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(71) Applicant: **WHIRLPOOL CORPORATION**
Benton Harbor Michigan 49022 (US)

(72) Inventor:
Malnati, Roterto,
Whirlpool Europe s.r.l.
21025 Comerio (IT)

(74) Representative:
Guerci, Alessandro
Whirlpool Europe S.r.l.
Patent Department
Viale G. Borghi 27
21025 Comerio (VA) (IT)

(54) Lighting device for chest freezers and the like

(57) In the lid (1) of a chest freezer there is mounted a light source (5), controlled by a rocking contactor means (20) also carried by the lid (1), said rocking contactor automatically closing the power circuit for the light source (15) when the lid (1) is opened.

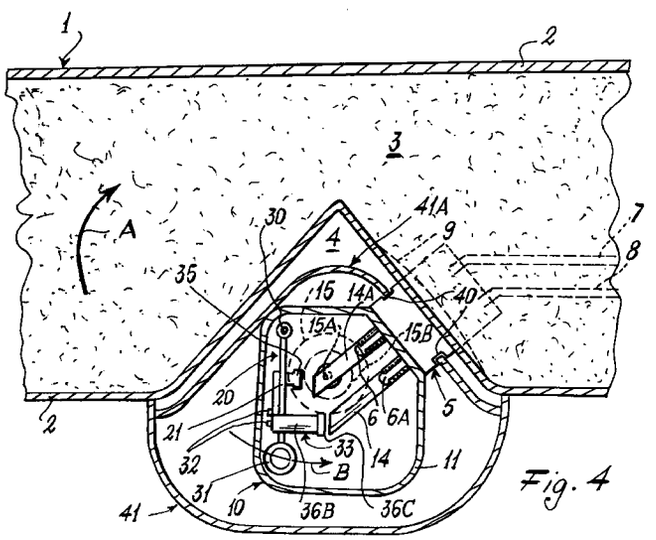

Fig. 4

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Description

This invention relates to a lighting device for chest freezers and the like comprising at least one light source (lamp) supported by the freezer lid, and a contactor which causes the light source to light when the freezer lid is lifted by the user to enable him to identity the freezer contents.

Chest freezers have been known for a long time. Because of their depth, it is difficult for the user to identity which of the contained products he requires. The freezer chest therefore has to be illuminated. For this illumination a conventional lamp is used, fixed to the inside of the lid by a lampholder and controlled by an electrical contactor carried by the lid. When the lid is closed the contactor makes contact with the top edge of the chest wall so that it opens and extinguishes the lamp, which lights again when the lid is raised, so that the contactor passes to its closed position, to light the lamp.

The main drawback of this known arrangement is the relative complexity and length of the wiring which has to be used to connect together the contactor, the lamp and the power source, so that as this wiring extends within the expanded insulating mass located within the lid whereas the lamp, lampholder and contactor are external to this mass, at least two separate seal means must be provided at the points in which these members are joined to the wiring to prevent escape of the insulation.

In addition the two members require separate fixing operations and fixing means, with increased costs and assembly time.

The main object of the present invention is to provide a lighting device enabling wiring, seal and fixing means and assembly time to be reduced.

This and further objects which will be more apparent from the detailed description given hereinafter are attained by the lighting device in accordance with the accompanying claims.

The invention will be more apparent from the detailed description of a preferred embodiment thereof, provided by way of non-limiting example with reference to the accompanying drawing, in which:

Figure 1 is a perspective view of the device of the invention and the means for its electrical powering;
Figure 2 is a schematic perspective view of the basic components of the device (the relative casing being omitted from this figure);
Figure 3 is a schematic perspective view of the diffuser used in connection with the device of the invention;
Figure 4 is a partial schematic section through a chest freezer using the device of the invention.

In the figures the reference numeral 1 indicates the lid of a conventional chest freezer. In known manner the lid comprises an enclosure 2 containing an insulating mass 3 formed of polyurethane expanded in situ. In a suitable position in its lower side the lid comprises a recess 4 in the longitudinal direction of the lid. In the illustrated example this recess is of inverted V cross-section, from one of its sides there projecting part of a plug 5 provided with two projecting flat contact pins 6, 6A, to each of which there is connected an electric wire 7, 8. The two wires 7, 8 terminate at a power source, not shown. The two wires extend into the insulating mass 3, which locks the plug 5 in situ. To prevent escape of insulating mass from the hole traversed by the plug 5, a sealing sucker 9 is provided in known manner surrounding the hole on the same side as the insulating mass 3.

On the two flat pins 6, 6A of the plug 5 there is mounted, supported and electrically powered a unit 10 comprising a casing 11 of insulating material formed of at least two parts 12, 13, for example snap-fitted together. The casing 10 comprises internally two contact strips 14, 14A fixed to it in my known manner when the casing parts are undergoing moulding.

At one of their ends the strips 14,14A are bent in known manner to form a gripper into which the two flat pins 6, 6A of the plug 5 are inserted.

At their other end the strips 14, 14A establish electrical contact with a lamp 15, one 14A by direct contact with the lamp end 15A and the other 14 by indirect contact with its screw base 15B via a rocking contactor indicated overall by 20 and described in detail hereinafter.

The lamp is screwed or otherwise fixed into the casing 11 via a threaded lampholder 19 provided in the enclosure. The lampholder 19 has a length less than the screw base 15B of the lamp so that the rocking contactor 20 can electrically engage the screw base at that part of it which projects into the enclosure beyond the threaded lampholder, to hence close the electrical circuit which powers the lamp.

The rocking contactor 20 has a rocker arm 21 of electrically conducting material pivoted upperly, at 30, between the parts 12, 13 of the casing 11 which are provided with corresponding seats, not shown, the rocker arm being provided with a counter-weight 31 at its lower end so that it tends to always assume a vertical position. The rocker arm comprises in a central position two conductive pins 32. Oh these pins there is mounted a contact member provided for this purpose with a corresponding pair of holes or seats. The ends of the pins 32 are riveted to prevent the contact member separating from the rocker arm. However the length of the pins 32 and the location of the riveted region are such as to allow a certain relative movement between the rocker arm and the contact member along these pins (or within these seats), to compensate the machining tolerances or, in the case of seats, to provide a compensation clearance.

The contact member 33 comprises (see Figure 2) a central region 34 in which the two holes are provided, an upper branch 35 and a lower branch 36. In the illus-

trated example, the lower branch comprises three portions, a first portion 36A substantially at a right angle to the central region 34, a second portion 36B substantially at a right angle to the preceding, and a third portion 36C substantially at a right angle to the preceding and intended to make contact with the strip 14. Alternatively the lower branch can be rectilinear or of other shape, depending on the position of the lamp screw base relative to the lamp and strip 14A.

The upper branch 35 also comprises three portions, a first portion 35 at a right angle to the central region 34, a second portion 35B substantially at a right angle to the preceding and intended to make contact with the screw base 15B of the lamp and a third portion 35C inclined away from the screw base 15B to form a lead-in therefor and prevent the rocking contactor 21 being damaged on changing the lamp. In the alternative case to that described, in which the branch is rectilinear (or of other shape), a rocker arm travel limiter can be provided associated with the parts 12 and 13 of the unit 10, to prevent the aforestated damage to the contactor.

According to an advantageous aspect of the invention, in two diametrically opposite regions of that part of the plug 5 which penetrates into the recess 4 there is provided a transverse rectilinear groove 40. The purpose of the grooves 40 is to allow easy engagement of a plastic diffuser 41 intended to cover the aforedescribed parts and formed as shown in Figures 3 and 4.

The diffuser 41 comprises an intermediate part 41A of substantially inverted V cross-section approximately corresponding to that of the recess 4 in the lid 1. On one side of this V there is provided an aperture 42 having a diameter approximately equal to the diameter of that part of the plug 5 which projects into the recess 4 with the exception of two chordal portions 42A corresponding to the grooves 40 provided in the plug 5 and a frontal aperture 43 with converging lead-in sides 44. On the perimeter of the diffuser 41 there are provided counteracting and stabilizing feet 45.

The diffuser 41 is applied by mounting its hole 42 over the projecting part of the plug 5 by utilizing the relative elasticity of the constituent (plastic) material of the diffuser. Following this engagement the chordal portions 42A of the hole 42 enter the grooves 40 in the projecting part of the plug 5 (see Figure 4), and the feet 45, because of their elasticity, interfere with the lower face of the lid to hence provide the necessary thrust for retaining the diffuser in situ, but which to replace the lamp can be removed by withdrawing it in the opposite direction from the projecting part of the plug 5.

The device of the invention operates as follows.

It will be assumed that the lid 1 is hinged to the freezer chest on the right side of Figure 4. On this basis, to gain access to the freezer contents, the lid 1 must be rotated in the direction of the arrow A of Figure 4. As the rocker arm 21 tends to remain vertical, this lid rotation results in a rotation of the rocker arm in the opposite direction (arrow B). At a certain point the two portions 35B and 36C of the contact member 33 come into contact with the strip 14 and with the screw base 15B of the lamp 15 respectively, to close the electrical lamp powering circuit which comprises the wire 8, the flat pin 6A, the strip 14, the portion 36C, the rocker arm 21, the portion 35B, the screw base 15B of the lamp, its filament, the contact 15A on the end of the screw base 15B, the strip 14A, the other flat pin 6 and the relative wire 7, without any discontinuity.

When the product has been removed from the freezer, rotating the lid 1 in the closure direction results in breaking of the rocker arm contact.

The advantages of the invention over traditional arrangements are apparent from the aforegoing description, including considerable ease of assembly, and simplification and reduction in wiring, fixing means and seal means against infiltration of expanded insulant.

Other embodiments of the invention are possible. In one of these the flat pins 6 and 6A can be of greater length that that of the corresponding flat pins shown, for example, in Figure 4 so as to project considerably from the plug 5 and penetrate considerably into the casing of the unit 10. In this manner the strips 14 and 14A are no longer required as their function is performed by the flat contact pins 6 and 6A, which are hence able to cooperate directly with the rocking contactor 20 and the screw base 15B of the lamp 15 respectively. These arrangements and others deducible from the aforegoing description are to be considered as falling within the scope of the present invention.

Claims

1. A lighting device for chest freezers, comprising at least one lamp (15) with relative lampholder (19) and an electrical contactor (20) to power it when the freezer lid (1) is opened, characterised in that the electrical contactor is a rocking contactor (20), this latter and the lampholder (19) being located in the same casing (10).

2. A device as claimed in claim 1, wherein the lampholder (19) has a depth less than that of the screw base (15B) of the lamp (15), so that a part of said screw base is exposed and contactable by the rocking contactor (20).

3. A device as claimed in one or more of the preceding claims, wherein the casing (10) contains conductor means (14, 14A), a first (14A) for direct connection to the end contact (15A) of the lamp (15) and the second (14) for cooperation with the rocking contactor (20) so as to close the power circuit of the lamp (15) against the exposed part of the relative screw base (15B).

4. A device as claimed in one or more of the preceding

claims, wherein the rocking contactor (20) comprises electrical connection means (33) for engaging the exposed part of the screw base (15B) and the second conductor means (6, 14).

5. A device as claimed in one or more of the preceding claims, wherein the conductor means (14, 14A) consist of strips provided with means for their removable engagement with a plug (5) which is rigid with the freezer lid (2) and connected by wires (7, 8), extending within the lid, to a power source.

6. A device as claimed in one or more of the preceding claims, characterised by being combined with a removable diffuser (41) which can be engaged with a projecting part of the plug (5) via grooves (40) in this latter and a conjugate hole (42) open to form a lead-in (42) on one side of said diffuser (41), said diffuser also comprising counteracting feet (45) for exerting a counteracting action on the lid (1) when the diffuser is mounted.

7. A device as claimed in any of the preceding claims, wherein the conductor means (6, 6A) of the plug (5) are of such a length to directly electrically cooperate with the end contact (15A) of the lamp (15) and with the rocking contactor (20), respectively.

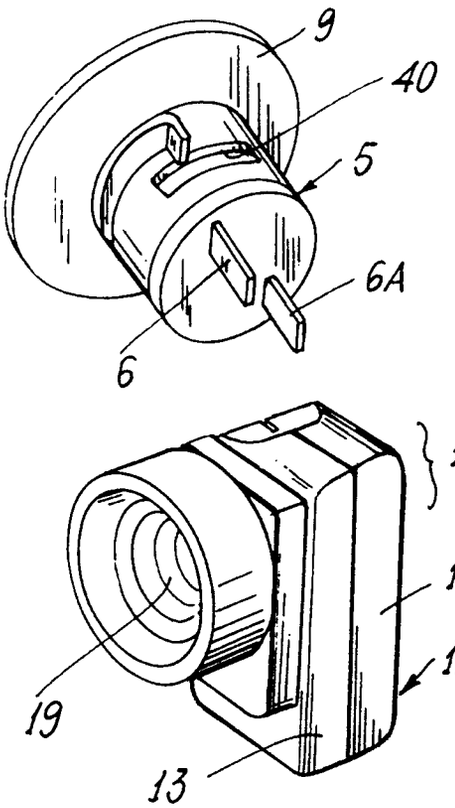
9
40
5
6A
6
10
12
11
19
13

Fig. 1

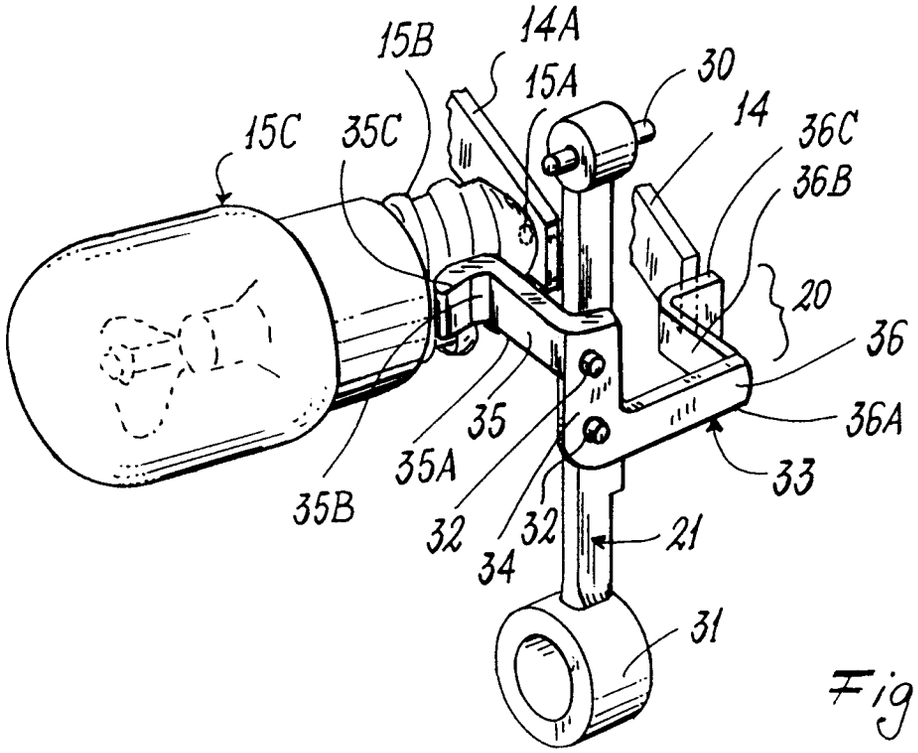
15B
14A
15A
30
15C
35C
14
36C
36B
20
36
36A
35
35A
33
35B
32
34
32
21
31

Fig. 2

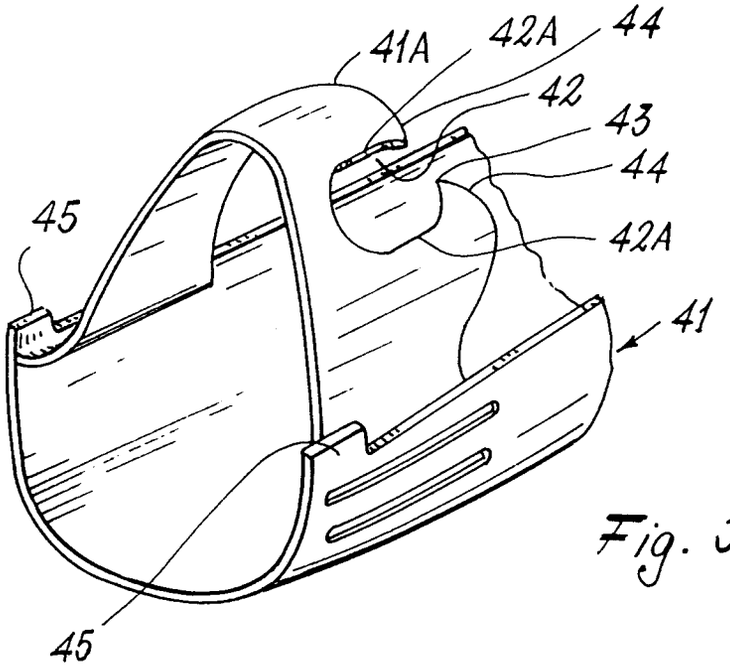
41A
42A
44
42
43
44
45
42A
41
45

Fig. 3

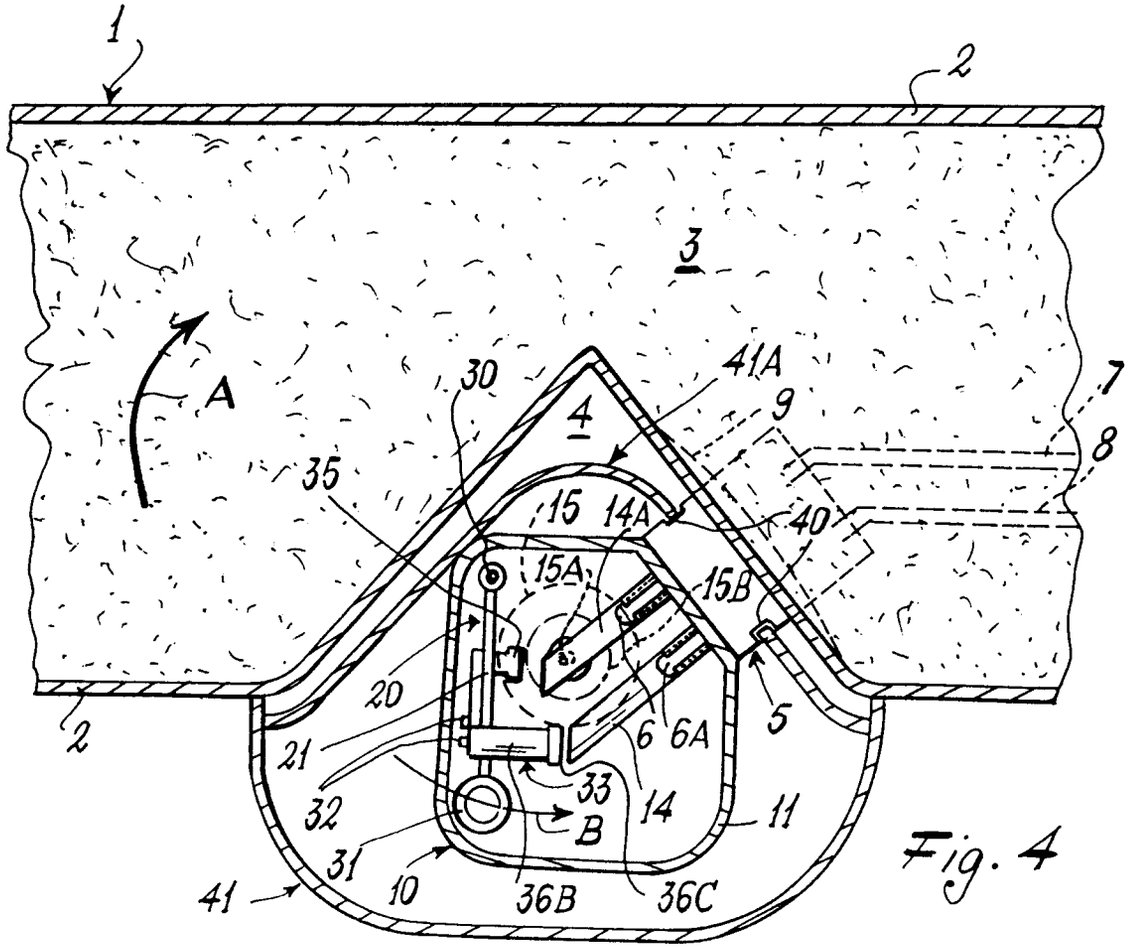
1
2
3
A
30
41A
4
9
7
8
35
15
14A
40
15A
15B
20
5
2
21
6
6A
32
33
14
11
B
31
10
36B
36C
41

Fig. 4