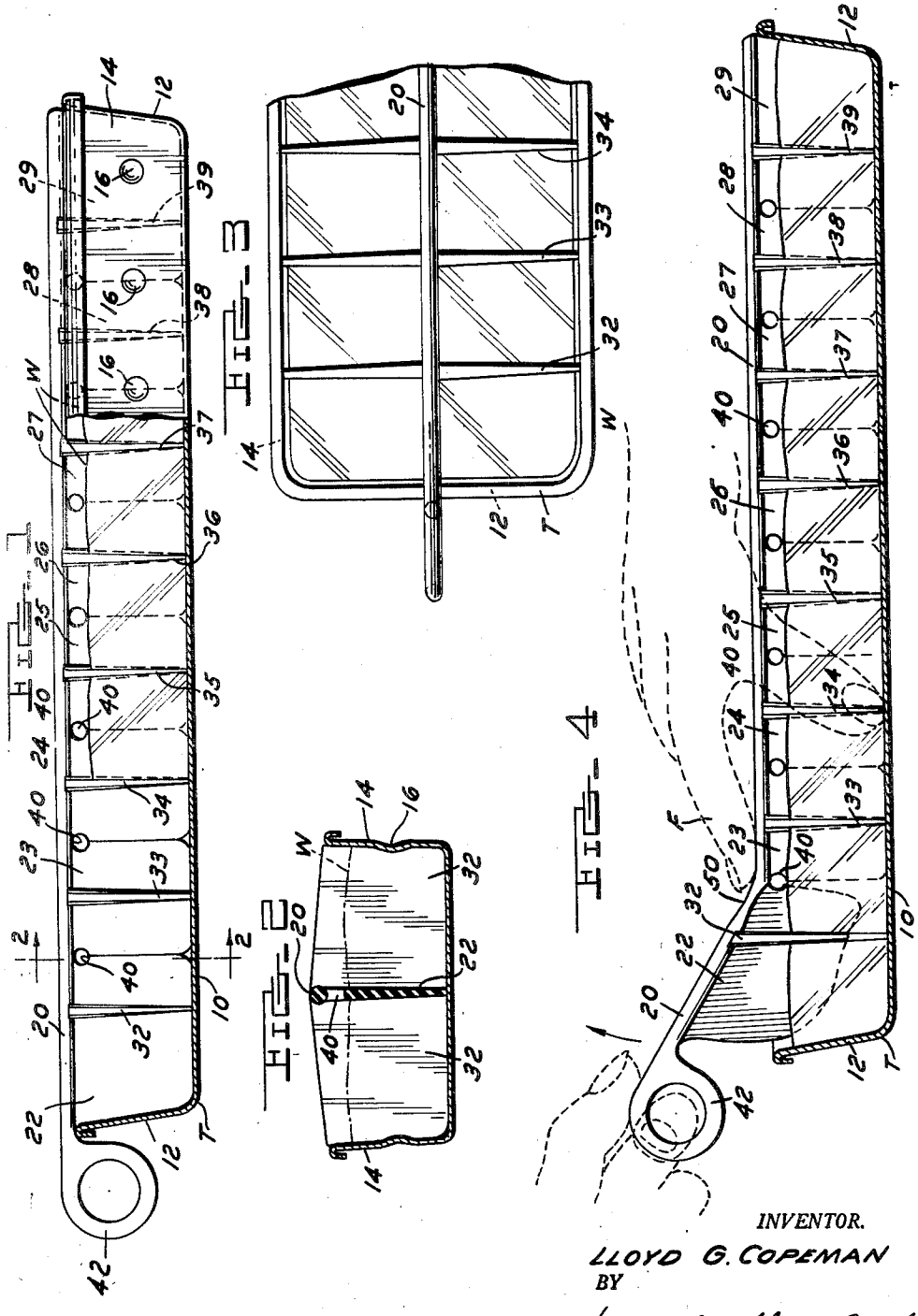
Sept. 7, 1954 L. G. COPEMAN 2,688,236

ICE CUBE TRAY COMBINATION

Filed Nov. 24, 1950 2 Sheets-Sheet 1



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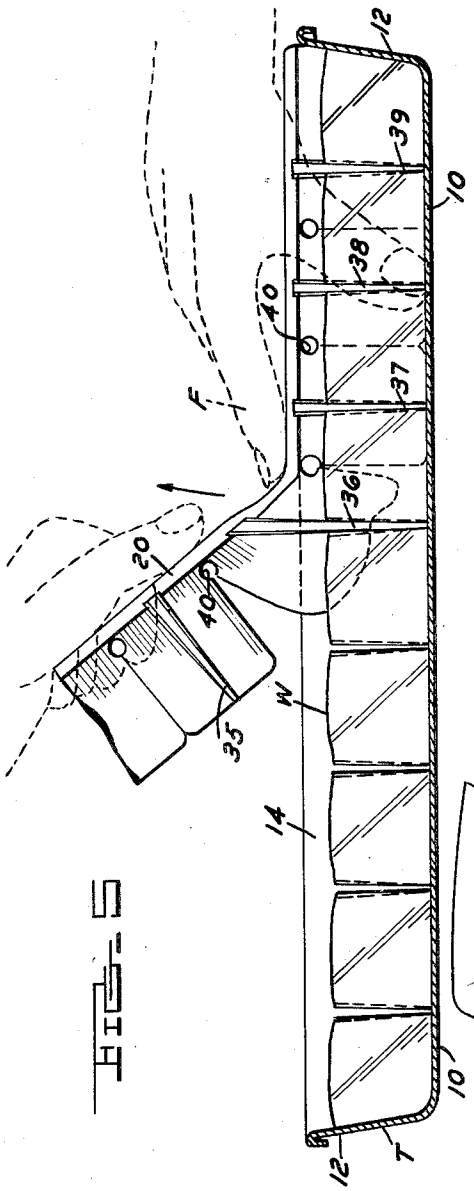



FIG. 5

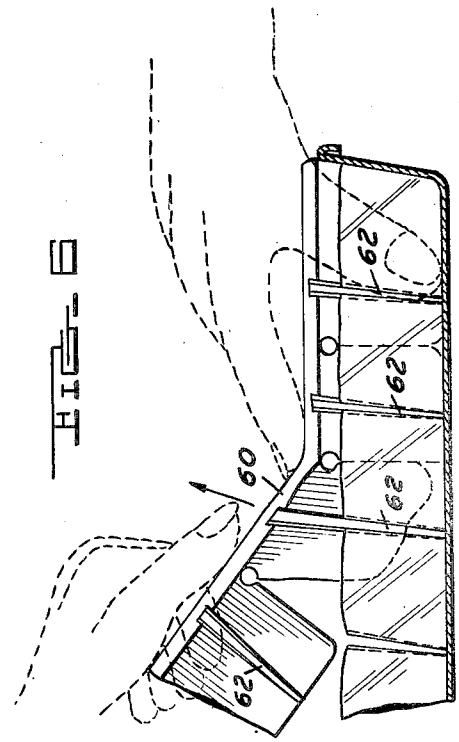



FIG. 6

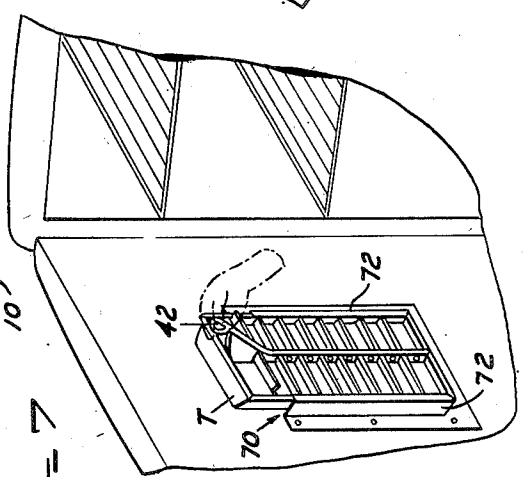



FIG. 7

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## ICE CUBE TRAY COMBINATION

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8 Claims. (Cl. 62—108.5)

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This invention relates to an ice cube tray combination particularly used for harvesting ice blocks and commonly used in refrigerators of the domestic type.

It is an object of the invention to provide an improved rubber ice tray grid and an improved combination between a rubber grid and a tray or container.

One of the problems in connection with a rubber ice tray grid is the fact that it is necessary to exert considerable initial force to remove the grid from the blocks. If this force could be reduced so that only one section of the grid was removed at a time, it would be considerably less and would also result in the possibility of removing merely two or four cubes at a time to permit use as desired when an entire tray was not needed.

Briefly, the invention consists of a rubber divider which has a single separator extending longitudinally of a tray with a plurality of transverse separators spaced along the dividers.

In this invention, the central divider is split vertically between the transverse separators, the split portions lying in contacting relation and aligned so that when the grid is at rest the parts form a continuous wall. Along the top of the central divider is a resilient stretchable or elongatable connecting portion which serves as the handling means for the entire grid. The surface of the grid is important in its operation. The preferred surface of the grid is a slippery smooth surface such as described in Jennings Patents Nos. 2,303,938 and 2,455,366. This surface is achieved by surface treatment or a wax migration condition and permits the grid to be removed with a minimum of force.

Other objects and features of the invention relating to the details of construction and operation and also to a combination with a household refrigerator having a rack portion for holding the tray will be evident in the following description and claims.

Drawings accompany the specification, and the various views thereof may be briefly described as:

Figure 1, a longitudinal elevation of an ice tray showing a portion in section containing ice and a portion in section freed of ice.

Figure 2, a transverse section on line 2—2 of Figure 1.

Figure 3, a top view of the tray and grid combination.

Figure 4, an illustration showing the manner of operation of the grid.

Figure 5, a further view showing the operation of the grid as the removal proceeds toward the end.

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Figure 6, a modified construction in which the transverse separators are disposed at an angle corresponding to the resultant directional force usually used in release.

Figure 7, an illustration of a holding rack for a tray which permits a grid to be readily removed.

Referring to the drawings, in Figure 1 a tray T is shown of the standard variety now in use. It consists of a shallow pan formed of sheet metal, preferably aluminum, having a bottom 10 and end walls 12. This tray has side walls 14, as shown in Figures 1 and 2, and these side walls are provided with dimples 16 which form a projecting portion into the interior of the tray having relatively smooth rounded walls.

The separator or grid element for the tray consists of a single backbone portion extending centrally and longitudinally of the tray composed of a round shaft of rubber 20 extending the length of the tray from which depends vertical dividers 22, 23, 24, 25, 26, 27, 28 and 29. These dividers are thin webs of rubber formed in a narrowing taper from top to bottom. Each of the dividers is aligned with and contacting the edge of the adjacent dividers so that when in position in the tray a substantially solid wall is formed.

Extending transversely of each divider substantially centrally thereof are transverse separators 32, 33, 34, 35, 36, 37, 38 and 39. These separators are formed with substantially the same cross section as the central dividers. At the joint between the central dividers 20 to 29 an aperture 40 is formed directly below the connecting member 20. At the end of the connecting memebr 20 is a finger loop 42 which enables a person to grasp the end for removing the separator.

The grid element is preferably formed of a soft, tough rubber which is quite pliable, the shaft 20 being of such a nature that they will stand considerable tension force and yet will stretch under such force. As previously stated the grid is preferably treated to provide a smooth, relatively frictionless ice contacting surface. This may be accomplished, as described in detail in the previously mentioned patents, by immersing the grids in a halogen solution, a sulphuric acid solution, or by incorporating a wax with the rubber mix prior to molding.

In the operation of the deivce, the grid element is placed in the tray and the tray filled to a wa-

ter level W which is approximately at the bottom of the holes **40**. The tray is then placed in a freezing container and the water changed to ice.

When it is desired to remove cubes, the tray is removed from the refrigerator and placed on a flat surface. Then, as shown in Figure 4, the right hand may be applied to the tray to hold it down while the left hand lifts the loop **42**. If the forefinger F of the right hand is placed on the shaft **20**, the rubber will stretch at **50**, permitting the web or separator **32** to lift together with the central divider **22**, thus freeing ice cubes in the first compartment of the tray adjacent the end **12**.

With the loosening of the webs **22** and **32** a slight twist of the tray will free the cubes at the fore end of the tray and they may be removed inasmuch as the removal of the web from between the cubes will permit them to approach each other and thus clear the inward projections **16**. Thus, projections **16** co-operate to hold the ice blocks in place as long as the grid is positioned between the pairs of cubes down the length of the container.

As shown in Figure 5, as the removal progresses down the container the right hand may be shifted and the left hand progressively moved down the grid, making it possible to remove a limited number of separators at a time.

In each case there is a stretching action between the two cross separators, permitting the lifting force or removal force to be applied to one cross grid at a time.

In Figure 6, a modified device is shown in which the backbone connector or shaft **60** is provided with fins **62**, each of which lies at an angle to the vertical, the top being closer to the rear of the tray as it is operated. Thus, when a lifting force is applied, the resultant of the force is at an angle away from the lifting end and the transverse separators have a tendency to move straight up out of their angled slots, thus avoiding somewhat the distortion of these transverse separators **62**.

In Figure 7, I have shown a rack **70** which consists of two tracks **72** which receive the edges of a tray as shown. A suitable stop is provided at the bottom to prevent the tray from slipping out. When the frozen tray is once mounted, open side out, in the rack, the loop **42** may be grasped and the grid readily stripped from the ice blocks which will remain in the tray by reason of their adhesion to the walls and bottom. The tray may then be removed and twisted to release the cubes from their other retaining walls.

What I claim is:

1. An ice tray and grid combination comprising a tray of sheet material having sides inwardly dimpled at spaced intervals, and a flexible resilient separator grid to lie in said tray having separating walls extending across the tray in two directions, the separator walls extending in one direction being split vertically between the walls extending in the other direction and joined at the top by a flexible, stretchable element to permit sectional removal of said grid from an ice-filled tray.



2. An ice tray grid or separator comprising a single longitudinally extending separator composed of a backbone member of resilient stretchable material and a plurality of individual, relatively thin central separators depending from said backbone in end-to-end relation, and a series of transverse separators normal to and extending from said central separators.

3. An ice tray grid as defined in claim 2 formed of soft rubber treated to have smooth and relatively frictionless ice-contacting surfaces.

4. An ice tray grid or separator comprising a single longitudinally extending separator composed of a backbone member of resilient stretchable material and a plurality of individual, relatively thin central separators depending from said backbone in end-to-end contacting relation and a series of transverse separators carried by said individual separators.

5. An ice tray grid or separator comprising a row of vertically disposed dividers arranged in aligned, end-to-end, contacting relation, transverse separators associated with said individual dividers, and means connecting said dividers comprising resilient, elongatable joints to permit said dividers and associated separators to be lifted one at a time from a surrounding block of ice.

6. An ice tray grid or separator comprising a row of vertically disposed, soft, smooth-surfaced, dividers arranged in aligned, end-to-end, contacting relation, a plurality of relatively soft, flexible, smooth-surfaced, transverse, longitudinally spaced separators associated with said individual dividers, and means connecting said dividers in their longitudinal relationship comprising an elongate member jointed to permit the ends of said grid to approach each other over the top of the grid, and means in said elongate member between the transverse separators movable to permit widening of the space between said separators and thus allow said dividers and associated separators to be lifted one at a time from a surrounding block of ice within a tray.

7. An ice tray grid as defined in claim 2 formed of rubber having its exposed surfaces treated to provide smooth, relatively frictionless ice-contacting surfaces as compared with ordinary flexible molded rubber.

8. An ice tray grid as defined in claim 2 formed of rubber having a surface treated with a sulphuric acid solution to provide a smooth, relatively frictionless and easily slipable contacting surface as compared with the surface of ordinary flexible rubber.

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