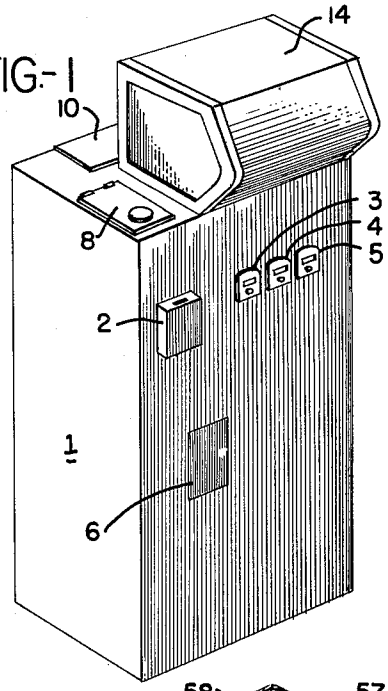
July 24, 1962 H. L. BURKS ET AL 3,045,719

DISPENSER APPARATUS

Filed Dec. 18, 1959 2 Sheets-Sheet 1

FIG.-1



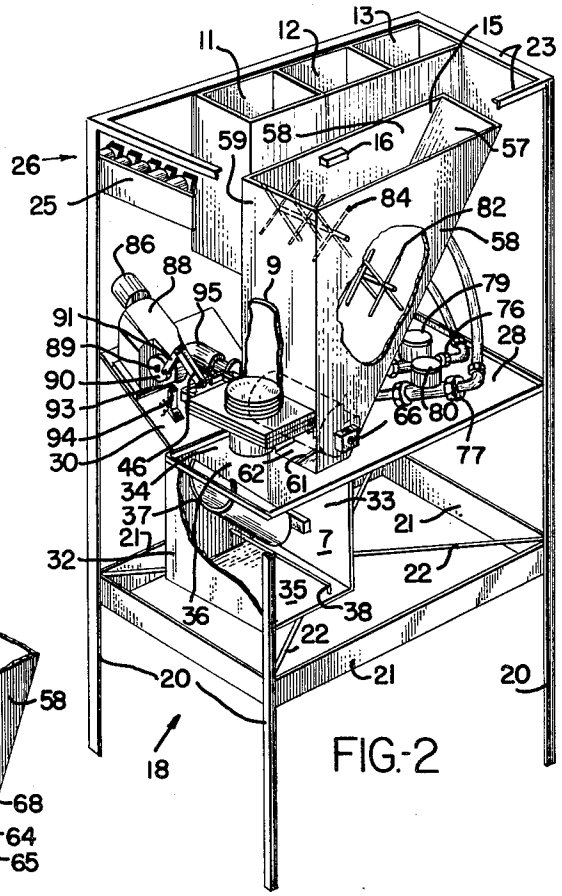


FIG.-2

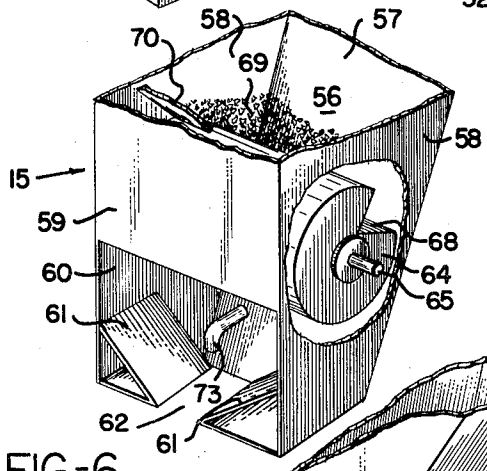


FIG.-6

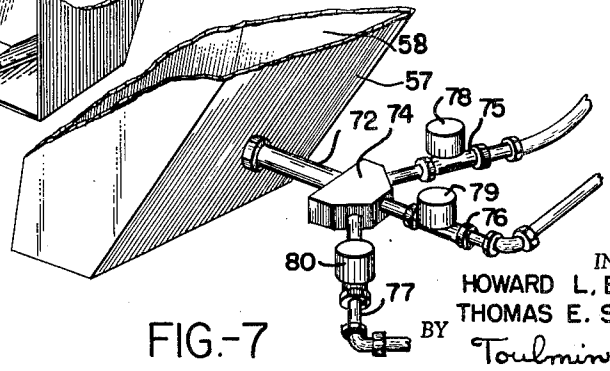


FIG.-7

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DISPENSER APPARATUS

Filed Dec. 18, 1959 2 Sheets-Sheet 2

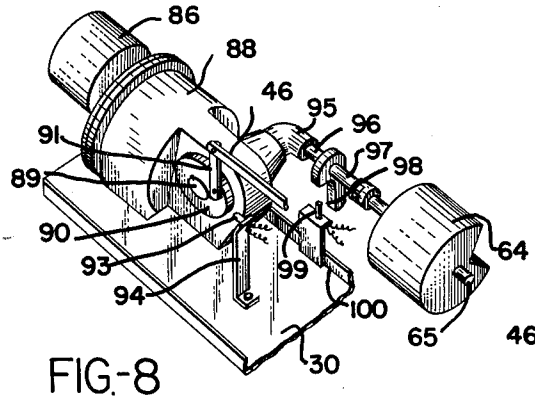


FIG.-8

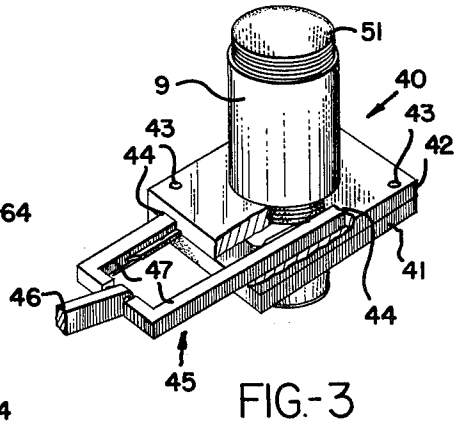


FIG.-3

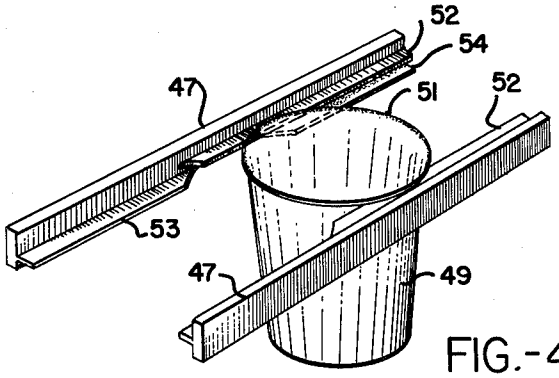


FIG.-4

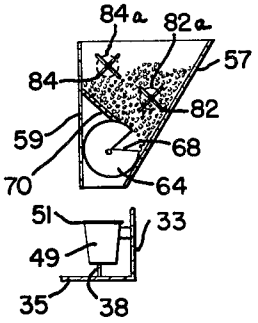


FIG.-5

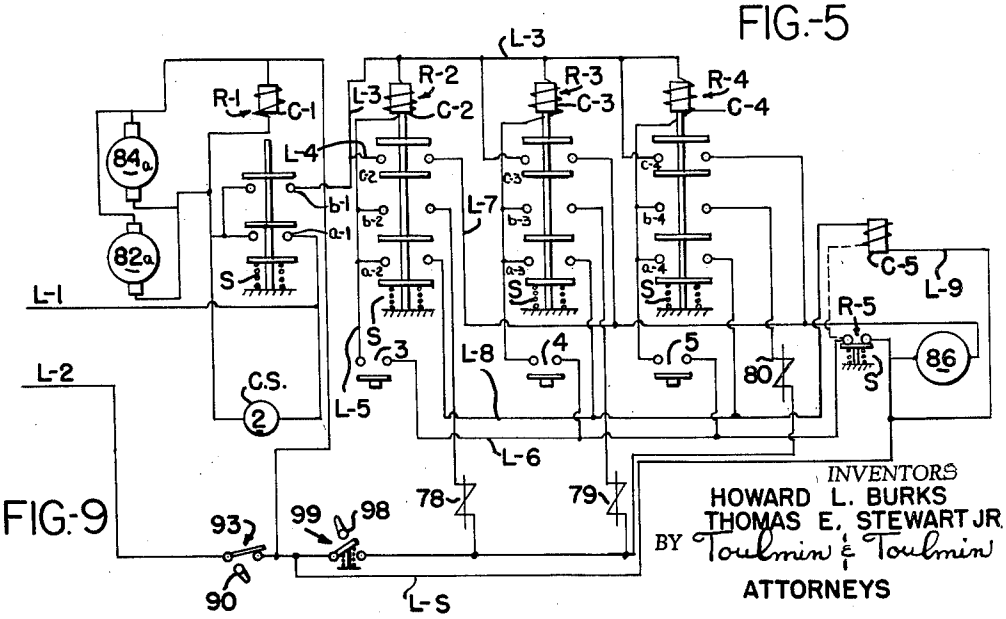


FIG.-9

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United States Patent Office 3,045,719 Patented July 24, 1962

3,045,719

DISPENSER APPARATUS

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Filed Dec. 18, 1959, Ser. No. 860,561
7 Claims. (Cl. 141—104)

This invention relates to dispensing machines and more particularly to a dispensing machine for a combination of ice particles and a flavoring liquid, the combination normally being dispensed into a cup, such as a drinking cup.

Small ice particles are used in the serving of chilled drinks and also in a refreshment termed a "snow cone" which comprises a flavored syrup poured over the small ice particles. Small ice particles such as crushed ice, and up to and including small cubes having a dimension of about ½ inch on a side, are normally dispensed by hand, as some difficulty has heretofore been encountered in attempting suitably accurate machine dispensing.

A difficulty with the dispensing of ice particles such as described from a compartment containing the ice particles is the tendency of the particles to cohere together even though the temperature be well below the freezing point. This coherence may be upset and accurate dispensing achieved if the ice particles are agitated and if the measuring pocket of the dispenser is suitably formed.

It is accordingly a primary object of this present invention to provide a novel dispenser for ice particles; it is to be understood that the term ice particles as used herein and in the claims is intended to apply to crushed ice, ice chips and ice cubes having a dimension of substantially ½ inch per side.

It is an important object of the invention to provide a dispenser in which the measured dispensed quantity of ice cubes may be small, such that the measured quantity may be delivered to a drinking cup.

It is a particular object of the invention to provide a dispenser for flavored, ice refreshments.

It is yet another object of the invention to provide a dispenser wherein the dispensing of the ice particles and flavoring liquid are automatically controlled after initiation of the dispensing operation.

The invention will be more fully understood by reference to the following detailed description and accompanying drawings wherein:

FIGURE 1 is a perspective view of the device of invention;

FIGURE 2 is a view of the structure of FIGURE 1, with parts removed, illustrating the arrangement of the interior of the structure of the invention;

FIGURE 3 is a fragmentary view, with parts broken away, illustrating a cup dispenser for use in the apparatus of the invention;

FIGURE 4 is a somewhat enlarged and fragmentary view of the cup dispenser structure;

FIGURE 5 is a view illustrating the cooperative relationship of components of the structure of the invention in relation to ice particles to be dispensed;

FIGURE 6 is a perspective and fragmentary view illustrating the cooperative relationship of the bin and measuring device of the structure of FIGURE 2;

FIGURE 7 is a perspective view illustrating the feed lines for the flavoring liquids in relation to the bin;

FIGURE 8 is a perspective and fragmentary view showing drive and control components; and

FIGURE 9 is a schematic view of an electric circuit arrangement useful in one embodiment of the invention.

Referring to the drawings, the numeral 1 in FIGURE 1 designates a vending machine case having a coin slot 2 and selection button units 3, 4, 5. It will be appreciated that the number of selection button units will correspond to the number of flavors to be dispensed.

The extraction door for removal of the dispensed material is indicated at 6; the interior of this region or compartment is designated at 7 (FIGURE 2).

On the upper side of the case 1 there is provided a hinged cover 8 for supplying cups to the dispenser unit, a cup guide being most clearly shown at 9 in FIGURE 3. A removable cover 10 provides for entry to the containers for the storage of liquid flavoring, these containers being indicated at 11, 12, 13 in FIGURE 2.

Mounted atop the casing 1 is a unit 14, which is a commercial type ice chip making machine for supplying crushed ice to the ice particle storage compartment or bin 15 (FIGURE 2). Since such unit is a commercial device and since the crushed ice may be supplied to the compartment 15 in any suitable manner, the machine 14 need not be described in further detail.

Referring now to FIGURE 2 more specifically, the frame of the machine is illustrated generally by the numeral 18 and comprises a plurality of vertically extending legs, braces 21 connecting the legs, and diagonal braces at 22.

At the upper extremity of the frame 18 braces 23 sustain the frame. Also carried on the upper end of the frame is a support 25 for a plurality of electrical relays, indicated generally by the numeral 26, and which relays will be discussed more particularly hereinafter. Further, it is to be noted that the compartments 11, 12, 13 are supported by the upper end of the frame in any convenient manner, for example, by welding or bolting to the frame structure.

Intermediate the vertical height of the frame there is provided a pan structure 28 from which the compartment 7 depends. To the rear of the compartment 7 there is provided a motor mounting plate 30. Compartment 7 itself has side walls 32, 33, a rear wall 34, a bottom wall 35, and is open at the top at 36. A slide 37 extends downwardly toward the bottom wall 35 and cooperates with a guide 38 for supplying cups on to the bottom wall in upright position.

With more specific reference to the cup dispenser, which is itself indicated generally at 40 (FIGURE 3), it is to be noted that the dispenser shown includes a lower plate 41, and an upper plate 42, which plates are retained together by bolt and nut combinations designated at 43.

The plates are grooved to provide oppositely disposed slots 44 (FIGURE 3), for receipt of a yoke 45 which slides in the slots and has thrust exerted thereto by the connecting rod 46. The yoke 45 comprises essentially (FIGURE 4) opposed rails 47, which in the motion of the yoke both support and provide for the dispensing of the cup, as designated at 49.

It is to be noted that the cup 49 (FIGURE 4) has a rim 51 which is received on the upper lips 52 of the rails 47. Upon motion of the rails relative to the plurality of superposed cups (FIGURE 3), the stack of cups drop to lips 53; then upon reversal of the motion the lowermost cup is severed from the stack by lip 52 and it drops between lips 53, 54 to slide 37. The stack of cups is then supported by lips 52.

The cup, as will be most clearly noted from FIGURE 5, is deposited in an upright position on the support guide 38 on the bottom wall 35 of compartment 7. The bin 56, having sloping rear wall 57, also opens into the compartment 7 for feeding material to the cup. This bin, as will be most clearly noted from FIGURES 6 and 7, has side walls 58 and a forward wall 59 which is open to define at 60 the lower opening of compartment 15. Upwardly turned portions 61 in spaced relationship define a narrowed opening 62 for the passage of ice particles to a cup positioned on guide 38.

The bin 56 is provided with a measuring roller 64 having shaft portions 65 which are journalled in bearings 66

(FIGURE 2) for smooth rotation of the roller. The roller **64** has a measuring pocket in the form of a V-shaped slot designated at **68** (FIGURE 6) and this slot, in the course of the operation of the machine, is filled with crushed ice indicated at **69** (FIGURE 5). It is considered important that the sides of this measuring pocket **68** be substantially rectilineal and that an apex be formed by the sides; preferably this is a true V. However, the apex may have a slight rounding, if desired. Other shapes of slots tend to inhibit release of the ice particles.

The roller **64**, as shown, is tangent to the inclined wall and closes the lower opening of compartment or bin **15** to inhibit the passage of ice particles through the opening. The measuring pocket or V-shaped slot having the rectilineal sides terminating in a common apex and designated at **68**, in the inoperative condition of the device (FIGURE 5) fronts on the ice particles **69**. However as illustrated particularly in FIGURE 5 the ice particles tend to cohere and cavitate about the measuring pocket and agitation is necessary to insure filling of the pocket. Such agitation is afforded by energization of motors **82***a* and **84***a* of prong agitators **82**, **84**, the shafts of which extend parallel to the axis of roller **64**.

Ice is dispensed in the rotation of the roller **64** through the lower opening **60** and slot **62** to the cup in position on the bottom wall **35**, wiper guard **70** being provided to engage the surface of the roller **64** and limit the quantity of material dispensed. Wiper guard **70** projects from the forward wall rearwardly toward the inclined rear wall and engages against roller **64**. It is thus positioned to prevent entry of ice between the forward wall and roller.

The mechanism for feeding flavoring liquids to the cups is shown most clearly in FIGURES 2 and 7. Thus a conduit **72** has a nozzle **73** (FIGURE 6) and communicates with a header **74** (FIGURE 7) into which conduits **75**, **76**, **77** lead respectively through solenoid valves **78**, **79**, **80**. Conduits **75**, **76**, **77** communicate, as most clearly shown in FIGURE 2, respectively, with the containers **11**, **12**, **13** which retain the flavoring liquids. The liquid dispensing action is effected under the influence of gravity in the operation of the device.

For operation a first motor **86** driving through a gear reduction box **88** actuates a shaft **89** carrying cam **90**. Connecting rod **46** for yoke **47** of the cup dispenser is secured to cam **90** for movement by link **91**. In the course of rotation cam **90** is arranged to engage a normally closed switch **93** mounted on a support **94** and to which switch detailed reference will be made in the description of FIGURE 9.

An elbow drive **95** having shaft portions **96**, **97** and a cam dog **98** is arranged for driving of roller **64** (FIGURE 8). Dog **98** in its rotation engages a normally open switch **99** and serves to maintain the switch closed for a predetermined period of time. As will be noted in connection with FIGURE 9 switch **99** controls the flavoring liquid flow. Switch **99** is itself supported on motor plate **30** by securing to flange **100**.

To operate the device a purchaser deposits a coin in the slot **2** (FIGURE 1) which is effective to close the coin switch designated in FIGURE 9 at C.S. This provides power from service main line L–**1** to coil C–**1** of relay R–**1** through the return service main line L–**2**. Simultaneously with the energization of the coil C–**1** power is applied to the agitator motor **82**–*a*, **84**–*a*, which then function to urge ice particles to the measuring pocket **68** of the roller **64**.

Energization of the coil C–**1** closes the contacts of the relay R–**1**, which contacts are designated *a*–**1**, *b*–**1**. Contact *a*–**1** is directly connected to the service main L–**1** and accordingly line power is applied through coil C–**1** to hold it energized, after C.S. has automatically opened after deposit of the coin. Line power is also applied through the contacts *b*–**1** to line L–**3**.

The relays designated generally at R–**2**, R–**3** and R–**4**, and illustrated generally at **26** in FIGURE 2, are effective to control energization of motor **86** and solenoids **78**, **79**, **80**, as well as to permit selection of the specific flavor of liquid desired. In this connection it is to be noted that the liquid may be a relatively thin syrup for drinking purposes, or may be a relatively heavy syrup for snow cones and the like.

Since all relays R–**2**, R–**3** and R–**4** function in the same manner, specific reference will be made only to the operation of one, and similar designations have been applied to the contacts of each, except for the suffix numerals on the contacts, which suffixes specifically relate a specific contact to a specific relay.

Assuming that the purchaser closes the button switch at **3**, power will be applied through relay coil C–**2** from line L–**3** to line L–**5**, L–**6** and the relay R–**5**, line L–S, and normally closed switch **93** to the service main line L–**2**.

Energization of the coil C–**2** closes the contacts of the relay R–**2** and power is applied to the motor **86** from L–**4** through closed contacts C–**2** and line L–**7** to line L–S, switch **93**, and service main L–**2**. Simultaneously power is applied from L–**5** through contacts *a*–**2** and line L–**8** and coil C–**5** of relay R–**5**, line L–**9** to L–S, switch **93** and service main L–**2**.

Energization of the coil C–**5** opens the contacts of relay R–**5**, but the coil C–**5** itself remains in circuit through the contacts at *a*–**2**. Opening of the contacts of R–**5** is effective to prevent operation of the unit by closing of the button switches, **4**, **5**, or by the closing of the button switch **3**, a second time.

With the starting of motor **86**, the yoke **45** of the cup dispenser **40** is urged inwardly (FIGURE 3) to move the yoke relative to the stacked cups, and upon withdrawal of the yoke as the motor rotates a cup is dispensed, as indicated hereinbefore. This cup then moves down the slide **37** and becomes positioned as indicated in FIGURE 5.

Energization of the motor **86** turns the roller **64** to present the measuring pocket **68** to the lower opening **60** of the ice particle storage compartment **15**. The ice particles drop through the opening **60** and are guided by the inturned opening **61** to the opening **62** and thence into the cup **49** (FIGURE 5).

In the course of rotation of the roller **64** the wiper guard **70** serves to limit the quantity of ice particles by preventing ice particles, other than those in the measuring pocket, from passing to the lower opening **60**. Simultaneously with the energization of motor **86** the cam **98** begins to rotate and after deposit of the ice particles the cam closes the switch **99**.

With the contacts closed at *b*–**2**, solenoid **78** is energized through the switch **99** and switch **93** to the service main L–**2**. Accordingly conduit **75** is opened to the nozzle **73** and liquid flavoring flows to the cup **49** (FIGURE 5) and over the ice particles in the cup.

The cam **98** is so shaped (FIGURE 8) as to permit the closure of the switch **99** for a length of time sufficient for a predetermined quantity of the liquid flavoring to flow. Switch **99** is biased to an open position and after passage of the cam the switch opens to its normal condition. Continued rotation of the motor causes the cam **90** to engage the switch **93** to open the same. This effectively disconnects the components of the circuit, the relays being opened by springs as indicated at S in the drawings. The device is then ready to service another customer and if another flavor is selected, such as that controlled by the solenoids **79** or **80**, relay R–**3** and R–**4**, respectively, would function in the manner of relay R–**2** as described.

It is to be noted that suitable heat insulation may be provided for the bin **15** in any convenient manner and that ice particles may be supplied to the bin in any convenient manner. Further, the agitators may, if desired, be driven independently of the circuitry associated with the coin slot, such that there is continual agitation of the ice particles.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions and accordingly, it is desired to comprehend

such modifications within this invention as may fall within the scope of the appended claims.

What is claimed is:

1. In a dispenser for an ice particle-flavored liquid combination, a frame, an ice particle storage compartment on said frame and having upper and lower open ends, means forming a gravity path for supplying ice particles toward said lower open end and including rectilineal side walls, a forward substantially vertical wall and an inclined rear wall of the storage compartment extending downwardly to the said lower open end, said inclined rear wall having a projection extending below and terminating rearwardly of the said forward wall, a roller within the compartment closing said lower open end having the roller axis extending transversely of the compartment and the roller being normally effective to inhibit the passage of ice particles through said lower open end, said roller including a measuring pocket which extends axially the width of the roller and has substantially a V-shape, means for effecting rotation of said roller to selectively present said measuring pocket to said lower opening and to the interior of said compartment, a wiper guard extending from the substantially vertical forward wall of the compartment downwardly into contact with the roller, said wiper guard extending substantially the width of the compartment to prevent the accumulation of ice particles between the substantially vertical forward wall and wiper guard, dual agitator means in the compartment between the wiper guard and inclined rear wall for urging ice particles to said roller and measuring pocket, a container on the frame adapted for retaining a source of a flavoring liquid, means for positioning a receiver for said ice particles and flavoring liquid below the said lower opening of said compartment, a feed line extending from the said container through said projection of said inclined wall and terminating in a nozzle below said lower opening of said compartment but above said last-mentioned means, valve means in said feed line for controlling the flow of said flavoring liquid, means effective upon rotation of said roller through one complete revolution to stop the rotation of said roller and the dispensing of ice particles through the said lower opening, and means synchronized with said roller rotation for opening and closing said valve means after the dispensing of the ice particles whereby a quantity of flavoring liquid may be dispensed to dispensed ice particles.

2. In a dispensing machine, a first means for dispensing a cup, a frame supporting said first means, a support on the frame for receiving a dispensed cup, an ice particle storage compartment having a lower open end terminating above said support and arranged for dispensing ice particles to a dispensed cup on the support, a roller closing said lower open end of said compartment having the roller axis extending transversely of the compartment and the roller being normally effective to inhibit the passage of ice particles through said lower open end, said roller including a measuring pocket which extends axially of the roller and has substantially a V-shape, first power means connected to said roller for effective rotation of said roller to present said measuring pocket to said lower opening, agitator means within the compartment and above the roller for urging ice particles to said roller and measuring pocket, second power means connected to the agitator means for driving the agitator means, a container on the frame adapted for retaining a source of flavoring liquid, a gravity feed line extending from the said container and terminating in a nozzle above said support for dispensing flavoring liquid to a dispensed cup on the said support, valve means in said feed line for controlling the flow of said flavoring liquid, means for initiating the operation of said second power means, means operative after operation of said second power means to initiate the operation of said first power means, means operative in response to the operation of the said first power means to open said valve means between said container and nozzle, and means responsive to the operation of said first power means to terminate the operation of said first power means and to close said valve means upon rotation of said roller through one complete revolution.

3. In a dispenser for an ice particle-flavored liquid combination having a cup dispenser and means for dispensing flavoring liquid into a supported dispensed cup, the structure comprising an ice particle storage compartment having a lower open end, support means for supporting a dispensed cup below said lower open end, an inclined rear wall of the storage compartment extending downwardly to the said lower open end, side walls and a forward wall of the compartment defining with the said inclined rear wall a gravity path for supplying ice particles toward said lower open end, a roller closing said lower open end having the roller axis extending transversely of the compartment and the roller being effective to inhibit the passage of ice particles through said lower open end, said roller including a measuring pocket which extends axially of the roller substantially the length of the roller and is in a V-shape, agitator means within the compartment and above the roller for urging ice particles to said roller and measuring pocket, and depending inturned portions of the side walls of the compartment providing a narrowed passage from the said lower opening toward said support for guiding ice particles to a cup on said support.

4. In an ice particle dispenser, a frame, an ice particle storage compartment in said frame having a lower open end and having front, side, and rear walls, a roller in the compartment adjacent the lower end but above the lower edge of said back walls extending transversely from one end wall to another and closing said lower end, said roller having an axially extending measuring pocket formed in its periphery, said back wall being inclined toward said front wall at least with respect to the portion of the back wall from the roller downwardly, means cooperating with the inclined portion of the back wall forming an inwardly tapering chute means to direct ice particles discharged from said roller into a cup or the like supported therebeneath, agitator means in the compartment above the roller operable to break the ice particles apart and to feed them into said pocket, means for actuating said agitator means prior to commencing rotation of said roller, and means for driving said roller through one revolution during which said pocket is carried from a prior position where it opens upwardly into said compartment around to a second position where it drops the ice particles therein into said chute means and then on around to said first position.

5. In an ice particle dispenser, a frame, an ice particle storage compartment in said frame having a lower open end and having front, side, and rear walls, a roller in the compartment adjacent the lower end but above the lower edge of said back walls extending transversely from one end wall to another and closing said lower end, said roller having an axially extending measuring pocket formed in its periphery, said back wall being inclined toward said front wall at least with respect to the portion of the back wall from the roller downwardly, means cooperating with the inclined portion of the back wall forming an inwardly tapering chute means to direct ice particles discharged from said roller into a cup or the like supported therebeneath, agitator means in the compartment above the roller operable to break the ice particles apart and to feed them into said pocket, means for actuating said agitator means prior to commencing rotation of said roller, means for driving said roller through one revolution during which said pocket is carried from a prior position where it opens upwardly into said compartment around to a second position where it drops the ice particles therein into said chute means and then on around to said first position, liquid flavoring material dispensing means in an upper part of said frame including conduit means leading to a position in said chute means and terminating in a downwardly

directed nozzle for supplying flavoring material to ice particles dispensed from said roller, valve means in said conduit means, and operated in response to rotation of said roller for opening said valve means after the ice particles have been discharged from the pocket in said roller.

6. An arrangement according to claim 5 in which said flavoring material dispensing means comprises a plurality of individual containers each for a different flavor, said conduit means comprising a conduit leading from each container to said nozzle, said valve means comprising an individual valve in each said conduit, and means operable for selecting the one of said valves to be operated during rotation of said roller while simultaneously energizing the means for driving said roller.

7. A dispenser for ice particles comprising an ice particle storage compartment having a lower open end through which ice particles are dispensed, a roller closing the said lower open end and agitator means above the said roller in the compartment, said roller having an axially extending groove providing a measuring pocket for receipt of ice particles, and said agitator means comprising a pair of

shafts having their axes substantially parallel to that of the roller axis and including on each shaft prongs extending from the shaft in spaced relation, one said shaft being above the other relative to said roller, and means for carrying out a dispensing operation comprising means for actuating said agitator means, means for then actuating said roller, means operable during rotation of the roller for halting said agitator means, and means operable after one complete revolution of said roller and with the pocket thereof opening upwardly into said compartment for halting said roller.

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