

[54] **STATIONARY MOLD ICE MAKER
WITH THE BOTTOM EJECTOR**

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[51] Int. Cl. F25c 1/04

[58] Field of Search 425/444; 249/74; 62/353, 71

[56] **References Cited**

UNITED STATES PATENTS

3,398,553 8/1968 Latter et al. 62/71 X

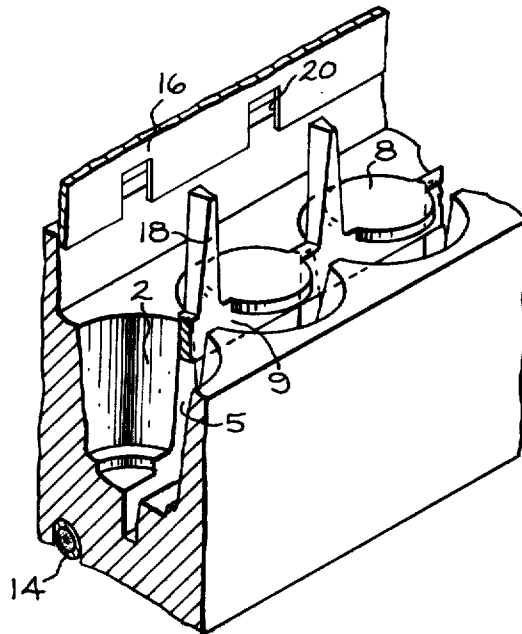
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[57] **ABSTRACT**

An ice maker comprising a mold containing a plurality of longitudinally spaced cavities connected by vertical passages and a vertically movable ejection means including a member extending through the passages. The ejection means includes upwardly extending dividers substantially filling the passages when the ejection means is in its normal or lower position to limit the formation of ice in the passages.

6 Claims, 4 Drawing Figures



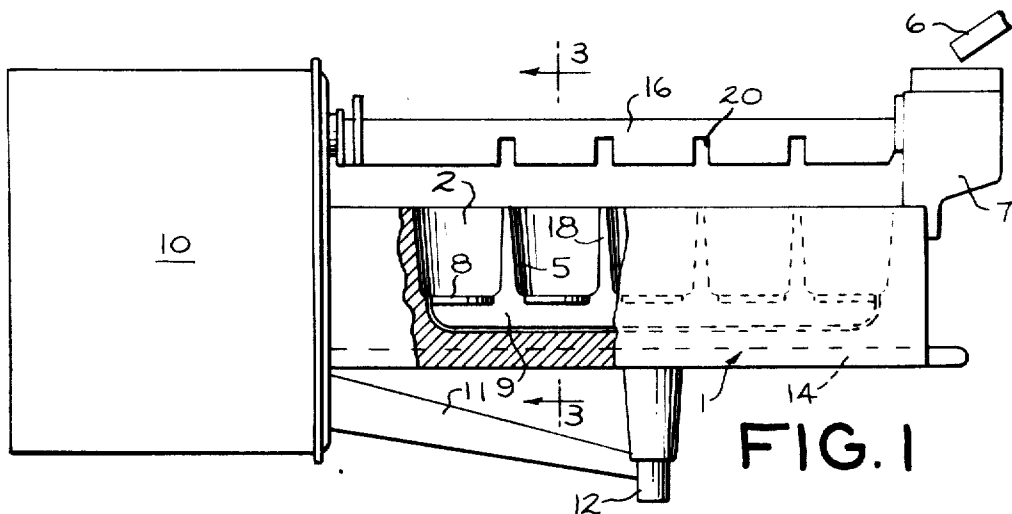


FIG. 1

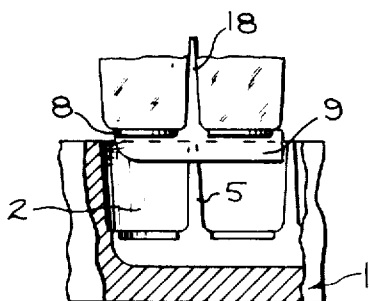


FIG. 2

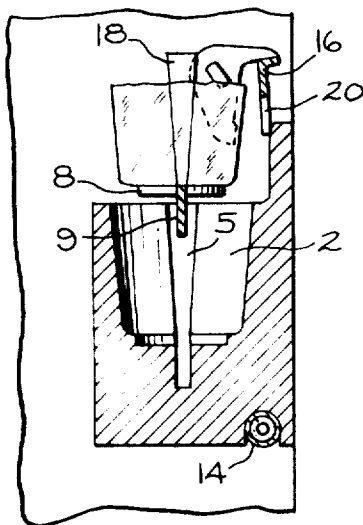


FIG. 3

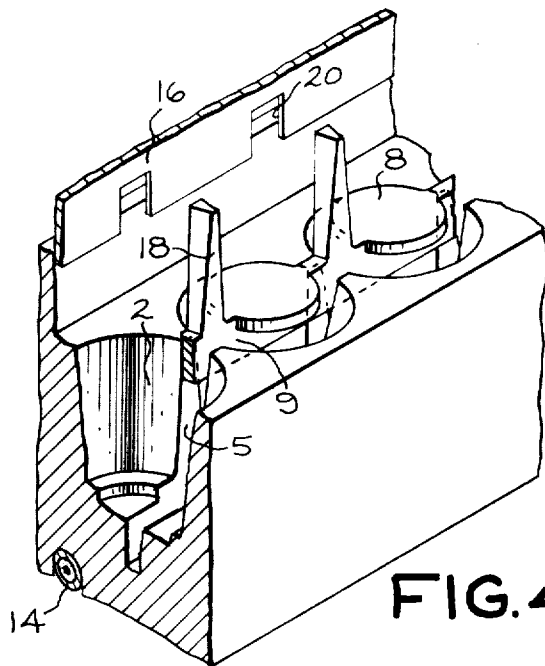


FIG. 4

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STATIONARY MOLD ICE MAKER WITH THE BOTTOM EJECTOR

BACKGROUND OF THE INVENTION

The present invention relates to an automatic ice maker for use in household refrigerators, the ice maker being of the type shown and described in U.S. Pat. Nos. 3,163,017 Baker et al. and 3,163,018 Shaw issued Dec. 29, 1964. An ice maker of this type comprises a mold including a plurality of cavities spaced from another with each of the walls between adjacent cavities having a passage extending from the top to the bottom thereof for distributing a charge of water between the cavities. The ice maker further includes a motor driven ejecting means comprising pads normally positioned in the lower portion of the cavities and movable to a position adjacent the top of the mold for ejecting the ice pieces from the cavities. These pads are connected to one another by a member extending through the passages.

The dice pieces formed in the cavities are interconnected by webs of ice formed in the passages. Some of these webs are broken during ejection and discharge of ice pieces from the mold into a storage receptacle. When this storage receptacle includes an automatic ice dispensing means such as that described and claimed in U.S. Pat. No. 3,422,994 Alvarez issued Jan. 21, 1969, it is desirable for proper operation of the dispenser that none of the ice pieces in the receptacle be interconnected.

It is a general object of the present invention to provide an ice maker of the aforementioned type designed to produce and discharge individual ice pieces.

SUMMARY OF THE INVENTION

In accordance with the present invention, the ejection means of a multiple-cavity ice maker of the above described type is provided with dividers extending upwardly therefrom within and substantially filling the passages when the ejection means is in its normal or lowered position to thereby substantially limit the formation in the passages of ice webs interconnecting the ice pieces formed in adjacent cavities. In accordance with a preferred embodiment of the invention, both the passages and the dividers are of complimentary V-shaped.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

FIG. 1 is an elevational view, partly in section, of an ice maker embodying the present invention;

FIG. 2 is a view of a portion of the mold structure of FIG. 1 illustrating the position of certain components during the ejection of ice pieces;

FIG. 3 is a vertical transverse sectional view taken along line 3—3 of FIG. 1; and

FIG. 4 is a perspective view of a portion of the ice maker mold structure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With initial reference to FIG. 1 of the drawing, there is shown an automatic ice maker comprising a mold 1 adapted to be supported on a wall of the freezer compartment of a household refrigerator. The mold includes a plurality of ice cavities 2 arranged in a straight

line longitudinally of the mold and separated from one another by wall portions each of which includes a vertical passage 5 extending from the top to the bottom of the cavities. These aligned vertical passages provide means for the flow of water from one cavity to another during the mold filling operation which involves the introduction of a charge of water from an outlet 6 into a water inlet member 7 adapted to discharge water into one of the end cavities 2.

Means for ejecting ice pieces from the cavities include a plurality of pads 8 which to a substantial extent form the bottoms of the cavities 2 and which are interconnected by an elongate member or bar 9 slideably received within the passages 5. The passages 5 also guide the bar in the operation of the ice maker to eject ice pieces.

Power and control means for operating the ice maker are generally contained within a housing 10 secured to one end of the mold and include a motor (not shown) connected through a drive means including a lever 11 and a rod 12 to the ejector means or more specifically to the member 9. The dice maker also includes a heater 14 for warming the mold to thaw or break the bond between the ice pieces and the cavity walls prior to operation of the injection means. After the ice pieces have been raised by the pads to a position substantially above the mold cavities, an elongated rake or sweep 16 pivotally supported above the upper surface of the mold and along the rear edge thereof, that is along the rear side of the cavities, is designed to move across the top of the cavities and sweep ice pieces into a storage receptacle.

As described in the above mentioned Shaw and Baker et al. patents to which reference is made for a more detailed description of the operating components of the ice maker, the automatic operating cycle of an ice maker of this type comprises filling of the cavities 2 with a charge of water, freezing of the charge of water into ice, heating of the mold by means of the heater 14 to free the formed ice pieces from the cavities, ejection of the ice pieces by movement of the ejection means including the pads 8 from their normal lower position in the bottom of the cavities to a raised position slightly above the upper surface of the mold as illustrated in FIG. 2 of the drawing. Pivotal movement of the sweep 16 across the top of the mold then effects engagement of the sweep with the ejected ice pieces to discharge the ice pieces from the mold. Thereafter the sweep returns to its normal position and the pads are lowered to their normal position during which time another charge of water is introduced into the cavities.

The charge of water introduced into the mold flows through the various passages 5 and is evenly distributed between the cavities 2. When the ice maker has the cavity, passage and ejector configuration and arrangement of the type disclosed in the aforementioned Shaw and Baker et al. patents the ice pieces ejected from the mold are interconnected by webs of ice formed by the freezing of the water within the passages 5.

In accordance with the present invention, means are provided for eliminating formation of the substantial amount of ice within the passages 5. To this end the ejector means includes a plurality of dividers 18 extending upwardly from the elongate member 9 within the passages 5. The dividers 18 are designed to substan-

tially fill the passages 5 when the ejector means is in its normal or lower position. Preferably, the passages 5 and the dividers 18 are V-shaped for maximum contact between their mating surfaces when the ejector means is in its normal position and to prevent mechanical binding during vertical movement of the dividers relative to the passage walls. In addition, as shown in FIG. 5 of the drawing, the dividers 18 preferably taper slightly in a forward direction, that is from the rear or sweep side of the mold to the forward edge thereof, to facilitate an easier breaking away of the ice cubes from the dividers under the action of the sweep 16.

By employing dividers 18 for substantially filling the passages 5 when the ejector means is in its lower or normal position, there is at the most only a thin film of water between the front and the back sides of the dividers and the adjacent side walls of the passage 5 for the formation of ice. Most of this ice is melted when the heater 14 is energized to free the ice pieces from the mold cavities and to this end it is desirable that the dividers as well as the remaining portions of the ejector means be composed of metal. After the heat release of the ice pieces, the ejector means moves upwardly to the position shown in FIGS. 2, 3 and 4 of the drawing after which the ice pieces are swept from the pads by action of the sweep means 16. The sweep means 16 is also provided with space slots 20 adapted to accommodate or receive the dividers 18 as the sweep pivots forwardly into engagement with the ice pieces. In the event any of the ice pieces remain frozen to the adjacent sides of the dividers 18, a slight forward draft of the dividers, that is, a back-to-front taper of the dividers, as illustrated in FIG. 4 of the drawing assists in the breaking away of the ice pieces from the dividers under the force of the sweep means.

Since the dividers 18 substantially seal the passages 5 during the ice freezing portion of the cycle, it is advisable to introduce a fresh charge of water into the mold between the time that the previously formed ice pieces are ejected therefrom and the time that the ejector means including the pads 8 return to the lower position. The water introduced into an end cavity can then become evenly distributed between the cavities before the dividers 18 have returned to a position in which they substantially seal the passages 5.

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

What is claimed is:

1. An ice maker comprising:

a mold containing a plurality of longitudinally spaced cavities connected by vertical passages in the walls separating adjacent cavities;

said ice maker including vertically movable ejection means comprising an elongate member extending through said passage, said ejection means being movable from a normal position adjacent the bottoms of said passages to an upper position adjacent the tops of said passages for ejection of the ice pieces from said cavities;

said ejection means including dividers extending upwardly from said elongate member said dividers being within and substantially filling said passages when said ejection means is in its normal position to thereby substantially limit the formation in said passages of ice webs interconnecting ice pieces formed in said cavities.

2. An ice maker according to claim 1 in which said passages and dividers are V-shaped.

3. An ice maker according to claim 1 including means for introducing a charge of water into said mold while said ejecting means is in an elevated position.

4. An ice maker according to claim 1 in which said ice maker includes means adjacent the rear side of said mold for discharging ejected ice pieces from said mold and said dividers taper horizontally towards the front side of said mold.

5. An ice maker comprising:

a mold containing a plurality of longitudinally spaced cavities and having vertical passages in the walls separating adjacent cavities, said passages extending from the top towards the bottoms of said cavities;

said ice maker including vertically movable ejection means comprising pads normally forming bottom wall portions of said cavities and an elongate member connecting said pads and extending through said passages, said ejection means being movable to an upper position adjacent the tops of said cavities for ejection of the ice pieces from said cavities;

said ejection means including upwardly extending dividers on said elongate member, said dividers being positioned within and substantially filling said passages when said pads are in their normal position to thereby substantially limit the formation in said passages of ice webs interconnecting ice pieces formed in said cavities.

6. An ice maker according to claim 5 in which said passages and dividers are V-shaped and said dividers are substantially V-shaped in horizontal cross section.

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