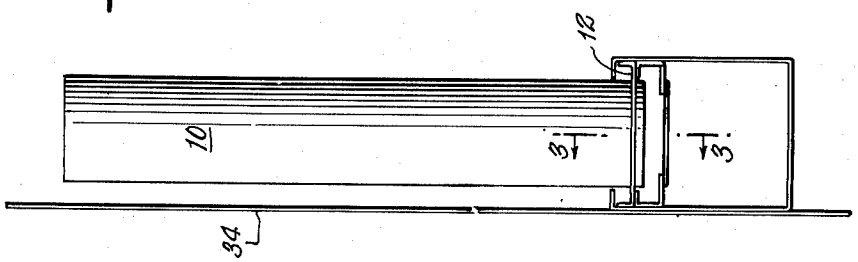
Feb. 16, 1954 H. F. BREMER 2,669,498

CUP DISPENSER

Filed Aug. 28, 1952 2 Sheets-Sheet 1

Fig. 2.



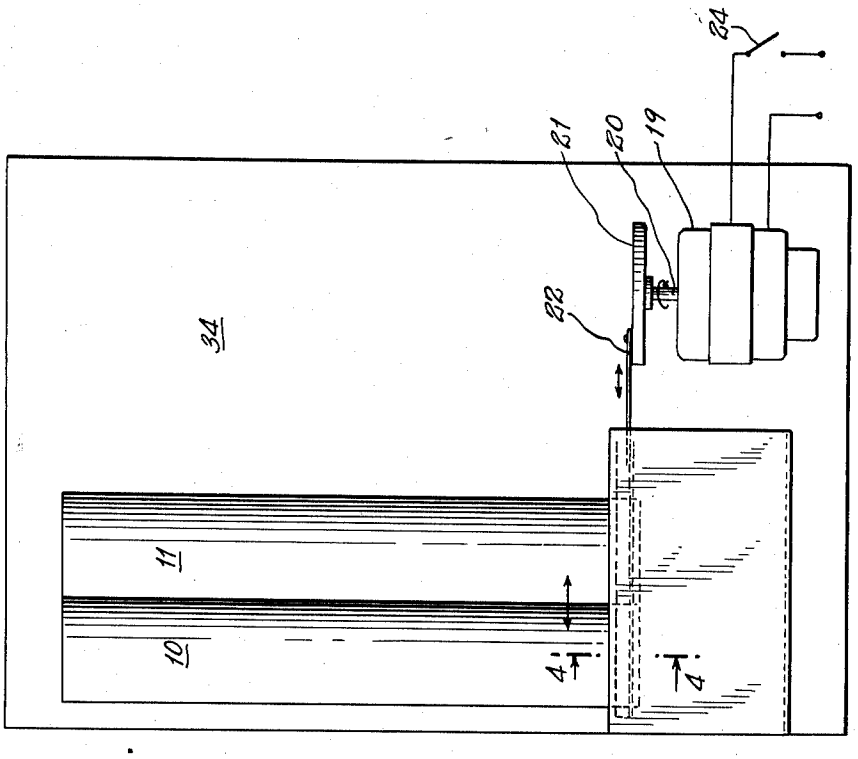


Fig. 1.

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2 Sheets-Sheet 2

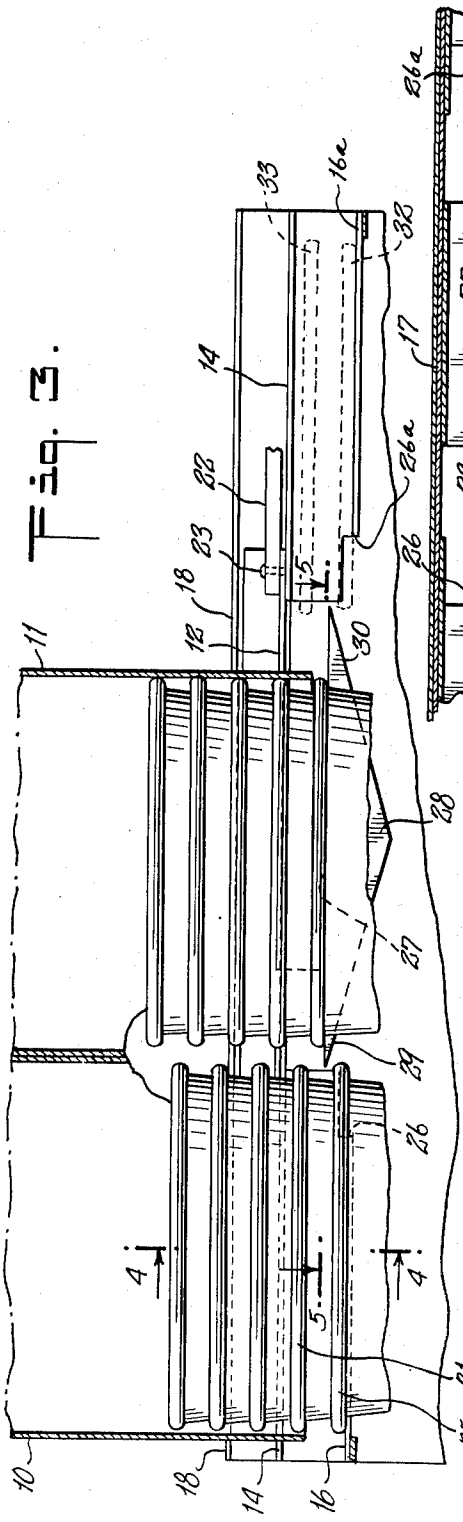


Fig. 3.

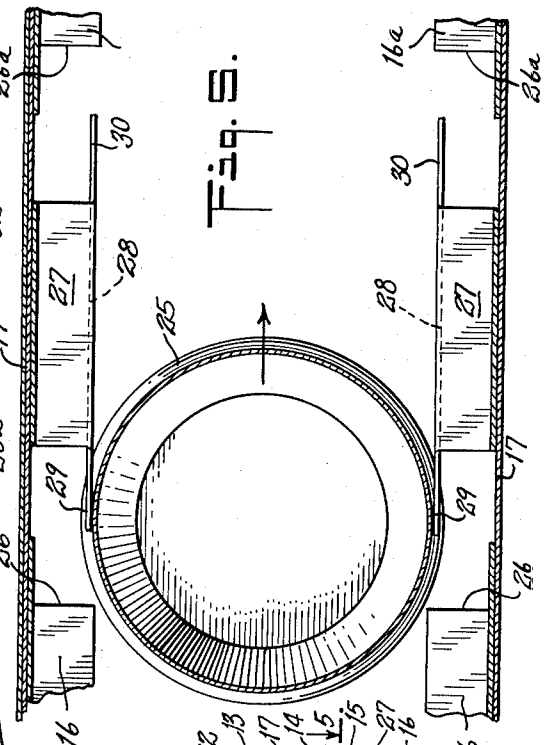


Fig. 5.

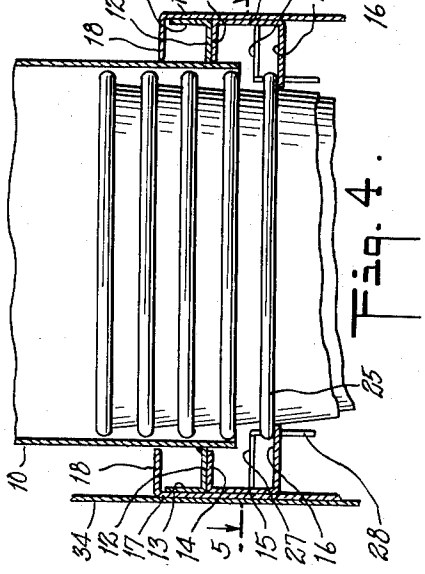


Fig. 4.

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CUP DISPENSER

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2 Claims. (Cl. 312—43)

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This invention relates to apparatus for dispensing rimmed paper cups or the like.

Apparatus for this purpose has commonly been of two types—a dispenser feeding from the base of a single stationary stack, the feeding mechanism usually having rotating parts; and a nest of tubes arranged in the form of a circle and revolving as a group about their common center. Neither type of apparatus is compact or efficient in the utilization of space, and each thereof is relatively costly to manufacture.

The objects of the present invention are to provide an apparatus which is compact and economical in the use of space, is certain in delivery, and has its moving parts arranged for straight-line operation permitting use in narrow spaces adjacent, for example, the front panel of a beverage dispenser.

The invention is here disclosed in a form suitable for use within the enclosure of a powered coin-actuated drink dispensing cabinet. It is contemplated that the apparatus may be used in other applications, and that it shall be stamped out of sheet metal.

Referring to the annexed drawings which form part of this specification:

Fig. 1 is an elevational view of an apparatus made according to the present invention, the same being mounted upon a plate 34 which is assumed to be the front panel of a drink dispensing device whose parts other than the cup dispenser are not shown;

Fig. 2 is a vertical elevation of the apparatus of Fig. 1, seen from the left of Fig. 1;

Fig. 3 is a partial vertical section in the plane 3—3 of Fig. 2, with cups shown in certain positions in full lines, and other positions in dotted lines;

Fig. 4 is a vertical section on the plane 4—4 of Fig. 3; and

Fig. 5 is a horizontal section on the plane 5—5 of Figs. 3 and 4, showing the lowest cup moving toward the position where its rim is about to be engaged by the sloping under-surface of cam members 29.

In the form of device here illustrated, a pair of tubes 10 and 11 are mounted upon a reciprocating frame 12. The tubes are placed vertically and preferably almost touching each other. They are of appropriate internal diameter to hold a stack of rimmed cups, nested together, and to permit such stack to slide freely up and down within the tube. The feed is from the bottom of each tube, and reloading is from the top.

The reciprocating frame 12 includes two L-

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shaped angle bars having vertically disposed flanges 13, 13 which bear against the trackway, described below, and thus guide the frame in its to-and-fro motion.

A pair of straight parallel trackways 14, 14 are formed by the upper inturned flanges of channel members 15, 15 whose lower inturned flanges form shelves 16, 16 for a purpose to be described. Side wall members 17, 17 secured to channel members 15, 15 have overhanging lips 18, 18 which serve as a guide for the tubes 10 and 11. The upper portion of side wall members 17, 17 also serve as a guide against which flanges 13, 13 bear. Thus frame 12, carrying the weight of tubes 10 and 11 secured thereto as by welding, rests upon trackways 14, 14 and is adapted to slide to-and-fro along the same. The structure is supported by plate 34 to which it is attached.

The foregoing constitute the moving parts of the mechanism, and being relatively few and simple in number, contribute to the efficiency of the operation. Any suitable means may be employed to propel the frame in each direction along the trackways when a cup is to be dispensed. In the type of apparatus here described for purposes of illustration, the actuating mechanism is a suitably powered motor 19 connected through shaft 20 with a disc 21 to which a connecting link 22 is eccentrically connected. The other end of link 22 is pivotally connected by pin 23 to one end of frame 12. The arrangement is such that one half revolution of motor 19, shaft 20 and disc 21 propels frame 12 from one end of trackway 14 to the other end thereof, and the next succeeding half revolution propels it backward to the point of starting. Motor 19 may be actuated in any desired manner, and ordinarily will be powered through a switch 24 actuated manually or through coin-actuated circuits not shown.

While trackways 14 extend from end to end of the device, shelves 16 are divided in such manner that a pair of shelves 16, 16 is located at one end of the trackway, and another pair of shelves 16*a*, 16*a* is located at the other end of the trackway, these pairs of shelves being arranged immediately below trackway 14 and parallel thereto. Shelves 16, 16 are in the same horizontal plane as shelves 16*a*, 16*a*. These pairs of shelves are disposed at such distance apart that the edges of the shelves will engage under the rim 25 of the lowest cup in a tube, when such tube is in that portion of its to-and-fro path of travel which is nearest its end of the trackway. Thus, shelves 16, 16 serve to support the rim 25 of the lowest

cup, and consequently all the cups in the stack above the lowest cup, in tube 10 when that tube is in the position indicated in Figs. 3 and 4. Similarly, shelves 16*a*, 16*a* support the rim 32 of the lowest cup, and hence all the cups in the stack above the lowest cup, in tube 11 when that tube is moved to the right hand end of its path of travel.

Shelves 16, 16 and 16*a*, 16*a* are cut away near the center of the trackway to form the edges 26, 26 and 26*a*, 26*a*. Centered in the space between the vertical planes containing edges 26, 26 and 26*a*, 26*a* are positioned intermediate support shelves 27, 27 secured to side wall members 17, 17. Each of shelves 27 has formed integrally therewith a vertically depending flange 28 which is stamped or cut from sheet metal in such manner as to form at each of its ends extending cam members 29 and 30. The distance between the parallel edges of shelves 27, 27, measured crosswise of the trackway, is slightly greater than the similar distance between the edges of shelves 16, 16 or 16*a*, 16*a* (see Fig. 4). The top surfaces of shelves 27 are in a horizontal plane (see Fig. 4) which is above the plane in which the top surfaces of shelves 16, 16 and 16*a*, 16*a* are disposed. Preferably the vertical distance between such planes is approximately half the vertical distance between the horizontal planes occupied by the rims of adjacent cups in the stack.

Each of cam members 29, 29, 30, 30 consists in effect of an elongated sheet of metal disposed in a vertical plane, having sharply pointed ends and a straight horizontal upper surface extending the full length of the cam with an under surface which slopes downwardly from the pointed end of the cam at each end thereof towards the middle of the cam where the vertical height thereof is greatest. For convenience these cams may be secured to, or by bending formed as a part of, the edge of shelves 27, 27. The pointed ends of the cam members terminate a little short of the vertical plane containing the adjacent edge 26, 26, 26*a*, 26*a* of the related shelf 16, 16, 16*a*, 16*a*.

The operation of the device is as follows:

Assuming that the frame 12 is at one end of its path of movement along trackways 14, 14, so that tubes 10 and 11 are in the position indicated in Fig. 3, the stack of cups within tube 10 is in the position shown in Figs. 3 and 4, with the rim of the lowest cup resting upon the edges of shelves 16, 16.

When it is desired to dispense a cup, the frame 12, together with tubes 10, 11 secured thereto, is moved longitudinally along trackways 14, 14 from the position at the left end of the trackway shown in Fig. 3 to the position where tube 11 reaches the right end of trackway 14. In the course of this movement, the rim 25 of the lowest cup in tube 10 is moved to the right until it clears the edges 26 of shelves 16, 16 and begins to fall. By this time the rim 31 of the next-to-lowest cup in tube 10 has reached a position where, when the support afforded by shelves 16, 16 is withdrawn and the stack starts to fall, rim 31 will engage the horizontal upper surface of cams 29, 29. In so doing, the entire stack falls a distance equal to approximately one half the distance between rims of successive nested cups in the stack. This slight fall of the stack serves in part to dislodge the lowest cup from its frictional engagement with the next-to-lowest cup. Such disengagement is further effected by the sloping under-surface of cam members 29.

As the lowest cup in the stack of cups in tube 10 moves to the right, as seen in Fig. 3, after passing edges 26, 26 it engages beneath the sloping under-surfaces of cams 29, 29 whose depending and downwardly sloping surface force this cup downward as the tube continues to move to the right. Thereby the frictional engagement of the lowest cup with the one next above it in the stack is positively broken, and the lowest cup is wedged downwardly to a position where it is free to fall. The falling cup is adapted to pass to a receiving position, not shown, where it may, for example, be filled with beverage. After dislodgement of the lowest cup, the cup which had theretofore been the next-to-lowest and has now become the lowest cup in the stack, rests upon the edges of shelves 27, 27 where it remains supporting the stack above it until the next cycle of operation.

During the second cycle of operation, a cup is fed from the other tube 11, whose stack at the beginning of the second cycle of operation is in the position indicated by the cup rims 32, 33 shown in dotted lines in Fig. 3. The feed from the right-hand end towards the center is the same, but reversed in direction, as the feed from the left hand end towards the center. Rim 32 of the lowest cup in the stack, after clearing edges 26*a*, 26*a* of shelves 16*a*, 16*a* is partly shaken loose as the rim 33 of the next-to-lowest cup falls downwardly until it comes to rest upon the horizontal upper surface of cams 30, 30. Rim 32 is wedged downwardly, thereby positively disengaging the lowest cup from the next-to-lowest cup, by engagement of rim 32 with the sloping under-surface of cam members 30, 30, while the rim 33 of the next-to-lowest cup moves along till it rests on shelves 27, 27.

While a cup is being fed from tube 11 during the motion of that tube from the right-hand end of the trackway towards its center, tube 10 is being moved from its position near the center of the trackway to a position at the left-hand end of the trackway as seen in Fig. 3. During this motion the rim of the cup resting upon intermediate support shelves 27, 27 is moved out of engagement therewith and is supported on the horizontal upper surface of cams 29, 29. When further movement brings this rim past the pointed ends of cams 29, 29, this cup and those above it in the stack falls slightly as it passes from said cams to the shelves 16, 16. Since shelves 27, 27 are higher than shalves 16, 16 (see Fig. 4) by an amount approximately equal to half the vertical distance between rims when the cups are normally stacked, the result is that downward movement of cups takes place in both tubes at each cycle of operation, the downward movement being equal to about half the distance necessary to discharge a cup, and at each cycle a cup is discharged from one of said tubes. Thus, during each cycle of operation, feeding occurs in both tubes but there is delivery of a cup from only one tube, the delivery alternating between tubes on alternate cycles of operation.

The actuating mechanism may be manual, coin-actuated power, or the like.

The form of device herein disclosed is for purposes of illustrating the invention which includes all forms thereof embraced within the following claims.

What is claimed is:

1. Apparatus for dispensing rimmed paper cups or the like, comprising a reciprocating frame, two straight parallel trackways for the support of said frame along which the frame is adapted to be moved from end to end of said trackways,

two tubes vertically mounted upon said frame, each tube being adapted to contain a stack of cups telescopically engaged and both tubes being adapted to move together as the frame moves, a first pair of straight parallel rim-supporting shelves below the trackways near one end thereof and adapted to support the rim of the lowest cup in one of the tubes when the frame is at that end of the trackways, a second pair of straight parallel rim-supporting shelves near the other end of the trackways and adapted to support the rim of the lowest cup in the other one of said tubes when the frame is at said other end of the trackways, said first and second pairs of shelves being in substantially the same horizontal plane, a third pair of straight parallel rim-supporting shelves positioned near the center of said trackways and in a horizontal plane above that of the first and second shelves, said third shelves being adapted to support the next-to-lowest cup in a tube moving towards the center of said trackways, and cam members having sloping under-surfaces adapted to detach the lowest cup from the next-

to-lowest cup in said tube when the latter moves toward center position, and horizontal upper surfaces adapted to support the next-to-lowest cup when the lowest cup is being detached and when the tube is returning from center position.

2. Apparatus as described in claim 1 wherein the vertical distance between the plane occupied by the first and second shelves and that occupied by the third shelves is less than the distance between the rims of adjacent cups in the stacks of cups which said tubes are adapted to contain, whereby at each cycle of operation the stacks move downwardly in both said tubes and a cup is dispensed from but one of said tubes.

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