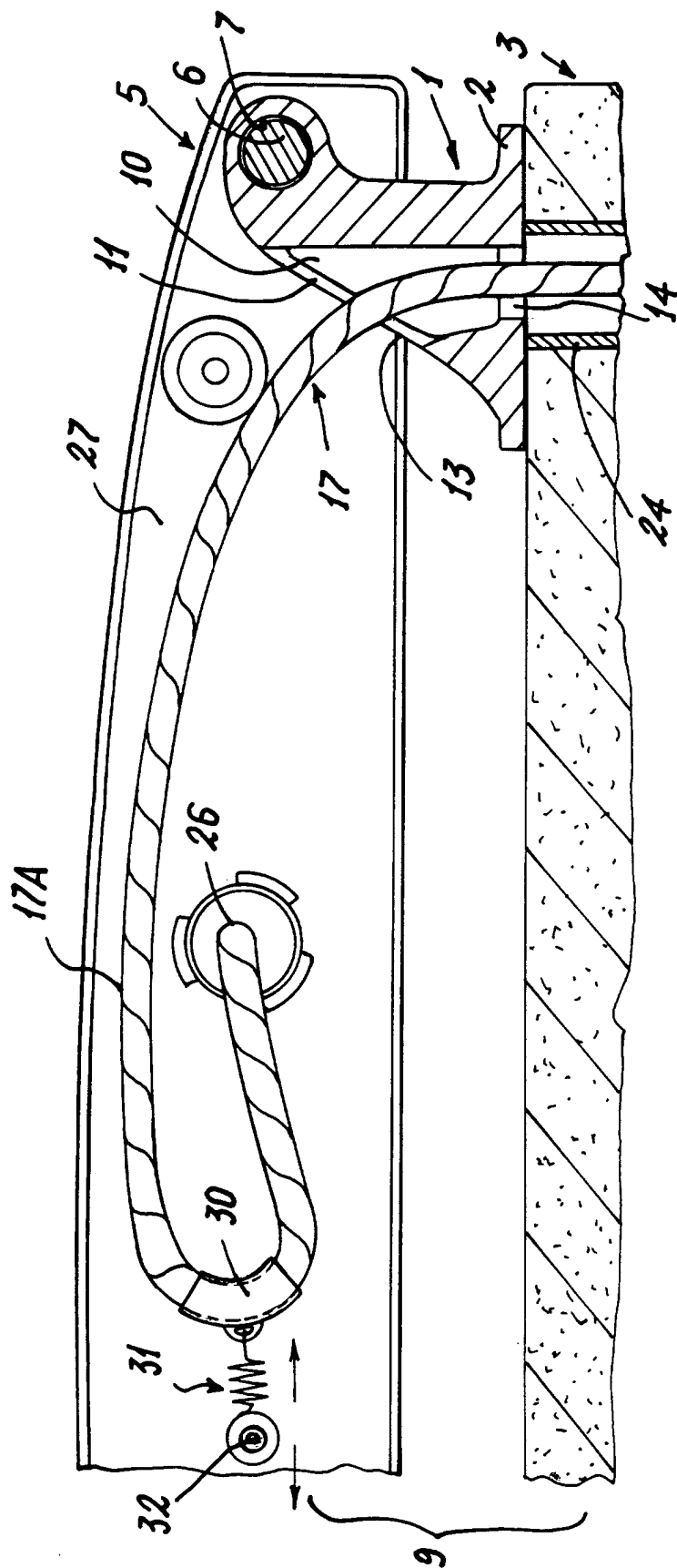


FIG. 5