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(54) Device for draining water from a refrigerating apparatus on defrosting thereof.

(57) The invention relates to a device for draining water from a refrigerating apparatus flowing from the evaporator thereof during the defrosting phase. A device of this type essentially comprises a passage extending through a wall of the apparatus and communicating with a collecting receptacle for evaporating of the collected water. In known devices of this type, the passage tends to become obstructed by food particles, dust and the like carried in the drained water, necessitating the passage to be regularly manually cleaned by the user.

According to the invention the passage has the approximate configuration of a venturi nozzle, resulting in an air flow passing therethrough in opposite directions as the door of the refrigerating apparatus is opened and closed, whereby the passage is reliably kept free of obstructions.

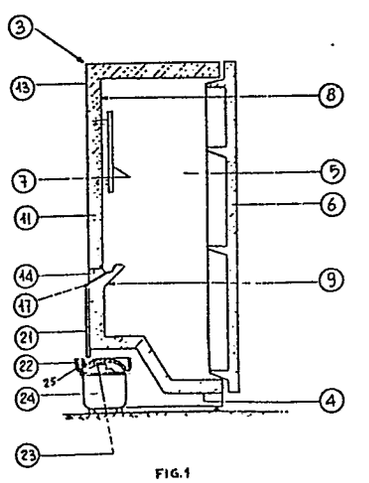

FIG.1

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Device for Draining Water from a Refrigerating Apparatus on Defrosting Thereof

Description

The present invention relates to a simple device for collecting the water set free by defrosting the evaporator of a refrigerating apparatus and for draining such water to the exterior of the apparatus.

As generally known the defrosting of the evaporator of a refrigerating apparatus is normally carried out by utilizing the heat produced by suitable electric heater elements disposed in heat-conducting contact with the evaporator, such heater elements being periodically energized and deenergized by thermostatic control means in response to the temperature sensed thereby.

The water set free by the defrosting operation is usually collected in at least one receptacle disposed below the evaporator and dimensioned in conformity therewith. The collected water is then drained to the exterior of the apparatus through a cylindrical passage having a small cross-sectional area connected to the receptacle and extending through the rear wall of the apparatus.

The passage itself is connected to a further conduit having a larger cross-sectional area and extending vertically along the outer surface of the rear wall to terminate adjacent a further collecting receptacle provided in a lower part of the apparatus.

The water contained in the further receptacle is then progressively evaporated by the heat produced by the condenser of the apparatus, the latter being disposed along the outer surface of the rear wall of the apparatus and extending partially into the further receptacle.

In another embodiment the further receptacle is shaped to conform to a top portion of the compressor and disposed in heat-transmitting contact therewith, so that the water contained therein is progressively evaporated by the heat transmitted from the compressor to the receptacle.

If in an apparatus of the type described the water collected in the receptacle contained within the refrigerating cell below the evaporator contains any food particles, dust or the like, the described passage and conduit tend to become clogged after some time, so that the water can no longer be drained from the interior of the refrigerating apparatus.

As a result, the water will overflow into the interior of the refrigerating cell, with the resultant annoyance to the user.

To avoid this troublesome occurrence, known refrigerating appliances are supplied with a small hand tool which may be inserted into the bores of the passage and/or conduit for cleaning them of obstructions of the type described above.

In practical use it has been found, however, that satisfactory results are only to be obtained if the user cleans the passage and/or conduit at regular intervals in accordance with the instructions by the manufacturer of the appliance.

On the other hand, however, the cleaning operation is often carried out in an erratic fashion or not at all, resulting in the passage and/or conduit becoming permanently obstructed, necessitating their replacement or repair by skilled service personnel.

The present invention aims at avoiding the occurrence of this trouble yb providing a device for draining the water from a refrigerating apparatus set free by defrosting there-

of, the main object of the invention being the provision of such a device of simple construction and simple and reliable operation, which is effective to prevent the formation of obstructions of the above described type without requiring any intervention on the user's part as in known appliances of this type.

These and other objects are attained according to the invention in a device for draining water from a refrigerating apparatus on defrosting the evaporator thereof, comprising a water collecting receptacle located below the evaporator and dimensioned in conformity thereto, a duct portion connected to said receptacle and passing at least partially through a respective thermo-insulated wall of the apparatus, and optionally a drain conduit communicating with said duct portion and extending along the outer surface of said wall to terminate adjacent a further water collecting receptacle disposed in a lower portion of the apparatus.

In accordance with the invention, a device of the type defined above is characterized in that said duct portion is of conical configuration converging towards said wall so as to define a passage of diminishing cross-sectional area, and in that there is provided at least one profile element adapted to be secured through said wall together with said duct portion, said profile element being formed with a first conical portion adapted to receive said duct portion therein, and a second conical portion converging towards said first conical portion and formed with a projecting lip at a position above said drain conduit.

The specific construction of the device according to the invention ensures that the passages thereof are effectively cleaned of any food particles, dust and the like, without manual intervention by the user, on each opening and closing operation of the door of the refrigerating apparatus by the air flowing through the passage on each such

opening and closing operation.

The characteristics and advantages of the invention will become more clearly evident from the following description, given by way of example with reference to the accompanying drawings, wherein:

fig. 1 shows a diagrammtical cross-sectional view of a refrigerating apparatus equipped with a draining device according to the invention, and

fig. 2 shows an enlarged detail of fig. 1.

A refrigeratign apparatus shown in the drawings is in the form of a domestic refrigerator 3 having a body 4 enclosing a refrigerating cell 5, and a door 6 hinged to the forward portion of body 4 for opening and closing cell 5 from in front of the apparatus.

Disposed in cell 5 is at least one evaporator 7 secured in a conventional manner to a rear wall 8 thereof. Below evaporator 7 rear wall 8 is integrally formed with a water collecting receptacle 9 dimensioned in conformity to evaporator 7.

Receptacle 9 serves the purpose of collecting the water leaking down from evaporator 7 when the latter is defrosted by means of conventional heater elements (not shown), and to direct the collected water to the exterior of the apparatus in a manner to be described.

The lower part of receptacle 9 is integrally formed with a duct portion 10 of conical configuration converging towards the thermo-insulated rear wall 11 of the apparatus (fig. 2).

Duct portion 10 is of a length permitting it to extend partially through rear wall 11, and is formed with a passage 12 of diminishing cross-sectional area.

Inserted between the inner panel 8 and an outer panel 13 of rear wall 11 is a profile element 14 cooperating with duct portion 10.

Profile element 14 has a first conical portion 15 dimensioned for receiving at least part of duct portion 10 therein, and a second conical portion 16 converging towards first conical portion 15 and formed with a projecting lip 17. Planar wall portions 18, 19 and 20 of profile element 14 permit the latter to be positioned in and secured to rear wall 11 of the refrigerating apparatus.

Profile element 14 is mounted in rear wall 11 by first pushing first conical portion 15 onto duct portion 10, followed by engaging wall portions 18 and 19 with outer rear wall panel 13, and wall portion 20 with inner rear wall panel 8. A further conduit 21 is secured in a conventional manner to the outer surface of outer rear wall panel 13 at a position below projecting lip 17 of profile element 14.

As shown in fig. 1, conduit 21 terminates at its lower end adjacent a further collecting receptacle 22 mounted on a cover 23 of the compressor 24 of the refrigerating apparatus and shaped to closely conform to said cover.

Receptacle 22 is thus in heat-transmitting contact with compressor 24, so that the heat emitted by the latter is used for evaporating the water collected in receptacle 22.

Receptacle 22 is preferably provided with a partition 25 for preventing the water from splashing over the rim of the receptacle.

If there is only a very small vertical distance between lip 17 of profile element 14 and receptacle 22, conduit 21 may be eliminated, so that the water flows directly into the receptacle.

On the other hand, receptacle 22 may of course be of different design and located at other positions as in known refrigerating appliances, as long as proper evaporation of the collected water is ensured.

The formation of the restricted passage 12 at the point of convergence of conical portions 15 and 16 of profile element 14 results in the drain passage being effectively cleaned of food particles, dust and the like carried in the water set free by the defrosting operation, so that such water is alway reliably drained into collecting receptacle 22.

This cleaning operation takes place in an automatic manner on each opening and closing operation of door 6 as a result of air flowing through passage 12 in the directions of arrows A and B, respectively.

The water draining device according to the invention is of simple construction and reliable operation, and does not require manual intervention on the user's part for cleaning passage 12, so that the disadvantages and shortcomings of prior art draining devices are effectively eliminated.

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Device for Draining Water from a Refrigerating Apparatus on Defrosting Thereof

Patent Claim

A device for draining water from the evaporator of a refrigerating apparatus on defrosting thereof, said device comprising a water collecting receptacle located below said evaporator and dimensioned in conformity to said evaporator, a duct portion connected to said receptacle and passing at least partially through a respective thermo-insulated wall of said apparatus, and optionally a drain conduit communicating with said duct portion and extending along the outer surface of said wall, said conduit terminating adjacent a further water collecting receptacle located in the lower portion of said apparatus, characterized in that said duct portion (10) is of conical configuration converging towards said wall (11) so

as to define a passage (12) of reduced cross-sectional area, and in that there is provided at least one profile element (14) adapted to be secured through said wall (11) together with said duct portion (10), said profile element (14) being formed with a first conical portion (15) adapted to receive said duct portion (10) therein, and a second conical portion (16) converging towards said first conical portion (15) and formed with a projecting lip (17) at a position above said conduit (21).

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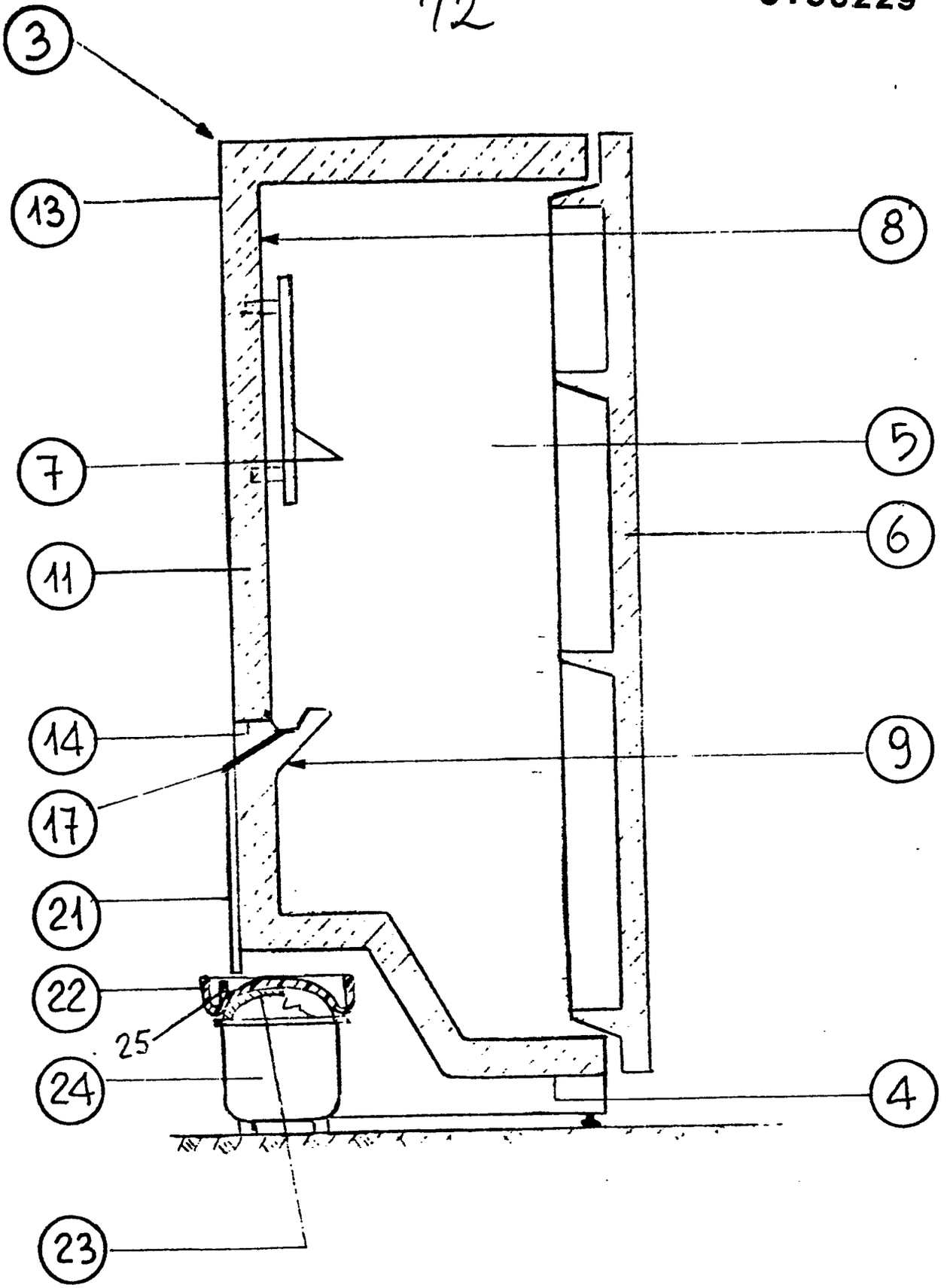

FIG.1

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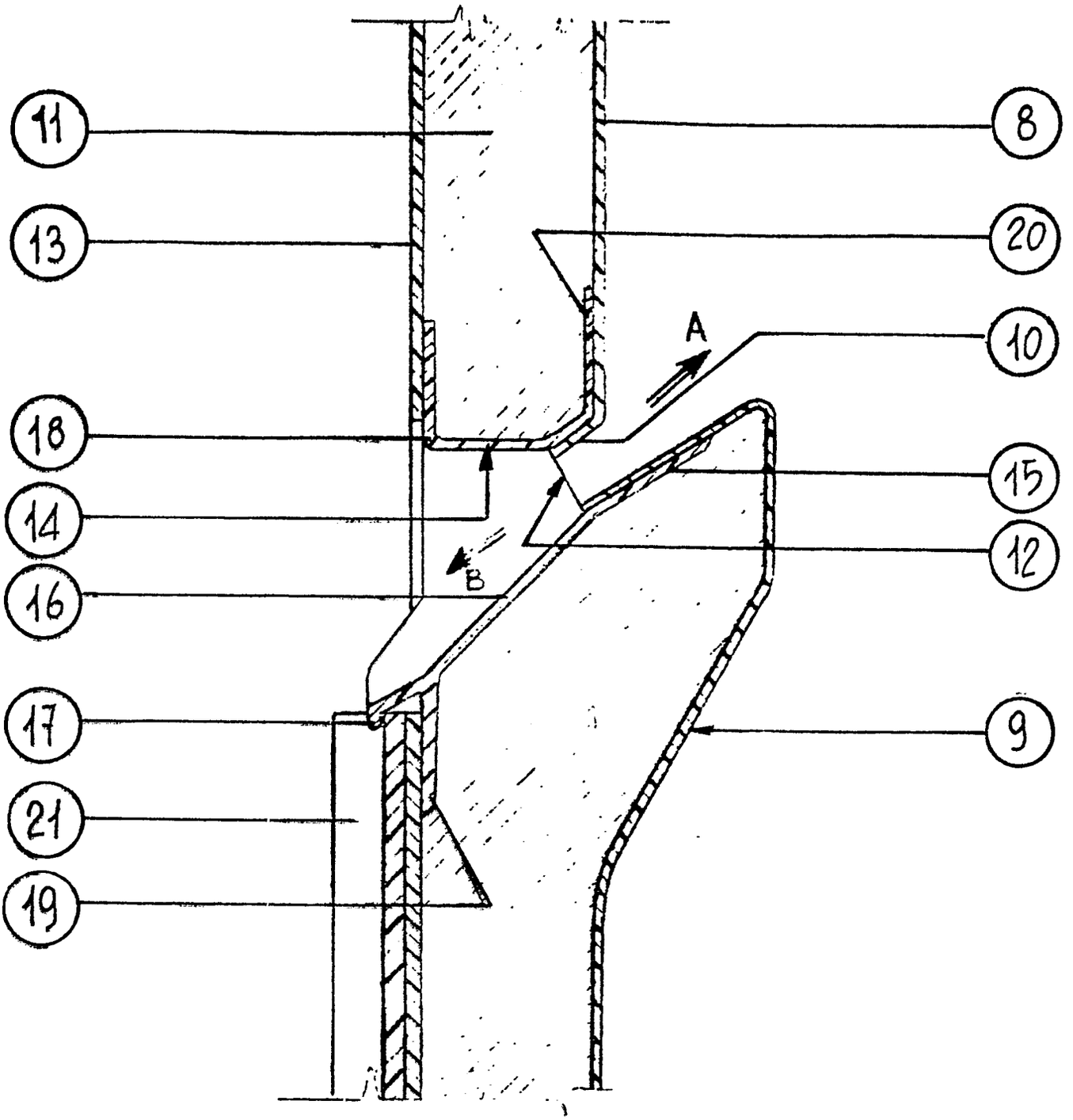

FIG. 2