(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 190 983 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.03.2002 Bulletin 2002/13

(51) Int Cl.[7]: **B67D 1/08**

(21) Application number: **01121693.4**

(22) Date of filing: **14.09.2001**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **26.09.2000 IT MI000541**

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(54) Refrigerated water dispenser for domestic refrigerators

(57) A refrigerated water dispenser for refrigerator doors, comprising a hollow structure (5) to be applied to the outer face of the door (1) and defining a compartment (11) into which a water feed means (13, 19) opens, in which said water feed means (13, 19) extends through the door (1) and terminates with a connection means (21) to which a water container (25, 26) is removably coupled.

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Description

[0001] The present invention relates to a refrigerated water dispenser for refrigerator doors, comprising a structure to be applied to the outer face of a refrigerator door, and defining a compartment into which a water feed conduit opens.

[0002] A water dispenser corresponding to this description is known from Italian patent application MI2000A00108 filed on 27/01/2000, entitled "Refrigerated water dispenser for refrigerators", in the name of the same applicant.

[0003] The present invention, although using the teachings of that patent application, proposes a particularly simple and economical solution, the innovative aspects of which are highlighted in the accompanying claims.

[0004] The invention will be more apparent from the ensuing detailed description given hereinafter by way of non-limiting example with reference to the single figure of the accompanying drawing showing a section through the water dispenser of the present invention installed on a refrigerator door.

[0005] In the figure the reference numeral 1 indicates a refrigerator door comprising an inner side 2 (cold because it faces the refrigerated compartment 2A of the refrigerator) and an outer side 3 (facing the room), between which the usual thermal insulation expanded in situ and indicated by 4 is present. On the outer side, a structure 5 comprising a base 6 and a shell 7 is fixed, for example by the method described in the aforestated patent application.

[0006] As taught in said patent application, the shell 7 presents a frontal opening 8 closed by a flap 9 hinged lowerly, at 10, to the shell and subjected to a spring or elastic force tending to maintain it in its closed position.

[0007] The structure 5 defines a compartment 11 in which the outlet 12 of a water feed conduit 13 is present.

[0008] Within this conduit 13, in the outlet part which penetrates into the compartment 11, a valve is present comprising a rotatable valving element 14 provided with a through hole and connected to an operating lever or arm 15 which interferes with the trajectory of the flap 9. A spring, not shown, for example a torsion spring, acts on the arm 15 to urge the valving element into the position in which it closes the conduit 13. A stop member, also not shown, halts the arm in this position.

[0009] The rotation (arrow F) of the flap 9 produced by the user causes the lever 15 to move and the conduit B to rotate into the open position with consequent dispensing of water.

[0010] The conduit 13 presents a flange 16 upstream of the valve, and passes through a hollow component 17, which remains embedded in the insulation 4 and is described hereinafter. The conduit 13 terminates with a thread 18, this thread engaging a member 19 presenting a flange 20 and forming part of the water flow path.

[0011] On screwing the member 19 onto the conduit 13, the flanges 16, 20 lock together the parts associated with the door.

[0012] The member 19 is of pipe shape and comprises a well 21 provided with a gasket 22 mounted on its open end.

[0013] From the base of the well there projects a protuberance 23, the purpose of which is clarified hereinafter.

[0014] The well 21 can sealingly receive the exit mouth 24 projecting from the base of a water vessel or container 25, which hence becomes removably coupled to the member 19 and supported by suitable seats (not shown) provided on the door liner.

[0015] The exit mouth is of frusto-conical shape in order not to allow escape of a ball 26A, which closes it and which on coupling the vessel 25 to the well 21 is moved upwards by the protuberance 23 to enable water to flow out when the valving element 14 passes to its open position.

[0016] The container 25 comprises a removable cover 26 bounding a chamber 27 which is upperly open at 28 and is hydraulically connected to the compartment 25A of the container 25 via a conventional replaceable filter 29 which penetrates into the compartment 25A and is supported on the base of said cover.

[0017] The combined vessel 25, cover 26, filter 29 and ball 26A can be extracted, i.e. removed from the well 21, cleaned, the filter replaced and then returned into position with a new filling of water. The water consumed can be replenished through the aperture 28 as required.

[0018] As can be seen from the figure, the component embedded in the insulation 4 forms a passage P, which surrounds the conduit 13 and passes through the thickness of the door. The component 17 comprises a part 17A presenting a conventional elastic seal flange 17B and a part 17C mounted about the former and also provided with an elastic seal flange 17D. The part 17A can be closed by a plug 17E.

[0019] For centering purposes the flange 16 can be provided with radial appendices and be housed in a seat 16A present in the base 6 and correspondingly shaped.

[0020] A sensor 40 can be provided on the inner side of the door to measure the level of water in the container 25; the amplified signal from said sensor can be applied to a light source, which when lit indicates that the water level in the container is low and hence should be increased. If the sensor 40 is used, instead of the plug 17A a tube (not shown) can be connected to the component 17 for passage of the electric connection cable to the sensor. When the container is removed from the well 21 and refilled, the ball closes the exit mouth 24 to prevent escape of water.

[0021] In a further embodiment the sensor 40 can be connected to a suitable circuit which automatically refills the container 25 with mains water, if the refrigerator is provided with a connection to the water main.

Claims

1. A refrigerated water dispenser for refrigerator doors, comprising a hollow structure (5) to be applied to the outer face of the door (1) and defining a compartment (11) into which a water feed means (13, 19) opens, **characterised in that** said water feed means (13, 19) extends through the door (1) and terminates with a connection means (21) to which a water container (25, 26) is removably coupled.

2. A dispenser as claimed in claim 1, wherein the water container (25, 26) is coupled to the connection means (21) by a bottom tubular appendix (24) thereof in which a valving means (26A) is situated.

3. A dispenser as claimed in claim 2, wherein the appendix (24) is frusto-conical and the valving means (26A) is a ball arranged to cooperate with a protuberance (23) present in the connection means (21).

4. A dispenser as claimed in claim 1, wherein a filter (29) is removably provided in the container (25, 26).

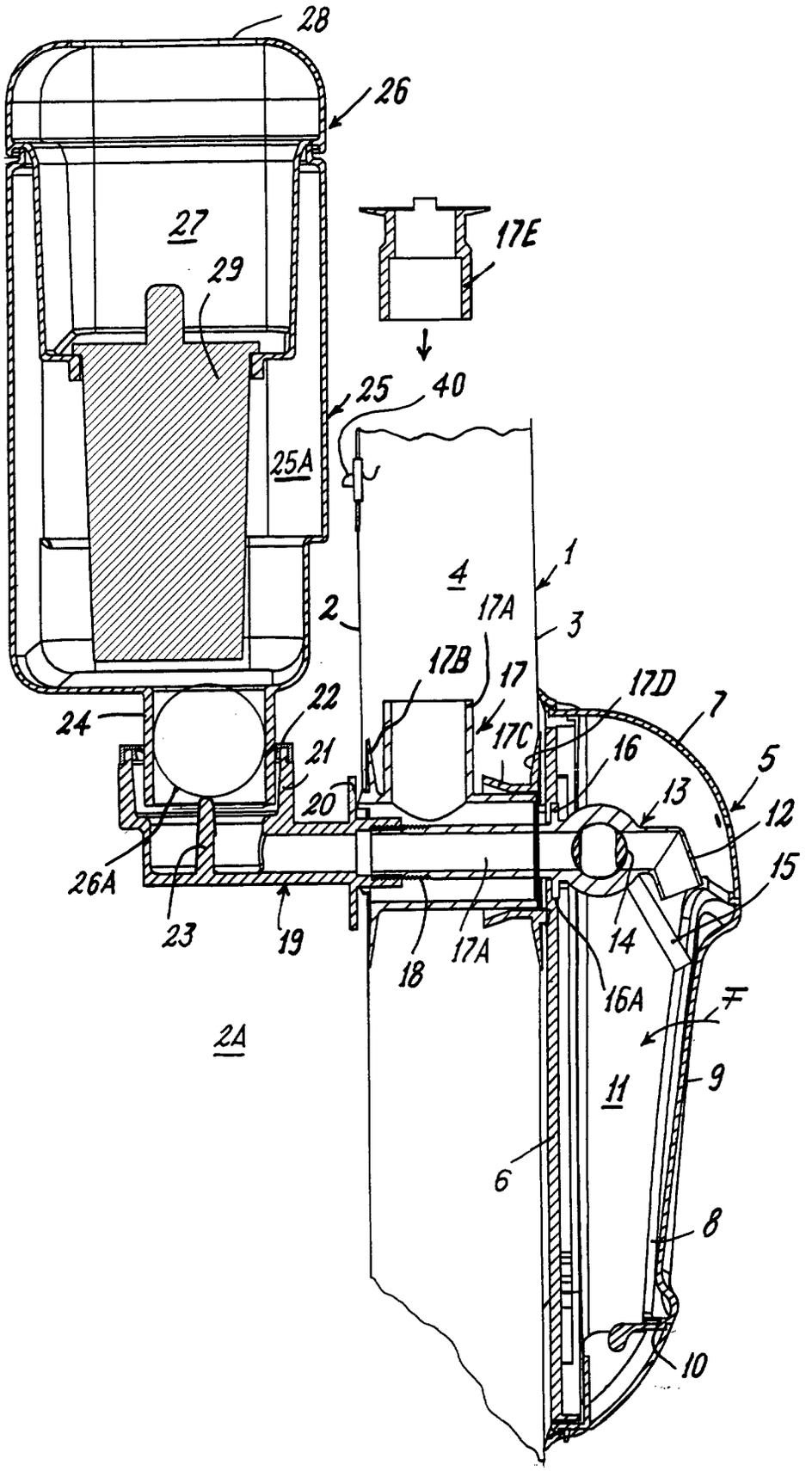
5. A dispenser as claimed in at least one of the preceding claims, wherein the water feed means (13, 19) presents within the compartment 11 a dispensing valve (14) operated by a lever or arm (15) interfering with the trajectory of a flap (9) hinged to the hollow structure (5) and closing an aperture (8) providing access to the compartment (11).

6. A dispenser as claimed in at least one of the preceding claims, wherein the water feed means (13, 19) passes through the door (1) inside a passage (P) bounded by an element (17) embedded in the door insulation (4).

7. A dispenser as claimed in at least one of the preceding claims, wherein a sensor (40) for the water level in the container (25, 26) is positioned outside of this latter to monitor the level.

8. A dispenser as claimed in claims 6 and 7, **characterised in that** the level sensor (40) is connected to a control circuit by a wire disposed within a tube connected to the element (17) embedded in the door insulation (4).

9. A dispenser as claimed in claim 7, wherein the level sensor (40) is connected to an automatic system for filling the container (25) with mains water.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