Feb. 7, 1933. H. J. THOMPSON ET AL 1,896,208

FEED FOR SUGAR CUBE DISPENSERS

Filed Jan. 25, 1932 2 Sheets-Sheet 1

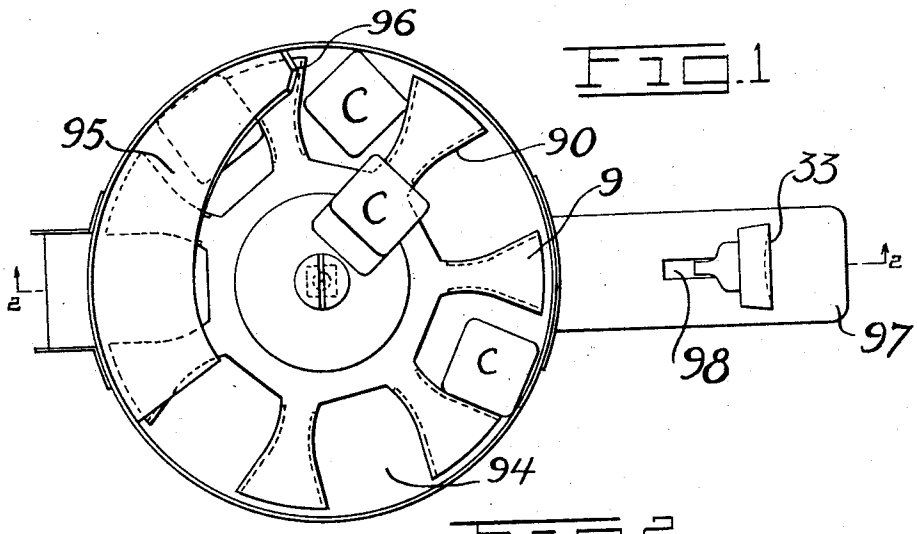


Fig. 1

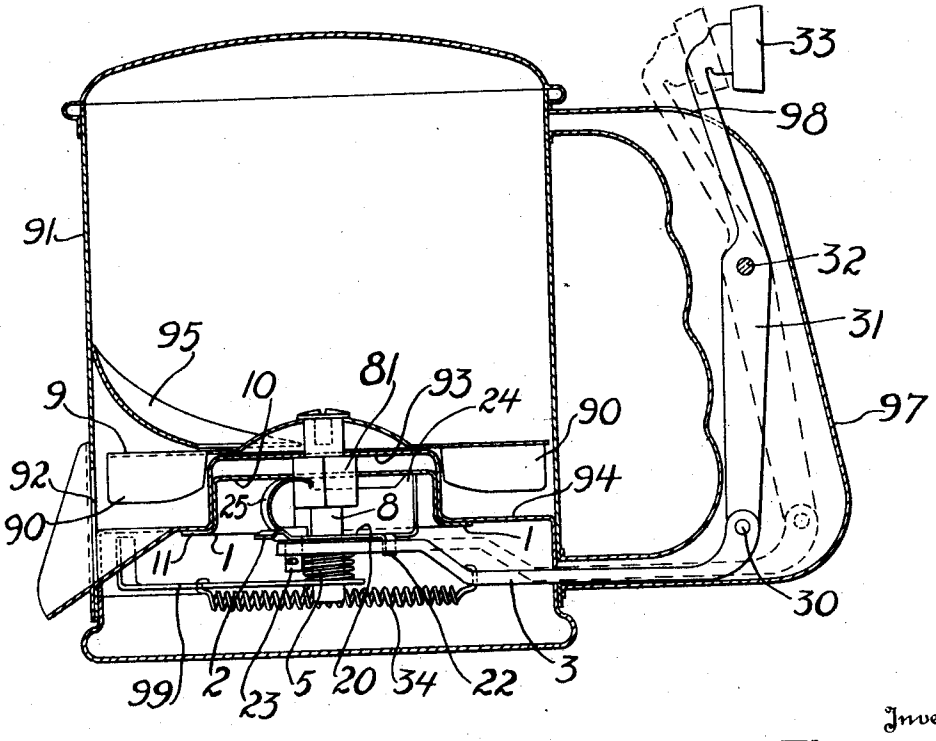


Fig. 2

Inventor

Henry J. Thompson

Anton F. Sulak

By Charles L. Reynolds

Attorney

Feb. 7, 1933. H. J. THOMPSON ET AL 1,896,208

FEED FOR SUGAR CUBE DISPENSERS

Filed Jan. 25, 1932 2 Sheets-Sheet 2

FIG. 3

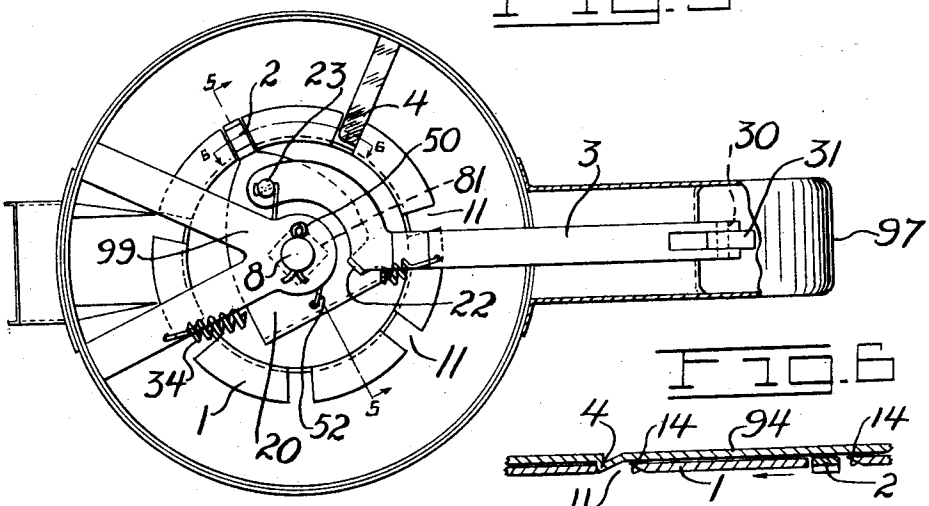


FIG. 6

FIG. 4

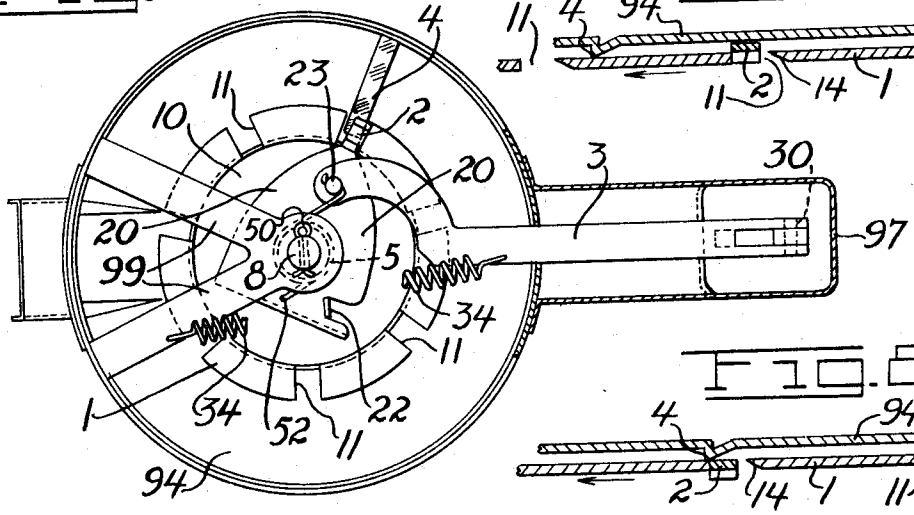


FIG. 7

FIG. 8

FIG. 5

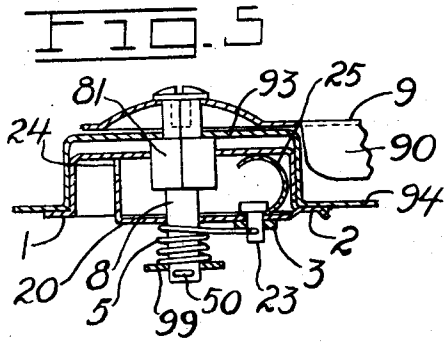
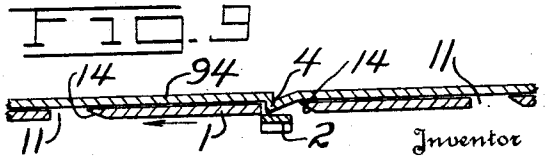


FIG. 9



Inventor

Henry J. Thompson

Anton F. Sulak

By Charles L. Reynolds

Attorney

Patented Feb. 7, 1933

1,896,208

UNITED STATES PATENT OFFICE

HENRY J. THOMPSON, OF SEATTLE, AND ANTON F. SULAK, OF KING COUNTY, WASHINGTON, ASSIGNORS OF ONE-THIRD TO HUGH M. CALDWELL, ONE-THIRD TO JOHN G. MYERS, AND ONE-THIRD TO JOHN D. ARROWSMITH, ALL OF SEATTLE, WASHINGTON

FEED FOR SUGAR CUBE DISPENSERS

Application filed January 25, 1932. Serial No. 588,690.

Our invention relates to dispensing apparatus, and more especially to apparatus such as is shown in application Serial No. 563,712, filed by John G. Myers and John D. Arrowsmith on September 19, 1931, for the dispensing of single lumps of sugar.

One of the objects of the present invention is to devise a feed apparatus for such a dispenser which shall be simple in construction, assembly, and operation, with the minimum number of parts, which can be assembled in a small space beneath the bottom of the container for sugar cubes, and which will properly control the movement of the star wheel which receives and advances the individual cubes into delivery position.

More specifically it is an object to provide such feed means which will insure the movement of the star wheel and the sugar cubes segregated thereby from one definite position in a given direction to another definite position, which will hold the star wheel while in such positions against return movement, but which, when in any intermediate position, may be so operated as to cause to and fro movement of the star wheel, thus to dislodge any jam that may occur, and to cause any sugar cube which may be cocked sidewise in its recess or pocket to be moved by contact with parts of the dispenser and with other cubes into proper position for delivery.

With these and other objects in mind, our invention comprises the novel parts and the novel combination and arrangement thereof with relation to each other, as is shown in the accompanying drawings, described in this specification, and as will be more particularly pointed out by the claims which terminate the same.

In the accompanying drawings we have shown our invention embodied in a form which is at present preferred by us.

Figure 1 is a top plan view of the dispenser with the cover removed.

Figure 2 is a vertical axial section through the dispenser, illustrating the relationship of the feed means to the delivery means.

Figure 3 is a bottom plan view of the dispenser and feed means in the normal position of rest, and Figure 4 is a similar view showing parts at the completion of a delivery movement and before return to the normal position.

Figure 5 is a detail axial sectional view substantially on the line 5—5 of Figure 3.

Figures 6, 7, 8 and 9 are detail sectional views showing parts in different positions during the cycle of operation, taken substantially along the curved line 6—6 of Figure 3.

The form assumed by the dispenser is largely immaterial, but our invention is best adapted to a device wherein a star wheel 9, having recesses or pockets 90, is rotatably mounted within a container 91 to advance sugar cubes C one by one into registry with a delivery outlet 92. The cube to be delivered is segregated from the others by its dropping into a recess 90, where it rests upon the bottom 94, and moving with the star wheel beneath a separator 95. Should a cube cock sidewise in the recess, a point 96 upon the forward edge of the separator will ordinarily turn it over, but occasionally it may be necessary to draw the star wheel back, to relieve such a cube of the pressure against the point before it will drop into the pocket, or be turned over by subsequent engagement with the point so that it will drop.

In the application referred to, it is preferable that the bottom of the receptacle be domed upward, as indicated at 93, and the star wheel is secured to rotate upon a vertical shaft 8 journaled in this domed portion 93. The flanges defining the pockets 90 are disposed between the dome and the wall of the container. The shaft is provided with a non-circular or squared portion 81 for a purpose which will appear hereafter.

Associated with the star wheel 9 is a ratchet plate 1, which may be somewhat cupped, as indicated at 10, to fit within the dome 93, from the under side. In such a case the plate takes the form of a flanged portion of this cup, which lies just beneath and in contact with the bottom 94 of the receptacle, and this plate is notched, as indicated at 11, the number of notches corresponding to the number of recesses 90 in the star wheel. The ratchet plate is provided with an aperture fitting upon the squared portion 81, by means of

which it may rotate the shaft 8 and consequently the star wheel 9.

Engageable with this ratchet wheel 1 is a feed dog 2. For convenience this may be formed as part of a plate 20 which is supported upon the lower end of the shaft 8 for oscillation thereabout. The dog 2 is so positioned as to engage within the several notches 11, and its arc of movement is just sufficient to move a notch, and consequently a recess 90 of the star wheel, enough to bring the next succeeding notch into delivery position. Such movement of the dog 2 may be accomplished by means of a link 3 pivoted at 23 to the plate 20, and secured at its other end, at the point 30, to an operating lever 31 which may be pivoted at 32 in the handle 97, the operating lever having a thumb button 33 which is positioned conveniently for engagement by the thumb of a hand which grasps the handle 97. A stop 22 upon the plate 20 will engage the link 3 to limit movement of the link and dog 2 under the influence of a return spring 34 (compare Figures 3 and 4). Limitation of the advance movement of the dog may be obtained in various ways, for instance, by contact of the operating lever 31 with the end of a slot 98 (see Figures 1 and 2) through which it projects.

Positioned to engage within one of the notches 11, when the star wheel is in delivery position, and to prevent return of the ratchet plate 1 and the star wheel from such position, is a holding dog 4. This may be secured to the under side of the bottom 94, or may be pressed thereinto, as is shown in the drawings. Preferably this is inclined so that the ratchet plate 1 will ride over the holding dog 4, but dropping over it when it has passed, will not be permitted to return.

Because a certain yieldability of the dog 2 and ratchet plate 1 with respect to each other and to the holding dog 4 is necessary, this can either be incorporated in the parts themselves, by making them of sufficiently resilient material, or it can be provided for in a way which we will now describe. Thus the plate 20 may be provided with two spaced feet 24 which bear upwardly against the cupped portion 10 of the ratchet plate, these feet 24 being opposite the dog 2, and the dog is supported by a resilient foot 25. In order to support the dog 2 and its plate 20, therefore, and to press the dog into the notches 11 in opposition to the resilient foot 25, we provide a spring 5 surrounding the lower end of the shaft 8, its lower end resting against a brace member 99 supported by a cotter pin 50, this spring exerting a force upward superior to the combined force of the resilient foot 25 and the weight of the plate 20 and connected parts, including the plate 1. The spring 5 may also assist the action of the spring 34 to return parts to the normal position of rest, shown in Figure 3, and for this purpose its ends may be connected respectively to the pin 23 and to the plate 20 at 52.

The normal position of rest is shown in Figure 3. The spring 34, assisted perhaps by the spring 5, has drawn the link 3 inward toward the shaft 8 until the link contacts with the stop 22. The feed dog 2 now lies within one of the notches 11. The holding dog 4 lies within an adjacent notch 11. It will be assumed that the cube of sugar which was thus brought to delivery position was discharged. Now it is desired to discharge another lump.

The button 33 is pressed, pulling the link 3 to the position shown in Figure 4. The feed dog 2 advances, under the pull of the link, an angular amount corresponding to the spacing between notches 11 and between recesses 90. This brings the notch engaged by the feed dog 2 into registry with the holding dog 4. The ratchet plate 2 had previously flexed slightly to ride over the fixed holding dog, and it now drops, or rather rises, about the holding dog, under the influence of the spring 5. This displaces the feed dog 2 from the notch, and upon return movement of the link 3 and dog 2, the dog will ride over—that is, under—the ratchet plate 1 until it comes into registry with the next notch 11, whereupon, under the influence of the spring 5, it will drop into this notch, and is now in the position of Figure 3, ready for the advance of another lump.

If the lump of sugar should become stuck in its recess, or improperly engaged with the point 96 or the separator 95, the feed movement of the dog 2 cannot be completed, but the ratchet plate 1, in any intermediate position, rides upon the holding dog 4, and there is nothing to displace the feed dog 2 until it is displaced by the fixed holding dog 4. Accordingly, the ratchet plate may be oscillated back and forth by pressing and releasing the button 33, and this will cause the star wheel 9 to move back and forth within the container until the lump which is stuck is dislodged and drops into proper position, whereupon the feed movement can be completed. Since it is not practicable to dump the contents of such a receptacle, should a cube become stuck, and since there is no way of getting at such a stuck tube, this feature is of considerable importance.

The edges of the several notches and the holding dog should be properly inclined to permit advance or feed movement, but to prevent return movement. Such inclination is shown, and the various positions of the parts during the feed movement are illustrated in Figures 6 to 9 inclusive. Thus it will be seen that the forward edge of the fixed holding dog 4, in the direction of movement of the ratchet plate 1, is inclined so that the ratchet plate will ride thereover. Similarly, the leading edge of each notch 11 is

inclined, as may be seen at 14, and while this does not affect the feeding engagement of the dog 2 within the notch, in combination with the inclined holding dog 4 it permits the leading edge of the dog at the commencement of the return movement to clear the edge of the notch, so that when the feed dog 2 starts back it will ride over the outermost or underneath surface of the ratchet plate 1.

What we claim as our invention is:

1. In combination with a receptacle having a delivery outlet and a star wheel rotatably mounted in the receptacle and recessed to receive and advance sugar cubes into registry with the outlet, feed means therefor comprising a ratchet plate having spaced notches corresponding to the recesses of the star wheel, and operatively connected to the latter, a fixed holding dog engageable within a notch to retain the ratchet plate and star wheel in delivery position, and when so engaged lying substantially flush with the lower surface of the ratchet plate, a feed dog pivotally mounted to engage another notch of the ratchet plate, means to advance said feed dog and the plate engaged thereby to bring another recess of the star wheel into delivery position, and when so advanced to be displaced from the notch by the holding dog now entering the same, whereby the feed dog may return over the plate to position to engage a further notch.

2. In combination with a receptacle having a delivery outlet and a star wheel rotatably mounted above the bottom of the receptacle and recessed to receive and advance sugar cubes into registry with the outlet, feed means therefor comprising a ratchet plate having spaced notches corresponding to the recesses of the star wheel, and operatively connected to the latter, means supporting said ratchet plate for rotation in contact with the under side of the bottom of the receptacle, a holding dog fixed with relation to such bottom, and raised beneath the bottom by an amount substantially the thickness of the ratchet plate, said dog being positioned to engage within a notch of the ratchet plate to retain the ratchet plate and star wheel in delivery position, a feed dog pivotally mounted to engage within another notch of the ratchet plate, means to advance said feed dog and the plate engaged thereby over the holding dog to bring another recess of the star wheel into delivery position, and when so advanced to be displaced from the notch by the holding dog now entering the same, the several parts being flexibly mounted to enable displacement of the ratchet plate relative to the holding dog, and the feed dog relative to the holding dog and plate, for return movement over the plate.

3. In a sugar cube dispenser, in combination with a container having a raised bottom and a delivery outlet adjacent the bottom, a ratchet plate rotatably supported from and immediately beneath the bottom, and notched about its periphery, a holding dog fixed to the bottom in the plane of the ratchet plate at rest, and engageable with a notch thereof, a feed dog bearing upon the under side of the bottom to engage within a notch of the ratchet plate, means to advance the feed dog and the ratchet plate engaged thereby, the several parts being supported to yield axially relative to the holding dog, whereby the ratchet plate may ride over the holding dog during advance, and the ratchet dog may ride upon the holding dog to be disengaged, at the end of an advance, and to be supported beneath the level of the ratchet plate, to return thereover, and means to advance cubes of sugar within the container towards the delivery outlet, said means being operatively connected to the ratchet plate.

4. In combination with a receptacle having a delivery outlet and a star wheel rotatably mounted in the receptacle and recessed to receive and advance individual sugar cubes into registry with the outlet, feed means therefor comprising a ratchet plate having spaced peripheral notches corresponding to the recesses of the star wheel, and operatively connected to the latter, a fixed holding dog engageable within a notch to retain the ratchet plate and star wheel in delivery position, and when so engaged lying substantially flush with the lower surface of the ratchet plate, a feed dog disposed for oscillation coaxially with the ratchet plate, and engageable with another notch of the ratchet plate, a resilient foot between the plate-engaging side of the pivot of the feed dog, a pair of feet at the opposite side of the dog's pivot, engaging the under side of the ratchet plate, and a compression spring engageable beneath the feed dog, of strength in excess of the strength of the resilient foot and the weight of parts, whereby the feed dog is yieldingly pressed into engagement with the ratchet wheel, and is disengageable therefrom upon engagement with the holding dog, to enable return of the feed dog over the ratchet plate.

5. In combination with a receptacle having a delivery outlet and a bottom upwardly domed inwardly from the walls of the receptacle, a vertical shaft journaled in the center of the dome, and a star wheel within the receptacle and secured to the shaft to be rotated thereby, feed means for said star wheel comprising a ratchet plate having spaced peripheral notches and an upwardly cupped central portion received within the dome, the ratchet plate being engaged with said shaft to advance the shaft, a fixed holding dog upon the under side of the bottom of the receptacle engageable within a notch of the ratchet plate to hold the latter and the star wheel in delivery position against retrograde movement, a feed dog disposed upon the lower end of the

shaft for oscillation, and engageable with another notch, a resilient foot projecting upwardly from the feed dog, adjacent the notch, to engage the top of the cupped portion of the ratchet plate, a pair of feet at the opposite side of the dog's pivot, likewise engaging within such cupped portion, a compression spring surrounding the shaft beneath the feed dog, and a thrust member upon the shaft upon which the lower end of the spring bears to hold the dog yieldingly pressed upward in opposition to gravity and the resilient foot.

6. In combination with a receptacle having a delivery outlet and a star wheel rotatably mounted above the bottom of the receptacle and recessed to receive and advance sugar cubes into registry with the outlet, feed means therefor comprising a ratchet plate having spaced notches corresponding to the recesses of the star wheel, and operatively connected to the latter, means supporting said ratchet plate for rotation in contact with the under side of the bottom of the receptacle, a holding dog fixed with relation to such bottom, and raised beneath the bottom by an amount substantially the thickness of the ratchet plate, said dog being positioned to engage within a notch of the ratchet plate to retain the ratchet plate and star wheel in delivery position, a feed dog pivotally mounted to engage within another notch of the ratchet plate, means to advance said feed dog and the plate engaged thereby over the holding dog to bring another recess of the star wheel into delivery position, and when so advanced to be displaced from the notch by the holding dog now entering the same, the several parts being flexibly mounted to enable displacement of the ratchet plate relative to the holding dog, and the feed dog relative to the holding dog and plate, for return movement over the plate, and the forward edge of the holding dog and the leading edge of each notch being oppositely inclined to facilitate displacement of the feed dog and return thereof beneath the ratchet plate.

Signed by HENRY J. THOMPSON at Seattle, King County, Washington, January 20th, 1932, and by ANTON F. SULAK at Seattle, King County, Washington, January 20th, 1932.

HENRY J. THOMPSON.
ANTON F. SULAK.