

April 8, 1969

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3,436,928

ICEMAKER WITH VARIABLE CAPACITY ICE STORAGE RECEPTACLE

Filed Oct. 31, 1967

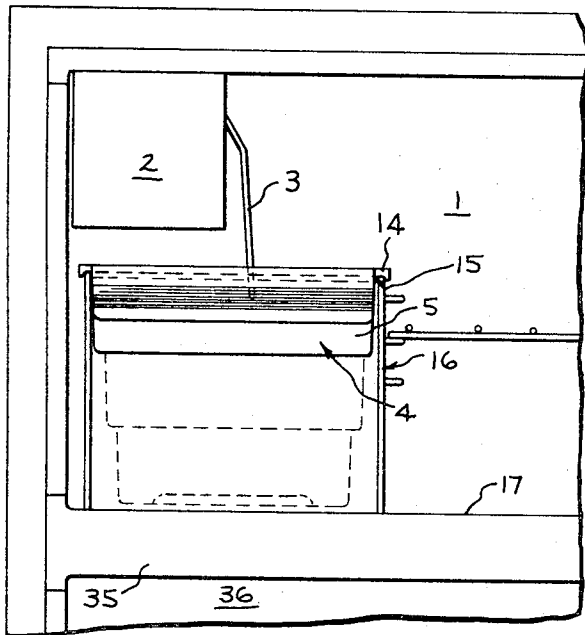


FIG. 1

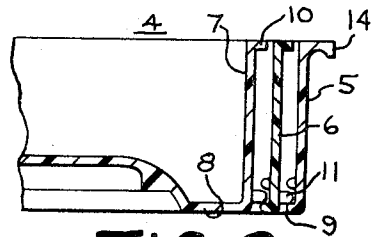


FIG. 2

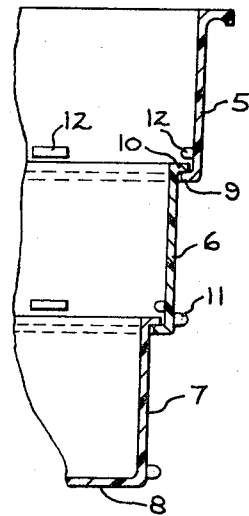


FIG. 3

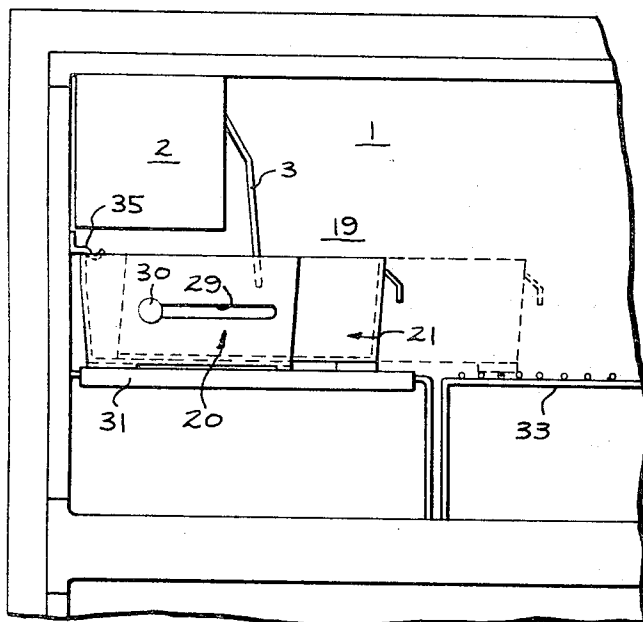


FIG. 4

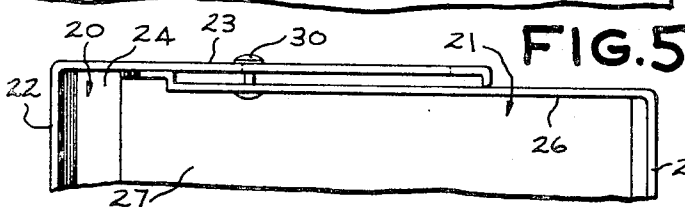


FIG. 5

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3,436,928

ICEMAKER WITH VARIABLE CAPACITY ICE STORAGE RECEPTACLE

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Filed Oct. 31, 1967, Ser. No. 679,330
Int. Cl. F25c 1/00, 5/18; B65d 7/24

U.S. Cl. 62-137

7 Claims

ABSTRACT OF THE DISCLOSURE

A refrigerator containing an automatic ice service including an automatic icemaker having an ice level sensing member for sensing a predetermined level of ice in a variable storage volume receptacle and means for supporting a portion of the receptacle relative to the sensing member for operation thereof regardless of the selected receptacle storage volume.

Background of the invention

The present invention relates particularly to automatic icemakers for household refrigerators. Such icemakers normally include means for automatically filling a plurality of mold cavities with water, discharging ice pieces formed in the cavities into a storage receptacle and ice level sensing means for terminating the automatic operation of the icemaker when a predetermined level of ice in the storage receptacle is sensed by the sensing means. Icemakers of this type are shown and described in Patents 2,970,453, Harle et al., and 3,331,215, Shaw. One of the principal customer complaints concerning such automatic ice services has concerned the storage volume or capacity of the receptacles. Some users object to a given receptacle as being too small in that it does not store a sufficient number of ice pieces to meet the user's daily consumption. Other users will object to the same receptacle on the grounds that its storage capacity substantially exceeds the user's ice requirements and that this excess capacity could better be used for the storage of other freezer compartment items.

Summary of the invention

In accordance with the present invention there is provided a household refrigerator automatic icemaker including a variable storage volume receptacle by means of which the user can select a storage capacity more closely matching the user's average or immediate ice piece requirements. The receptacle is so designed and supported relative to the ice level sensing means that, regardless of the capacity selected, the sensing means will interrupt the automatic operation of the icemaker when the receptacle is filled with ice pieces. To this end, there is provided a receptacle including a first section forming at least part of an upper wall portion of the receptacle, a second section movable relative to the first section to vary the total storage volume of the receptacle and means for supporting the first section relative to the icemaker sensing means so that the icemaker is de-energized when the ice stored in the receptacle reaches a predetermined level regardless of the selected capacity thereof.

Brief description of the drawing

With reference to the accompanying drawing:

FIGURE 1 is a front view of a portion of a refrigerator cabinet incorporating one embodiment of the present invention;

FIGURE 2 is a front sectional view of a portion of the variable volume receptacle forming part of the ice service illustrated in FIGURE 1 in its minimum volume state;

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FIGURE 3 is a view of the same receptacle expanded for maximum capacity;

FIGURE 4 is a view similar to FIGURE 1 illustrating a second embodiment of the present invention; and

FIGURE 5 is a top view of a portion of the ice storage receptacle illustrated in FIGURE 4 of the drawing.

Description of the preferred embodiments

With reference to FIGURE 1 of the drawing, there is illustrated a household refrigerator comprising a freezer compartment 1 having an access opening at the front thereof closed by a door (not shown). Within the upper portion of the freezer compartment 1, there is mounted an automatic icemaker 2 which may be of any of the well-known types presently provided in household refrigerators for the automatic production of ice pieces for storage in a receptacle positioned below or adjacent the icemaker and which includes a sensing means or member for interrupting the automatic operation of the icemaker when the ice in the receptacle reaches a predetermined level relative to the sensing means. In the illustrated icemaker this sensing member comprises a feeler arm or member 3 which is periodically reciprocated by the icemaker operating mechanism from a normal position extending into the top of the receptacle to an elevated position above the receptacle and back to its normal position. The control means associated with or operated by the feeler arm 3 is designed to interrupt the operation of the icemaker when the accumulated ice in the receptacle prevents the arm from returning to its lower or normal position. For a more detailed description of an icemaker including such a feeler arm reference is made to the aforementioned Patent 3,331,215, Shaw.

In accordance with the present invention, there is provided a variable capacity receptacle whereby the total amount of stored ice pieces can be more closely matched to the user's anticipated requirements. In the form of the invention illustrated in FIGURES 1, 2 and 3 of the drawing, this variable volume receptacle, generally indicated by the numeral 4, is designed to provide a selection of three different storage capacities and comprises three vertically telescoping coaxial wall sections in the form of rectangular tubes. More specifically, it includes an upper section 5 forming the top wall portion of the receptacle, an intermediate section 6 and a lower or bottom section 7. The bottom section includes an enclosure 8 forming the bottom wall of the receptacle. The bottom edge of each of the sections 5 and 6 terminates in an inwardly projecting rib or flange 9 while the upper edge of each of the sections other than the top section terminates in an outwardly projecting rib 10. When the various wall sections are moved to their expanded positions as shown in FIGURE 3, these respective ribs or flanges engage one another and cooperate to prevent separation of the individual sections.

For the purpose of locking the various sections in their desired positions when the receptacle is collapsed or only partially expanded, the intermediate section 6 and the lower section 7 are provided with outwardly extending spaced lugs 11 which are designed to cooperate with the inwardly projecting rib 9 on the bottom edge of an adjacent wall section to retain the wall sections in their desired relative positions. These lugs 11 are preferably positioned inwardly from the corners of the respective sections and the sections are made of a somewhat flexible plastic or equivalent material so that the lower edge portions of the open rectangular sections 5 and 6 including the flanges 9 can flex a sufficient amount to pass the lugs 11 as the receptacle is adjusted to its various storage capacities. Also if desired, inwardly extending lugs 12 may be provided on the interior surfaces of the sections 5 and 6 in a posi-

tion to overlie the flange 10 and lock the various adjacent sections in their various relative positions.

In order that the receptacle 4 will be operatively positioned relative to the sensing members 3 regardless of the selected storage capacity thereof, the receptacle is removably supported below the icemaker 2 by means of slides 14 provided on the opposite side edges of the upper wall section 5 adapted to slide on and be supported by horizontally extending guides 15 forming part of a wire frame structure 16 resting on the bottom wall 17 of the freezer compartment 1. By this means, the receptacle is supported solely by means forming part of its upper wall section 5 which constitutes a top wall portion of the receptacle and the sensing member 3 will therefore interrupt the automatic operation of the icemaker 2 to prevent overflow of ice pieces from the receptacle whenever the receptacle is filled with ice and regardless of the selected capacity thereof.

Thus the user may completely collapse the receptacle 4 as shown in FIGURE 2 and thereby select the minimum storage capacity represented generally by the capacity of the lower section 7, partially expand the receptacle to obtain the combined storage volumes of two of the sections or completely expand the receptacle as shown in FIGURE 3 to obtain maximum ice storage capacity. Of course, when the receptacle is in any form other than its completely expanded form, additional freezer compartment storage volume for other freezer items is available below the receptacle.

In the embodiment of the invention illustrated in FIGURES 4 and 5 of the drawing, a variable volume receptacle generally indicated by the numeral 19 comprises two interfitting horizontally telescoping sections 20 and 21. The member 20 includes an end wall 22 and opposed side walls 23 and a bottom wall 24 while the section 21 includes an end wall 25, opposed side walls 26 and a bottom wall 27. The cross-sectional dimensions of the section are smaller than the dimensions of the section 20 so that it can be telescopically received within the section 20. Any suitable means may be provided for slidably securing the two sections together. One means, as illustrated, comprises horizontal slots 29 in the opposed side walls 23 of the section 20 and pins 30 extending through the slots 29 and the adjacent side walls 26 of the section 21.

In its contracted position, the receptacle 19 is supported on a fixed shelf 31 below the icemaker 2 in a position in which the sensing member 3 can sense the level of ice therein. When the section 21 is slid horizontally relative to the section 20 to its dotted line position to provide an increased storage capacity, its outer end may be supported, as shown in FIGURE 4, on a removable shelf 33.

Also if desired, a latch means 35 may be provided for overlying and anchoring the end 22 of the section 20 to the adjacent side wall of the freezer compartment 1 and thereby assure that the wall portion represented by the section 20 is properly positioned below the icemaker 2 or more specifically with reference to the sensing member 3 for proper operation of the sensing member regardless of whether or not the receptacle 19 is in contracted or expanded condition.

While the invention has been described with specific reference to a refrigerator comprising a fixed volume freezer compartment, it will be obvious that it may also be used in a refrigerator including means for varying the volume of the freezer compartment 1. In such a refrigerator, the partition 35 separating the freezer compartment 1 from the fresh food compartment 36 is, in accord-

ance with the well known practice, movably supported within the refrigerator cabinet for adjustment of its vertical position. In such a refrigerator, the variable capacity ice receptacle is preferably supported by support means secured to the side walls or rear walls of the freezer compartment rather than on the partition 35.

While the invention has been described with reference to a specific embodiment thereof, it will be understood that it is not limited thereto and it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A refrigerator including a freezer compartment containing an automatic icemaker and an receptacle for storing ice pieces produced by said icemaker, said icemaker including a sensing member for de-energizing said icemaker at a predetermined level of ice in said receptacle;

said receptacle including a first section forming at least part of the upper wall portion of said receptacle and a second section movable relative to said first section to vary the storage volume of said receptacle, and means for supporting said first section relative to said sensing means whereby said icemaker is de-energized when the ice in said first section reaches said predetermined level.

2. The refrigerator of claim 1 in which said receptacle comprises a plurality of vertically telescoping sections.

3. The refrigerator of claim 1 in which said sensing member comprises a pivoted feeler arm movable relative to said receptacle.

4. The refrigerator of claim 1 in which said receptacle sections are horizontally movable relative to one another and said first section is supported on a fixed support below said icemaker.

5. A refrigerator including a freezer compartment containing an automatic icemaker and a receptacle removable from said compartment for storing ice pieces produced by said icemaker, said icemaker including a sensing member for de-energizing said icemaker at a predetermined level of ice in said receptacle;

said receptacle being a variable storage capacity receptacle and including a first section forming at least part of the upper wall portion of said receptacle and a second section movable relative to said first section to vary the storage volume of said receptacle, and means for removably supporting said first section relative to said sensing means whereby said icemaker is de-energized when the ice in said first section reaches said predetermined level.

6. The refrigerator of claim 5 in which said receptacle comprises a plurality of vertically telescoping sections.

7. The refrigerator of claim 6 in which said upper section includes outwardly extending horizontal slides and said slides are supported on a support including cooperating horizontal guides.

References Cited

UNITED STATES PATENTS

2,812,875 11/1957 Buzicky et al.----- 220—8

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U.S. Cl. X.R.

62—344; 220—8