Feb. 10, 1953 L. A. PHILIPP 2,627,729

REFRIGERATING APPARATUS

Filed May 17, 1950 2 SHEETS—SHEET 1

Fig. 1

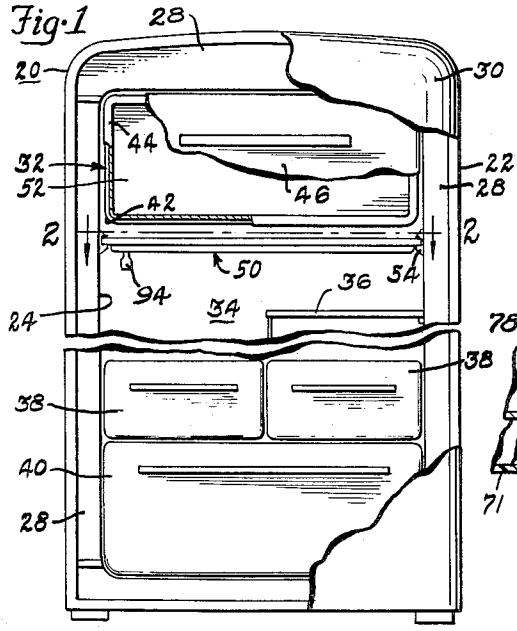


Fig. 4

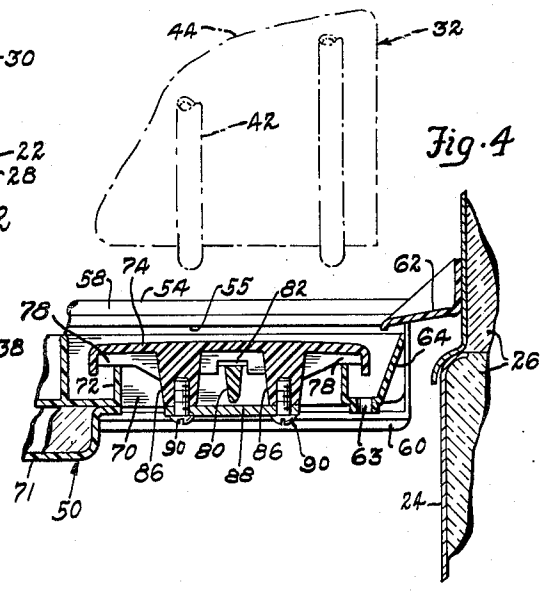


Fig. 5

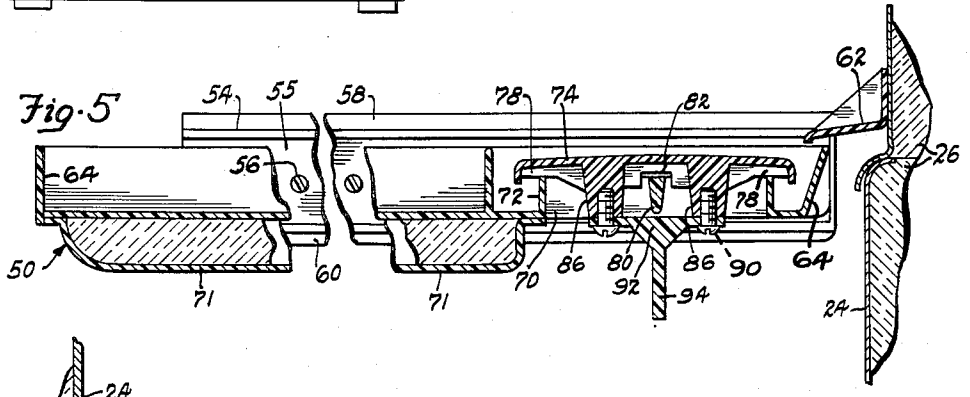
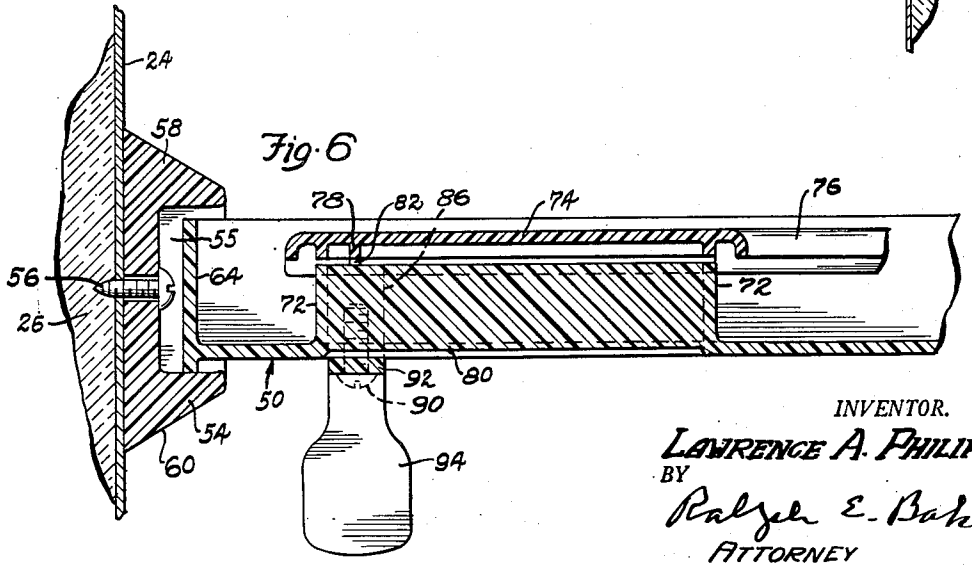


Fig. 6



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REFRIGERATING APPARATUS

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Fig. 2

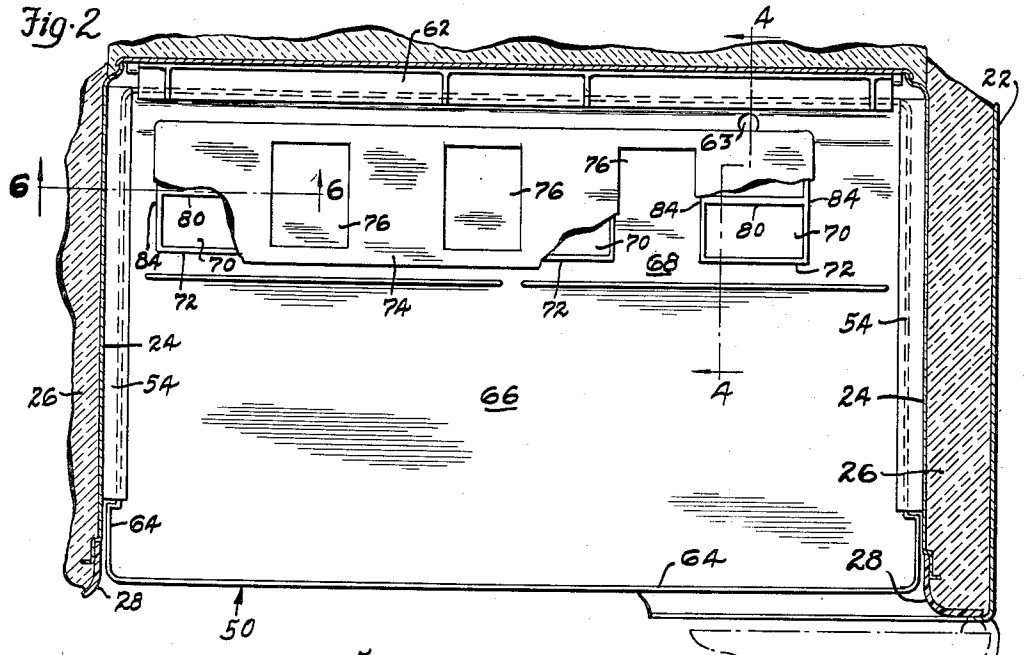
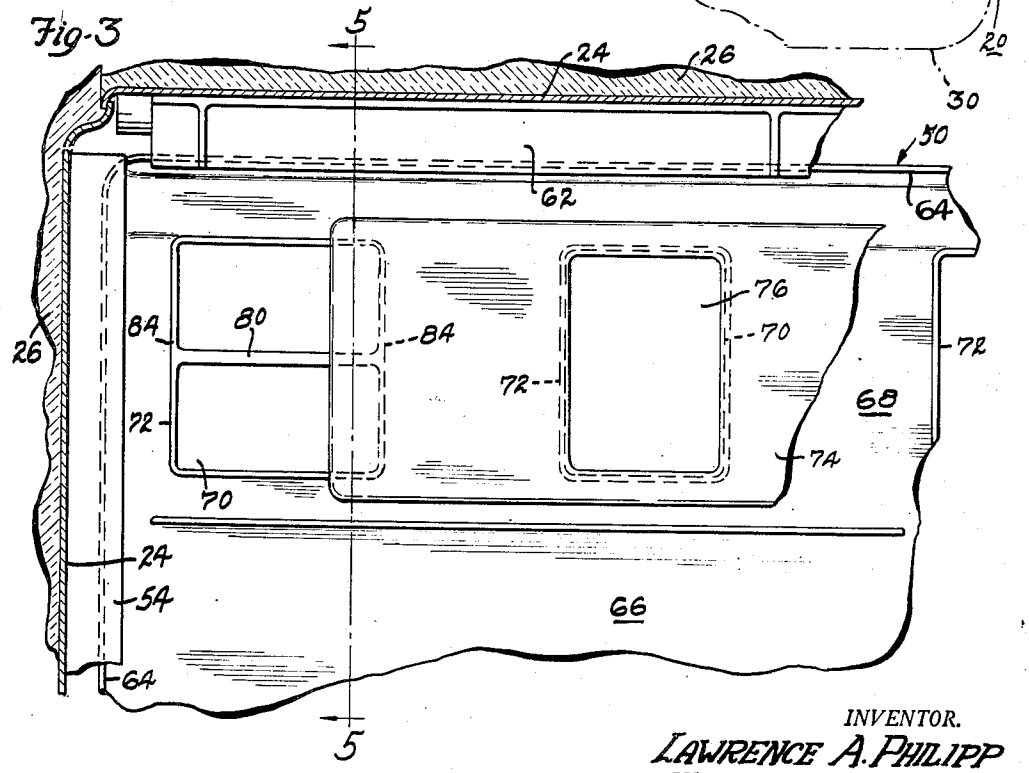


Fig. 3



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REFRIGERATING APPARATUS

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3 Claims. (Cl. 62—103)

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This invention relates generally to refrigerating apparatus and particularly to a combination air baffle and drip pan for household type refrigerators.

It is an object of the present invention to provide an improved refrigerator in which the temperature and humidity of a food storage compartment thereof, refrigerated by a cooling element in a separate adjacent compartment, may be conveniently adjusted or regulated without changing the thermostat operating setting of the cooling system.

Another object is to cool both of the above mentioned compartments by a single cooling element in one of the compartments and to provide for conveniently controlling air circulation between the compartments to control the temperature and humidity of the other of the compartments.

Another object of the invention is to provide an improved combination drip pan and air baffle to accomplish the above mentioned result.

Another object of the invention is to provide for household refrigerators, an air baffle-damper structure of a character such that the average household user may easily and conveniently regulate the damper to effect a change in temperature and humidity in the food storage compartment.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the invention is clearly shown.

In the drawings:

Fig. 1 is a front, broken view of a household refrigerator embodying features of the present invention;

Fig. 2 is a horizontal, cross sectional view of the refrigerator, taken along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged, fragmentary view of the refrigerator, similar to Fig. 2, but showing certain parts in different position;

Fig. 4 is a fragmentary, vertical sectional view of the refrigerator, taken along the line 4—4 of Fig. 2;

Fig. 5 is a view similar to Fig. 4, taken along the line 5—5 of Fig. 3; and

Fig. 6 is another fragmentary, vertical sectional view of the refrigerator, taken along the line 6—6 of Fig. 2.

Referring to the drawings by characters of reference, the numeral 20 designates, in general, a cabinet of a household type of refrigerator. The cabinet 20 may be constructed generally of a box-like casing 22 and a smaller box-like liner 24.

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Between the casing 22 and the liner 24, suitable, well known heat insulation 26 is preferably provided to decrease the rate of heat leakage into the cabinet. At the front of the cabinet 20, the casing 22 and the liner 24 terminate in spaced relationship, and are preferably bridged by heat breaker strips 28 to decrease heat conduction between the parts and to trim-finish an access door opening in the cabinet. A door 30 is provided to close the access opening to the cabinet, and may be hung on one side of the cabinet by suitable hinges.

A cooling element or refrigerant evaporator 32 of a refrigerating system (not shown) is provided within the cabinet 20, adjacent the top thereof. Any of the suitable, well known types of refrigerating systems may be used. Below the evaporator 32, is a food storage compartment 34 where foods may be preserved at temperatures above freezing and in this compartment may be provided a number of shelves 36, supported on the liner 24. In the present cabinet, a pair of laterally positioned containers 38 are located and supported below the lowermost of the shelves 34 for the storage of fresh vegetables to be kept in a moist state. Also, in the present cabinet, a bin 40 may be provided below the containers 38 for the storage and preservation of fresh fruits.

Any cooling element or refrigerant evaporator may be used in the cabinet 20 which has a cooling capacity sufficiently large enough to make ice, freeze foods, and cool the food storage compartment 34 to the desired temperature. Such an evaporator may comprise, in general, a refrigerant evaporator coil or tube 42 and a box-like container 44. Arranged in good heat transfer relationship with the walls of the container 44, the evaporator coil 42 may be welded, brazed, clamped, or be otherwise suitably secured to the container 44. The container 44 substantially occupies the upper region of the cabinet or extends substantially to the liner side and rear walls and to the door 30 to provide large storage capacity for ice trays, frozen foods, etc. (not shown). The front of the evaporator container 44 is open for access thereinto, and may be closed by an inner door 46.

In accordance with my invention, I provide a partition or combination drip pan and air baffle 50 to catch defrost water from the evaporator and liner and to control temperature and humidity of the food storage compartment 34. The pan 50 is positioned immediately beneath the evaporator 32 and divides the interior of the cabinet into an upper freezing or evaporator com-

partment 52 and the lower food storage compartment 34. The pan 50 extends beyond the evaporator container 44 and has its outer edges spaced from the side and rear liner walls and from the inner side of the door. Secured to opposite sides of the liner 24 is a pair of supporting members or rails 54 for supporting the pan 50 and for closing the spaces between the side edges of the pan and the liner sides. As shown in Fig. 6, the pan supporting rails 54 may be secured by screws 56 to the sides of the liner. Preferably, the pan supporting rails 54 are made of a low heat conducting material, such as a phenolic plastic, to decrease heat conduction. These rails 54 preferably have elongated recesses 55 to receive side edge portions of the pan 50, and the top and bottom surfaces 58 and 60 respectively of the rails are inclined so as to drain frost water. As will be seen in Fig. 6, the upper inclined rail surface 58 slopes downwardly from the liner side and overhangs the pan 50 so as to direct any water, which may run down the sides of the liner, into the drip pan 50. The lower surfaces 60 of the rails 54 slope downwardly from the pan to the sides of the liner so as to drain any moisture which may collect thereon to the liner sides below the pan so as to avoid dripping of water onto foodstuffs on the shelves. Secured to the liner rear wall is another water baffle member 62 which overhangs the rear edge of the pan 50. The baffle member 62 closes or overlies the space between the rear edge of the pan 50 and the liner rear wall restricting air flow between compartments, and also directs any water, which may run down the liner rear wall, into the drip pan 50. A drain hole 63 is provided in the pan 50 and may be located adjacent the rear edge thereof.

The pan 50 is preferably made of a low heat conducting material, such as a phenolic plastic, formed with an upwardly directed dam or guard in the form of a flange 64 which extends around the outer edge of the pan to retain the drip water. The pan 50 comprises a front, impervious portion 66 and a rear, apertured portion 68. The rear baffle portion 68 is provided with a number of spaced air openings or passages 70 for passage of cold air from the evaporator compartment 52 to the food storage compartment 34. The warmer air in the food storage compartment rises and passes between the front edge of the pan 50 and the door 30 to the evaporator compartment 52, and thus, by gravity circulation, a desired temperature is maintained by the evaporator 42 in the food storage compartment. Preferably, a second pan 71 is secured to and covers the underside of the impervious pan portion 66 of pan 50 and insulation is provided between the pans to decrease heat conduction. The air passages 70 may be arranged in a row extending widthwise of the pan adjacent the rear edge thereof. Around each of said air passages 70, is an upstanding dam-like wall portion or water guard 72 in the form of a flange which is provided to keep water in the drip pan 50 from passing through the air passages 70 during the defrosting period. In addition, I utilize the end guards or wall portions 72 to function as a slideway for a damper 74 which is provided to control the rate of air flow through the air passages 70, and consequently control temperature and humidity in the food storage compartment 34.

Like the pan 50, the damper 74 is preferably made of a suitable low heat conducting material, such as phenolic plastic. The damper 74 may be an elongated member of a size to overlie and to close substantially the air passages 70, as shown in Fig. 2. In the damper 74 is provided a number of longitudinally spaced air passages or openings 76 which correspond to the air passages 70 in the air baffle-drip pan 50. In the full open position of the damper 74, as shown in Fig. 3, the damper openings 76 align with the pan openings 70 allowing maximum circulation of air between the evaporator compartment 52 and the food storage compartment 34. Between the extreme damper positions of closed and fully open the damper 74 may be, of course, positioned to acquire corresponding rates of circulation of the air between the evaporator and food storage compartments.

Adjacent its opposite ends, the damper 74 is formed with skids 78 in the form of downwardly directed flanges, whose lower edges rest and are slideable on the upper edge of the dams or guards 72 of the end air passages 70. In each of these end air passages or openings 70, I provide a damper retainer member 80 which is cooperable with a groove 82 in the adjacent damper flange 78 to limit movement of the damper laterally of the damper slideway. As shown, the damper retainer members 80 may be provided by forming the pan 50 with a web-like structure in each of the end air passages 70. These web-like retainer members extend longitudinally of the damper and join integrally with the opposite sides, as at 84, of the water guards 72 which extend about the air passages 70. Also formed integral with the damper 74, is a pair of laterally positioned depending bosses 86, located respectively adjacent each end of the damper. Secured to the lower ends of one of these pairs of bosses 86 is a damper retainer or holddown plate 88 which slidably engages the underside of the pan 50 to limit upward movement of the damper. Screws 90 or other suitable means may be provided to secure the holddown plate 88 flat against the lower end of the pair of damper bosses. A second holddown plate 92 is secured to the other pair of damper bosses 86 and is provided with a depending handle 94 for conveniently shifting or adjusting the damper 74. The handle 94 extends downwardly through the adjacent end air passage 70 and the bosses 86 in the air passage are engageable with opposite sides of the dam as a stop for the damper.

From the foregoing description, it will be noted that I have provided for household type refrigerators, an improved air baffle and damper by means of which air circulation between a cooling element compartment and a food storage compartment may be readily regulated to change temperature and humidity conditions of the air therein. For example, under certain conditions, such as in humid weather, condensation is likely to occur on cold surfaces of the food storage compartment of the refrigerator, particularly if the refrigerator door is being opened frequently. When this occurs, the user may correct this condition merely by moving the damper 74 further toward fully open position, as may be required. This, of course, increases the rate of air circulation between the evaporator and food storage compartments, which entrains the undesirable moisture in the food storage compartment and deposits it as frost on the evaporator. It will also be understood that I have provided a combination drip pan and air baffle in which the air baffle damper is slidably supported on water guards or dams around air holes in the baffles

in the interests of efficiency and economical constructions.

Although only a preferred form of the invention has been illustrated, and that form described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. A water and air baffle for use in a refrigerator cabinet to separate a pair of compartments comprising, a flat pan having a front substantially imperforate section and a rear coplanar section, an air passage through said rear section, an upstanding flange around said passage forming a water dam and also forming a slideway, a slidable damper on said slideway controlling said passage, said damper having a downturned flange transversely of and resting at its lower edge on said upstanding flange to slide thereon and having an adjacent edge overhanging said flange, said downturned flange spacing the damper proper from the upper edge of said upturned flange to determine minimum air flow through said passage when the damper is in fully closed position, a rib on said dam extending in said opening transverse to said downturned flange, and a guide slot in said downturned flange receiving said rib.

2. A water and air baffle for use in a refrigerator cabinet to separate a pair of compartments comprising, a pan, an air passage through said pan, an upstanding wall around said passage forming a water dam, a slideway on top of said wall, a slideable damper on said slideway controlling air flow through said passage, means

interposed between said damper and slideway spacing said damper from the top of said wall to determine minimum air flow through said passage when the damper is completely overlying said passage, and cooperating guide means on said damper and wall slideably guiding said damper.

3. A water and air baffle for use in a refrigerator cabinet to separate a pair of compartments comprising, a pan, an air passage through said pan, an upstanding wall around said passage forming a water dam, a slideway on top of said wall, a slidable damper on said slideway controlling air flow through said passage, said damper having a downturned flange transversely of and resting at its lower edge on said wall to slide thereon, said downturned flange spacing the damper proper from the upper edge of said wall determining minimum flow through said pasage when the damper is in position completely overlying said passage, a guide on said dam extending into said passage transversely to said downturned flange, and a guide slot in said downturned flange receiving said guide.

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