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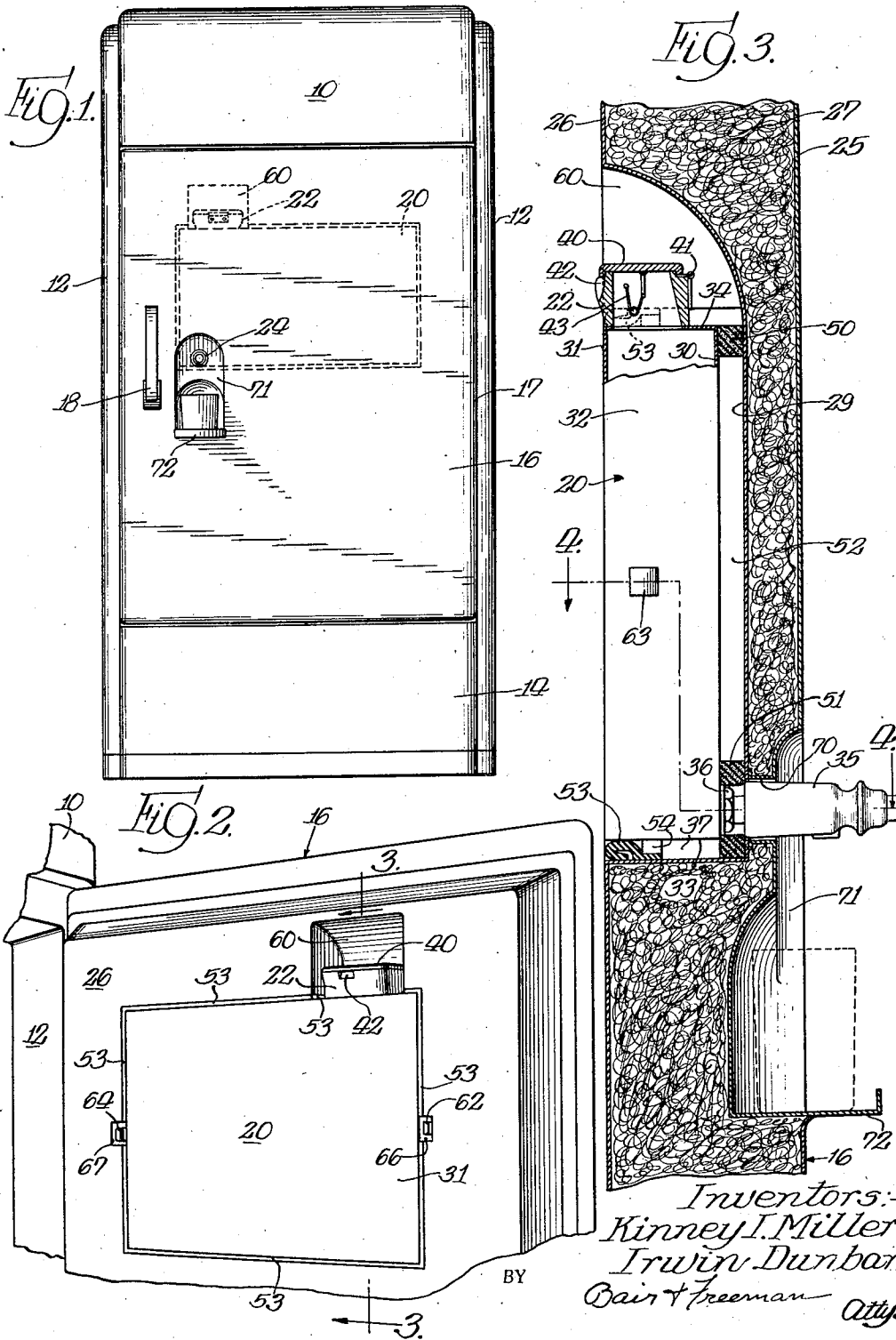
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COOL WATER RESERVOIR FOR REFRIGERATORS

Filed July 7, 1941

2 Sheets-Sheet 1



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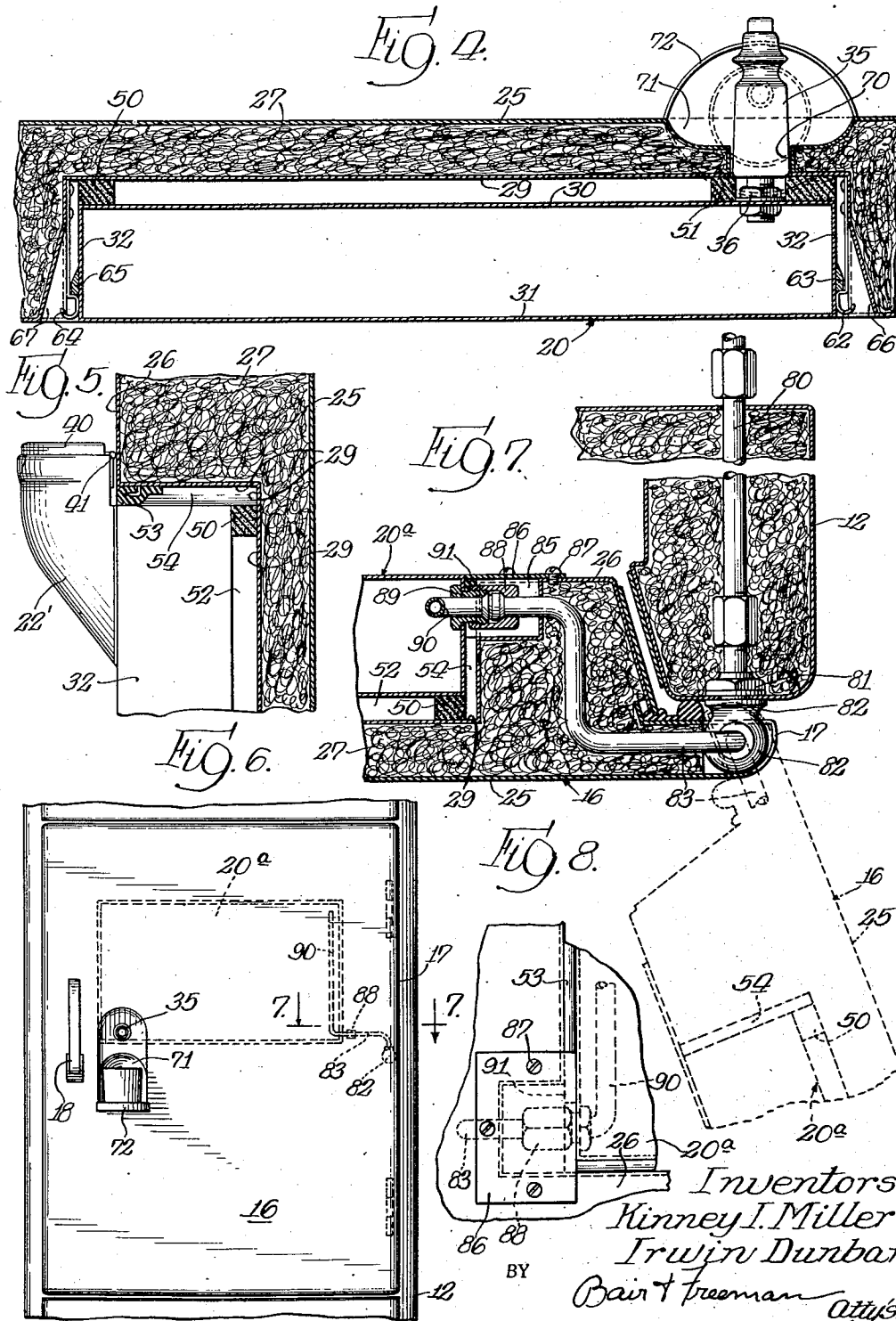
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UNITED STATES PATENT OFFICE

2,299,103

COOL WATER RESERVOIR FOR REFRIGERATORS

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5 Claims. (Cl. 62—89)

Our invention relates to refrigerators and particularly a cool water reservoir installed in the refrigerator wall for maintaining a constant supply of cool water which can be tapped off outside the refrigerator cabinet.

Among the objects of the invention is to provide a cool water reservoir for a refrigerator which occupies a substantially minimum amount of space within the cabinet of the refrigerator and which is removably attached to the inside wall of the refrigerator so that it can be removed when desired for cleaning or replacement.

Also among the objects of the invention is to provide a new and improved removable cool water reservoir for a refrigerator which is accessible from the outside of the refrigerator cabinet without opening the door of the cabinet every time it is desired to draw a supply of cool water.

Another object of the invention is to provide a new and improved reservoir for cool water which can be removably attached to the inside wall of a refrigerator door structure and so positioned that it can be readily filled without the use of a funnel and wherein the tap providing an outlet for the cooler is so positioned extending to the outside of the cabinet that there is no opportunity for freezing to occur at the outlet.

Also among the objects of the invention is to provide a cool water reservoir so constructed that the contents will not splash about unnecessarily when attached to a refrigerator door which is frequently opened and closed and which is also cushioned in its mounting upon the door so that there will be no displacement or rattling when the door is closed.

Among the further objects of the invention is to provide a cool water reservoir for attachment to the inside of a refrigerator door which is provided with a water supply directly from the water main and which is so mounted on the door that the reservoir may be readily detached from the water supply line and removed from the door, together with an outlet tap for the reservoir for purposes of cleaning and replacement; there being provided in all forms of the invention auxiliary dead air spaces to compensate for any reduction in thickness of the normal insulation removed for the insertion of the reservoir in the wall of the cabinet.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth,

pointed out in the claims and illustrated in the accompanying drawings, in which:

Figure 1 is a vertical elevational view of the front of a refrigerator showing the position of the reservoir installed in a door,

Figure 2 is a vertical elevational view showing the upper part of the refrigerator door as viewed from the inside,

Figure 3 is a longitudinal section taken on the line 3—3 of Figure 2, drawn to a slightly larger scale,

Figure 4 is a top view in section on the line 4—4 of Figure 3,

Figure 5 is a fragmentary vertical section showing a modified type of filler spout.

Figure 6 is a vertical elevational view of a modified form of the device showing a connection to a water supply pipe,

Figure 7 is a fragmentary cross sectional view taken on the line 7—7 of Figure 6 showing the door in closed position and showing an open position for the door by dotted lines, and

Figure 8 is a fragmentary elevational view of the inside of the door showing a water supply connection for the reservoir of Figures 6 and 7.

In the past it has been sought to provide cool water reservoirs inside of refrigerator cabinets so arranged that the liquid contents could be drawn off by means of a tap extending to the outside of the cabinet. In the main, such cool water reservoirs have been permanently installed in the refrigerators so that they have not been accessible for cleaning and flushing or for ready and convenient replacement. When water is kept in a small container, such as a reservoir of this kind must be, if it is not used frequently deposits occur in the inside of the receptacle which give the water a smell and sometimes cause deterioration of the inside of the receptacle. It is also true that when receptacles are kept in an empty condition, the interior is likely to deteriorate and unless they can be removed for cleaning purposes, the entire installation might eventually have to be replaced.

The invention comprising the subject matter of this patent application is devoted to the purpose of providing an inexpensive cool water reservoir comprising a receptacle which can be detached from the refrigerator by merely loosening a pair of clamps so that the housewife may be able to remove it and wash it by ordinary means in a dishpan and then replace it before it is filled again with water to be cooled. In making such a receptacle completely removable, various factors must be taken into consideration, such, for

example, as having the tap though permanently attached to the receptacle removable with the receptacle without the use of wrenches. Also when a portion of the wall of the refrigerator is removed to make a place for the reservoir, thereby reducing the thickness of insulation, the loss of insulation must be compensated for in some way or other.

With these problems in mind, we have shown by our invention a conventional refrigerated cabinet 10 which may utilize either mechanical or ice refrigeration provided with side walls 12, a front wall 14 and a door 16 hinged at the edge 17. A door latch 18 is provided at the opposite side of the door. In a modification of our invention shown in Figure 1, a cool water reservoir 20 is shown mounted upon the door provided with a filling spout 22 and an outlet tap 24 by means of which cool water can be drawn from the reservoir outside the refrigerator cabinet.

The door 16, as best shown in Figure 3, is provided with an outer plate 25 forming the outside wall, an inner plate 26 forming an inside wall and a mass of insulation 27 between the outer and inner walls. In the inner wall is provided a recess 29 which, as shown in Figure 2, is slightly larger than the outside dimension of the reservoir and is designed to receive the reservoir so that it is substantially concealed within the door, though it is contemplated that where conditions may permit, the reservoir may protrude slightly beyond the inside wall of the door. Blocks or cushions 37 support the receptacle in the recess.

The reservoir itself consists of a receptacle having one side 30 within the recess and another side 31 facing the inside of the refrigerator cabinet. The receptacle has vertical side walls 32, a bottom 33 and a top wall 34. At the bottom of the receptacle is provided an outlet tap 35 herein shown to be of the push-button type which is secured to the receptacle by means of a suitable fitting 36 near the bottom. At the top of the receptacle is provided the filling spout 22 which is somewhat wider than it is deep in order that it may be readily filled by use of a pitcher without the necessity of using a funnel. The filling spout is provided with a normally closed cover 40 having a hinge 41 at the rear. A cut out recess 42 is provided at the front for convenience in lifting the cover. Inside the cover is an over-center spring device 43 secured at one end to the spout and at the other end to the cover in such a way that the expansion of the spring normally holds the cover closed but which will likewise hold the cover in a full open position, after the cover has been moved to open position, by a shifting of the position of the spring.

At the bottom of the recess surrounding the adjacent side 30 of the receptacle is provided a strip of resilient insulating material 50 which extends entirely around the recess. In addition, at the bottom of the recess surrounding the base of the tap 35 is an auxiliary ring 51 of the material for sealing the tap opening when the receptacle is in place within the recess. The strip 50, together with the ring 51, forms the desired dead air space 52 between the adjacent walls of the receptacle and recess, respectively, which compensates in part for the loss in insulation due to making a recess in the door. It has likewise been found beneficial to make the strip 50 of a somewhat resilient material so that it will cushion the movement of the receptacle relative to the door as the door is opened and closed.

It has been found further advantageous to surround the side walls of the recess with an insulating strip 53 so that an auxiliary dead air space 54 may be provided around the side walls respectively of the receptacle and the recess.

At the upper side of the recess there is provided a hollowed out portion 60 which is designed to receive the filler spout 22 so that it may be inset from the inside wall of the door. The insulating strips, of course, are designed to surround the receptacle adjacent the spout so that no insulating value may be sacrificed.

For securing the receptacle in position in the recess, there is provided cooperable spring clips 62 and 64 at the sides of the recess engaging respectively, a pair of shoulders 63 and 65 on the receptacle. Recesses 66 and 67 are provided to give a finger hold for manipulating the spring clips.

A tap aperture 70 extends through the door and is slightly larger in diameter than the maximum diameter of the tap to permit the tap to easily slide through the aperture. Adjacent the tap aperture is a depression 71 in the outside wall of the door and at the bottom of the depression is a shelf 72. The shelf provides a support for a tumbler, for example, as well as serving as a drip pan. The depression 71 permits setting the tumbler partially within the door so that there may be a protrusion of the shelf and tap outwardly from the door a distance no greater than the latch 18.

Under circumstances where it may be desirable to maintain a maximum insulating efficiency in the door structure adjacent the receptacle a filling spout of the type shown in Figure 5 may be used. A spout 22' extends outwardly from the inside wall 31 of the receptacle and then upwardly where it is provided with the regular cover 40. When constructed in this manner, the hollowed out portion 60 can be eliminated and the upper insulating strip 53 carried straight across the top of the receptacle.

In normal use, the receptacle is installed in the wall of a refrigerator, as shown in Figures 1, 2, 3 and 4, though, of course, it may be installed on one of the permanent side walls as well as on a swinging door. The spring clips 62 and 64 retain the receptacle in place in the recess against the cushioning and sealing strips 50. The tap 35 extends through the wall of the cabinet and the aperture giving access to the tap is properly sealed by means of the sealing ring 51. It has been found good practice to fasten the sealing and resilient strips to the walls of the recess so that the receptacle contains only metal parts and may be immersed in its entirety during the process of cleaning.

While the receptacle is in place on the door, it may be filled through the filling spout 22 at the top. The liquid in the receptacle is cooled in the ordinary way by the temperature of the inside of the box and cool water may be drawn off by means of the tap without the necessity of opening the door each time. When it is desired to remove the receptacle, it is only necessary to open the door, release the spring clips 62 and 64 and then withdraw the receptacle from the recess. At the same time, the tap 35 will slide out of the tap aperture past the surrounding sealing ring 51. The receptacle can then be cleaned by whatever method may be best. When it is desired to reinsert the receptacle, it can be replaced either full or empty by pushing it straight into the recess provided for it until the spring

clips 62 and 64 engage the respective shoulders 63 and 65. During insertion the tap is again slid through the aperture 70 and the surrounding sealing ring 51. When in place, by reason of the fact that the receptacle is relatively thin, even though it may be filled with a substantial quantity of water, there will be no undue splashing of the water as the door is opened and closed since there is little opportunity for the liquid to flow from front to back relative to the door.

On occasions where it may be desirable to have cool water under pressure, a modified form of the device may be found convenient. Such a modified form is illustrated in Figures 6, 7 and 8. Except for the details of the connection, by reason of which water from a regular pressure supply is introduced into the receptacle, the receptacle construction and the mounting upon the refrigerator door is essentially the same as described in the preferred form. When the pressure type is provided, it will, of course, not be necessary to provide the receptacle with a filling spout 22. The spring-clip construction for removably holding the receptacle in the door remains the same as does also the manner of providing strips for cushioning and insulating the recess provided for the receptacle.

In order to conduct tap water under pressure directly to the receptacle, there is shown a water supply pipe 80 connected to the conventional water main which extends as shown through the insulation at one side of the refrigerator cabinet. The supply pipe terminates in a fitting 81 at the front of the cabinet adjacent the side where the door is hinged. In the particular modification selected, the fitting 81 is, for the sake of convenience and appearance, concealed within the edge of the door to which the hinges are fastened. Connected to the fitting 81 is a swivel connection 82 of some conventional design and at the other side of the swivel connection is a tube or pipe line 83 for conducting tap water to the reservoir. It is found good construction to make the axis of the swivel connection in alinement with the axis of the door hinges so that all rotate about the same axis when the door is open.

At the side of the recess normally provided to receive the receptacle is a pocket 85 normally closed by a lid 86 here shown attached to the inside wall of the door by means of screws 87. The pipe 83 terminates in a detachable connection 88 which is designed to engage a fitting 89 on the receptacle. Within the fitting is a gooseneck 90 by means of which water is conducted from the connection to the top of the receptacle in order to prevent short circuiting of water freshly introduced into the receptacle directly to the outlet tap.

In order to maintain the insulating efficiency of the seal around the receptacle, it may be found advantageous to fill the space 91 with some insulating strip attached to the lid 86 so that when the lid is placed over the pocket, the entire space along the adjacent side wall of the receptacle will be filled with an insulating substance and the dead air space between the respective walls of the recess and the receptacle will remain intact.

A receptacle 20a described in Figures 6, 7 and 8, is normally positioned as there shown with the connection 88, 89 made up so that water from the water supply pipe 80 is introduced under pressure into the reservoir. When the tap is opened, cool water will be delivered under pressure. In the construction shown, the door may be freely opened and closed by reason of the presence of

the swivel connection 82 in the water supply line.

When it is desired to remove a receptacle of the sort thus described for cleaning purposes, it is necessary only to first remove the lid 86 by taking out the screws 87, then to uncouple the coupling 88, 89 and slide the portion 88 back along the tube or pipe line 83, then disengage the spring clips 62 and 64 and remove the receptacle as previously described. After washing and cleaning, the receptacle can then be returned to its position in the recess, the connection 88, 89 remade and the lid 86 placed back over the pocket 85. The water supply pipe in the meantime will, of course, be shut off by a valve or tap of the usual kind, not shown.

There has thus been provided a removable cool water reservoir for refrigerators which is quick and convenient to install and which can be readily removed for cleaning and then replaced whether the source of water be intermittent or continuous and under pressure.

Some changes may be made in the construction and arrangement of the parts of the device without departing from the real spirit and purpose of the invention, and it is our intention to cover by the claims any modified forms of structure, or use of mechanical equivalents, which may be reasonably included within their scope.

We claim as our invention:

1. In a refrigerator cabinet wall structure including outer and inner plates and insulating material therebetween the combination of a removable liquid reservoir comprising a relatively thin receptacle having a tap adjacent the bottom and a normally closed filling aperture at the top of said receptacle, said wall structure having a recess in the inner plate slightly larger than the outside dimensions of said receptacle, said receptacle being positioned in the recess, a sealing strip around the recess forming a dead air space between the bottom thereof and the receptacle when in place and releasable engaging elements on the walls of said receptacle and said inner plate respectively for releasably securing the receptacle to the wall.

2. In a refrigerator cabinet door structure including outer and inner plates and insulating material therebetween the combination of a removable liquid reservoir comprising a relatively thin receptacle having a tap adjacent the bottom and a normally closed filling aperture at the top of said receptacle, said door having a recess in the inner plate slightly larger than the outside dimensions of said receptacle, said receptacle being positioned in the recess, a sealing strip around the recess forming a dead air space between the bottom thereof and the receptacle when in place and releasable engaging elements on the walls of said receptacle and said recess respectively located between the strips and the inside edge of the recess for releasably securing the receptacle to the door.

3. In a refrigerator cabinet door structure including outer and inner door plates and insulating material therebetween the combination of a removable liquid reservoir comprising a relatively thin receptacle having an outwardly projecting tap adjacent the bottom and a normally closed filling aperture at the top of said receptacle, said door having an aperture therethrough adjacent the tap limited to a size slightly larger in cross sectional area than the outside cross sectional area of said tap to permit said tap to extend to the outside of the cabinet, said door having a recess in the inner plate slightly greater in

height and width than the corresponding dimensions of said receptacle, said receptacle being normally positioned in the recess, a sealing strip around the recess forming a dead air space between the walls of the recess and the receptacle respectively a secondary sealing ring around said tap aperture sealing off said dead air space and releasable engaging elements on the walls of said receptacle and said recess respectively for releasably holding the receptacle in the recess.

4. In a refrigerator cabinet door structure including outer and inner walls and insulating material therebetween the combination of a removable liquid reservoir comprising a relatively thin receptacle having an outwardly projecting tap adjacent the bottom and a normally closed filling aperture at the top of said receptacle, said door having an aperture therethrough adjacent the tap limited to a size slightly larger in diameter than the outside diameter of said tap to permit said tap to extend through the door to the outside of the cabinet, a depression adjacent the aperture and a shelf at the bottom of the depression, said door having a recess in the inner wall slightly greater in height and width than the corresponding dimensions of said receptacle, said receptacle being normally positioned within the recess, a sealing strip around the bottom of the recess forming a dead air space between the bottom thereof and the adjacent side of the receptacle when normally positioned, a seal forming a sliding fit around the tap aperture in contact with the tap and the adjacent receptacle wall, and spring pressed engaging elements on the walls of said receptacle and said door respectively for releasably holding the receptacle in the recess.

5. In a refrigerator cabinet door structure including outer and inner walls and insulating material therebetween the combination of a removable liquid reservoir comprising a relatively thin receptacle having an outwardly projecting tap adjacent the bottom and a normally closed filling spout at the top of said receptacle, said door having an aperture therethrough adjacent the tap limited to a size only slightly larger in diameter than the outside dimension of said tap to permit said tap to extend through the door to the outside of the cabinet, a relatively shallow depression adjacent the aperture and below the lower edge of said reservoir and a shelf at the bottom of the depression extending outwardly relative to the face of the door, said door having a recess in the inner wall slightly greater in height and width than the corresponding dimensions of said receptacle normally receiving the receptacle therein, and a pocket adjacent the top of said recess for reception of said filling spout, a sealing strip around the bottom of the recess supporting said reservoir and forming a dead air space between the bottom of the recess and the adjacent side of the receptacle when in normal position, a seal around the tap aperture in contact with the tap and the adjacent receptacle wall when in normal position, sealing strips around the walls of the recess forming an auxiliary dead air space between the receptacle walls and adjacent walls of the recess and spring pressed engaging elements on the walls of said receptacle and said door respectively outside of said dead air spaces for releasably holding the receptacle on the door.

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