April 5, 1927. J. W. McCARTHY 1,623,353

CUP DISPENSER

Filed Nov. 8, 1923

Fig. 1

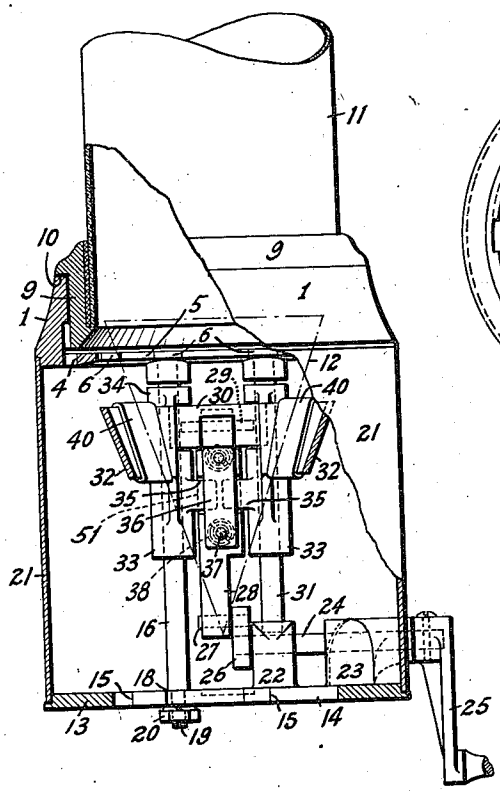


Fig. 3

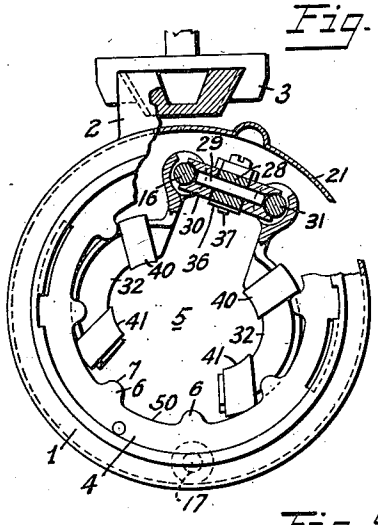


Fig. 5

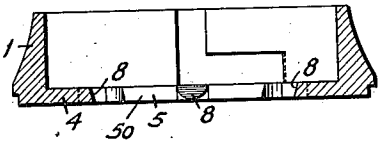
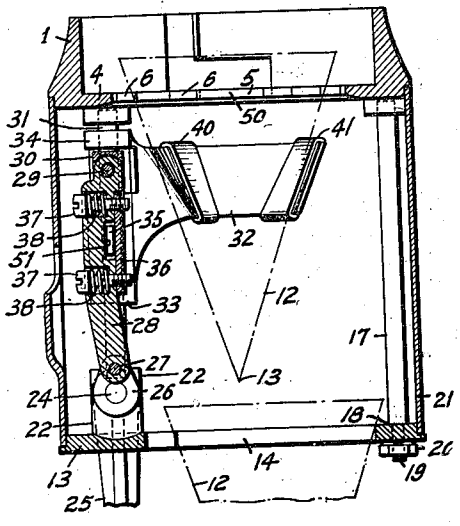


Fig. 2



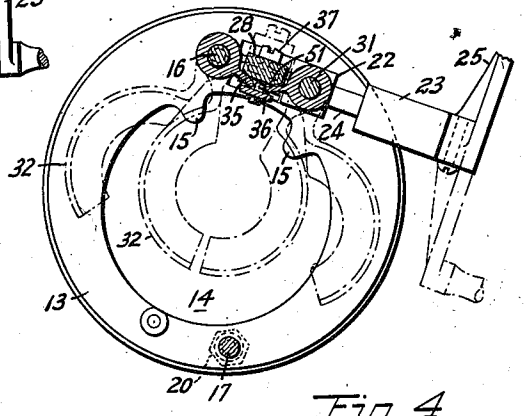


Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN W. McCARTHY, OF LOCKPORT, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO VORTEX MFG. CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CUP DISPENSER.

Application filed November 8, 1923. Serial No. 673,510.

This invention relates to dispensers for paper cups and with respect to its more specific features to devices for dispensing flexible conical paper cups from a nest of such cups, and whether the cups have or have not projections, or flanges, at their mouths.

One object of the invention is the provision of a simple, relatively inexpensive and compact device for readily and efficiently dispensing conical paper cups one by one from a closely nested column without injury to the cups; also one that will operate on flanged as well as unflanged cups.

Other objects of the invention will be in part obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a view of the dispenser in elevation, parts being broken away and sectioned to disclose interior construction,

Fig. 2 is a vertical central section showing the cup support and the cup drawing mechanism of the dispenser as viewed at right angles to Fig. 1,

Figs. 3 and 4 are plan views, parts being broken away, to show interior construction, Fig. 4, in dotted lines, showing the grippers in open and in closed position,

Fig. 5 is a vertical section through the cup supporting ring, and showing one form of the fingers of such ring.

Referring now more specifically to the drawing, the frame of the dispenser comprises an annular bracket 1 which may be horizontally disposed and provided with a bracket supporting lug 2 adapted to engage a fixture 3 secured to a wall or table or the like. The numeral 4 indicates the cup support which, in the embodiment illustrated, consists of a flanged portion of the bracket 1, this portion having an opening 5 therethrough for the passage of the cups and also having a series of rigid fingers 6 projecting toward the center of the opening 5. Preferably the fingers 6 are rounded peripherally as illustrated at 7. When unflanged cups are to be dispensed, the inner faces of the fingers may be parallel to the axis of the cup path. However, when flanged cups are dispensed, it is advantageous to bevel the fingers as illustrated at 8 in Fig. 5. The numeral 9 represents a ring having a flange 10 for resting upon the upper edge of the bracket 1 to support the ring 9 removably within the bracket 1. The numeral 11 indicates a cover, or dome, which may be of glass, closed at the top and held in the ring 9 in any suitable manner. One of the paper cups to be dispensed is indicated at 12 in dotted lines, these cups having conical side walls, the side walls in the cups illustrated coming to a point or apex 13. The diameter at the mouths of the cups is greater than the diametrical distance between opposite fingers 6, so that the cups are adapted to be disposed in the opening 5 with their side walls resting against the fingers 6. In this position the mouths of the cups are above the fingers 6 and the greater portion of the conical side wall of the lowermost cup is exposed for the operation of cup drawing mechanism hereinafter described. Between the fingers 6, the flange 4 is preferably cut away or recessed to such an extent that when a cup is drawn downwardly from the cup supporting fingers, the conical wall of the cup may flex into the spaces 50 between adjacent fingers 6, the drawing of the cups being thus facilitated and injury thereto being avoided.

The numeral 13 indicates a lower rigid annular frame plate having an opening 14 through which the cups are discharged. The numeral 15 indicates cup arresting fingers or lugs on the inner edge of the plate 13, projecting into the opening 14, and serving, in connection with the remainder of the inner periphery of the annular plate, to arrest a drawn cup in convenient position to be taken hold of by the hand of the user. The upper bracket 1 and the lower plate 13 may be connected in any suitable manner. In the present instance they are connected by the rigid rods 16 and 17 which depend from the under face of the bracket 1, and have shoulders 18 and reduced screw threaded ends 19 passing through openings in the plate 13 and engaged by nuts 20. The members 1 and 13 are held in relative position by the rods 16 and 17 and are enclosed by a circumferential

wall 21 to form a chamber occupied by the cup drawing mechanism.

On the upper face of the annular plate 13 are the standards 22 and 23 providing bearings for the power shaft 24, which latter may extend outside the wall 21 and be provided with a crank or handle 25 for rotating the same and thereby actuating the cup drawing mechanism. On the inner end of the shaft 24 is a crank 26 having a crank pin 27 in pivotal engagement with the end of a gripper actuating member, or connecting rod 28, which latter is in turn pivoted at 29 to a head or block 30 reciprocal alongside the cup path and in the present embodiment guided by one of the rods 16 and another and parallel rigid rod 31 depending from the bracket member 1 and supported in a recess in the upper face of the standard 22, as illustrated in Fig. 1.

The numerals 32 indicate the body portions of cup grippers having sleeves 33 by which they are pivotally mounted for oscillation on the rods 16 and 31 transversely of the cup path, the grippers being also simultaneously reciprocally translatable along said rods to effect cup drawing and positioning of the grippers for subsequent cup gripping. The grippers 32 are rigid metal members which may be cast integrally with their sleeves 33 and with upper bearing eyes 34 also engaging the rods 16 and 31. Thus a long bearing is provided for the grippers so as to maintain them in predetermined relative position as they oscillate and translate on the guide rods 16 and 31. On the sleeve 33 of each gripper is a dog 35 with which the connecting rod 28 cooperates to effect oscillation of the grippers on their pivotal axes, or guide rods 16 and 31.

Carried by the connecting rod 28 is a gripper actuating, or gripper turning, plate 36 adapted to move with and relative to the connecting rod. Cap screws 37 are threaded in the plate 36 and pass loosely through the connecting rod 28, springs 38 being interposed between the heads of these screws and the connecting rod 28. In the embodiment illustrated, the connecting rod is provided with recesses in which the springs 38 lie. When the various parts are assembled the dogs 35 lie between the plate 36 and the connecting rod 28, the latter being recessed as at 51, if desired, to accommodate said dogs. The gripper body, the connecting rod 28, the head or block 30 and the guide rods 16 and 31 are of substantial rigid material, preferably metal, so that accurate positioning of the parts may be relied upon without undue give, if any.

In operation a column of closely nested conical paper cups will be set with the lowermost cup supported by the fingers 6 and projecting downwardly between the grippers, which latter should be open at that time. When the shaft 24 is rotated, the crank pin 27 will cause the connecting rod 28 both to reciprocate on the guide rods 16 and 31 and also to be oscillated transversely of its reciprocal path. Movement of the connecting rod 28 in one direction on its oscillatory axis will cause the plate 36 to be pressed against radial dogs 35 and effect cup approaching movement of the grippers and cause the soft faces of the grippers resiliently to be pressed against the outside lateral wall of the lowermost cup of the column, the springs 38 being stressed by movement of rod 28 upon gripping contact with cup. Should the cup wall give unduly or should there be any tendency for the grippers, on their drawing movement, to separate from the cup wall, the springs 38 will act to move the grippers sufficiently inwardly, so as resiliently to maintain grip on the cup and resiliently resist receding movement between the grippers when a cup is being drawn. The head 30 lies between the sleeve 33 and the bearing eyes 34 of the grippers so that as the head 30 reciprocates on the guide rods 16 and 31, the grippers simultaneously reciprocate therewith. As the connecting rod 28 moves downwardly, the grippers having been moved into contact with the cup, the gripped cup is drawn from the fingers 6 and from the column of cups and through the opening 5. Subsequently the grippers separate by movement on their pivotal axes engendered by an oscillatory movement of the connecting rod 28, the inner wall of recess 51 contacting with and moving the dogs 35, thus freeing the gripped cup and permitting it to drop into the opening 14 where it is caught by the fingers 15, and may subsequently be removed.

The bodies 32 of the grippers have soft, frictional, resilient, cup gripping faces 40 and 41, relatively soft rubber bands being employed in practice, and in the present embodiment, the body portions 32 are concaved to provide reentrant cup centering body portions, the soft, frictional, gripping faces 40 and 41 of each gripper projecting from the body 32 and being disposed at different distances from the axis of oscillation of the gripper. In the present embodiment, the body portion of each gripper and the frictional faces referred to incline toward the longitudinal axis of the drawing path in the direction of cup drawing, and the reentrant body portion of each gripper is of such peripheral extent transversely of the cup path that it cooperates with its companion gripper to almost fully enclose the cup to be drawn. In this wise the two cooperative grippers, although moving in arcuate paths transversely of the cup axis, do not disturb correctly positioned cups and tend to cooperate with each other to center an inaccurately positioned cup, which latter might

be occasioned by some untoward happening. The construction disclosed herein is an improved form of the dispenser disclosed in the copending application of Harold Carle Serial No. 367,060, filed March 19, 1920.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A cup dispenser comprising a container for a stack of nested cups, gripper mechanisms, means for oscillating the same in a horizontal plane transversely of the cup path, and means adapted to be operated to cause said gripper mechanisms to be reciprocally translated to effect cup drawing and positioning of the gripper mechanisms for subsequent cup gripping.

2. A cup dispenser comprising a container for holding a stack of nested cups, a vertical support therebelow, cup grippers thereon, means for oscillating the grippers at right angles to said support to effect a gripping and then a release operation of said grippers, and friction pads on said grippers at different distances from the axes of oscillation of the grippers.

3. A cup dispenser comprising a container for a stack of nested cups, pivoted cup grippers, a connecting rod connected therewith, a crank connected with said connecting rod, and a handle for actuating said crank to cause the cup grippers to oscillate to grip and pull a cup from the container and then release the cup.

4. A cup dispenser comprising a support for a column of nested cups, stationary axes mounted therebelow, grippers pivoted on said axes, a member connected to reciprocate the grippers on said axes, means for operating said member to cause the grippers to oscillate transversely of said axes, and means coupling said member with said grippers including dogs on said grippers, and a cooperating plate on said member.

5. A cup dispenser comprising a support for a stack of nested cups, stationary guides, cup grippers slidably and pivotally mounted on said guides, a gripper actuator head reciprocal alongside said guides and coupled to effect reciprocal movement of said grippers, a connecting rod pivoted to said head, a crank coupled to reciprocate and oscillate said connecting rod, and operative connections between said connecting rod and said grippers to cause operation of said connecting rod to effect pivotal movement of said grippers.

6. A dispenser of the class described comprising a support for a stack of nested cups, stationary guides, cup grippers slidably and pivotally mounted thereon, a gripper actuating head reciprocal alongside of said guides and coupled to effect reciprocal movement of said grippers, a connecting rod pivoted to said head, a crank coupled to reciprocate and oscillate said rod, and operative connections between said rod and grippers including a gripper actuating plate movable with and relative to said rod, dogs on said grippers in the path of movement of said plate and rod, and resilient means to resist separating movement between said rod and plate under pressure from said dogs.

In testimony whereof I affix my signature.

JOHN W. McCARTHY.