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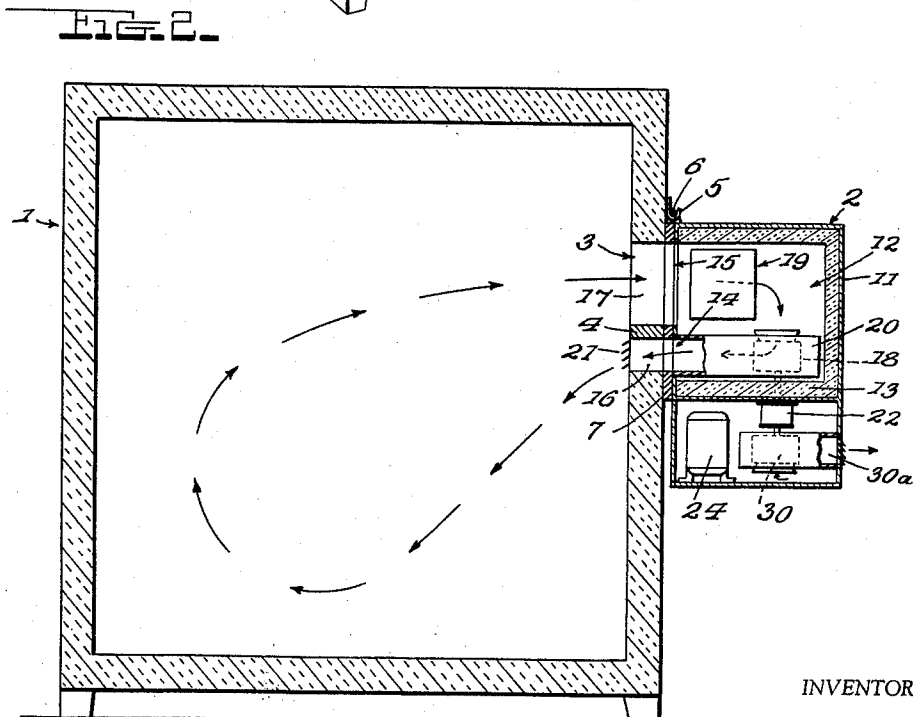
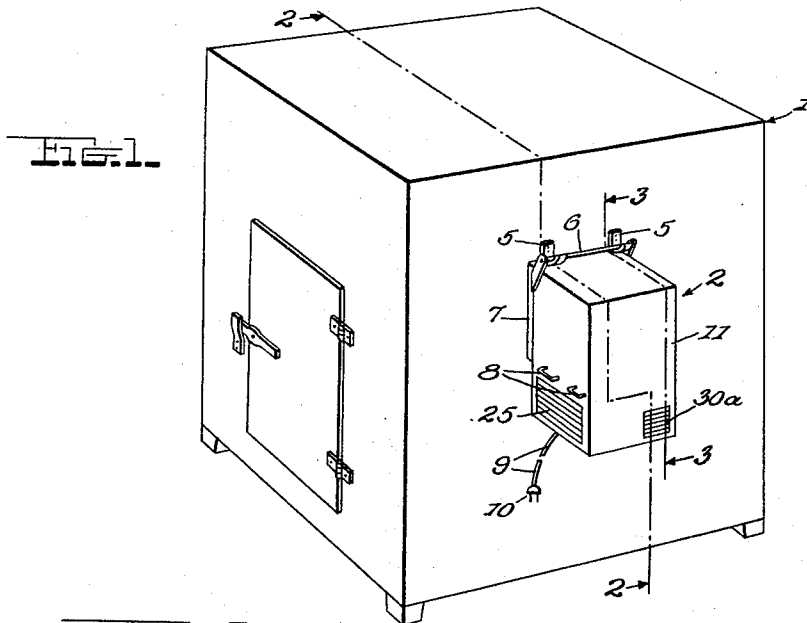
S. S. CORHANIDIS

2,914,927

DETACHABLE REFRIGERATING UNIT

Filed Nov. 17, 1955

3 Sheets-Sheet 1



INVENTOR

S. S. Corhanidis

BY

Bryant & Horsey

ATTORNEYS

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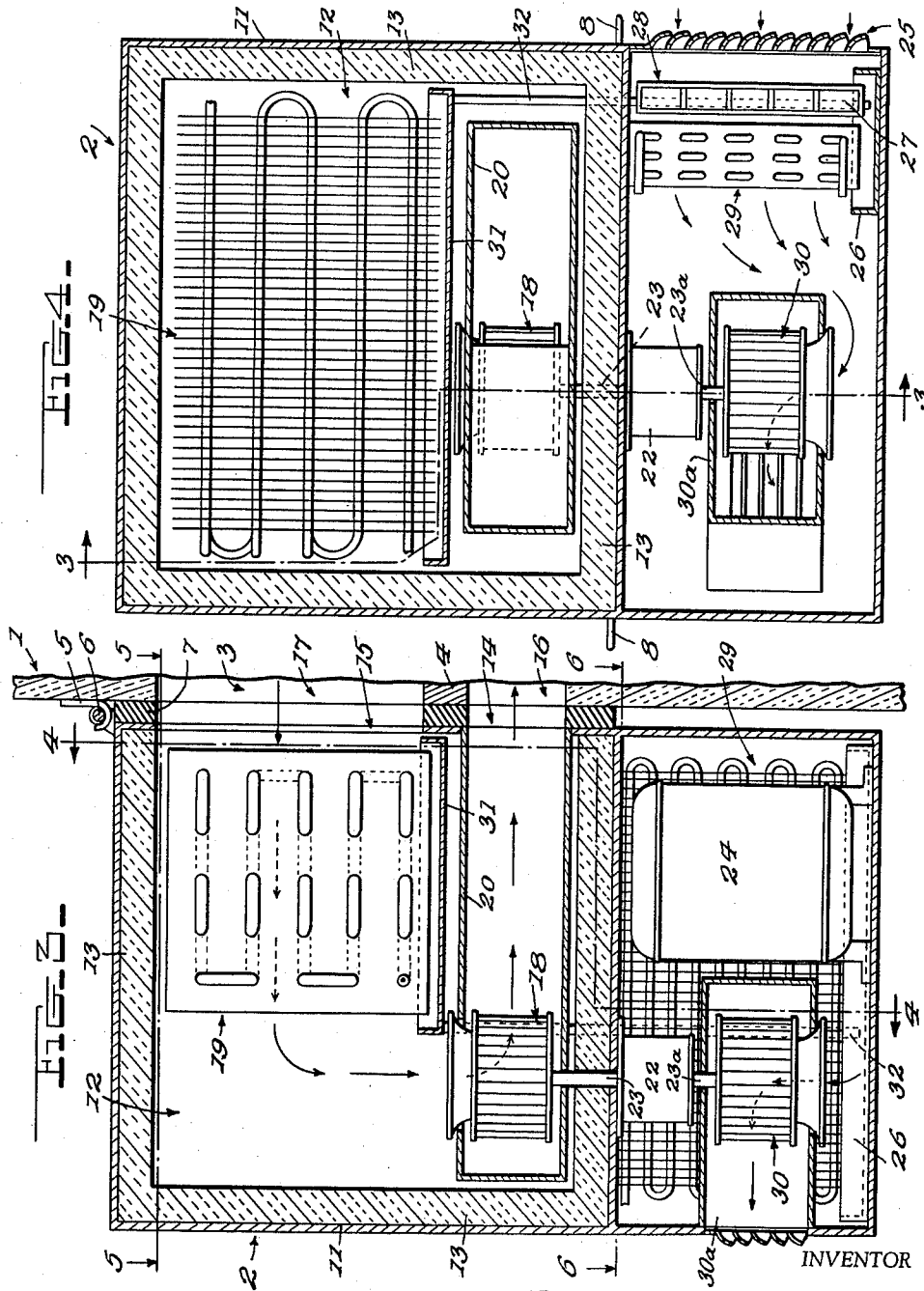
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S. S. Corhanidis

BY *Bryant & Lowmy*
ATTORNEYS

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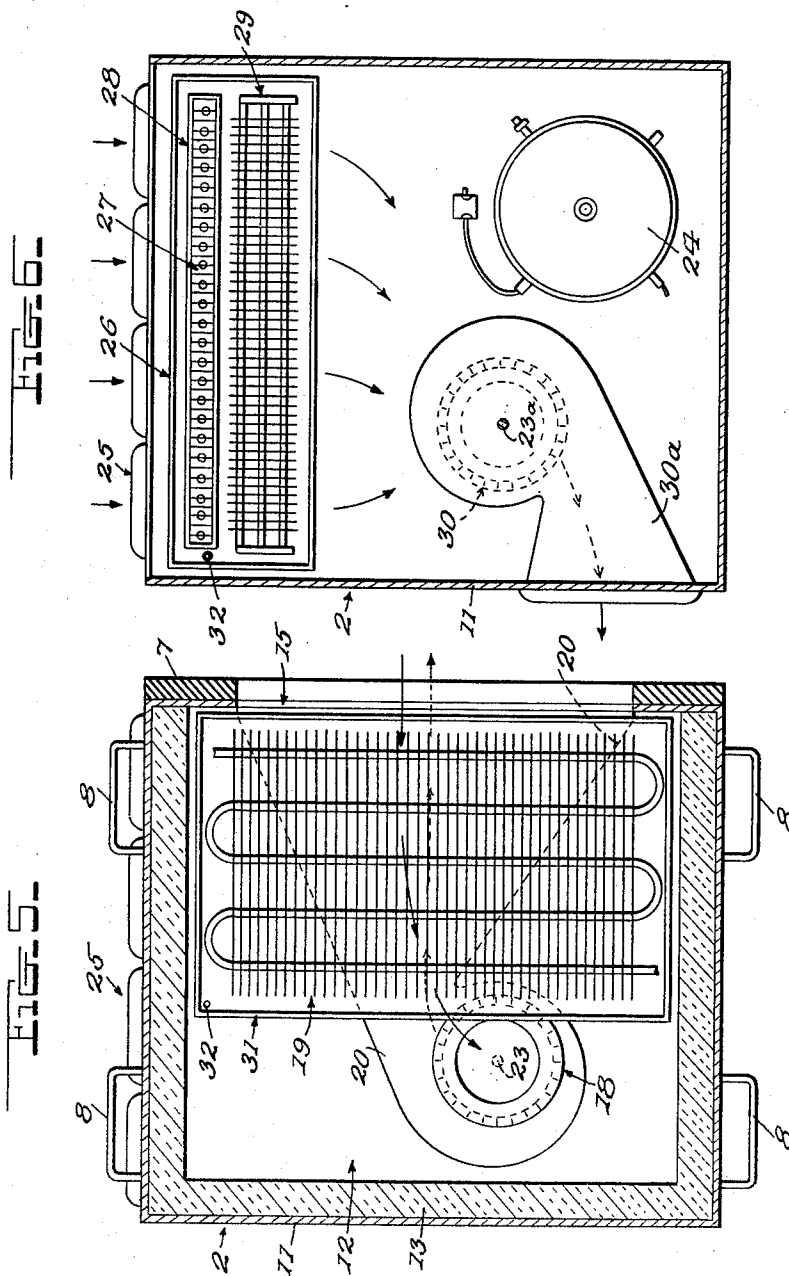
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INVENTOR

S. S. Corhanidis

BY *Bryant & Lowmy*

ATTORNEYS

1

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DETACHABLE REFRIGERATING UNIT

Sebastien S. Corhanidis, Athens, Greece

Application November 17, 1955, Serial No. 547,526

Claims priority, application Greece December 16, 1954

1 Claim. (Cl. 62—429)

This invention relates to refrigerating systems in which one or more refrigerator compartments or chambers may be maintained within a predetermined range of low temperatures by a single detachable refrigerating unit which continuously forces refrigerated air into and withdraws it from the refrigerating compartment or chamber with which said unit is connected. More particularly it relates to a refrigerating unit which is readily adaptable to provide regulated freezing or cooling temperatures in any insulated box or chamber without taking up any space within said box or chamber, and which may be instantly attached or detached. It may serve as the sole supply of cooling means for the box or chamber, or as an auxiliary for supplying additional cooling means to an overloaded box or chamber or when additional quick freezing or cooling is desired.

A similar refrigerating means is shown in my U.S. Patent No. 2,489,009 of November 22, 1949, but the present invention is designed to provide an improved, more efficient and less expensive construction.

In carrying out the above end, one object has been to so change the relative sizes of the air supply and return ports, connecting the refrigerating unit with the chamber to be refrigerated, that better diffusion of air will be obtained in said chamber. The air forced into this chamber is given a much higher velocity than the air withdrawn from this same chamber, giving a better sweeping action in the chamber and resulting in more uniform air distribution and more uniform temperature. Moreover, the short-cycling of air from the supply port to the return port is greatly reduced.

A further object of the invention is to provide a novel construction which requires only one electric motor for driving two blowers which heretofore required separate motors. As in the above mentioned patent, one of these blowers continuously forces refrigerated air into and withdraws it from the refrigerating chamber and the other creates an air current which cools a condenser for the refrigerant and absorbs any water which drips from the refrigerating coil.

In the accompanying drawings:

Fig. 1 is a perspective view showing the improved refrigerating unit applied to a housing, the interior of which forms a refrigerating compartment or chamber;

Fig. 2 is a vertical sectional view substantially on line 2—2 of Fig. 1;

Fig. 3 is an enlarged vertical sectional view substantially on the planes indicated by the lines 3—3 of Figs. 1 and 4;

Fig. 4 is a vertical sectional view substantially on line 4—4 of Fig. 3; and

Figs. 5 and 6 are horizontal sectional views substantially on lines 5—5 and 6—6 of Fig. 3.

The box 1 of Fig. 1 may be any type of insulated compartment or refrigerator, and may be one of a number of similar or different types of insulated compartments to be supplied with refrigeration by the same demountable refrigerating unit 2. It will be understood

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that the box 1 of Fig. 1 is only illustrative and may comprise a room, chamber, cell or any single or multiple enclosure that may or may not be insulated.

In this illustrated embodiment the refrigerating unit 5 is applied on one side of the compartment near the top, but it may be applied at any other suitable location on any side of the compartment.

The application of this unit to any insulated compartment is made by providing an opening 3 in the wall of the compartment the size of the combined inlet and outlet ports with a partition 4 separating the inlet from the outlet port of the so formed air passageway.

Hooks 5 are affixed to the wall of the compartment at the suitable location in order to accommodate the hanger bar 6 of the refrigerating unit.

The refrigerating unit is held in this position by its weight and an air tight seal of the registering ports is secured by providing a resilient gasket 7 around the ports.

It may be seen from the above description that the installation or the removal of the unit is a simple matter, requiring no special skill and may be performed without the help of any tools, by merely lifting the unit by the handles 8 provided on each side of the unit for this purpose and hanging it on the hooks 5. The unit has an ordinary electric cord 9 and plug 10 which may be connected to any electrical outlet after the unit is installed.

The refrigerating unit 2 comprises a box-like outer casing 11 which has the cooling chamber 12 in its upper part enclosed by an insulating wall 13, except for ports 14 and 15 which communicate with ports 16 and 17, respectively. A centrifugal blower 18 is mounted in chamber 12 for drawing air from the compartment 1 through ports 17 and 15 and cooling coil 19 and discharging it through duct 20 and ports 14 and 16 back into the compartment. Grids 21 may be provided at the compartment inlet port 16 which may be turned to any angle desired to provide a most effective circulation path of cooled air in the particular compartment to which the unit is applied.

The blower is driven by a motor 22 on the outside of the insulating wall 13 of chamber 12 through a shaft 23 passing through this wall.

The space in the lower part of the refrigerating unit is occupied by a condensing unit and a motor-compressor combination 24. One side of this space is left open to the outside air through grid 25. A drain collector pan 26 is mounted at the bottom along the back of this grid and has an air moistening ribbon 27 threaded over a frame 28 stretched across the opening and dipping into the collector pan to soak up any accumulation of water therein. Back of this frame 28 is the cooling coil 29 for the compressed refrigerant. The condensing unit further includes a centrifugal blower 30 driven by an extension 23a of the motor shaft 23. This blower draws ambient air through grid 25, air moistening ribbon 27, and cooling coil 29 and pushes it out the duct 30a in another side of this space.

A drip pan 31 is mounted under the cooling coil 19. This drip pan has a drain pipe 32 emptying into the collector pan 26. Any condensate or melting frost which drips from the cooling coil into the drip pan 31 drains through the drain pipe 32 into the collector pan 26 where it is soaked up by the ribbon 27 which gives it up to the air drawn through the grid 25 in vapor form, thus cooling the air by extracting from it the heat of vaporization and assisting in cooling the refrigerant in the cooling coils 29 to a lower temperature. This increases the efficiency of the cooling means, while at the same time it automatically disposes of any collected condensate in the collecting pan.

It will be noted that conventional connections between

the various parts of the unit shown and cooling temperature control assured by a conventional pressure control switch are omitted from the drawings for the sake of clarity.

Attention is invited to the fact that the ports 14, 16 through which the refrigerated air is forced into the housing 1 are much smaller than the ports 15, 17 through which the air is drawn from said housing, a ratio of one-to-three being preferable. This results in a velocity for the ingoing air much greater than that of the outgoing air, giving a better sweeping action in the housing 1 and causing more uniform air circulation and more uniform temperature. Moreover, short-cycling of air from the supply to the return is greatly decreased.

Attention is also directed to the fact that by directly coupling the two blowers 18 and 30 directly to the shaft 23, 23a of the motor 22, this single motor suffices for both blowers and thus an important saving is effected.

Obviously a refrigerating unit of this type may also be used for maintaining room temperatures within comfortable limits on hot days with a properly set temperature control switch.

Thus it will be seen that the present device provides not only for various systems of servicing more than one refrigerator or cooler with a single detachable refrigerating unit, but also supplies a real need as a separable unit which takes up no space inside the refrigerator compartment, which is compact and may be quickly replaced by a spare without the necessity of discontinuing operation of the whole refrigerator while repairs are being made on its refrigerating apparatus, as is now normally necessary.

It is furthermore now possible to use an existing model ice box, and by the application of the present device, convert it into an iceless refrigerator in short order at small expenses, and simultaneously increase its cubic capacity by making use of the ice space.

The present unit may be applied as a booster to refrigerators or quick freeze units, where needed. This device has many other obvious advantages.

Modifications in the details of the refrigerating unit may obviously be made without departing from the spirit and scope of this invention as claimed.

I claim:

In a portable refrigeration unit for external use on

the side of a chamber to be cooled, a casing including upper and lower compartments insulated from each other, inlet and outlet ports in said upper compartment, said inlet port overlying said outlet port and having substantially greater area than said outlet port whereby air to be cooled is drawn therein at an appreciably lesser velocity than the velocity at which it is expelled from said outlet port, a centrifugal blower assembly in said upper compartment including an upwardly disposed intake opening in said compartment and communicating with said inlet port for drawing cool air downwardly therefrom, a duct disposed in the lower portion of said upper compartment and enclosing said blower, said duct including a diverging lateral discharge opening communicating directly with said outlet port for forcing cooled air into the chamber to be cooled, a refrigeration unit in said upper compartment overlying the duct of said blower assembly for cooling air passing therein, power means in said lower compartment including an upwardly extending drive shaft terminating in said duct and operatively connected to said blower assembly, a second centrifugal blower assembly in said lower compartment operatively connected to a lower end of said drive shaft, said second blower assembly including a lateral lower intake opening in said second compartment and a lateral outlet opening communicating exteriorly of said casing, an air inlet opening in one side of said casing spaced from said lower intake opening of said second blower assembly, a motor-compressor in said second compartment operatively connected to said refrigeration unit, and a vertically disposed condensing coil unit in said second compartment operatively connected to said motor-compressor unit and refrigeration unit, said condensing coil unit being interposed between the lower intake opening of said second blower assembly and the air inlet opening in said casing whereby air passing into said lower compartment cools a refrigerant in said condensing coil unit.

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