

Jan. 8, 1957

A. R. CLARK ET AL

2,776,546

ICE CUBE TRAY

Filed Aug. 6, 1953

FIG. 1

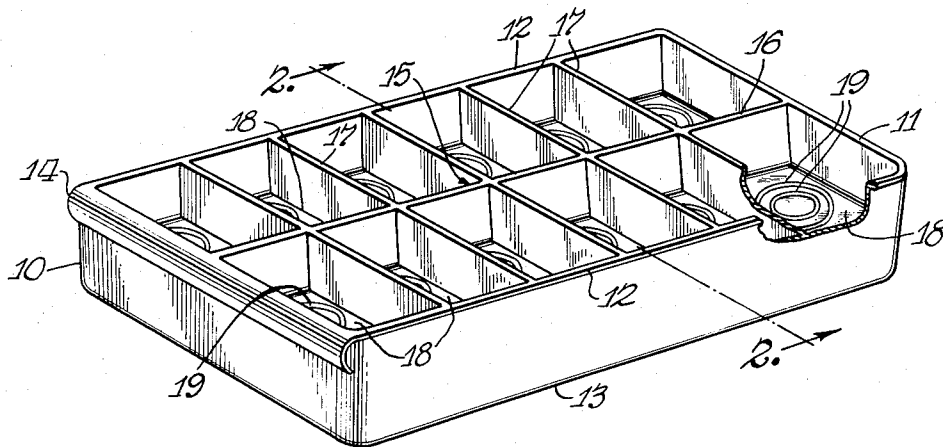


FIG. 2

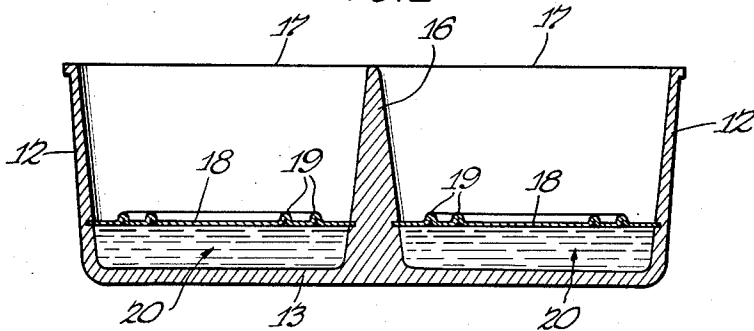
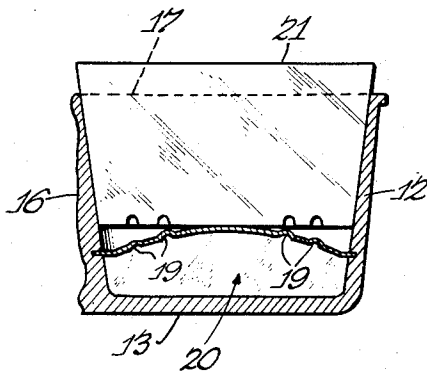


FIG. 3



INVENTORS
ADNA R. CLARK
ERIC H. SCHWENKER

Paul O. Pippel

ATTORNEY

1

2,776,546

ICE CUBE TRAY

Adna R. Clark and Eric H. Schwenker, Evansville, Ind.,
assignors, by mesne assignments, to Whirlpool-Seeger
Corporation, a corporation of Delaware

Application August 6, 1953, Serial No. 372,672

1 Claim. (Cl. 62—108.5)

This invention relates generally to refrigeration systems and more particularly to an improved refrigerator ice cube tray.

As is well known in the art the problem of providing means for easy removal or loosening of ice cubes from a refrigerator ice cube tray has been a difficult one. Therefore it is an object of this invention to provide a refrigerator ice cube tray wherein the ice cubes may be easily removed.

It is a feature of this invention that a eutectic solution is used to facilitate the easy removal of ice cubes from a refrigerator ice cube tray.

Other objects and features of the present invention will be apparent upon a perusal of the following specification and drawing of which:

Figure 1 is an isometric view of the preferred embodiment of the present invention;

Figure 2 is a cross-sectional view of the embodiment shown in Figure 1 taken along the line 2—2; and

Figure 3 is a partial cross-sectional view of the section shown in Figure 2, additionally showing the operation of the present embodiment.

The present embodiment is the preferred embodiment, but it is to be understood that changes can be made in the present embodiment by one skilled in the art without departing from the spirit and scope of this invention.

For a detailed description of the present invention reference is made to the drawing. A refrigerator ice cube tray is provided having a front wall 10, a rear wall 11, side walls 12, and a bottom wall 13. A handle 14 may be provided for the removal of the ice cube tray from a refrigerator. An ice cube grid 15 is provided as an integral portion of the ice cube tray. The ice cube grid 15 comprises a longitudinal wall 16 and a plurality of transverse walls 17. The ice cube grid 15 and the ice cube tray, namely the longitudinal wall 16, the transverse walls 17, the front wall 10, the rear wall 11, the side walls 12, and the bottom wall 13, are formed as a unitary structure of any material capable of supplying substantial rigidity to the structure. The material of the unitary structure is preferably a material having good heat conductivity, such as aluminum. The ice cube grid 15, and the walls 10, 11 and 12, are formed to have surfaces inclined from the vertical so that the lower portions thereof are substantially thicker than the upper portions thereof, whereby the lower portions thereof are substantially more rigid than the upper portions. The inclined surfaces facilitate removal of ice cubes formed in the tray.

Within the rigid unitary structure described above, a plurality of plates or false bottoms 18 are mounted, as can easily be seen in Figure 2. One false bottom 18 is mounted within each chamber formed by the ice cube grid 15 and the ice cube tray. The false bottoms 18 are formed of any resilient material such as a spring steel, brass, plastic or rubber. Each of the false bottoms is mounted in a sealed relationship to the walls of the chamber wherein the false bottom 18 is mounted.

2

To facilitate easy deformation or flexing of each of the false bottoms 18 when fixedly mounted within the various compartments, a plurality of circular ribs 19 are formed therein.

It may thus be seen that each chamber defined by the ice cube grid 15 and the ice cube tray is divided into an upper and a lower chamber by each of the false bottoms 18. The lower chambers, beneath the false bottoms 18, are each completely filled with an eutectic solution 20. Any eutectic solution well known in the art may be used which has a lower freezing point than that of the water used for making ice cubes, and above the normal refrigerator compartment temperature wherein the ice cube tray is placed for forming of the ice cubes.

To describe the operation of the present invention reference is particularly made to Figure 3 of the drawing. When ice cubes are to be made, water used for ice cube making is disposed within each of the upper compartments above the false bottoms 18. The ice cube tray is then placed within a refrigerator for freezing of the water and the eutectic solution therein. The water which has a higher freezing temperature than the eutectic solution will be frozen first and the ice cubes will be formed. At some period of time thereafter, the eutectic solution 20 will freeze. The expansion of the eutectic solution 20 will cause an upward bowing of the flexible false bottoms 18, and the upward bowing of each of the false bottoms 18 will release and raise each of the ice cubes formed in the tray from the walls of the tray. An example of such an ice cube is designated with the character 21 in Figure 3. The loosened and raised ice cube 21 may then be easily removed from the ice cube tray.

After the ice cubes have been removed from the tray, the tray is heated to melt the eutectic solution 20. Upon a melting of the eutectic solution 20 the false bottoms 18 will restore to assume a substantially flat shape and the tray may again be filled with water for the further production of ice cubes.

Having described the invention what is considered new and desired to be protected by Letters Patent is:

An article of manufacture comprising a container having front, back and two side walls, a flat bottom and a plurality of partitions integrally formed therein, said partitions being disposed to cooperate with the walls and bottom of said container to provide a plurality of individual compartments adapted to receive a liquid therein, said front, back and side walls and said partitions all being formed with the lower portions thicker than the upper portions thereof and being disposed so that all the inner surfaces of the walls of each compartment are inclined outwardly, said container and partitions being fashioned of rigid material and as a unitary structure, a plurality of resilient false bottoms having a plurality of ribs formed on upper surfaces of each thereof, said resilient false bottoms being mounted one each in said compartments and being secured to the walls of their respective compartments in a sealed relationship therewith by having each false bottom extending on all of its four sides into an engaging peripheral, inwardly open groove in each of the four walls of each ice cube cavity, said false bottoms being disposed so as to divide each of said compartments into an upper compartment adapted for directly receiving water for freezing therein and a lower sealed compartment, an eutectic solution disposed to completely fill each of said lower compartments below said resilient false bottoms, said eutectic solution having a freezing point lower than the freezing point of any water disposed within said upper compartments, whereby ice cubes are formed in said upper compartments and said eutectic solution is thereafter frozen to bow said resilient false bottoms upwardly

to loosen and raise the ice cubes from said upper compartments when said container and any water disposed therein is subjected to a temperature below the freezing temperature of said eutectic solution.

References Cited in the file of this patent

UNITED STATES PATENTS

2,037,417 Hull ----- Apr. 14, 1936

5

2,181,593
2,287,941
2,341,700
2,342,743
2,345,453
2,389,317
2,415,451

Whitaker ----- Nov. 28, 1939
McGuffey ----- June 30, 1942
Diack ----- Feb. 15, 1944
Lutes ----- Feb. 29, 1944
Brace ----- Mar. 28, 1944
Kitto ----- Nov. 20, 1945
Synnestvedt ----- Feb. 11, 1947