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ICE CHIPPING AND FLAKING TRAY

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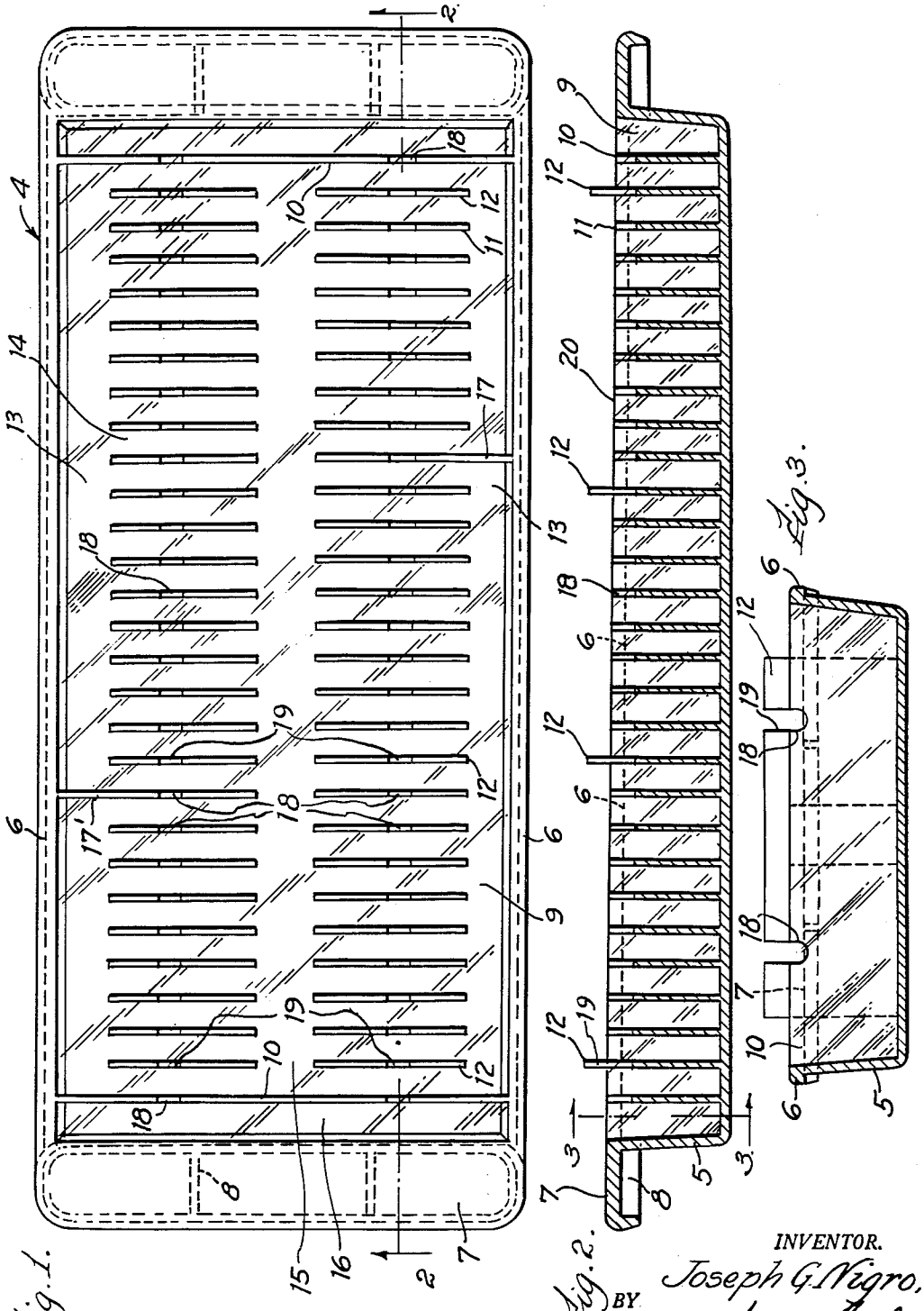


Fig. 1.

Fig. 2.

Fig. 3.

INVENTOR.
Joseph G. Nigro,
BY David Manly Feller.
ATTORNEY.

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ICE CHIPPING AND FLAKING TRAY

Joseph G. Nigro, Chicago, Ill., assignor to Gits Molding Corporation, Chicago, Ill., a corporation of Illinois

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My invention relates to ice chipping and flaking trays, the instant application being an improvement over the disclosure in my copending patent application filed February 21, 1952 designated Serial No. 272,871 and entitled "Tray Means for the Production of Frangible, Chippable, and Flakable Artificial Icicle Elements," now Patent No. 2,674,862, issued April 13, 1954.

An important general object of my invention is to provide a tray which is in part subdivided by webs and partitions defining icicle forming cavities so that the said tray, which is made of resilient and flexible plastic material, when subjected to torsional strains or stresses, will cause the icicle formed therein to disintegrate and chip and flake as described and elucidated in the aforementioned copending patent.

The present application is particularly intended to provide an ice tray element and partial division means therein capable of producing chipped ice particles, which are readily miscible with aqueous liquids and wherein special provisions are made to facilitate the application of torsional stresses and strains onto the tray means, so that the chipping or other comminution of the ice body formed therein into small and irregular size particles with a minimum of physical effort will be facilitated, while at the same time assuring that the tray means *per se* will be stressed only within its elastic limit, so as to prevent permanent damage to the tray means itself by the application of stresses used for chipping or otherwise comminuting the ice therein.

In this respect the present invention comprises an improvement over the device of my prior patent aforesaid, in that the division means provided therein, while rigidly secured to and preferably also integral with the body of the tray means, comprises at least two rows of parallel partition means which are rigid with the bottom of the tray and preferably also integral therewith and which are spaced from the sides of the tray to provide a channel between the outside rows and the sides of the tray and also which are spaced from each other to provide at least one channel for forming a strip of ice separating the rows of partition means. When there are but two such rows, the channel therebetween is preferably centrally disposed, parallel to the sides of the tray means and merges with the perimetral channel at each end of the tray means. The absence of a positive attachment between these parallel partition means and the sides of the tray and also the absence of a central median rib, both of which were conventional in the prior art, facilitates torsional twisting of the tray required to chip up the ice congealed therein with a minimum of effort.

In addition to the division means aforesaid, there is preferably also provided a relatively few (at least one in each row) of partition means which are rigidly secured to both the sides and bottom of the tray and which are disposed in a staggered arrangement longitudinally thereof. These additional partition means serve in part as the other partition means and also serve to strengthen

the tray and to prevent its destruction or damage by the torsional strains to which it is subjected in normal use.

There may further be optionally provided adjacent to each end of the tray means, a stiffening or reinforcing web or partition which is parallel to the adjacent end and which is preferably rigidly secured to the bottom and both sides of the tray.

Other objects and advantages inherent in my invention will become apparent from an examination of the accompanying drawings, bearing further elucidation in the ensuing description, wherein like symbols are used to designate like parts, and in which:

Fig. 1 is a top elevational view of my invention;

Fig. 2 is a longitudinal cross-sectional view taken substantially on the line 2—2 of Fig. 1; and

Fig. 3 is a transverse cross-sectional view taken substantially on the line 3—3 of Fig. 2 with a certain portion of web broken away in order more clearly to depict the structure of the web lying behind the said cutaway web.

Referring to the drawings, the tray embodying the invention is generally designated **4** and consists of a tray body **5** which is slightly tapered downwardly so as to facilitate its removal from the mold; the same being molded of rubber or other suitable flexible and resilient organic plastic material.

The body **5** terminates in two similar handle portions **7**, one at each end, each of which is strengthened by the intermediate web portions **8**. The handles **7** merge with a beaded portion **6** around the sides of the tray to lend rigidity thereto.

The liquid holding cavity **9** in the tray has a transverse web or partition **10** near each end extending between and rigid with the side and bottom walls. A web or partition **17** extends inwardly from one side wall to a point near the center of the tray, and another similar web **17'** extends a corresponding distance inwardly from the opposite side wall. The webs **17** and **17'** are rigid with the associated side walls respectively and with the bottom of the tray. Between the staggered webs **17** and **17'**, and also between the latter and the end of the tray nearest to each are a series of short webs or partitions **11** and **12**, all rigid with the tray bottom and all terminating at a uniform distance from the side wals. Each of the webs **11**, therefore, stands isolated from the sides of the tray and is not attached to other webs, nor to the side walls of the tray. The webs **10**, **11**, **12**, **17** and **17'**, considered collectively, form a series of webs, in two rows as shown, which are spaced apart uniformly in a direction longitudinal of the tray. The four or more webs **12** which are provided are higher than the webs **11** in order to permit setting trays as herein shown in super-imposition to allow the liquid therein to drain over the top surface **20** of the tray and permit freezing of the liquid within the perimetral channel **13** and the intermediate spaces **14** between webs **11** and **12**. The webs or partitions **10**, **11**, **12**, **17** and **17'** may be provided as shown with cut out portions **18** and **19** in axial alignment so as to permit the liquid to congeal within these cut out portions and thus strengthen the frozen icicle produced in each compartment of the cavity **9**.

The icicle is formed within the cavity **9**, which is in part subdivided by the partitions or webs aforesaid into channels **16** disposed between the transverse webs **10** and the ends of the tray respectively, a perimetral channel **13** between the rows of webs **11** and **12** and the sides of the tray and between these rows and the webs **10**, spaces **14** between the webs **11**, **12**, **17** and **17'** in each row of webs, and a central longitudinal channel **15** between the two rows of webs or partitions shown. These spaces or channels are further interconnected through

the agency of the liquid occupying the cut out portions 18 and 19, and levelled off to the top surface of the tray 20. The production, or the making of ice chips, and flakes, is a rather simple procedure and comprises grasping the handles 7 of the tray, one in each hand and subjecting the same to a torsional or twisting action to and fro, causing the congealed or frozen icicle to disintegrate and form irregular chips and flakes.

Although the drawings and the above specification disclose the best modes in which I have contemplated embodying my invention, I desire to be in no way limited to the details of such disclosure, for in the further practical application of my invention many changes in the form and construction thereof may be made as circumstances require or experience suggests without departing from the spirit of the invention as expounded within the scope of the appended claims.

Having thus disclosed and revealed my invention, what I claim as new and desire to secure by Letters Patent is:

1. Tray means for producing ice chips, flakes and crystals, comprising a tray element including a bottom, sides and ends of flexible and resilient plastic material, provided with manipulating handle portions at each of said ends, a plurality of substantially parallel partition means, which are respectively secured to the bottom of said tray element, for dividing the liquid-retaining compartment of said tray element in part into a multiplicity of ice congealing compartments, each of wafer-like narrowness, said partition means being arranged in at least two rows which are spaced apart from the sides of said tray element and which are spaced apart from one another to define a perimetral ice congealing channel merging at each end of said tray element with at least one central ice congealing channel between said rows, said ice congealing compartments being of a size and shape such that ice congealed therein is of such thinness that said tray means, subsequent to the congealing of liquid therein to form ice, and when subjected to torsional strains and stresses by torsional movements caused by relative twisting of its handle portions with respect to each other, causes the ice formed therein to be resolved into ice chips, flakes and crystals of relatively small and irregular configuration readily miscible with liquids.

2. Tray means in accordance with claim 1, in which there are only two of said rows of partition means and one centrally disposed ice congealing channel between said two rows and substantially midway between and parallel with the sides of said tray element.

3. Tray means for producing ice chips, flakes and crystals, comprising a tray element including a bottom, sides and ends of flexible and resilient plastic material, provided with manipulating handle portions at each of said ends, a plurality of substantially parallel partition means, which are respectively secured to the bottom of said tray element, for dividing the liquid-retaining compartment of said tray element in part into a multiplicity of ice congealing compartments, each of wafer-like narrowness, said partition means being arranged in two rows which are spaced apart from the sides of said tray element and which are spaced apart from one another to define a perimetral ice congealing channel merging at each end of said tray element with a central ice congealing channel disposed between said rows, at least one additional partition means in each of said rows, said additional partition means being staggered longitudinally of said tray element so that one such additional partition means in one of said rows will not be opposite another such partition means in the other of said rows, each said additional partition means extending from one of said side walls to said central ice congealing channel and being secured to both said bottom and one of said side walls of said tray element, so as to furnish additional structural rigidity between said bottom and side walls, said additional partition means cooperating with adjacent ones of the first named partition means in defining ice congealing compartments as aforesaid, said ice congealing compartments being of a size and shape such that ice congealed therein is of such thinness that said tray means, subsequent to the congealing of liquid therein to form ice, and when subjected to torsional strains and stresses by torsional movements caused by relative twisting of its handle portions with respect to each other, causes the ice formed therein to be resolved into ice chips, flakes and crystals of relatively small and irregular configuration readily miscible with liquids.

4. Tray means in accordance with claim 11, comprising in addition, at least one partition adjacent to each end of said tray element and substantially parallel with the adjacent end and extending from side to side of said tray element, being secured to said bottom and both sides of said tray element, for reinforcing the end portions of said tray element.

5. A tray that can receive liquid and that can hold and confine that liquid while that liquid is congealed to ice and that can thereafter respond to twisting to convert said ice into ice chips or flakes and that comprises a liquid retaining compartment with a bottom and with upstanding walls, said liquid retaining compartment having an axis that extends between two opposed walls of said liquid retaining compartment, a plurality of plates that are integral with said bottom of said liquid retaining compartment and that extend upwardly from said bottom of said liquid retaining compartment, said plates being closely adjacent each other to define a multiplicity of comparatively narrow liquid congealing spaces of wafer-like narrowness, a number of said plates being arranged in groups of two or more plates, two of the plates in each group of plates having the adjacent ends thereof spaced apart to define a connecting opening and having the opposite ends thereof directed away from said connecting opening, the said two plates in said groups of plates having the upper edges of the adjacent ends thereof free to flex laterally, said connecting openings extending downwardly from the approximate level of the upper edges of said walls of said liquid retaining compartment to the approximate level of said bottom of said liquid retaining compartment, and a number of said connecting openings being in register with each other to define a liquid congealing passageway in said liquid retaining compartment, said tray being made of flexible material whereby said opposed walls can be reciprocally rotated about said axis of said liquid retaining compartment to recurrently distort said liquid retaining compartment and the said plates therein to subject said ice to torsional stresses and strains, said liquid congealing spaces defined by said plates being interconnected by said pasageway to permit the formation of an icicle with a multiplicity of interconnected readily frangible congealed wafers of such thinness that the said distortion of said liquid retaining compartment and the said plates therein during reciprocal rotation of said opposed walls breaks said mafers into chips and flakes of relatively small and irregular configuration that are readily miscible with liquids.

6. A tray that can receive liquid and that can hold and confine that liquid while that liquid is congealed to ice and that can thereafter respond to twisting to convert said ice into ice chips or flakes and that comprises a liquid retaining compartment with a bottom and with upstanding walls, said liquid retaining compartment having an axis that extends between two opposed walls of said liquid retaining compartment, a plurality of plates that are integral with said bottom of said liquid retaining compartment and that extend upwardly from said bottom of said liquid retaining compartment, said plates being closely adjacent each other to define a multiplicity of comparatively narrow liquid congealing spaces of wafer-like narrowness, a number of said plates being arranged in groups of two or more plates, the plates in each group of plates being disposed in end-to-end relation and having the adjacent ends thereof spaced apart to define a connect-

ing opening and having the opposite ends thereof directed away from said connecting opening, said plates in said groups of plates having the adjacent ends thereof free to flex laterally, said connecting openings extending downwardly from the approximate level of the upper edges of said walls of said liquid retaining compartment, and a number of said connecting openings being in register with each other to define a liquid congealing passageway in said liquid retaining compartment, and said tray being made of flexible material whereby said opposed walls can be reciprocally rotated about said axis of said liquid retaining compartment to recurrently distort said liquid retaining compartment and the said plates therein to subject said ice to torsional stresses and strains, said liquid congealing spaces defined by said plates being interconnected by said passageway to permit the formation of an icicle with a multiplicity of interconnected readily frangible congealed wafers of such thinness that the said distortion of said liquid retaining compartment and the said plates therein during reciprocal rotation of said opposed walls breaks said wafers into chips and flakes of relatively small and irregular configuration that are readily miscible with liquids.

7. A tray that can receive liquid and that can hold and confine that liquid while that liquid is congealed to ice and that can thereafter respond to twisting to convert said ice into ice chips or flakes and that comprises a liquid retaining compartment with a bottom and with upstanding walls, said liquid retaining compartment having an axis that extends between two opposed walls of said liquid retaining compartment, a plurality of plates that are integral with said bottom of said liquid retaining compartment and that extend upwardly from said bottom of said liquid retaining compartment, said plates being closely adjacent each other to define a multiplicity of comparatively narrow liquid congealing spaces of wafer-like narrowness, a number of said plates being arranged in groups of two or more plates, two of the plates in each group of plates having the adjacent ends thereof spaced apart to define a connecting opening and having the opposite ends thereof directed away from said connecting opening, the said two plates in said groups of plates having the adjacent ends thereof free to flex laterally, and a number of said connecting openings being in register with each other to define a liquid congealing passageway in said liquid retaining compartment, said tray being made of flexible material whereby said opposed walls can be reciprocally rotated about said axis of said liquid retaining compartment to recurrently distort said liquid retaining compartment and the said plates therein to subject said ice to torsional stresses, said liquid congealing spaces defined by said plates being interconnected by said passageway to permit the formation of an icicle with a multiplicity of interconnected readily frangible congealed wafers of such thinness that the said distortion of said liquid retaining compartment and the said plates therein during reciprocal rotation of said opposed walls breaks said wafers into chips and flakes of relatively small and irregular configuration that are readily miscible with liquids.

8. A tray that can receive liquid and that can hold and confine that liquid while that liquid is congealed to ice and that can thereafter respond to twisting to convert said ice into ice chips or flakes and that comprises a liquid retaining compartment with a bottom and with upstanding walls, said liquid retaining compartment having an axis that extends between two opposed walls of said liquid retaining compartment, a plurality of plates that are integral with said bottom of said liquid retaining compartment and that extend upwardly from said bottom of said liquid retaining compartment, said plates being closely adjacent each other to define a multiplicity of comparatively narrow liquid congealing spaces of wafer-like narrowness, and a number of said plates being arranged in groups of two or more plates, the plates in each group of plates being aligned and having the adjacent ends thereof spaced apart to define a connecting opening and having the opposite ends thereof directed away from said connecting opening, each of said plates in said groups of plates having the adjacent ends thereof free to flex laterally, the plates in said groups of plates coacting to define a plurality of rows of plates in said liquid retaining compartment, said connecting openings extending downwardly from the approximate level of the upper edges of said walls of said liquid retaining compartment, said tray being made of flexible material whereby said opposed walls can be reciprocally rotated about said axis of said liquid retaining compartment to recurrently distort said liquid retaining compartment and the said plates therein to subject said ice to torsional stresses and strains, some of said liquid congealing spaces defined by said plates being interconnected by said connecting openings to permit the formation of an icicle with a multiplicity of interconnected readily frangible congealed wafers of such thinness that the said distortion of said liquid retaining compartment and the said plates therein during reciprocal rotation of said opposed walls breaks said wafers into chips and flakes of relatively small and irregular configuration that are readily miscible with liquids.

9. A tray that can receive liquid and that can hold and confine that liquid while that liquid is congealed to ice and that can thereafter respond to twisting to convert said ice into ice chips or flakes and that comprises a liquid retaining compartment with a bottom and with upstanding walls, said liquid retaining compartment having an axis that extends between two opposed walls of said liquid retaining compartment, a plurality of plates that are integral with said bottom of said liquid retaining compartment and that extend upwardly from said bottom of said liquid retaining compartment, said plates being closely adjacent each other to define a multiplicity of comparatively narrow liquid congealing spaces of wafer-like narrowness, and a number of said plates being arranged in groups of two or more plates, two of the plates in each group of plates having the adjacent ends thereof spaced apart to define a connecting opening and having the opposite ends thereof directed away from said connecting opening, said connecting openings extending downwardly from the approximate level of the upper edges of said walls of said liquid retaining compartment to the approximate level of said bottom of said liquid retaining compartment, said tray being made of flexible material whereby said opposed walls can be reciprocally rotated about said axis of said liquid retaining compartment to recurrently distort said liquid retaining compartment and the said plates therein to subject said ice to torsional stresses and strains, some of said liquid congealing spaces defined by said plates being interconnected by said connecting openings to permit the formation of an icicle with a multiplicity of interconnected readily frangible congealed wafers of such thinness that the said distortion of said liquid retaining compartment and the said plates therein during reciprocal rotation of said opposed walls breaks said wafers into chips and flakes of relatively small and irregular configuration that are readily miscible with liquids.

10. A tray that can receive liquid and that can hold and confine that liquid while that liquid is congealed to ice and that can thereafter respond to twisting to convert said ice into ice chips or flakes and that comprises a liquid retaining compartment with a bottom and with upstanding walls, said liquid retaining compartment having an axis that extends between two opposed walls of said liquid retaining compartment, a plurality of plates that are integral with said bottom of said liquid retaining compartment and that extend upwardly from said bottom of said liquid retaining compartment, said plates being closely adjacent each other to define a multiplicity of comparatively narrow liquid congealing spaces of wafer-like narrowness, some of said plates having at least one

end thereof free to flex laterally, said ends of said plates defining the sides of openings that interconnect some of said liquid congealing spaces of wafer-like narrowness, and manipulating handles that are adjacent the ends of said liquid retaining compartment, each of said manipulating handles including a rib that extends outwardly from an end of said liquid retaining compartment and that extends transversely of said axis and that returns to said end of said liquid retaining compartment and also including a generally flat web that extends from the upper edge of said end of said liquid retaining compartment to said rib, said tray being made of flexible material whereby said manipulating handles can be reciprocally rotated about said axis of said liquid retaining compartment to recurrently distort said liquid retaining compartment and the said plates therein to subject said ice to torsional stresses and strains, said liquid congealing spaces defined by said plates permitting the formation of an icicle with a multiplicity of readily frangible congealed wafers of such thinness that the said distortion of said liquid retaining compartment and the said plates therein during reciprocal rotation of said manipulating handles breaks said wafers into chips and flakes of relatively small and irregular configuration that are readily miscible with liquids.

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