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ACCESSORY UNIT FOR REFRIGERATING APPARATUS

Filed May 23, 1931

2 Sheets-Sheet 1

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2 Sheets-Sheet 2

Fig. 7.

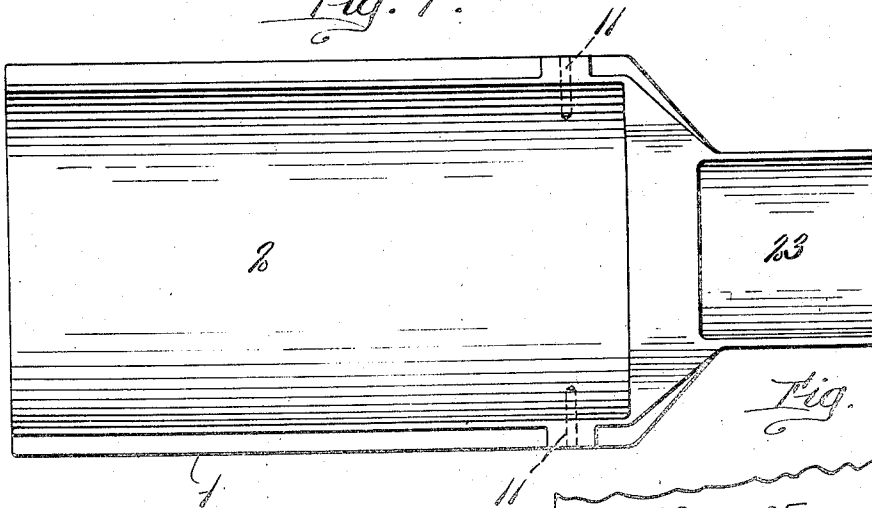


Fig. 8.

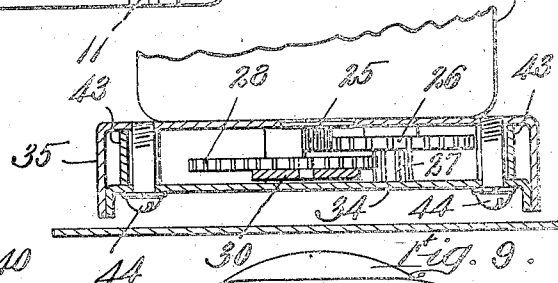


Fig. 10.

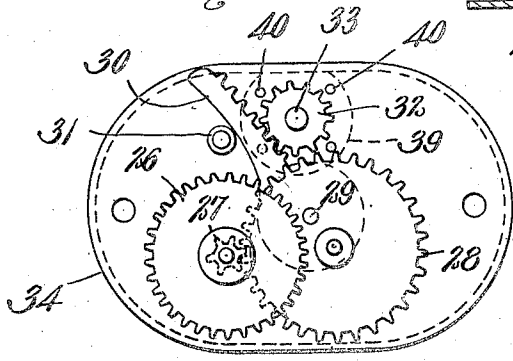


Fig. 9.

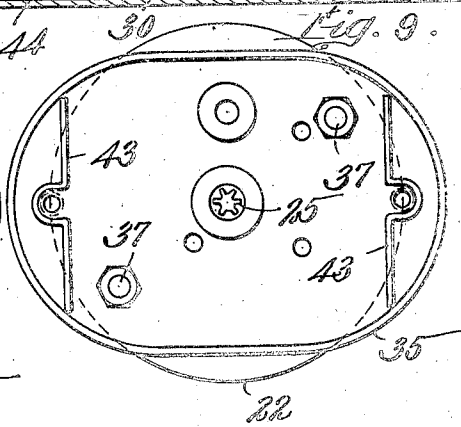
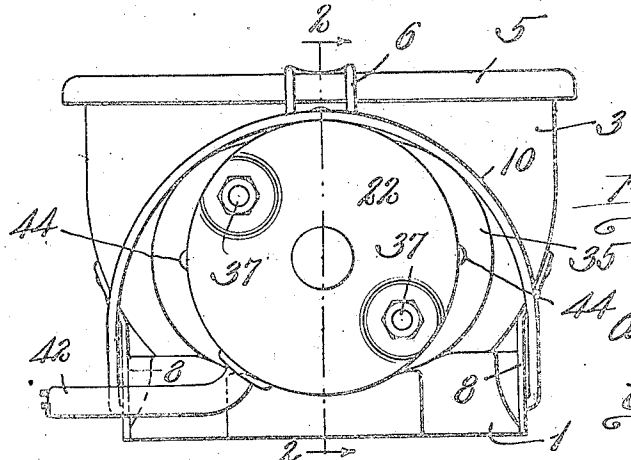


Fig. 6.



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ACCESSORY UNIT FOR REFRIGERATING APPARATUS

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9 Claims. (Cl. 259—101)

Our invention relates to refrigerating apparatus and more especially to self-contained accessory units for domestic refrigerating apparatus adapted for use in connection with the latter in freezing ice-cream and the like, and it has for its object to provide an improved portable unit of this class.

To this end we have provided a self-contained accessory unit of the class described comprising a base having a flat bottom surface to fit flatwise upon a tray-supporting shelf or the like of a domestic refrigerating apparatus so as to provide substantial and adequate heat-transmitting contact between the two, and on this base is mounted a dasher-actuating electric motor and also a container for holding the ice-cream mix or other material that is to be frozen.

It is also a feature of our invention that one of said two last mentioned elements is separably connected with the other and also separably connected with said base so that the container can be washed and cleaned while said two elements are separated thereby facilitating this operation and avoiding wetting the motor.

It is also a feature of our invention that means is provided for separably connecting the armature shaft of the motor with a dasher that is removably mounted within the container.

Also, in the best form of our invention, the dasher is preferably reciprocated or vibrated by the motor while the unit is in use, power transmitting mechanism being provided through which the continuous rotary movement of the armature shaft of the motor in one direction operates to impart a reciprocatory or vibratory motion to the dasher.

Other features of our invention are hereinafter pointed out.

In the accompanying drawings:

Figure 1 is a side elevation, partly in section, of an accessory unit constructed in accordance with our invention and adapted for use in connection with a domestic automatic refrigerating apparatus.

Figure 2 is a central longitudinal section on line 2—2 of Figure 6.

Figure 3 is a transverse sectional view on line 3—3 of Figure 1.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 illustrates the construction of the coupling means forming part of the connection between the dasher of the unit and the motor.

Figure 6 is an end elevation of the unit shown in Figures 1 and 2.

Figure 7 is a plan view of the base member hereinafter described.

Figure 8 is a plan view, partly in section on line 8—8 of Figure 2 and partly in elevation, of a portion of the unit that is between the motor and the container.

Figure 9 is a front view of the gear box, hereinafter described, with its cover plate removed.

Figure 10 is an elevation of the inner side of the cover plate of the gear box showing the mechanism that is supported thereby.

The embodiment of our invention herein illustrated comprises a base member 1 preferably a casting made from a metal such as aluminum, or any other suitable material, which is a good conductor of heat.

Upon its top side the base 1 is made with a parti-cylindrical recess 2 which provides a cradle for a sheet metal container 3 whose lower portion is semi-cylindrical and of the same length, width and curvature as the recess 2 so as to contact with the base member throughout the curved bottom surface of said recess. It is a feature of the illustrated construction that the area of the curved surface of the recess 2 is the same as the area of the bottom surface 4 of the base member 1. Therefore the heat transmitting contact between the container 3 and the base member 1 is the same in capacity as the heat transmitting contact between the base member 1 and the shelf of the refrigerating apparatus on which the unit is placed while it is in use.

The container 3 includes, as a part thereof, a cover or lid 5 provided upon its under side with a channel or groove 6a into which the chime of container 3 is adapted to fit as shown. This cover or lid 5 is removable but is normally locked in position upon the container body 3 by means of two spring latches 6 whereof one is provided at each end of the container 3. Each spring latch 6 is made from spring wire and is pivotally mounted at 7 on container 3 so that it can be swung and sprung into and out of lid-holding position.

The container 3 is made, near one end thereof, with a pair of apertured legs 8, one at each side of said container, between which the base member 1 is fitted. These legs 8 are normally fastened to the base member 1 by the intumed end portions 9 of a spring bail 10, said intumed end portions occupying sockets 11 provided at opposite sides of the base member. It will be clear that by springing the legs of the bail 10 apart the legs 8 can be freed from the base 1.

One end wall of the container 3 is formed with a circular aperture within which is permanently fixed or arranged a compressible rubber grommet 12, whose inner face is made with a lip 13, Figs. 3 and 4, which provides a socket 13a to receive one end of the hub 14 of a dasher 15.

The dasher 15 is disposed longitudinally within the container 3 very close to the semi-cylindrical bottom wall of said container. Adjacent one end thereof, said dasher is made with a laterally projecting arm 16 having a reduced end portion extending through a hole formed transversely through the hub 14 and rigidly fixed therein by upsetting the end of said arm as shown. Within the hub 14 is a core block 17, Fig. 5, that is fixed in position therein by the arm 16 and this core block 17 is provided at one end with a socket 18 whose opposite side walls are beveled at their outer ends as at 19.

At its opposite end the dasher 15 is made with a longitudinally disposed trunnion 20 axially aligned with hub 14 and removably supported within a socket 21 provided upon the adjacent end wall of the container 3.

Both sockets 13a and 21 are open at their tops so that when the dasher is freed as hereinafter described, it can be lifted out of the container. Also the axes of hub 14 and trunnion 20 are coincident with the center of the curve defining the semi-cylindrical bottom wall of the container so that when the dasher 15 is vibrated or reciprocated as presently to be described, it moves back and forth transversely on a path parallel with the curved bottom wall of the container.

The dasher 15 is driven by an electric motor 22 that is fitted into a cradle-recess, or pocket, 23, provided upon the top side of base member 1 at one end thereof and said motor is securely fastened in position within this recess 23 by means of the spring bail 10 which extends across the top of the same and behind an abutment 24 provided on the frame as shown in Figures 2 and 6. As will be seen the bail 10 is obliquely disposed by reason of which it serves to hold the motor against movement away from the container and also to hold said motor down against the base member 1.

The armature shaft of motor 22 carries at one end thereof a pinion 25, Figs. 2, 8 and 9, which drives a gear 26 that is compounded with a pinion 27 that is in mesh with another gear 28. This gear 28 carries a wrist pin 29 with which is connected one end of a rack bar 30 occupying a position between a guide roll 31 and a pinion 32.

The pinion 32 is fixed in position upon one end of a spindle 33, Figs. 2, 5 and 10, that is partly supported within a bearing provided upon a cover plate 34 which closes one side of a gear box 35. The parts 25, 26, 27, 28, 29, 30, 31 and 32 are all completely inclosed by the gear box 35 and its cover plate 34.

The motor 22 is of ordinary construction except that the two bolts 37 which hold the sections of its frame together as usual are extended through apertures provided in one of the walls of the gear box 35 and provided with extra nuts 36 by means of which and said bolts the gear box is fixed rigidly and permanently to one end of the motor frame.

When the motor 22 is running the pinion 25 on its armature shaft is continuously rotated in one direction and operates through gear 26, pinion 27, gear 28, wrist pin 29 and rack bar 30 to oscillate the gear 32 and spindle 33.

At one end thereof the spindle 33 extends through to the outside of the gear box cover plate 34 and has its outer end portion flattened at opposite sides thereof to provide a blade or tongue 38 which occupies a position within the socket 18, Fig. 5, of the dasher hub 14 so that while said spindle is oscillated by the motor 22, it acts to impart rotary reciprocatory or vibratory motion to the dasher 15. Thus the gears within the gear box not only serve as speed reducing gears but also as motion-translating mechanism whereby the continuous rotary movement of the armature shaft in one direction is converted into rotary reciprocatory movement of the dasher.

Normally the spindle 33 locks the dasher 15 in its operative position within the container 3, but when the spring bail 10 is operated to free the motor the latter can be moved endwise away from the container thus withdrawing the spindle 33 from the hub 14 of the dasher so that after removal of the lid 5 the dasher can be removed from the container.

The cover plate 34 has a cup shaped plate 39 fastened to it by means of rivets 40, Fig. 10, and this plate engages a flange 41, Fig. 5, provided on spindle 33 to prevent endwise movement of the latter in a direction away from motor 22. This cup shaped member or plate 39 also has the important function of compressing the rubber grommet 12 so that the joint between the latter and the spindle as well as the joint between the grommet and the end wall of the container are closed and sealed during the operation and use of the device. Thus all leakage of the mix or other material that is being frozen from the container through the aperture in its end wall is prevented.

The current supplying cable for motor 22 is shown in part at 42 and may be connected in any suitable manner with a source of current supply.

Between the cover plate 34 of the gear box 35 and the opposite wall of the latter are disposed two bolster members 43, Figs. 8 and 9, and said cover plate is clamped fixedly against these bolster members by means of screws 44 as shown in Fig. 8.

The frame of the motor 22 is held against relative displacement through the engagement of the bottom wall of the gear box 35 with the top of the base member 1. Also, as will be clear from Figures 1 and 2, the spring bail 10 serves to hold one end of the container 3 against a shoulder 45 on base 1 and one end of the frame of motor 22 against a shoulder 46 also provided on said frame. In this way the motor and container are held against relative displacement with respect to each other and with respect to the base member.

The above described freezer accessory unit for domestic refrigerating apparatus is of very simple, efficient and inexpensive construction and may be used within the ordinary automatic domestic refrigerating apparatus upon one of the shelves thereof in lieu of the usual tray. Also, when the unit is not in use it can be removed from the refrigerating apparatus and stored elsewhere.

It is a feature of advantage to the above described construction that the surface contact between the base member 1 and the shelf on which it is used, is no less in area than that of the surface contact between the container 3 and said base member and that at both of these

points the contacting surfaces are of comparatively great extent so that the absorption of heat from the mix within the container is correspondingly rapid.

- 5 It is also a feature of advantage that each of the four main elements of the above described unit can be separated from the other three so that all parts of each are accessible and that while the unit is in use these four main elements
10 are held connected and in co-operative relationship by a single mechanism herein shown as the spring bail 10.

The legs 8, referred to above, in addition to serving as part of the means through which the
15 container 3 is connected with the base member 1 also serve to support said container in an upright position when it is removed from the base and placed upon a table or the like.

What we claim is:

- 20 1. A portable unit of the character described comprising an upstanding container provided with a supporting base to rest upon and have extended surface contact with a shelf or the like of a domestic refrigerating apparatus and
25 having an integral upright wall formed with an aperture; a dasher pivotally and removably mounted within said container so as to vibrate on a horizontal axis; an endwise removable horizontally disposed spindle extending through said
30 aperture one end of which is within said receptacle and separably connected with said dasher so as to lock the latter in position within said container at all times while said dasher is in motion; joint closing means for preventing leakage through said aperture; a dasher operating
35 motor removably mounted on said base, and power-transmitting and motion-translating means permanently mounted on the frame of said motor and permanently connecting the
40 armature shaft of said motor with said spindle.

2. A portable self-contained accessory freezing unit for automatic refrigerators comprising
45 a mix-holding container made from a material having a high degree of thermo-conductivity whose interior is made with a horizontal semi-cylindrical lower portion disposed between vertical end walls and having a rectangular mouth or chime at its top, said container being provided
50 exteriorly with a base to fit flatwise on a shelf or the like; a removable cover for the top of said container; a dasher bar disposed longitudinally within said container and pivotally supported adjacent to its opposite ends by said walls
55 near the tops thereof so as to vibrate transversely on an axis with respect to which said semi-cylindrical lower portion is approximately parallel and concentric; a motor aligned opposite one end of said container and separably fastened to said base, said motor having a shaft that is
60 continuously rotated in one direction, and power-transmitting and motion-translating mechanism disposed in alinement with and between said motor and said container through which said shaft acts to vibrate said dasher bar sidewise
65 within the semi-cylindrical lower portion of said container, said mechanism being permanently connected with said motor shaft and separably connected with said dasher and including a spindle that extends through the adjacent wall of said container and is slidably coupled to one
70 end of said dasher bar within said container so as to hold said end in its operative position and so that when said motor and mechanism are removed the dasher bar is freed and can be
75 removed from the container.

3. A portable self-contained accessory freezing unit for automatic refrigerators comprising a mix-holding container made from a material having a high degree of thermo-conductivity whose interior is made with a horizontal semi-cylindrical lower portion disposed between vertical end walls and having a rectangular mouth or chime at its top, said container being provided exteriorly with a base to fit flatwise on a shelf or the like; a removable cover for the top of said container; a dasher bar disposed longitudinally within said container and pivotally supported adjacent to its opposite ends by said walls near the tops thereof so as to vibrate transversely on an axis with respect to which said semi-cylindrical lower portion is approximately parallel and concentric; a motor aligned opposite one end of said container and separably fastened to said base, said motor having a shaft that is continuously rotated in one direction; power-transmitting and motion-translating mechanism disposed in alinement with and between said motor and said container through which said shaft acts to vibrate said dasher bar sidewise within the semi-cylindrical lower portion of said container, said mechanism being permanently connected with said motor shaft and separably connected with said dasher, and a single bail element for holding said motor and mechanism in operative position upon said base, said bail element having its opposite ends pivotally connected with the opposite sides of said base and its intermediate middle portion extending across and separably engaged with the frame of said motor.

4. A portable self-contained accessory freezing unit for automatic refrigerators comprising a mix-holding container made from a material having a high degree of thermo-conductivity whose interior is made with a horizontal semi-cylindrical lower portion disposed between vertical end walls and having a rectangular mouth or chime at its top, said container being provided exteriorly with a base to fit flatwise on a shelf or the like; a removable cover for the top of said container; a dasher bar disposed longitudinally within said container and pivotally supported adjacent to its opposite ends by said walls near the tops thereof so as to vibrate transversely on an axis with respect to which said semi-cylindrical lower portion is approximately parallel and concentric; a motor aligned opposite one end of said container and separably fastened to said base, said motor having a shaft that is continuously rotated in one direction; power-transmitting and motion-translating mechanism disposed in alinement with and between said motor and said container through which said shaft acts to vibrate said dasher bar sidewise within the semi-cylindrical lower portion of said container, said mechanism being permanently connected with said motor shaft and separably connected with said dasher, and a single bail element for holding said motor and mechanism in operative position upon said base, said bail element having its opposite ends pivotally connected with the opposite sides of said base and its intermediate middle portion extending across and separably engaged with the frame of said motor so as to yieldingly urge the latter downwardly and also toward said container.

5. A portable self-contained accessory freezing unit for automatic refrigerators comprising a mix-holding container made from a material

having a high degree of thermo-conductivity whose interior is made with a horizontal semi-cylindrical lower portion disposed between vertical end walls and having a rectangular mouth or chime at its top, said container being provided exteriorly with a base to fit flatwise on a shelf or the like; a removable cover for the top of said container; a dasher bar disposed longitudinally within said container and pivotally supported adjacent to its opposite ends by said walls near the tops thereof so as to vibrate transversely on an axis with respect to which said semi-cylindrical lower portion is approximately parallel and concentric; a motor aligned opposite one end of said container and separably fastened to said base, said motor having a shaft that is continuously rotated in one direction; power-transmitting and motion-translating mechanism disposed in alinement with and between said motor and said container through which said shaft acts to vibrate said dasher bar sidewise within the semi-cylindrical lower portion of said container, said mechanism being permanently connected with said motor shaft and separably connected with said dasher, and a single ball element for holding said motor and mechanism in operative position upon said base, said ball element having its opposite ends pivotally connected with the opposite sides of said base and its intermediate middle portion extending across and separably engaged with the frame of said motor, the said opposite end portions of the ball element engaging said container to hold the latter in position upon said base.

6. A portable self-contained accessory freezing unit for automatic refrigerators comprising a mix-holding container made from a material having a high degree of thermo-conductivity whose interior is made with a horizontal semi-cylindrical lower portion disposed between vertical end walls and having a rectangular mouth or chime at its top, said container being provided exteriorly with a base to fit flatwise on a shelf or the like; a removable cover for the top of said container; a dasher bar disposed longitudinally within said container and pivotally supported adjacent to its opposite ends by said walls near the tops thereof so as to vibrate transversely on an axis with respect to which said semi-cylindrical lower portion is approximately parallel and concentric; a motor aligned opposite one end of said container and separably fastened to said base, said motor having a shaft that is continuously rotated in one direction; power-transmitting and motion-translating mechanism disposed in alinement with and between said motor and said container through which said shaft acts to vibrate said dasher bar sidewise within the semi-cylindrical lower portion of said container, said mechanism being permanently connected with said motor shaft and separably connected with said dasher; means for holding said motor and mechanism in position upon said base, said means yieldingly urging said motor downwardly and also toward said container, and a compressible joint closure annulus surrounding said spindle and overlying the outer surface of said adjacent wall, said annulus being compressed between the latter and said mechanism so that it is contracted against said spindle and against said wall thereby to prevent leakage.

7. As a new article of manufacture, a portable

self-contained mix-holding accessory unit for insertion within the freezing compartment of an automatic domestic freezing apparatus comprising a container having a base to seat flatwise upon a shelf or the like and including a bottom wall, two side walls and two end walls; a closure lid removably fitted to the tops of said side and end walls; a dasher within said container removably supported by the end walls thereof so as to vibrate on a horizontal axis; an electric motor for driving said dasher disposed upon the exterior of said container opposite one of said end walls below the level of the top of said closure lid, said motor being seated upon an end extension of said base; means separably and positively fastening said motor in position upon said end extension, consisting of a spring ball having end portions occupying sockets provided in said base and an intermediate portion extending across the top of said motor and engaging the latter to hold the same fixedly in position upon said end extension and to yieldingly urge said motor toward said container, and power-transmitting and motion-translating mechanism permanently connected with said motor through which the armature shaft of said motor acts to vibrate said dasher and by which the latter is held in position within said container but so that removal of said motor and mechanism from said extension permits of removal of said dasher from said container.

8. A self-contained accessory unit for use within a domestic refrigerating apparatus comprising a metal base member having a flat bottom surface to fit flatwise upon a tray-supporting shelf or the like of said apparatus so as to provide substantial heat-transmitting contact between the two, said base member being made with a pair of sockets, one at each side thereof; a metal container seated upon said base member provided with a pair of apertured legs embracing said base member with their apertures each in register with one of said sockets; a dasher-operating motor mounted on said base member; and a spring ball having end portions extending through the apertures of said legs into said sockets thereby to fasten said container in position upon said base member and an intermediate portion engaging said motor to hold the latter fixedly in position upon said base member and yieldingly urge the same toward said container.

9. A self-contained accessory unit for use within a domestic refrigerating apparatus, said unit comprising a metal base member having a flat bottom surface to fit flatwise upon a tray-supporting shelf or the like of said apparatus so as to provide substantial heat-transmitting contact between the two and having a concaved top surface providing a cradle-recess; a metal container having a convex bottom portion seated within the cradle-recess of said base member and provided with a pair of legs, one at each side of the latter; means separably fastening said container in position upon said base member; a dasher movably supported within said container; an electric motor mounted upon said base member, and power-transmitting means separably connecting the armature shaft of said motor with said dasher.

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