ICE CRACKING DEVICE

FIG. 9.

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ICE CRACKING DEVICE
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Inventor's drawing.

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This invention relates to motor driven ice cracking apparatus of the character adapted to reduce relatively large pieces of ice, such as cubes from conventional freezer trays, to relatively small pieces or chips of greater surface area more effectively to chill beverages or the like.

A principal object of the invention is to provide an ice cracking attachment device for use as an accessory with household blenders, particularly blenders known as Waring Blenders, to be substituted for the usual blending container and driven by the usual blender motor. The principles of the invention, however, are not limited to such applications of use and may, if desired, be embodied in unitary or other forms of devices.

Ice shaving or crushing machines hereinafore devised possess the common disadvantages of too finely reducing larger pieces of ice to thin shavings or particles which tend too readily to melt and also to clog the machine or portions thereof. In improved contrast therewith, devices of the present invention are designed to shatter or crack larger pieces or cubes of ice into smaller discrete bits somewhat more resistant to melting and having less tendency to agglomerate.

Another object of the invention is to provide ice cracking apparatus capable of adjustment, if desired, to provide ice particles of predetermined size such as coarse, medium and fine.

Another and more specific object is to provide a device embodying a cutter element having an upright pointed blade for engagement with the cubes or other pieces of ice which is rotatable at relatively high speed, such as of the order of 10,000 r.p.m., very rapidly to shatter the charge of ice and also having an impeller portion to throw the shattered pieces outwardly against an impact surface further to comminate the same. The invention also contemplates the provision of a sweeping blade associated with the cutter element whereby to sweep the cracked ice particles from the comminuting chamber into a discharge outlet.

Other and further objects and advantages of the invention will be apparent from the following detailed description taken in conjunction with the accompanying drawings wherein preferred embodiments of the principles of the invention have been selected for exemplification.

In the drawings:

Fig. 1 is a vertical sectional view taken on the line 1—1 of Fig. 4 and showing an ice cracker device constructed in accordance with the invention;

Fig. 2 is another vertical sectional view of the device taken on the line 2—2 of Fig. 4 and showing the device mounted in operative position upon a blender base indicated in fragment;

Fig. 3 is another vertical sectional view of the device taken on the line 3—3 of Fig. 4;

Fig. 4 is a top plan view of the device;

Fig. 5 is a front elevational view of the legend plate and chute adjusting arm;

Fig. 6 is an end elevational view of the cutter element;

Fig. 7 is a side elevational view of the cutter element;

Fig. 8 is a fragmentary sectional view of a portion of the cutter element taken on the line 8—8 of Fig. 7; and

Fig. 9 is a fragmentary vertical sectional view similar to Fig. 2 of a modified form of the invention.

Referring more particularly to the drawings, wherein like numerals refer to like parts, the ice cracker device in the preferred construction of one modification of the invention is formed of a top section or casting 10 and a base section or casting 12 secured together in any suitable manner such as by the screws 14. The device as shown in Figs. 1–4 is adapted to be mounted upon a blender base or the like in lieu of the usual blending container and, to this end, the bottom or base section 12 is provided with a plurality of peripheral slotted or recessed portions 16 for mating engagement with the upright container supporting fingers 18 carried by a blender base indicated in fragment at 20 and such as shown, for example, in Patent No. 2,761,659.

The bottom section 12 has formed therein a chamber 22 which is preferably cup-shaped in form so as to tend to prevent clogging of ice. Rotatably mounted in the chamber 22 is an upright cutter element 24, described in detail hereinafter, attached at 26 to a shaft 28 having a bottom connection 34 for driven engagement with the drive shaft 36 of the blender electric motor. A flywheel 30 and thrust washer 32 may be provided to overcome the off balance of the cutter element 24 and to effect smoother running.

For feeding ice cubes or other relatively large pieces to the chamber 22, a chute 38 is carried1 centrally of the top section 10. As shown in Fig. 4 the chute 38 is preferably of rectangular configuration so as to tend to prevent rotation therein of the ice cubes and, as indicated in Fig. 1, a ram or the like 40 may be provided for forcing the ice deposited in the chute 38 downwardly against the upward projecting point of the cutter element 24. The bottom end portion 39 of the chute provides an impact surface against which split or shattered ice pieces impinge and are further broken up when thrown outwardly therefrom by the cutter element 24. A peripheral skirt 41 at the bottom edge of the chute 38 provides a seal to prevent the egress of ice particles to the upper interior portion of the top section 10.

It has been found that by adjusting the relative distance between the impact surface 39 of the chute 38 and the cutter 24 the degree of cracking of the ice can be effectively controlled. Accordingly, the invention contemplates that the chute 38 may be slidably mounted for vertical adjustment in the top housing section 10 and its relative position selectively controlled by a bracket arm 42 pivoted at one end to a bracket 44 secured to a wall portion of the housing section 10, pivotally attached intermediate its ends to opposed sides of the chute 38 as indicated at 46 and terminating in a handle 48 projecting outwardly of the top section 10, all as best shown in Figs. 3 and 4. The projecting handle 48 may cooperate with a legend plate 50, as shown in Fig. 5, having stops 52 selectively to position the bracket arm 42 and the chute 38 supported thereby in appropriate positions for coarse, medium or fine cracking. This feature of adjustability may, of course, be embodied in either the attachment form of the invention as shown in Figs. 1–4 or the unitary form as indicated in Fig. 9, or omitted from either, as may be desired.

The cutter element 24, as shown in detail in Figs. 6 to 8, is preferably formed of an integral piece of highly polished stainless steel having an extended upright sharpened point 54 at one side of its axis of rotation and, at the opposite side of its axis of rotation, an impeller surface 56 for throwing ice pieces split or cracked by the pointed blade 54 outwardly against the surrounding im-

2,905,397
3 pact surface 39 and a sweeping blade 57 for sweeping cracked ice particles outwardly of the chamber 22 through the discharge spout 58. The sharpened point 54 is preferably curved forwardly of the direction of rotation as shown in Fig. 6 so as to bite into and shatter the ice pieces thrust downwardly into its path by the ram 40. The upper leading edges of the impeller and sweeping portions 56 and 57 are preferably rounded as indicated in Fig. 8 to tend to direct the contacted ice particles in an upward direction and to avoid any cutting action such as would be effected by a sharp edge with resultant, undesirable formation of snow and water. To tend to balance the asymmetrical element 24, holes 59 may be provided in the body portion of its extended side and a counterbalance 60 may be provided at its opposite side. Conventional blender motors are designed for relatively high speed rotation of the order of 10,000 r.p.m. and the cutter element 24, being directly driven thereby, accordingly shatters and cracks the charged ice pieces with great rapidity so that a constant stream of cracked ice particles emerges outwardly of the spout 58 as long as the charge continues.

As is shown in Fig. 9, the principles of the invention may be embodied in a unitary electric motor driven device having the ice cracking housing 62 fixed to a permanent base 64 in driving connection with the motor M. The internal structure and operating parts within the housing 62 may be identical with that described in detail in connection with the blender attachment form of the invention.

It will be understood that the present invention is not confined to the precise construction and arrangement of parts as herein illustrated and described but includes various modifications thereof as are embraced within the scope of the following claims.

What is claimed is:

1. A device for cracking ice into small particles which comprises, a chamber having side walls, a chute for feeding pieces of ice into said chamber, an upright cutter element supported in said chamber for relatively high speed rotation about a vertical axis, an impact surface projecting downwardly in said chamber and terminating in an edge inwardly spaced from said walls and surrounding in spaced relation the upper portion of said cutter element, said cutter element including an upwardly extending pointed blade on one side of said axis of rotation and a laterally extending impeller on the opposite side of said axis of rotation for throwing shattered ice pieces against said impact surface and said edge, the vertical position of said edge being approximately between the vertical extremities of said cutter element, means for supporting said impact surface and said cutter member for adjustable relative vertical movement therebetween to alter the effective position of said edge whereby selectively to control the size of the resulting cracked ice particles, and means for discharging ice particles from said chamber.

2. A device for cracking ice into small particles which comprises, a chamber having side walls, a chute for feeding pieces of ice into said chamber, an upright cutter element supported in said chamber for relatively high speed rotation about a vertical axis, an impact surface projecting downwardly in said chamber and terminating in an edge inwardly spaced from said walls and surrounding in spaced relation the upper portion of said cutter element, said cutter element including an upwardly extending pointed blade on one side of said axis of rotation and a laterally extending impeller and sweeping blade on the opposite side of said axis of rotation for respectively throwing shattered ice pieces against said impact surface and said edge for sweeping cracked ice particles from the chamber, said sweeping blade being provided with a rounded leading edge, and means for discharging ice particles from said chamber, the vertical position of said edge being approximately between the vertical extremities of said cutter element.

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