

Jan. 31, 1928.

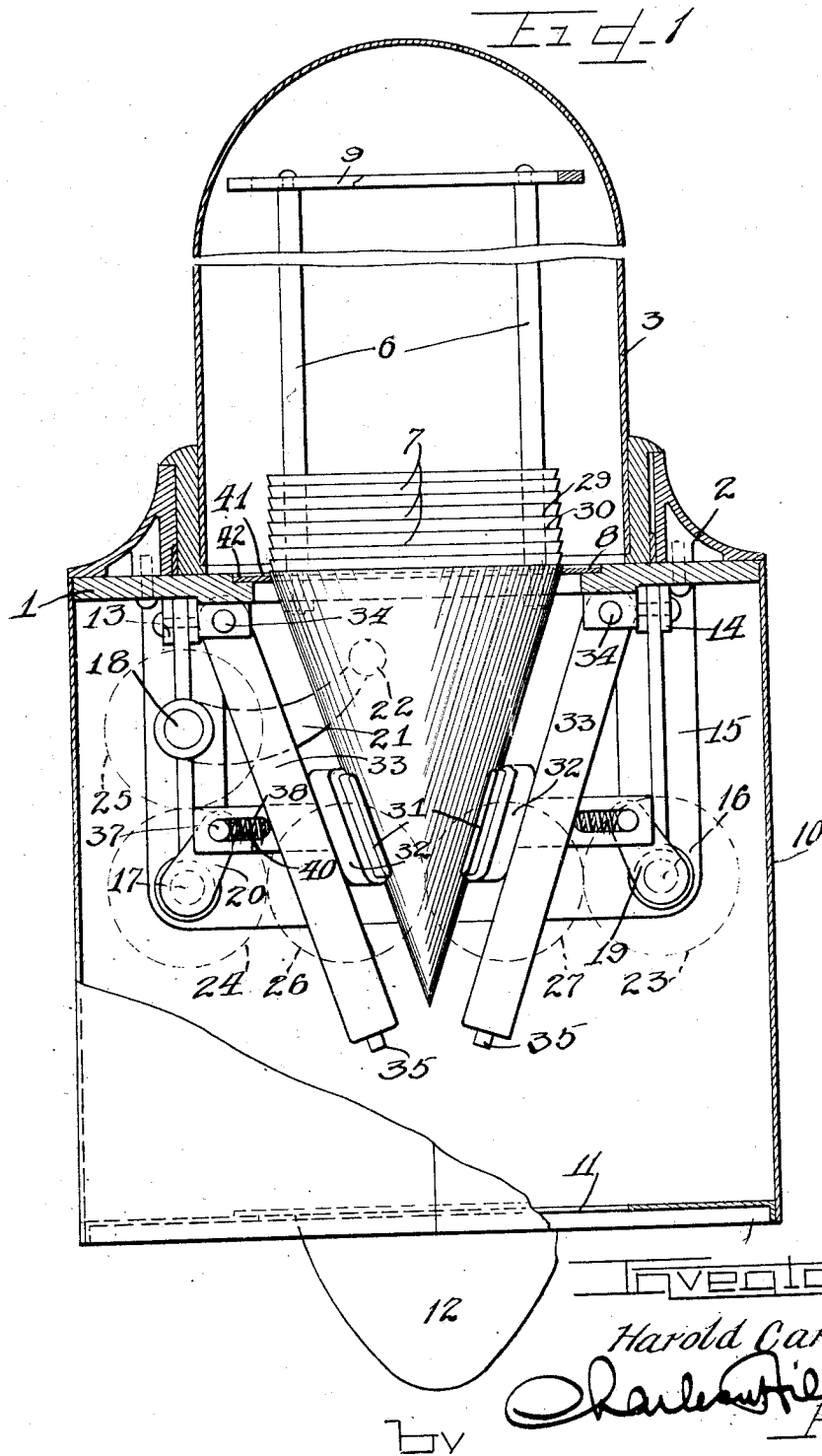
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CUP DISPENSER

Filed June 13, 1925

2 Sheets-Sheet 1



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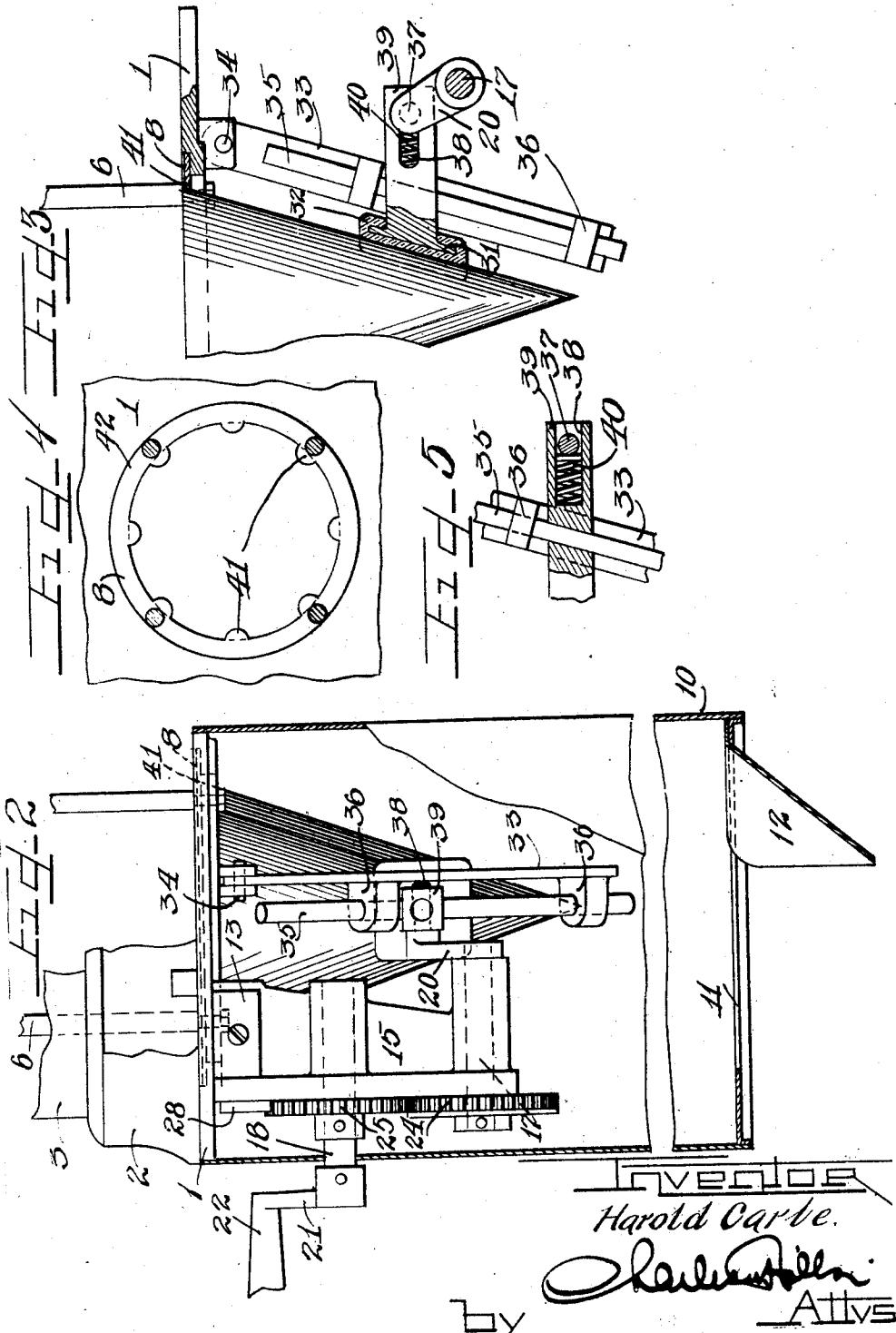
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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CUP DISPENSER.

Application filed June 13, 1925. Serial No. 36,771.

This invention relates especially to apparatus for dispensing conical paper cups one by one from a column or magazine of nested cups, and the object of the invention is to provide a simple and practical construction of dispenser, one not apt to get out of order and which will dispense the cups with commendable efficiency.

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 side elevation of a dispenser embodying the invention, partly broken away to disclose interior parts.

Figure 2 is a view in elevation of certain portions of the interior of the dispenser looking at right angles to Figure 1.

Figure 3 is a side elevation, partly in section, illustrating one of the grippers and its actuating mechanism in detail.

Figure 4 is a horizontal section of a portion of the dispenser showing the cup supporting ring, in plan, and

Figure 5 illustrates a detail.

As shown on the drawings:

Referring now more specifically to the drawings it may be stated that the construction herein described involves improvements over the dispenser shown in applicant's Patent No. 1,472,584, dated October 30, 1923. Like the dispenser of the former application, the present dispenser includes a frame or plate 1 having an upstanding flange 2 in which is held the lower end of a glass dome 3 closed at its upper end, suitable rods 6 upstanding from the frame 1 and serving to guide a column of nested conical paper cups 7 into position on a cup support 8. The upper ends of the guide rods 6 are braced by an annulus 9. By removing the dome a column of nested cups may be readily inserted through the annulus 9 to rest upon the support 8.

Thereupon the dome may be replaced and the apparatus is ready for dispensing the cups. The dome 3 is preferably of a diameter greater than that of the cups so as to permit the cups to freely gravitate toward the support 8, the cups being guided by loose contact, if any, with the guide rods 6.

The cup gripping and drawing mechanism is enclosed within a casing 10 depending on all sides from the frame plate 1, and closed at its bottom except for an opening 11. When a cup is drawn from the column it may drop through the opening 11 and be caught by a lip 12, which latter, in conjunction with the opposite side wall of the opening 11, arrests the cup in the opening 11 with its bottom, or apex, presented in convenient position to be grasped by the hand.

To lugs 13 and 14 depending from the underside of the plate 1 are attached the opposite ends of a yoke shaped rigid bracket 15, in which are supported shafts 16, 17 and 18, the shafts 16 and 17 being each provided with rotatable gripper actuating members, as the cranks 19 and 20. To the shaft 18 is affixed a hand crank 21 having a handle 22, the hand crank and handle being outside the casing 10 in convenient position for actuation by the user. In the present embodiment the cranks 19 and 20 are rotated in synchronism in opposite directions and to this end the shafts 16 and 17 are equipped with spur gears 23 and 24, and the shaft 18 with a spur gear 25 meshing with the gear 24. The gear 23 is driven from the gear 24 through the idler spur gears 26 and 27 which may be journaled on the bracket 15. A pawl 28 may be employed to prevent rotation of the spur gear 25 in but one direction. Any suitable part of the dispenser, as for instance the frame 1, may be provided with means for conveniently attaching it to a wall, table, or the like, in position to permit the cups to gravitate toward the cup support 8.

The cups to be dispensed have conical walls and may be made of paper so as to be flexible and resilient. Also in the embodiment illustrated the upper edges, or lips, of the cups are each in a single plane and are unprovided with flanges. With this construction, similar cups nested together form a column of nested cups and the open edges, or lips, 29 and 30 of adjacent cups are quite

close to each other. For drawing the cups one by one from the column of nested cups there is employed a pair of grippers, the body portions or bases of which are indicated by the numeral 31. These bases may be of metal transversely curved to conform to the circumferential curvature of the cup, and inclined to the axis of the column of cups so as to be substantially parallel to the outside lateral wall of the cup when in gripping relation to the latter. Each gripper is equipped with a soft frictional cup gripping face, which face may be provided by soft rubber material 32 overlying the base 31 and conforming in shape thereto.

The grippers cooperate with each other to grip and to draw the cups from the column of nested cups and from the support 8, and in the present embodiment the grippers are supported for movement on opposite sides of the cup path by rigid arms 33 pivoted at 34 on stationary axes to oscillate, or swing, transversely of the cup path and the longitudinal axis of the column of cups. The numerals 35 indicate gripper carrying members, as the cylindrical rods 35, with which the grippers move, the rods 35 being reciprocally slidable in relatively stationary guides, or eyes 36, on the arms 33, transversely of the pivotal axes 34, the rods 35 being also oscillatable and adapted to swing with the arms 33 around the pivotal axes 34, but being stationary relative to said arms in their oscillatory movement around said axes. The gripper carrying members 35 are coupled to the gripper actuating members, or cranks, 19 and 20 respectively, which latter upon rotation, oscillate the arms 33 and the rods 35 around the pivotal axes 34 to effect cup-gripping and cup-releasing movements of the grippers and also effect reciprocal movement of the rods 35 on the arms 33 to effect cup drawing. In the present embodiment this coupling is effected by crank pins 37 on the cranks 19 and 20, which pins engage slots 38 in rigid parts 39, which parts move with the rods 35 and also with the grippers and may be considered a part of either. The numerals 40 indicate springs adapted resiliently to transmit gripping thrust from the gripper actuating members 19 and 20 to the gripper carrying members 35, these springs, in the present embodiment, lying in chambers in the gripper body extensions 39 and being operatively interposed between the cranks 19 and 20 and of rods 35, one end of each spring abutting the end of the chamber remote from the crank pin 37.

Assuming a column of nested cups to rest upon the cup support 8 as before explained, the operation may be briefly set forth as follows. By turning the crank 21 the soft frictional gripping faces 32 will move toward the outer surface of the lateral wall

of the end, or bottom cup, of the column and said cup will be gripped between said frictional faces. Continued movement of the cranks 19 and 20 will cause the grippers simultaneously to move in directions away from the support 8 and the end cup will be drawn through the support and from the next adjacent cup of the column. Upon further movement of the cranks 19 and 20, the grippers will eventually separate and permit the drawn cup to fall therefrom through the opening 11 in the bottom of the casing, and the lip 12 will cooperate to arrest the cup in this opening with its end in position to be conveniently grasped.

In the present embodiment the support for the column of cups consists of a plurality of rigid fingers 41, being integral parts of a thin flat metal ring 42, which is stationarily mounted on the frame 1 as indicated at 8, Figure 1. The fingers 41 are circumferentially spaced apart so as to contact with the outer lateral wall of the end cup of the column and thereby contact and support the column at several different points circumferentially of the end cup, so that when the end cup is drawn from the column its conical wall may flex into the space between adjacent fingers 41 so as to ease the withdrawal movement of the end cup. As illustrated, the fingers 41 are so disposed as to contact with the conical wall of the cup closely adjacent the edge, or lip 29, of the lowermost cup. The cup contacting ends of the fingers are thin longitudinally of the column so as to permit the end cup to be drawn from the column and leave the conical wall of the next adjacent cup lying across the corners of the fingers formed by the flat upper faces of the fingers and the edges thereof. These flat upper faces of the fingers are the "near" faces thereof in that they are the faces presented to the approaching cups. These faces are also in planes substantially normal to the longitudinal axis of the column. The fingers 41 project inwardly toward the longitudinal axis of the column of cups and have rounded edges presenting their convexities toward the cups.

In dispensing thin paper flexible conical cups, it is sometimes difficult to grip the conical surface so as to effectively draw the cup in a direction from the mouth, or lip to the bottom, or apex. The tendency of the grippers is rather to part from the conical surface upon the initial drawing movement. Hence, it is desirable to detach the cup as quickly as possible from the supporting fingers 41, and to this end these fingers are made quite thin as explained so that the cup will have but a very short movement before being completely separated from the fingers. This is not only desirable where the grippers are frictional, but it is especially important when the cups are of material such as paper,

which will yield or may be marred by too strong a grip or by gripper faces which might deface or otherwise injure the cup. By rounding the edges of the fingers as explained, the cup can flex uniformly without assuming sharp angles circumferentially, and there is therefore less tendency to develop resistance to drawing movement as otherwise might be the case did the flexing take place around a sharp or rather abrupt shoulder, which latter might thereupon indent the cup so as to tend to mar its surface as well as restrain its movement. By providing flat surfaces for the inner faces of the fingers, the conical wall of the cup may lie across the edge or corner hereinbefore referred to and yet be free from restraint above this face, so that the cups can uniformly gravitate and seat themselves in succession upon the fingers and are not obstructed by the edges of the cups at their greatest diameter contacting with other lateral wall parts of the dispenser. By interposing the springs 40, the cup to be drawn is gripped with resilient effect, and these springs will act to slightly advance the grippers toward the cup in the drawing operation, should the cup wall yield unduly, or should the grippers slip axially of the cup. Thus the grippers are maintained in contact with the cup during the drawing operation.

I am aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

I claim as my invention:

1. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, a pair of cup grippers having soft, frictional cup gripping faces, supported for movement on opposite sides of the cup path, and crank means, adapted to cause movements of said grippers toward the outer surface of the lateral wall of the endmost cup of said column and movement of the grippers simultaneously from said support thereby to grasp said endmost cup and draw the same from said column, including rigid arms pivoted on stationary axes for oscillation transversely of the longitudinal axis of said column, and gripper carrying members oscillatable with said arms, stationary relative to said arms in their oscillatory movement around said axes, and slidable on said arms for cup drawing and reciprocal movements transversely of said axes.

2. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, a pair of cup grippers having soft, frictional cup gripping faces, supported for movement on

opposite sides of the cup path, means, adapted to cause movements of said grippers toward the outer surface of the lateral wall of the endmost cup of said column and movement of the grippers simultaneously from said support thereby to grasp said endmost cup and draw the same from said column, including rigid arms pivoted on stationary axes for oscillation transversely of the longitudinal axis of said column, gripper carrying members oscillatable with said arms, stationary relative to said arms in their oscillatory movement around said axes, and guided on said arms for cup drawing and reciprocal movements transversely of said axes, and rotatable gripper actuating members coupled to said carrying members to effect oscillation of said arms and reciprocal movements of said carrying members on said arms.

3. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, a pair of cup grippers having soft, frictional cup gripping faces, supported for movement on opposite sides of the cup path, means, adapted to cause movements of said grippers toward the outer surface of the lateral wall of the endmost cup of said column and movement of the grippers simultaneously from said support thereby to grasp said endmost cup and draw the same from said column, including rigid arms pivoted on stationary axes for oscillation transversely of the longitudinal axis of said column, gripper carrying members oscillatable with said arms, stationary relative to said arms in their oscillatory movement around said axes, and guided on said arms for cup drawing and reciprocal movements transversely of said axes, rotatable gripper actuating members coupled to said carrying members to effect oscillation of said arms and reciprocal movements of said carrying members on said arms, and springs adapted resiliently to transmit gripping thrust from said actuating members to said carrying members.

4. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, a pair of cup grippers having soft, frictional cup gripping faces, supported for movement on opposite sides of the cup path, means, adapted to cause movements of said grippers toward the outer surface of the lateral wall of the endmost cup of said column and movement of the grippers simultaneously from said support thereby to grasp said endmost cup and draw the same from said column, including rigid arms pivoted on stationary axes for oscillation transversely of the longitudinal axis of said column, gripper carrying members oscillatable with said arms, stationary relative to said arms in their oscillatory movement around said axes,

and guided on said arms for cup drawing and reciprocal movements transversely of said axes, rotatable gripper actuating members coupled to said carrying members to effect oscillation of said arms and reciprocal movements of said carrying members on said arms, and springs interposed between said actuating members and said carrying members adapted resiliently to transmit gripping thrust from said actuating members to said carrying members.

5. A dispenser for cups of the character described including, in combination, a plurality of circumferentially spaced rigid fingers adapted to contact with the outer lateral wall of the end cup of a column of nested conical cups and thereby support the column with the end cup exposed in position to be gripped, the cup contacting ends of said fingers being thin longitudinally of said column so as to permit the end cup to be drawn from the column and leave the conical wall of the next adjacent cup lying across the corners of said fingers, a pair of cup grippers having soft, frictional cup gripping faces, supported for movement on opposite

sides of the cup path, means, adapted to cause movements of said grippers toward the outer surface of the lateral wall of the endmost cup of said column and movement of the grippers simultaneously from said support thereby to grasp said endmost cup and draw the same from said column, including rigid arms pivoted on stationary axes for oscillation transversely of the longitudinal axis of said column, gripper carrying members oscillatable with said arms, stationary relative to said arms in their oscillatory movement around said axes, and guided on said arms for cup drawing and reciprocal movements transversely of said axes, rotatable gripper actuating members coupled to said carrying members to effect oscillation of said arms, and reciprocal movements of said carrying members on said arms, and springs adapted resiliently to transmit gripping thrust from said actuating members to said carrying members.

In testimony whereof I have hereunto subscribed my name.

HAROLD CARLE.