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(54) **Device for the passage of pipes from a cabinet to a door of an electrical appliance**

(57) A device is described for the passage of a pipe (9) from a cabinet (1) to a door (4) of an electrical appliance with the door (4) of the cabinet (1) being rotatable as regards a vertical axis. Such device (20) comprises a round housing (15) internal to said door (4) for the passing of the pipe (9), a hinge (29) for the coupling of the cabinet (1) to the door (4). The hinge (29) is provided with a tubular duct (28) associated with the housing (15) of the pipe (9) and coaxial to it and the axis of the tubular duct (28) corresponds to the rotation axis of the door (4) as regards the cabinet (1) of the electrical appliance.

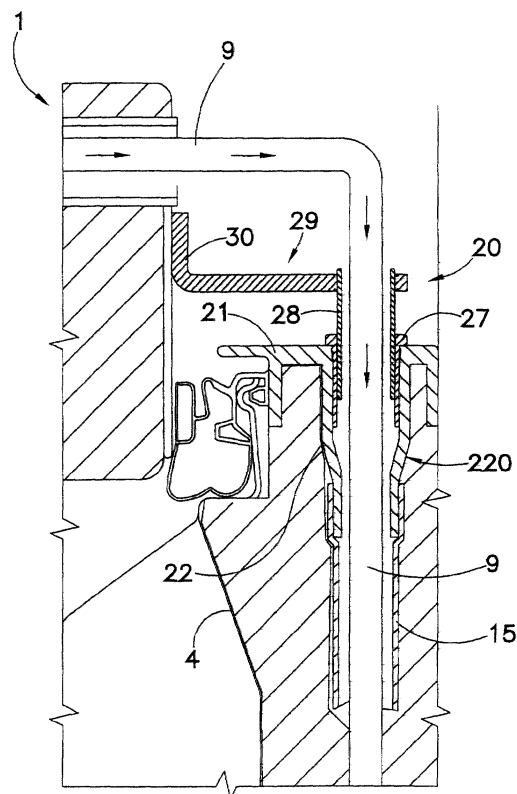


FIG.2

EP 1 139 043 A2

Description

[0001] The present invention refers to a device for the passage of pipes from a cabinet to a door of an electrical appliance, in particular for a refrigerator provided with a device dispensing cool water into the outside.

[0002] There are known refrigerator appliances provided with devices for the dispensing of water coming from an external water network. In such case a circuit for the connection with an external water network is provided and a hydraulic circuit internal to the refrigerator appliance that is suitable to take the water up to a tank internal to the heat-insulated case of the refrigerator; a tap connected with the aforesaid tank provides to the output of water.

[0003] In such refrigerator appliances there is the need to realize solutions for the passing of the pipes of the dispensing unit from the cabinet to the door of the heat-insulated case. In fact in such passage the pipe can be subject to traction or torsion strains during the stages of opening and closing of the door which tend to wear it thus diminishing its efficiency.

[0004] In view of the state of the art herein described, scope of the present invention is to present a device for the passage of pipes from a cabinet to door of an electrical appliance which solves the aforesaid problems.

[0005] According to the present invention, such scope is attained by means of a device for the passage of a pipe from a cabinet to a door of an electrical appliance, said door being rotatable as regards a vertical axis, characterized in that it comprises a round housing internal to said door for the passage of the pipe, a hinge for the coupling of the cabinet to the door, said hinge being provided with a tubular duct associated with said housing of the pipe and coaxial to it in such a way that the tubular duct axis corresponds to the rotation axis of the door as regards the cabinet of the electrical appliance.

[0006] Owing to the present invention it is possible to realise a device for the passage of pipes from a cabinet to an electrical appliance door that reduces the strains that the duct is submitted to during the opening and the closing of the door.

[0007] The characteristics and the advantages of the present invention will become evident from the following detailed description of an embodiment thereof, that is illustrated as a non limiting example in the enclosed drawings, in which:

Figure 1 is a lateral section according to a vertical plane of a refrigerator that has a device for the passage of a duct from the cabinet to the door according to the present invention;

Figure 2 is a view in magnified scale of the device for the passage of a duct from the cabinet to the door of the refrigerator in Figure 1;

Figure 3 is a top view of the head and the bushing of the device in Figure 2;

Figure 4 is a section view only of the head in Figure

2 according to a line IV-IV;

Figure 5 is a section view of a hinge of the device in Figure 2;

Figure 6 is a perspective view of the bushing of the device in Figure 2.

[0008] With reference to Figure 1 a refrigerator according to the present invention is shown. The refrigerator comprises in a way known per se a cabinet 1 that encloses within itself a heat-insulated case 2 and, on the bottom of the same, a freezing cell 3. The heat-insulated case 2 and the freezing cell 3 are frontally open and they are provided with doors 4 and 5 that are hinged to the cabinet 1 in order to be revolving around a vertical axis. On the back of the case 2 a condenser and a compressor are provided that are part of a traditional system of refrigeration not visible in the figures.

[0009] The refrigerator is provided with a water inlet 7, directly connectable with the house water network. Valve devices 8 preferably associated with a liter-counter not visible in the figure are associated with the water inlet 7. In output of the valve devices 8, a duct for the transport of water 9, that is housed in a back interspace of the cabinet 1, goes up to the top of the cabinet 1, continues in a top interspace of the cabinet 1 towards the front part of the same, passes through the door 4 and ends in a water accumulation tank 10 destined to contain a drinking water reserve. The tank 10 is mounted onto the internal wall of the door 4 as a bracket and preferably it has an elongated shape. A filtering device 11 is associated with the tank 10 that is suitable to carry out a function of chemical filtering of the water supplied by the water network, for the elimination of possible organic compounds, of products of the reaction of the chlorine present in the water, of substances released by the pipes of the water network.

[0010] The filtering device 11 is part of a dispensing device 12 comprising a tap 13 that takes the filtered water outside. Between the filtering device 11 and the dispensing device 12 second valve means 14 are located.

[0011] The door 4 of heat-insulated case 2 is provided with a round sheath 15 on the inside through which the duct 9 and the electrical wires for the solenoid valve 8 and for possible pilot lights located on the top of the refrigerator appliance pass, that are better visible in Figure 2 where only one part of the sheath that slides in the door 4 along the entire length of the duct 9 is shown. Said sheath 15 is inserted during the foaming stage of the door 4 without altering the aesthetic profile of said door 4 as compared with the traditional doors for refrigerator. The sheath has an internal diameter greater than the external diameter of the duct 9 so that the same duct 9 can be inserted in the sheath 15 with a clearance.

[0012] On the top of the door 4, in correspondence of the rotation axis of the door 4, a device 20 for the passage of the duct 9 from inside the cabinet 1 to the same refrigerator door 4 is provided. Said device 20 is made up of a head 21 of the door 4 which is provided with a

tubular duct 22 that is inserted in a cavity 22 made on top of the sheath 15 during the foaming stage of the door 4 and better visible in Figures 3 and 4. Said tubular duct 22 has a section decreasing from the top toward the bottom and it has an internal octagonal section 23 on the top and a round section 24 on the bottom. The head 21 is provided with edges 25 and 26 for its fastening onto the door 4 of the refrigerator.

[0013] Inside of the octagonal section part 23 of the head 21 a bushing 27 is located that has an octagonal external lateral surface but a rounded internal lateral surface. Inside the bushing 27 a tubular part 28 of a hinge 29 is arranged that has an L-shape extension 30 for its fastening to the cabinet 1 by means of appropriate screws insertable in holes 31. Said tubular part 28 is coaxial to the sheath 5 and to the rotation axis of the door 4 and inside of it the duct 9 and possible electrical wires pass through.

[0014] During the opening and the closing of the door 4 of the heat-insulated case 2 of the refrigerator both the head 21 as well as the bushing 27 and naturally the sheath 15 rotate thus following the rotation of the door while the tubular part 28 remains fixed. In this way the duct 9 undergoes only a minimal strain caused by the opening and the closing of the door 4.

5. Device according to claim 4, **characterized in that** said pipe (9) takes water coming from an external water network to said cool water dispenser (12) located in the refrigerator.

6. Device according to claim 1, **characterized in that** in said round housing (15) of the door (4) electrical wires for pilot lights that are placed on the top of door (4) also pass through.

Claims

1. Device for the passage of a pipe (9) from a cabinet (1) to a door (4) of an electrical appliance, said door (4) being rotatable as regards a vertical axis, **characterized in that** it comprises a round housing (15) internal to said door (4) for the passage of the pipe (9), a hinge (29) for the coupling of the cabinet (1) to the door (4), said hinge (29) being provided with a tubular duct (28) associated with said housing (15) of the pipe (9) and coaxial to it in such a way that the axis of said tubular duct (28) corresponds to the rotation axis of the door (4) as regards the cabinet (1) of the electrical appliance.
2. Device according to claim 1, **characterized in that** it comprises a head (21) of the door (4) which is provided with a tubular part (22) connected with said round housing (15) for the passing of the pipe (9), said tubular part (22) partially containing said tubular duct (28) of the hinge (29).
3. Device according to claim 2, **characterized in that** it comprises a bushing (27) between said tubular part (22) of the head (21) and said tubular duct (28) of the hinge (29).
4. Device according to claim 1, **characterized in that** said electrical appliance is a refrigerator with dispenser of cool water (12).

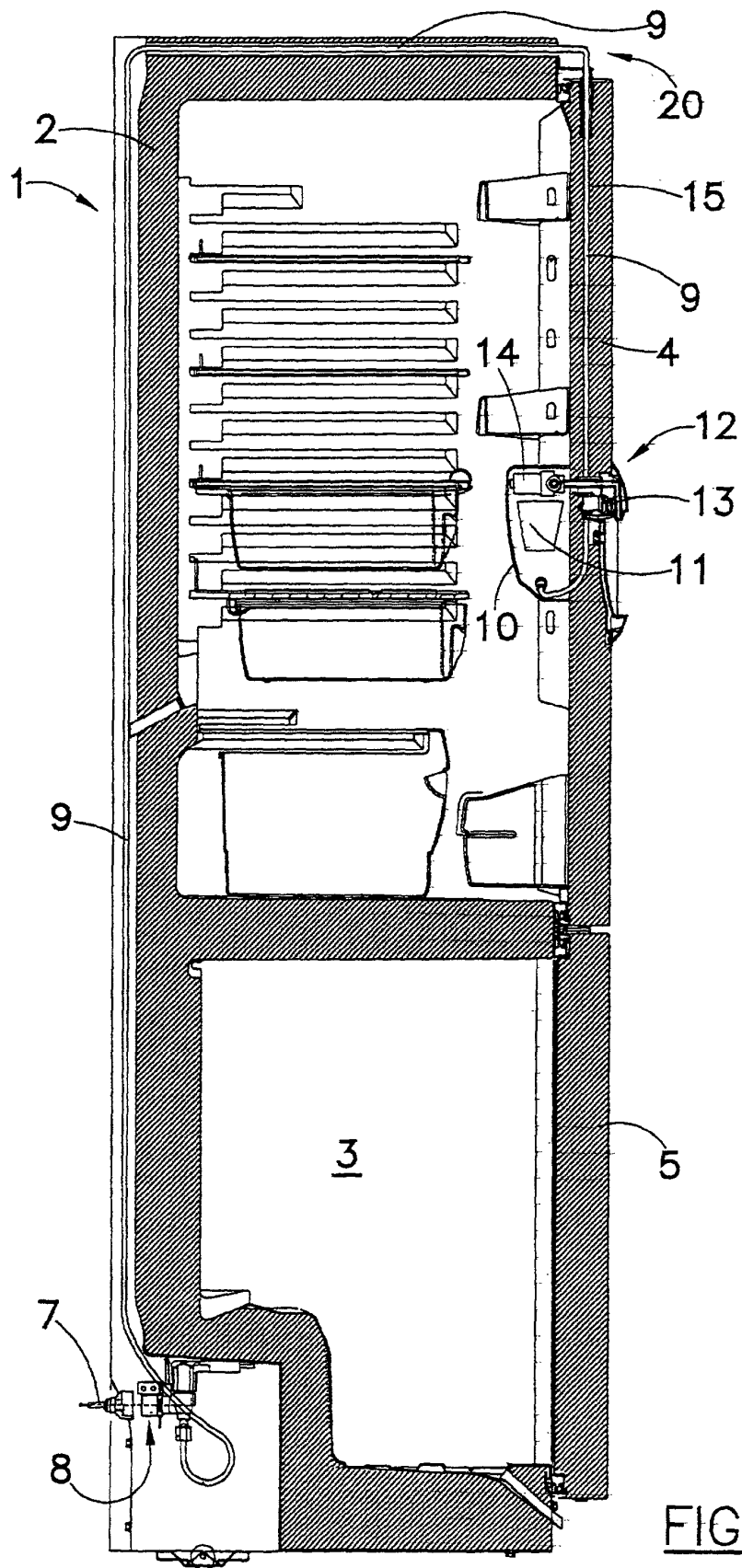


FIG.1

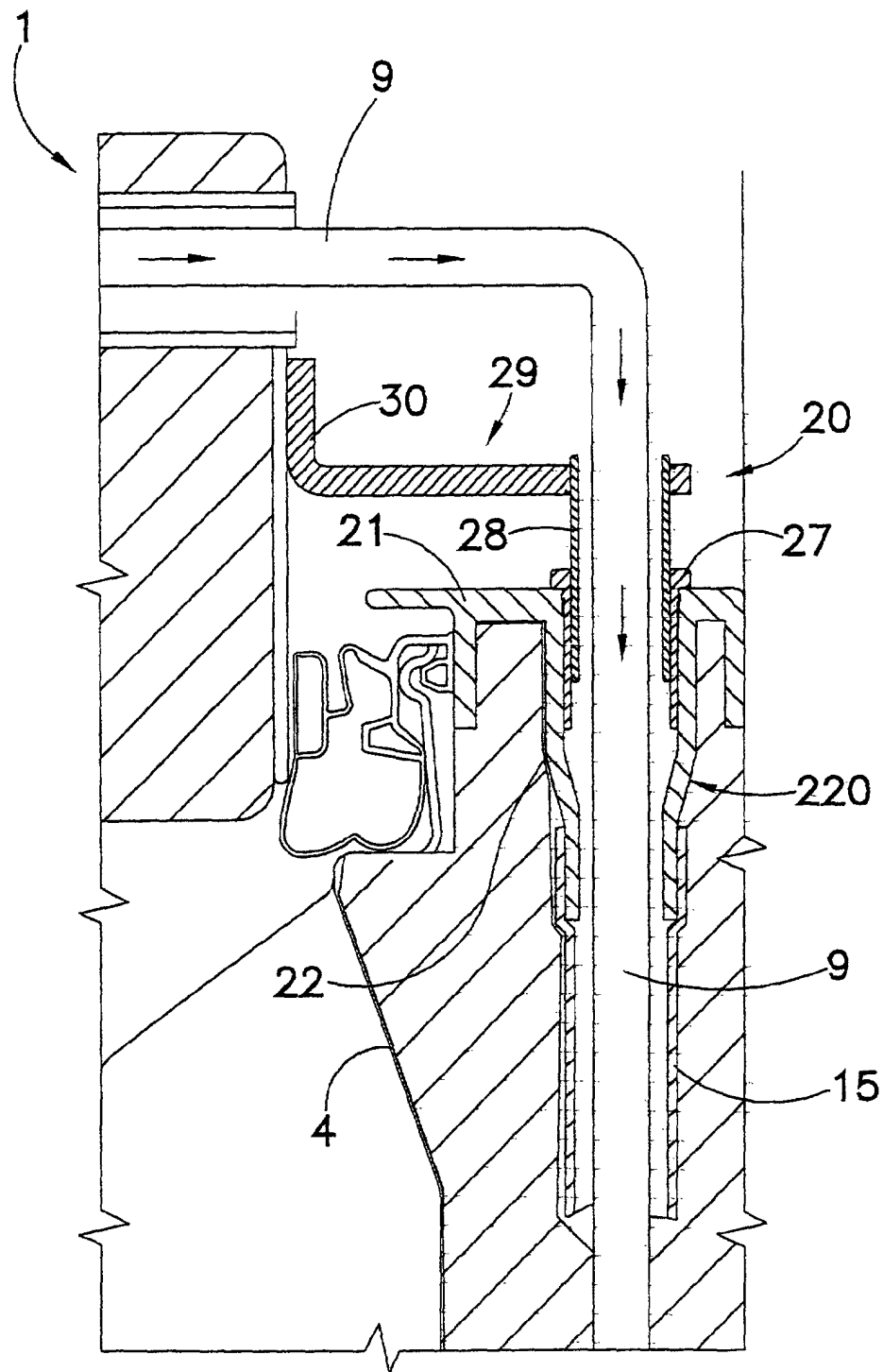


FIG.2

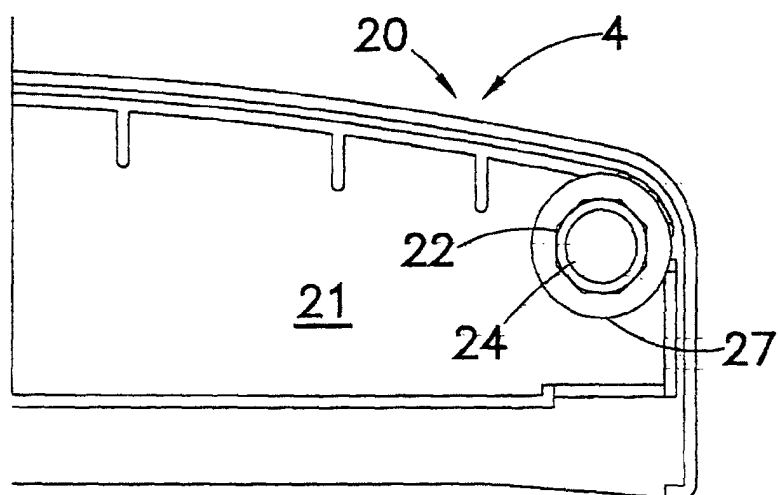


FIG. 3

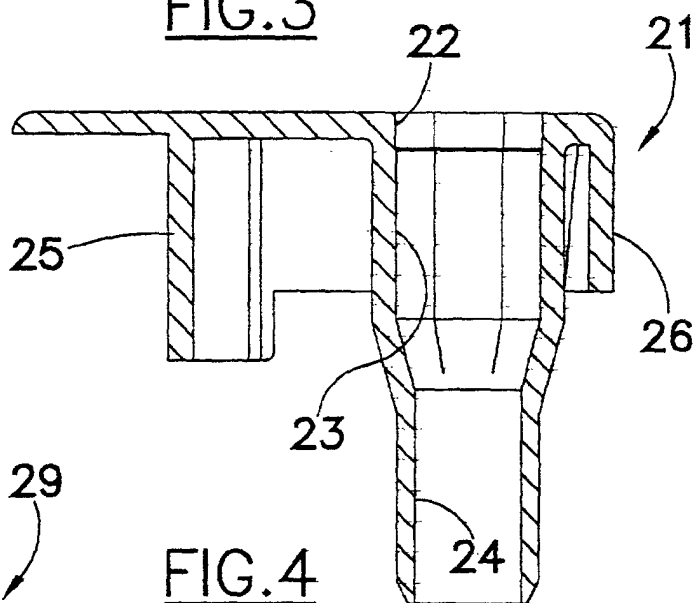


FIG. 4

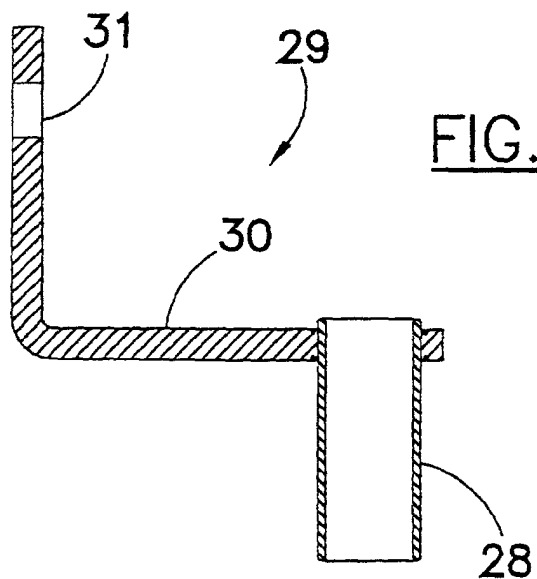


FIG. 5

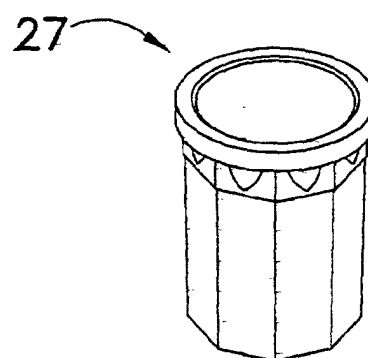


FIG. 6