Dec. 21, 1954 H. L. WEISS 2,697,333

COMBINATION REFRIGERATOR AND SPACE COOLER

Filed Nov. 14, 1952

2 Sheets-Sheet 1

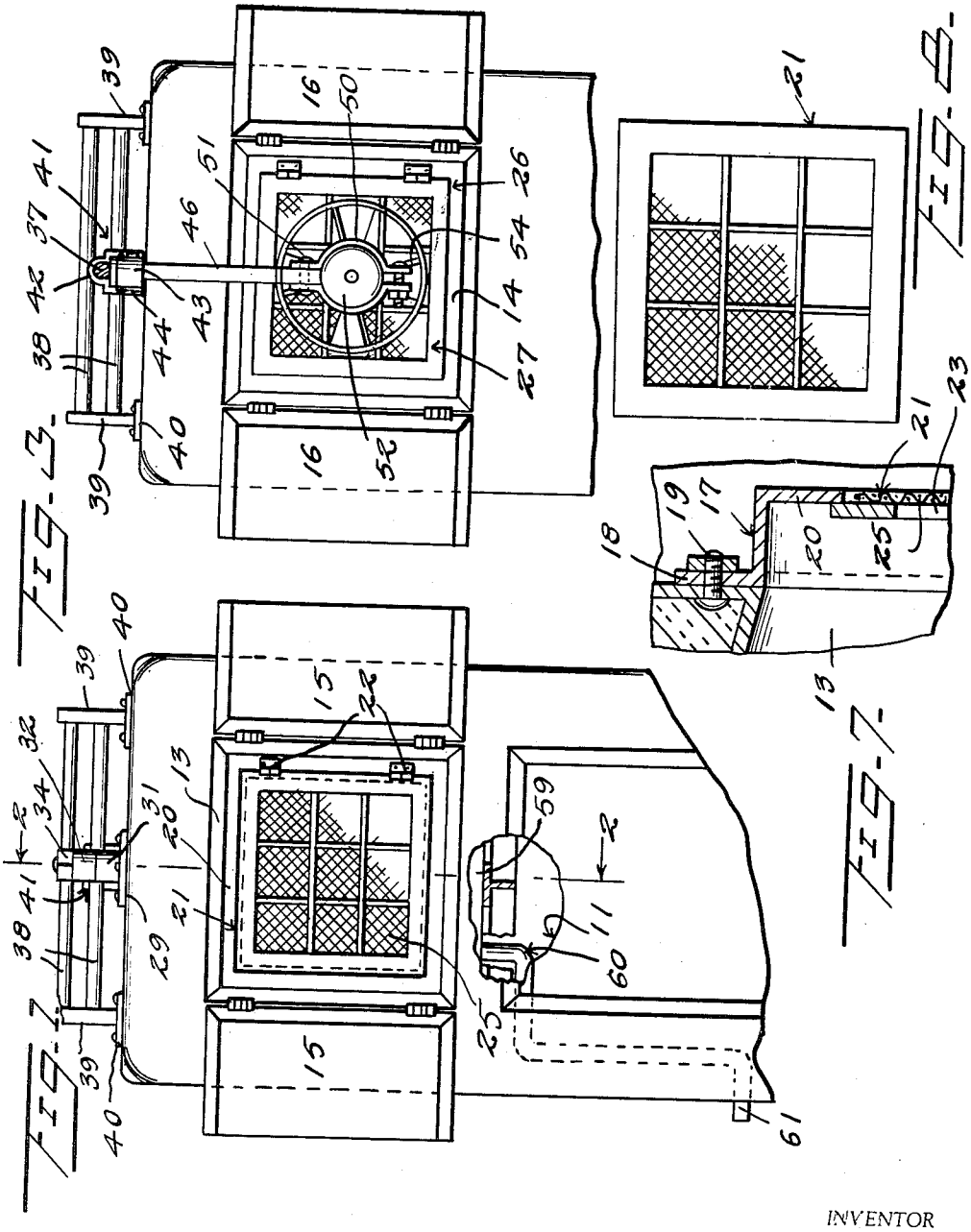


FIG. 3.

FIG. 5.

FIG. 4.

FIG. 7.

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2 Sheets-Sheet 2

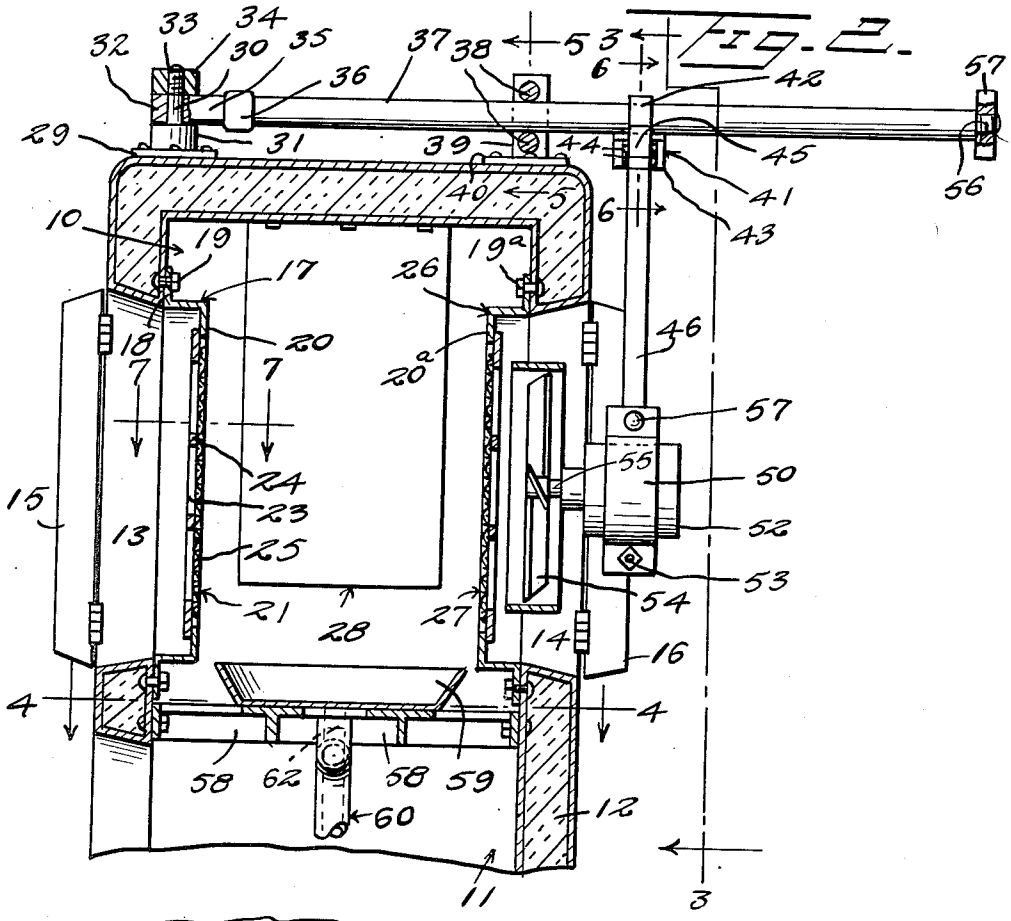


FIG. 2.

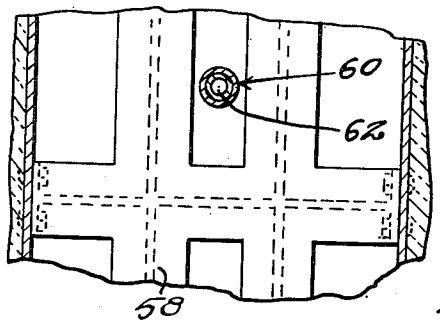


FIG. 4.

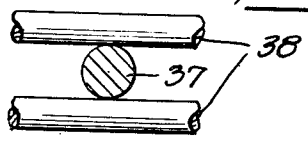


FIG. 5.

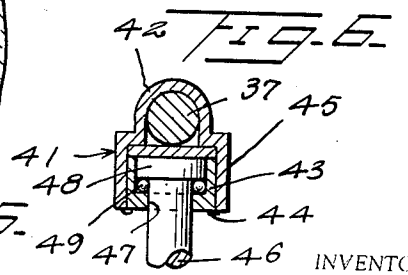


FIG. 6.

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COMBINATION REFRIGERATOR AND SPACE COOLER

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5 Claims. (Cl. 62—89)

This invention relates to a novel combination refrigerator and space cooler adapted to be used under hot weather conditions not only for refrigerating food and liquids but additionally for cooling an enclosure or a portion of an enclosure in which the refrigerator is disposed thereby eliminating the need for a separate air conditioning unit.

A primary object of the present invention is to provide a combination refrigerator and space cooler wherein the cooling unit of the refrigerator is utilized for cooling air propelled through a portion of the unit for cooling an enclosure space adjacent the refrigerator.

Another important object of the invention is to provide a combination refrigerator and space cooler wherein the air expelled from the space cooler for cooling an enclosure space around the refrigerator is chilled to a substantial extent by the frost accumulation on the cooling unit so that the cooling unit is maintained defrosted by the space cooler and the frost is utilized as an air cooler rather than being wasted, as conventionally occurs.

Still a further object of the invention is to provide a space cooling unit forming a part of a refrigerator including a fan or blower removably supported in a part of the refrigerator and which is readily removable therefrom when not in use to enable the refrigerator portion, utilized as an air cooler, to be conveniently closed and sealed.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a front elevational view, partly broken away, illustrating the front portion of the upper part of of the combination refrigerator and space cooler;

Figure 2 is an enlarged vertical sectional view of the upper portion of the unit taken substantially along a plane as indicated by the line 2—2 of Figure 1;

Figure 3 is a rear elevational view, partly in section and on a reduced scale, taken substantially along a plane as indicated by the line 3—3 of Figure 2;

Figure 4 is a fragmentary horizontal sectional view taken substantially along a plane as indicated by the line 4—4 of Figure 2;

Figures 5 and 6 are fragmentary vertical sectional views on enlarged scales, taken substantially along planes as indicated by the lines 5—5 and 6—6, respectively, of Figure 2;

Figure 7 is a fragmentary horizontal sectional view taken substantially along a plane as indicated by the line 7—7 of Figure 2, and

Figure 8 is a plan view of one of the inner closures of the space cooling unit.

Referring more specifically to the drawings, the space cooler unit, designated generally 10 is illustrated as constituting the upper part of a combination refrigerator and space cooler, a part only of the lower refrigerator portion 11 of which is illustrated and which may be be of any conventional construction. The space cooler and refrigerator are enclosed by an insulated casing 12 common to both structures. The front and rear walls of the upper casing unit portion, constituting a part of the cooling unit 10, are provided with a front wall opening 13 and a rear wall opening 14. The front wall opening 13 is normally closed by a pair of hinged front doors 15 which when swung outwardly to fully open positions, as illustrated in Figure 1, completely expose

the front opening 13. The rear opening 14 is similarly closed, when the unit 10 is not in operation, by a pair of hinged rear doors 16 which correspond to the doors 15.

An inner door frame 17 has an outer flange 18 disposed against the inner side of the front wall of the casing 12 around the front opening 13 and which is secured thereto by suitable fastenings 19 and said frame has an inwardly offset inner portion 20 to which an inner front door 21 is swingably connected by hinges 22 along one side of the door 21 and frame portion 20. The door 21 is disposed against the outer side of the inner frame portion 20 and covers the opening defined thereby, when in a closed position, and is capable of being swung on its hinges 22 to completely expose the opening of said door frame 17. The door 21 is provided with a relatively large opening 23 containing muntins 24 and which is covered by mesh wire fabric 25. A frame 26, corresponding to the frame 17, is disposed against the rear wall of the casing 12 on the inner side thereof and is secured thereto by fastenings 19a around the rear opening 14. A door 27, corresponding to the door 21, is hingedly mounted on the outer side of the inwardly offset inner portion 20a of the frame 26 in the same manner as the door 21 and is likewise swingable outwardly to an open position. A refrigerator cooling unit of any conventional type, designated generally 28, is supported in the upper portion of the casing 12 between the door frames 17 and 26 and the doors 21 and 27 and constitutes the cooling unit for the bottom refrigerator section 11 as well as for the space cooler 10.

A plate 29 is secured to the upper side of the top of the casing 12 adjacent the front thereof and intermediate of its sides and has a pin or stem extending upwardly therefrom and which stem 30 is provided with an enlarged bottom portion 31 forming an upwardly facing shoulder. An eye 32 turnably engages a smooth intermediate portion of the stem 30 and rests turnably upon the upwardly facing shoulder defined by said enlarged bottom portion 31. The upper end 33 of the stem 30 is threaded to receive a nut 34 to retain the eye 32 on the intermediate portion of the stem 30 and rotatably between the enlargement 31 and nut 34. The eye 32 has a stem or arm 35 projecting radially therefrom and which is connected by a coupling 36 to one end of a rod 37 which extends rearwardly across the top of the casing 12 and to substantially beyond the rear wall thereof.

An intermediate portion of the rod 37 is swingably disposed between a pair of rod elements 38 which are disposed above the casing 12 adjacent the rear thereof and parallel to the front and rear of said casing and which rod elements 38 are supported at their ends by posts 39 which are secured to and rise from base plates 40 which are secured to the top of the casing. The posts 39 limit swinging movement of the rod 37 and the lower row element 38 provides a support for the intermediate portion of the rod 37. A hanger supporting slide, designated generally 41 and best illustrated in Figure 6, includes an upper yoke portion 42 which fits over and slidably engages on the rod 37 rearwardly of the casing 12. The slide 41 includes an upwardly opening socket 43 which is secured as by welding, as indicated at 44, between the outwardly offset depending legs 45 of the yoke 42. The upper part of a hanger rod 46 is turnably disposed in and extends through an opening 47 in the bottom of the socket 43 and is provided at its upper end with a head 48 which is turnably supported in the socket 43. The socket 43 may be provided with antifriction bearing means 49 for supporting the head 48 therein.

A pair of corresponding clamp sections 50 have upper ends straddling the lower end of the hanger rod 46 and connected thereto as by means of a rivet 51. Outwardly offset intermediate portions of the clamp sections 50 engage around a motor casing 52 and the lower free ends of the clamp sections 50 are detachably and adjustably connected by a nut and bolt fastening 53 which is tightened for clamping the motor casing 52 between the intermediate portions of the clamp sections 50. A fan or blower 54 is fixed to a motor shaft 55 and is supported

thereby normally in the rear opening 14 and outwardly of and adjacent the rear door 27. The rod member 37 has a restricted threaded rear end 56 on which a nut 57 is detachably mounted, of larger diameter than the rod 37 and which forms a stop to limit sliding movement of the slide 41 rearwardly on the rod 37.

Bracket members 58 are secured in the casing 12 horizontally between the upper cooling unit chamber and the lower refrigerating chamber for supporting a drip pan 59 beneath the cooling unit 28. A drain pipe 60 has an upper end connected to and communicating with the interior of the pan 59, and an outwardly and downwardly offset opposite end 61, which opens outwardly of a side of the lower refrigerator portion of the casing. The upper end of the drain pipe 60 communicates with the pan 59 by engaging around a drain nipple 62 thereof which depends from the drain pan bottom, so that the drain pan can be removed without disturbing the drain conduit.

During cool weather when the space cooling unit 10 is not required, the doors 16 are normally retained in a closed position for sealing the upper chamber of the casing 12. In order to enable the rear doors 16 to be closed, the slide 41 is moved rearwardly to adjacent the stop 57 for moving the blower 54 a sufficient distance rearwardly of the opening 14 to enable the doors 16 to be closed and if desired, the hanger rod 46 may be turned in the socket 43 to swing the blower 54 away from the casing to facilitate closing of the doors 16. The front doors 15 and the inner front door 21 may be opened to afford access to the refrigerator cooling unit 28, or if desired said front door 21 may be removed from the frame 17 by disconnecting the sections of the hinges 22. During hot weather when it is desired to utilize the space cooling unit 10, the doors 15 and 16 are swung to their fully open positions of Figures 1 and 3 and the slide 41 is moved forwardly on the rod 37 and the hanger rod 46 may be turned in the socket 43, if necessary, to position the fan or blower 54 in the rear opening 14 and adjacent the screen covered opening of the rear inner door 27. With the parts thus disposed, as illustrated in Figures 1 to 3, the motor 52 is operated or energized in a conventional manner, as is conventional in electric fan motors, to drive the shaft 55 and the fan or blower 54. Rotation of the fan or blower 54 will cause air to be drawn inwardly of the casing 12 through the rear wall opening 14 from an enclosure area adjacent the back of the casing and this air will be propelled through the mesh wire fabric of the inner rear door 27, around the cooling unit 28 and thence outwardly through the mesh wire fabric covered opening of the front door 21 and through the front casing opening 13 for cooling an enclosure or a portion of an enclosure in which the unit 10 is disposed. The air in passing around the cooling unit 28 is cooled thereby, particularly by the frost which accumulates on such refrigerator units and in turn melts the frost. A part of the moisture thus created is picked up by the air passing between the openings 14 and 13 while the majority of the melted frost drains from the unit 28 into the pan 59 and from said pan through the drain outlet 60. This drainage may be collected in any suitable receptacle, not shown, disposed beneath the discharge end 61 of the drain conduit and externally of the casing 12. While the unit 28 will effectively cool the air passing through the casing between the openings 14 and 13 when no frost is collected thereon, the space cooling unit will utilize the frost as a cooling means and which otherwise reduces the effectiveness of the cooling unit in chilling the refrigeration chamber 11, so that the space cooling unit 10 functions as a defroster for the cooling unit 28 in addition to utilizing any frost thereon for chilling the air passing through the upper portion of the casing 12.

It will thus be apparent that a dual purpose type of refrigerator has been provided which may be utilized not only for maintaining foods in a chilled condition but which may be additionally employed effectively as a space cooling unit for one or more rooms of an enclosure, such as a dwelling, in or adjacent which the casing 12 is disposed and in being so employed will additionally function as a defroster of the refrigerator cooling unit. Further, the front and rear doors 15 and 16 may be readily closed when the cooling unit is not being employed and after the fan or blower 54 has been displaced rearwardly of the casing 12 by movement of the slide 41 on the supporting rod 37. The rod 37 may be swung from its centered position of Figure 3 to conveniently position the fan 52, 54 behind and to either side of the casing 12 and the rod 46 may be turned relatively to the slide 41 for facing the fan in any direction so that it may be used in a conventional manner while disposed externally of the casing 12 and while the doors 15 and 16 are closed.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A combination refrigerator and space cooler comprising an insulated casing defining a bottom refrigerator chamber and an upper space cooler chamber communicating with the bottom chamber, a refrigerating unit disposed in said upper casing chamber for cooling both of said chambers, said casing having front and rear walls provided with aligned openings communicating with said upper chamber and between which said refrigerating unit is disposed, closure means for closing or exposing said aligned openings; a supporting rod disposed above and supported on the casing and extending rearwardly therefrom, a slide reciprocably mounted on said rod, a hanger member suspended from said slide, a driven fan including a motor casing connected to said hanger member and supported thereby in a normal position for sliding movement with the hanger member and slidable on the supporting rod rearwardly away from the casing or forwardly for positioning the fan in the rear wall opening of the casing when the closure means thereof is in an open position and whereby operation of the fan will draw air through the rear casing opening and will propel the air around said refrigerating unit to be cooled thereby and outwardly through the front wall opening of the casing when the closure means thereof is in an open position for cooling the space around and adjacent the refrigerator and for defrosting the refrigerating unit.

2. A combination refrigerator and space cooler as in claim 1, said supporting rod being swingably mounted for swinging movement in a horizontal plane for displacing the fan toward either side of the casing when said fan is in a retracted position out of engagement with the rear wall opening.

3. A combination refrigerator and space cooler as in claim 1, means pivotally connecting said rod to the casing at the forward end of said rod and above and adjacent the front of the casing for swinging movement of the rod in substantially a horizontal plane, guide means supported on the casing adjacent its rear wall and in which an intermediate portion of said supporting rod is swingably supported, said guide means having end portions forming abutments for limiting swinging movement of the supporting rod.

4. A combination refrigerator and space cooler comprising an insulated casing defining a bottom refrigerator chamber and an upper space cooler chamber communicating with said bottom chamber, a refrigerating unit disposed in said upper chamber for cooling both chambers, said casing having front and rear walls provided with aligned openings in the space cooling unit portion thereof and between which said refrigerating unit is disposed, closure means for closing or exposing said aligned openings, a blower, and means supported by the casing and movably supporting the blower in either an operative position in the rear wall opening or in an inoperative position behind the casing and so disposed that the closure means of the rear wall opening may be moved to and from fully opened and closed positions.

5. A combination refrigerator and space cooler as in claim 4, said blower being swivelly suspended by said means and swingably and slidably supported thereby for swinging movement in substantially a horizontal plane and for sliding movement toward and away from the rear wall of the casing.

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