Nov. 11, 1952 N. H. NELSON ET AL 2,617,355

USED CUP DISPOSAL MEANS

Filed Aug. 12, 1947 2 SHEETS—SHEET 1

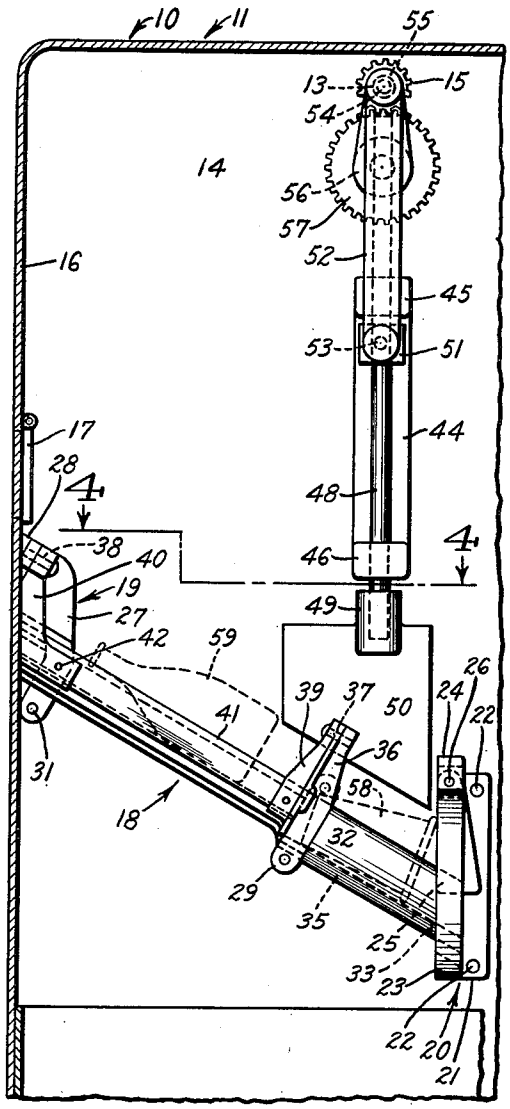


Fig. 1

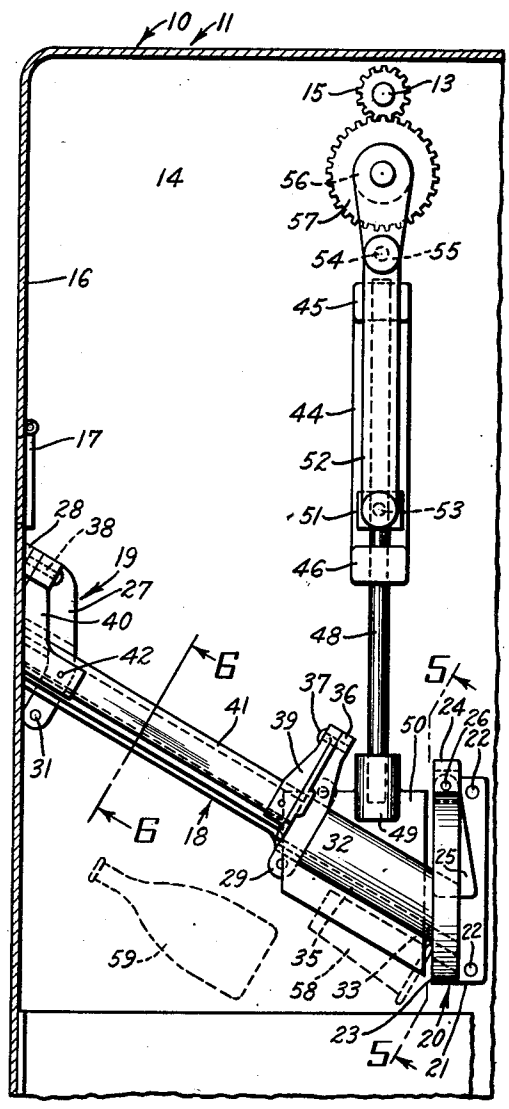


Fig. 2

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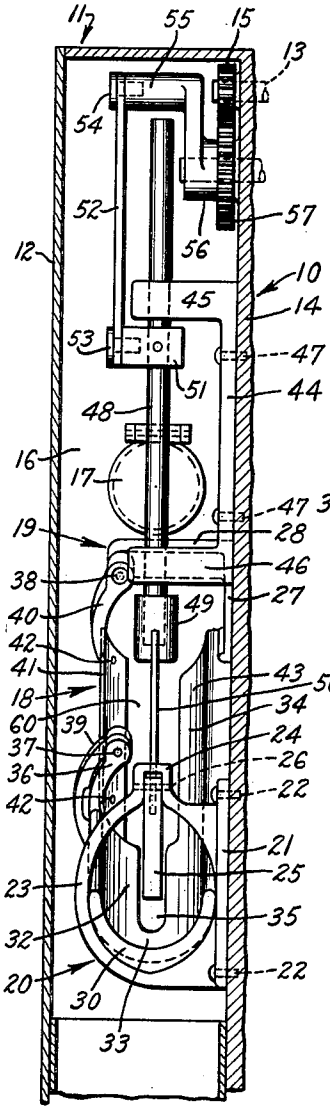


Fig. 3

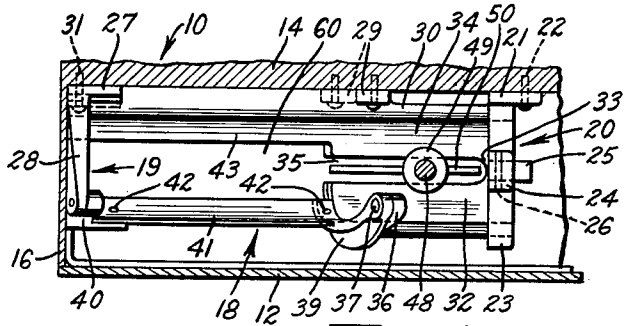


Fig. 4

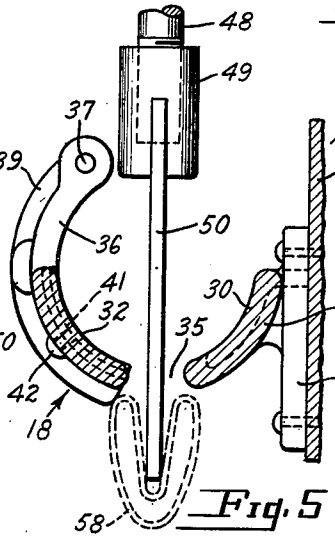


Fig. 5

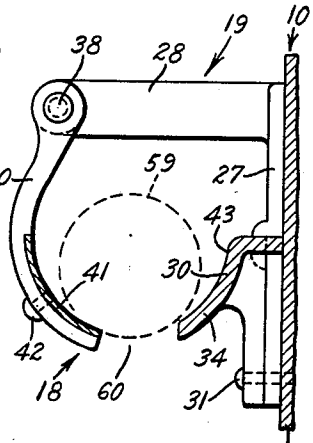


Fig. 6

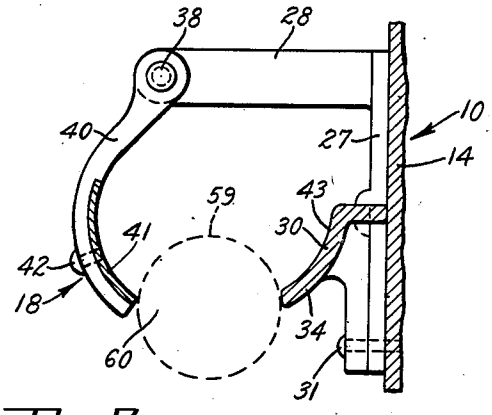


Fig. 7

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USED CUP DISPOSAL MEANS

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Application August 12, 1947, Serial No. 768,116

5 Claims. (Cl. 100—144)

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This invention has relation to new and useful improvements in vending machines and has particular relation to a means for disposing of the paper cups employed with liquid or drink vending machines.

An object of the invention is to provide a used paper cup disposal means including means to crush such cups whereby to have them occupy but a small space and also including means whereby heavy, rigid articles, such as bottles or the like, are prevented from reaching and jamming such crushing means.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scape of the appended claims.

In the drawings:

Fig. 1 is a side elevational view of the means of the invention, a portion of the enclosing cabinet being shown, and showing in dotted lines a cup to be crushed and a bottle;

Fig. 2 is a similar view but showing the crushing of the cup and the ejecting of the bottle before the latter reaches the crusher;

Fig. 3 is a view taken as looking from the right hand edge of Fig. 1;

Fig. 4 is a top plan view of the means of the invention, the view being taken as along the plane of the line 4—4 of Fig. 1;

Fig. 5 is a vertical sectional view taken as along the plane of the line 5—5 of Fig. 2;

Fig. 6 is a sectional view taken as along the line 6—6 of Fig. 2; and

Fig. 7 is a view similar to Fig. 6 but with the swinging portion of the means open to drop or eject a bottle.

Referring in detail to the drawings, at 10 is generally indicated a portion of a cabinet which preferably is the cabinet of a milk or other drink vending machine such, for example, as that disclosed in the application of Polsen & Nelson, Ser. No. 537,658, filed May 27, 1944, now Patent No. 2,426,707 of September 2, 1947, or in Patent 2,354,349 which issued on July 25, 1944. Such cabinet includes a lateral extension 11, the upper portion only of which is shown. Normally the outer side of the extension 11 is closed by a door 12.

In the present instance, a driving shaft 13,

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which may be and preferably is the shaft 45 of the application of Polsen & Nelson, Ser. No. 598,110 filed June 7, 1945, which issued as patent 2,556,739 on June 12, 1951, extends through the side wall 14 of the cabinet 10 and at the outer side of said wall is equipped with a gear 15 fast to the shaft whereby to be rotated with the latter. As will later appear, the shaft 13 through the gear 15 serves to drive the crushing mechanism of the present cup disposal device.

In its forward wall 16, the cabinet extension 11 is provided with a relatively small opening normally closed by a door 17 hinged toward its upper edge as shown and adapted to be pushed inwardly to admit of the insertion of a used cup into the cabinet extension. In this connection, it is noted that the machines disclosed in the above identified applications for patent are vending machines of the type designed to dispense milk or other liquid.

According to the plan, the machines dispense this liquid into paper cups which are also supplied by the machine, and in the present instance, we are seeking to provide for the disposal of used paper cups. The cups are rather bulky and unless stacked within one another, very few cups occupy a relatively large space. According to the designs of the present invention, used cups will be automatically crushed by the machine so as to occupy a small space and the person having used the cup merely pushes the same through the opening closed by the hinged door 17. Door 17 is so hung that it simply gravitates to closed position although, if desired, springs may be provided urging it to closed position.

In the cabinet extension 11 and extending substantially parallel with the cabinet wall 14 is a chute generally designated 18. Such chute is arranged at an incline and has its higher end toward the wall 16 and located slightly under the opening normally closed by the door 17. Chute 18 is supported from the cabinet wall 14 as from a pair of bracket-like members, generally designated 19 and 20.

Bracket member 20 includes a plate-like portion 21 fastened to the wall 14 as by drive screws 22 and integral with said plate is a loop or oval shaped portion 23 having an offset 24 at its upper side and into which is pivotally mounted the upper end of a stop 25. Such stop is in the form of a weight and its pivot is shown at 26. The stop hinges or is suspended across a goodly portion of the loop 23 partly blocking the lower end of the chute 18. Bracket 19 comprises a plate-like portion 27 fastened against the wall 14 to-

ward the front of the cabinet and includes a horizontal arm 28 extending outwardly from the wall 14 and across the wall 16.

A bracket plate 29 is also secured against the cabinet wall 14 and is located intermediate the ends of the chute 18. This bracket carries a longitudinally extending chute portion 30 which may be integral with the bracket and the forward or higher end of such portion 30 is bolted or secured to the bracket plate 27 as by means of drive screws or the like 21 attaching such bracket plate to the cabinet wall 14.

The lower end or the inner end portion of the chute segment or section 30 enters into the lower portion of the loop or oval 23 as best shown in Fig. 3, whereby such lower end is supported by the bracket generally designated 20. Chute section 30 has an integral portion 32 which with the lower widened portion of the section 30 constitutes the bottom wall of the lower or inner portion of the chute. As best shown at 33 in Fig. 3, the section 30 is integral with the chute bottom wall portion 32.

Inwardly of the lower end of the chute, the mentioned portion 32 is separated from the widened portion 34 of section 30 by a slot 35. On the higher end of the chute portion 32 there is provided an arm-like extension 36. A pivot 37 through the upper end portion of said arm and a pivot 38 through the outer end portion of the arm 28 of bracket 27 provide pivotal mountings for the upper ends of a pair of arms 39 and 40, respectively.

These arms 39 and 40, toward their lower ends, carry an elongated transversely curved plate or chute section 41 fastened to the arms as by rivets or the like 42. Section 41 is complemental to the narrower upper portion 43 of the chute section 30 previously mentioned. The pivot mountings 37 and 38 clearly provide for swinging movement of the chute section 41 toward and from the narrower portion 43 of the chute section 30. The purpose of this will later be fully set forth.

Mounted on the wall 14 above the lower or inner end portion of chute 18 is a bracket 44 provided with upper and lower arms 45 and 46. This bracket is secured to the wall in any suitable manner, as by the drive screws 47. Reciprocable in aligned openings in the bracket arms 45 and 46 is a bar or rod 48, the lower end portion of which is threaded into tapped sockets in a head-like member 49 carrying a crushing blade 50.

Fastened to the rod 48 in its portion between the arms 45 and 46 is a block 51. A link 52 has its lower end pivoted to said block 51 by a pivot means 53 and a pivot means 54 connects the upper end of said link with the outer end of a crank 55 to the hub portion 56 of which a gear 57 is made fast. Gear 57 is constantly in mesh with gear 15 on the shaft 13 above referred to.

With this construction, it will be apparent that each time the shaft 13 is rotated, the crank 55 will be rotated and the bar 48 and consequently the crushing blade 50 will be given a downward and then an upward movement. Thus, during each rotation of the gear 57 the crushing blade 50 is moved downwardly from the position of Fig. 1 to that of Fig. 2 and then back upwardly to the position of Fig. 1.

When the present means is in use, a person in disposing of a used paper cup, merely pushes the same through the opening normally closed by door 17. The cup falls into the chute 18 and slides down the same to a position against the inner side of the stop 25 and over the slot 35. Such position of a used paper cup is suggested by the cup 58 shown in dotted lines in Fig. 1.

Now the next time the machine is operated (as disclosed in the above identified Polsen & Nelson application, Ser. No. 598,110, filed June 7, 1945), the crank 55 is operated and shifts the crusher blade 50 downwardly so that said blade engages the cup 58 and crushes in its upper wall and then as the blade continues downwardly, the cup is further folded and is forced through the slot 35, as suggested in Fig. 5. The crushed and folded cup drops into the lower portion of the cabinet where a suitable receptacle (not shown) may be placed and then the movement of the bar 48 is reversed and as the bar is carried upwardly, the crusher blade 50 is returned to the elevated position in Fig. 1.

Since the crushing mechanism is operated by the dispensing apparatus, through the gear 15 on the shaft 13, it is particularly desirable that provision be made whereby the mechanism will not be jammed should someone, through carelessness or malice, push a bottle or other rigid article through the opening normally closed by the door 17. Should a bottle or other heavy object be dropped onto the chute, as for example, the bottle shown at 59 by dotted lines, the weight of the bottle will overbalance the chute section 41 on its pivotally mounted arms so that said section will swing downwardly, as from the position of Fig. 6 to that of Fig. 7, and permit the bottle to drop out of the chute before the bottle comes under the crushing blade.

This will prevent smashing of the bottle with the resultant presence of broken glass among the used cups in the cabinet and will further prevent any chance of jamming of the mechanism operating the crushing blade. Should the heavy object fail to pass out of the chute by opening of the gate-like section 41 thereof, the object will strike the pivotally mounted stop 25 and swing the same outwardly or toward the right in Figs. 1 and 2 and pass under the stop and drop off the end of the chute.

Thus, the present mechanism includes two safety features to prevent jamming of the mechanism and to prevent any other inconvenience such as might result from the presence of broken glass. The heavy object, as a bottle or the like, will either be dropped as suggested in Fig. 2 through opening of the gate-like portion 41 of the chute, or will pass downwardly and off the end of the chute on striking and swinging the stop 25. Very small objects may pass through the upper portion of the chute as through the space 60 between the swinging gate or section 41 of the chute and the narrower portion 43 of the fixed section 30 of the chute.

Having thus set forth the nature of our invention, what we claim is:

1. In a cup disposing means, an inclined chute adapted at its higher end to receive a cup to be crushed, a stop at the lower end of said chute, a vertically reciprocable plunger above the lower end of said chute and adapted to crush a cup which is against said stop, said chute in its higher portion including a pair of sections of which one is hinged for laterally, bodily swinging movement away from the other to an open position and back toward the other to a normal position, said hinged section adapted on receiving a weight substantially heavier than that of a paper cup to swing away from the other section to an open position and drop said object through the

bottom of the chute, and means for reciprocating said plunger.

2. In a cup disposal means, an inclined chute adapted at its higher end to receive a cup to be disposed of, a stop at the lower end of said chute and adapted to bring to rest a cup sliding down said chute, said chute immediately forwardly of said stop having a slot in its bottom wall, a blade-like plunger of a width to pass through said slot, a vertically disposed rod, guide means mounting said rod for vertical reciprocating movement, means securing said plunger to the lower end of said rod, and means for reciprocating said rod and thus said plunger to carry the latter downwardly into engagement with a cup retained by said stop, said means for reciprocating said rod being adapted to move said plunger downwardly sufficiently to crush and carry such engaged cup through said slot.

3. In a cup dispensing means, an inclined chute adapted at its higher end to receive a cup to be crushed, a stop at the lower end of said chute, said chute immediately forwardly of said stop having a slot in its bottom wall, a blade-like plunger mounted for vertical reciprocating movement through said slot, said plunger on downward movement adapted to fold and crush a cup being held by said stop and carry the folded and crushed cup through said slot, means for reciprocating said plunger, and said stop comprising a pivotally mounted weight adapted to swing out of the way under the impact of a heavy object moving down said chute whereby to permit said object to move off the end of the chute and out of the path of said plunger.

4. In a cup dispensing means, an inclined chute adapted at its higher end to receive a round walled paper cup to be crushed, stop means at the lower end of said chute; said chute being trough-shaped and immediately forwardly of said

stop means having a longitudinal centrally disposed slot in its bottom wall of greater length and less width than the respective length and diameter of said cup whereby said cup rests in centralized relation upon the longitudinal edges of said slot, a vertically reciprocatory blade-like plunger longitudinally and vertically aligned with the longitudinal center line of said slot having an elongated lower edge of greater length than said cup, said plunger being of less length and less width than said slot whereby it is adapted to pass through said slot and on downward movement fold and crush a cup supported upon the longitudinal side edges of said slot and force the folded and crushed cup downwardly through and out of said slot, and drive means connected to said plunger for reciprocating said plunger whereby its lower edge moves between a position above the cup and a position below said slot.

5. The invention as defined in claim 4 wherein said lower edge of said plunger is inclined in parallel relation to said inclined chute.

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