

April 21, 1936.

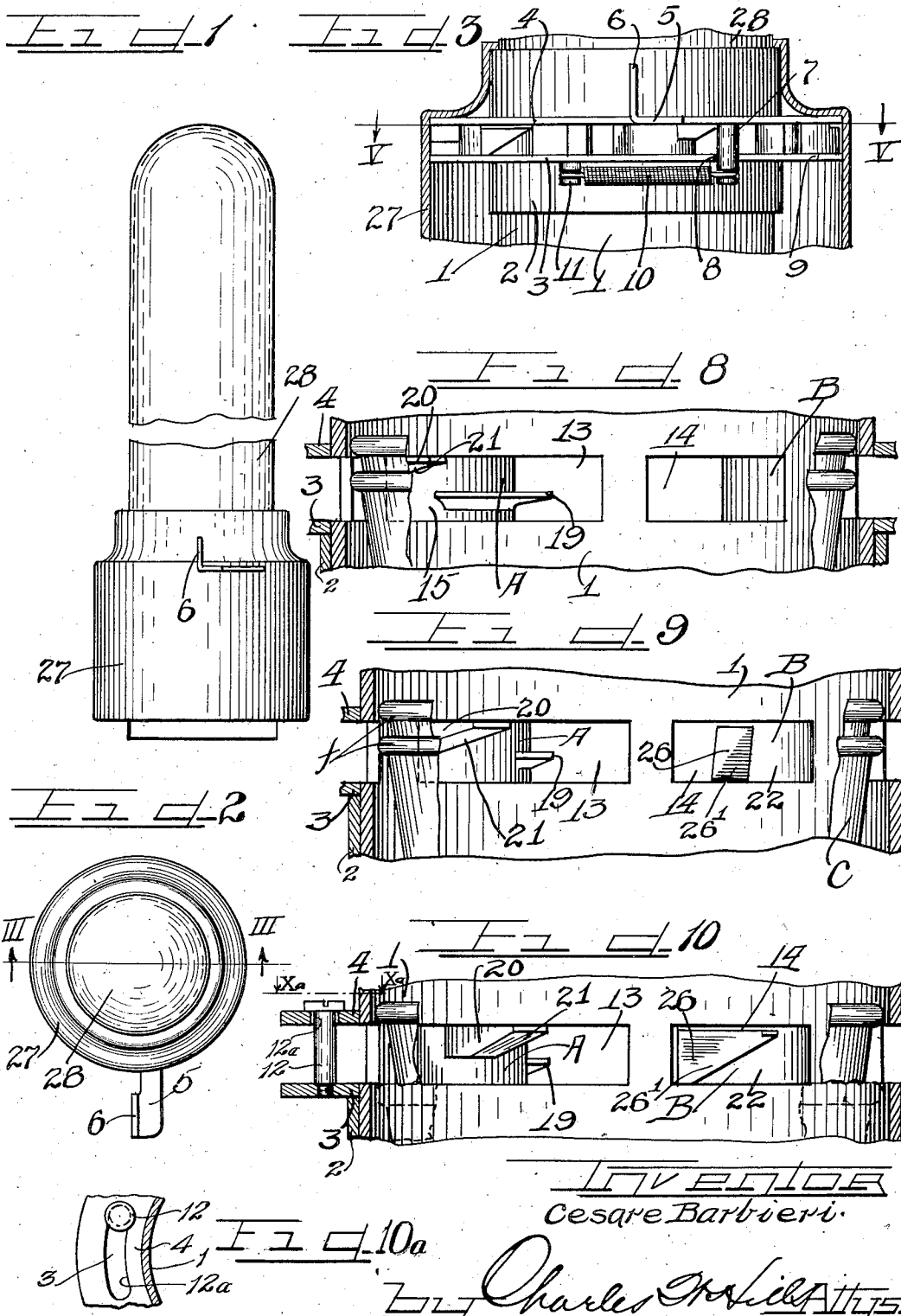
C. BARBIERI

2,037,751

DISPENSER

Filed June 5, 1933

3 Sheets-Sheet 1



April 21, 1936.

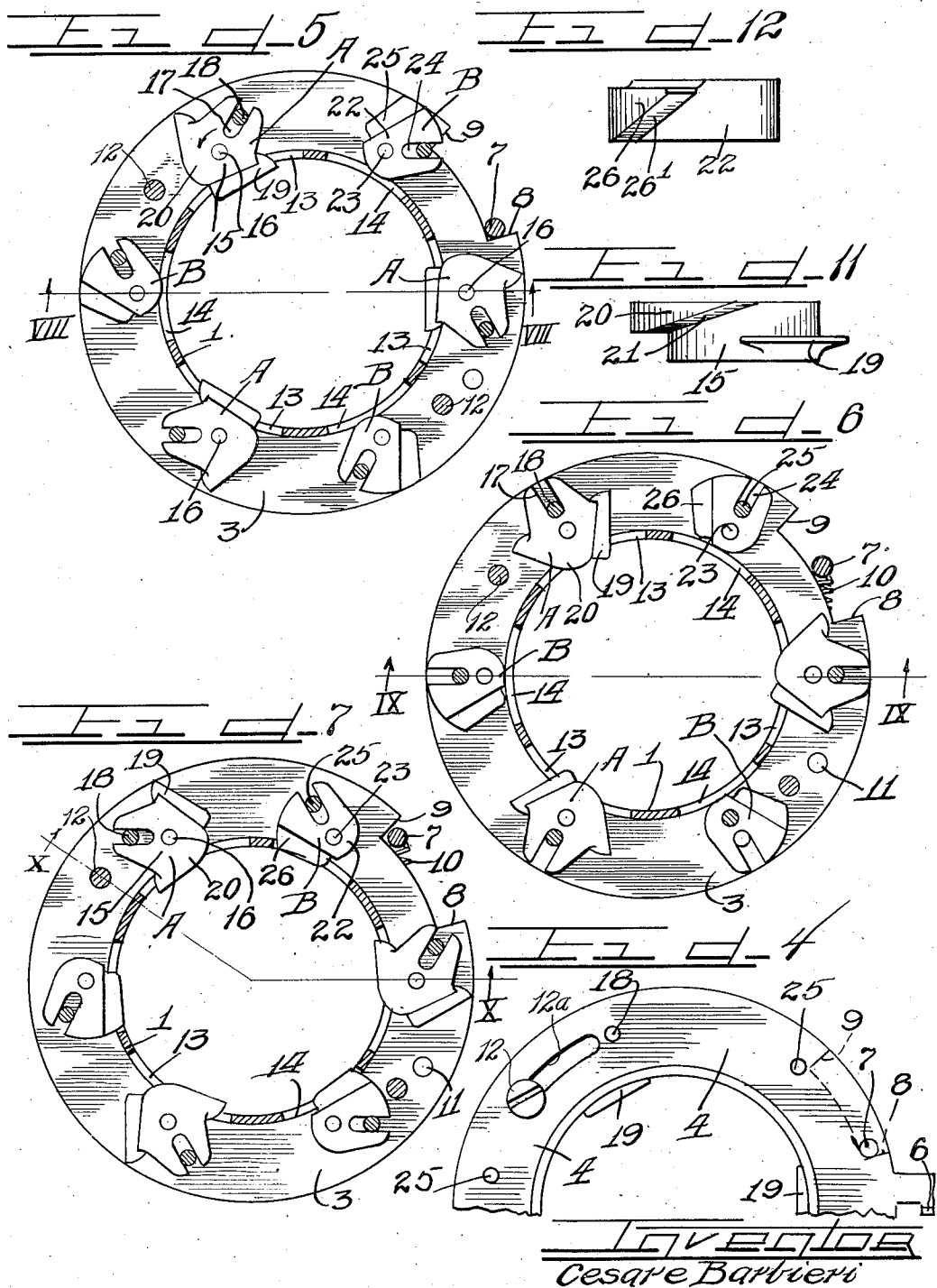
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DISPENSER

Filed June 5, 1933

3 Sheets-Sheet 2



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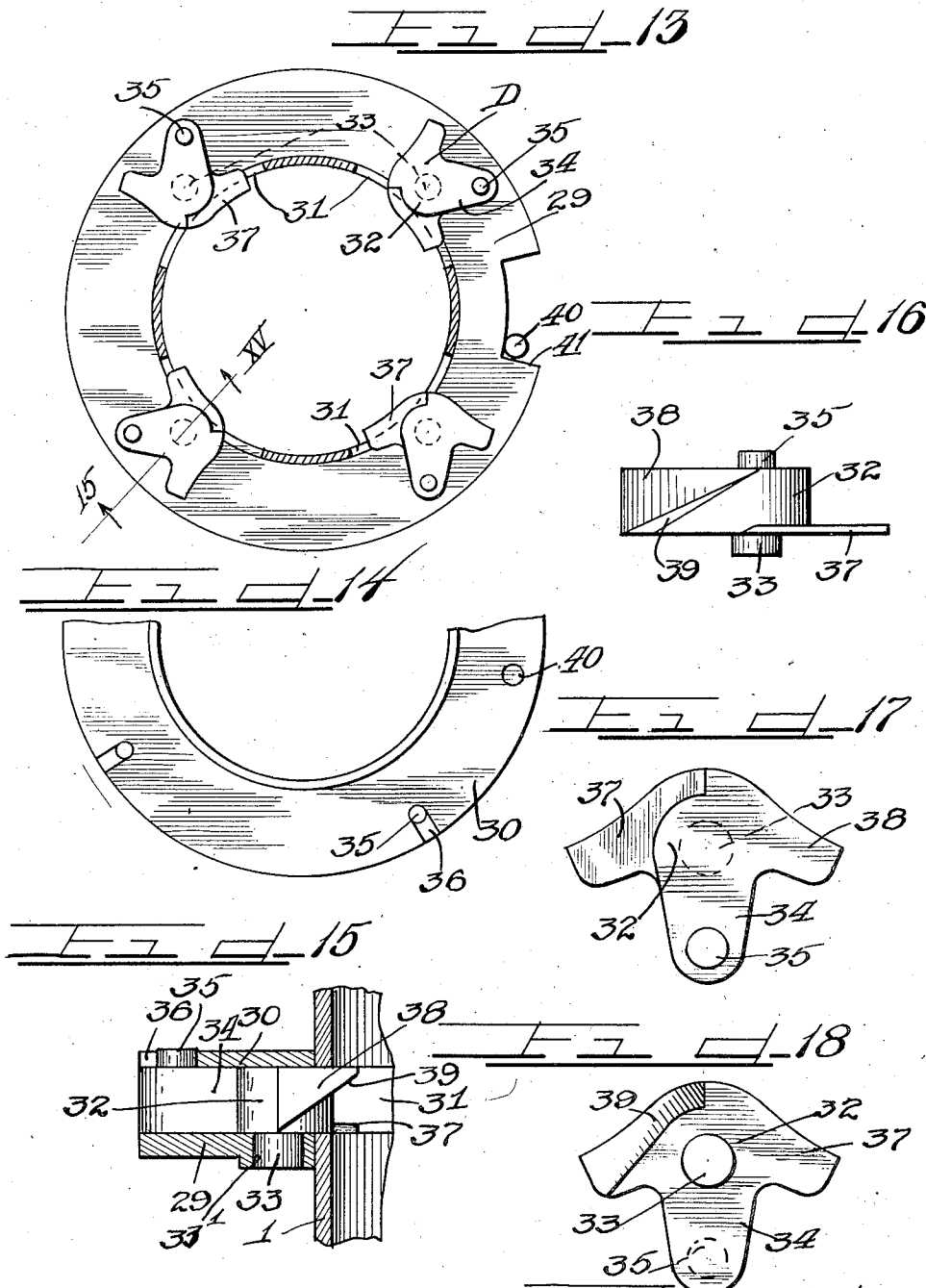
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2,037,751

DISPENSER

Filed June 5, 1933

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,037,751

DISPENSER

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Application June 5, 1933, Serial No. 674,352

9 Claims. (Cl. 312-44)

My invention relates to dispensing devices adapted particularly for dispensing frusto conical flat bottom and flanged paper cups from a stack within a container.

An important object of the invention is to provide improved rotary wedge mechanism for separating and delivering the cups one at a time from the stack.

A further object is to provide an arrangement involving rotary wedge members for imparting a primary wedging action against the lowermost cup for separation thereof from the stack, and a second set of wedge members for imparting a final wedging action to assure complete separation and freeing of the lowermost cup.

The invention also involves other features of construction, arrangement and operation, and all the various features of the invention are incorporated in the structures disclosed on the accompanying drawings, in which drawings

Figure 1 is an elevation of a dispensing device;

Figure 2 is a plan view thereof;

Figure 3 is an enlarged section on plane III—III of Figure 2;

Figure 4 is a plan view of the rotary dispensing ring structure;

Figure 5 is a section on plane V—V of Figure 3 showing the dispensing elements in normal position;

Figure 6 is a view similar to Figure 5 showing the dispensing elements in intermediate dispensing position;

Figure 7 is a view similar to Figure 5 showing the dispensing elements in final dispensing position;

Figure 8 is a section on plane VIII—VIII of Figure 5, with parts omitted for clarity;

Figure 9 is a section similar to Figure 8 on plane IX—IX of Figure 6;

Figure 10 is a section similar to Figure 8 on plane X—X of Figure 7; Figure 10a is a fragmentary plan sectional view taken substantially as indicated by the line Xa—Xa of Figure 10.

Figure 11 is an enlarged side elevation of one of the primary operating wedge elements;

Figure 12 is an enlarged side elevation of one of the auxiliary wedge elements;

Figure 13 is a plan view of dispensing element supporting ring showing a modified structure and arrangement;

Figure 14 is a plan view of the rotary wedge actuating ring;

Figure 15 is an enlarged section on plane XV—XV of Figure 13;

Figure 16 is an enlarged side elevation of one of the wedge elements;

Figure 17 is a plan view of the wedging element shown in Figure 16; and

Figure 18 is an underside view of the wedging element.

The dispensing device shown comprises a body part in the form of a cylindrical metal tube 1 having secured thereto a collar 2 from which extends the annular ring or flange 3 which supports the various escapement and delivery controlling members which cooperate with cups to control their passage through the tube 1. Above the ring 3 and rotatable on the tube 1 is the annular flange or ring 4 for controlling the operation of the cup passage controlling members, this ring having an actuating arm 5 extending laterally therefrom and terminating in a finger plate 6. The extent of rotation of the ring 4 is controlled by the engagement of the abutment pin 7 on the ring 4 with the shoulders 8 and 9 on the stationary ring 3, a spring 10 connecting between the pin 7 and a pin 11 on the ring 3 tending to hold the ring 4 with the pin 7 in engagement with the shoulder 8. The ring 4 is prevented from longitudinal movement further away from ring 3 by means of a number of bolts 12, in this instance two (Figures 5, 6, 7 and 10). The ring 4 is provided with an arcuate slot 12a on each side thereof therein loosely embracing the shank of the bolt 12 to permit rotation or oscillation of the ring 4 relatively to the ring 3.

Between the rings 3 and 4 the tube 1 has a number of open spaces or slots 13 circumferentially spaced equal distances apart, and on the ring 3 adjacent to each of these open spaces is a rotary escapement and wedge member A. Intermediate the open spaces 13 are the open spaces 14 in the tube 1, and on the ring 3 adjacent to each of these spaces is supported another escapement or wedging element B.

Each member A comprises a body part or hub 15 pivoted for rotation or rocking movement on a pin 16 secured to and extending upwardly from the ring 3. Each member has a substantially radially extending slot 17 in which engages an actuating pin 18 secured to and extending downwardly from the rotatable ring 4, so that when this ring is oscillated, the members A will be rotated. Each member has also a horizontal and tangentially extending escapement ledge 19 therefrom and a wedge 20 extending tangentially in a plane above the ledge. The top of the extension 20 is horizontal or flat, while its lower face 21 is inclined to present a wedge surface. In the normal

position of the parts shown in Figures 5 and 8 with the post 7 held against the shoulder 8 by the spring 10, the elements A are in position to project the escapement ledges 19 through the open spaces 13 and a distance into the interior of the tube 1 for engaging below the flange f of the lowermost cup of the stack of cups C projecting into the tube. Upon rotation of the ring 4, the members A will rotate in counter clockwise direction to withdraw their ledges 19 from underneath the flange of the lowermost cup, but, while the ledges are being withdrawn, the points of the wedge extensions 20 come into engagement below the flange of the next lowermost cup to assume the burden of supporting the stack, and then upon final rotation of the elements A, the wedge extensions will be moved through the space between the flanges of the next lowermost cup and the lowermost cup with the wedge surfaces 21 exerting a downward pressure against the flange of the lowermost cup tending to separate and free the cup from the stack for delivery to the bottom of the tube 1.

Each of the auxiliary rotary wedge members B comprises a body 22 pivoted for rotary movement on a pin 23 extending upwardly from the ring 3, each member having a substantially radially extending slot 24 for receiving an actuating pin 25 extending downwardly from the rotary ring 4, so that when this ring is rotated, the members B will be rotated. These members B do not have escapement ledges but are provided on one side with a wedge extension 26 whose top side is flat but whose lower side presents the wedge surface 26'. In the normal position of the mechanism as shown in Figures 5 and 8, the wedge extensions 26 of the members B are withdrawn from the open spaces 14 in the tube 1. The arrangement and operation is such that, when the ring 4 has rotated about half way, as shown in Figures 6 and 9, the wedge extensions 20 on the members A have travelled part way between the flanges of the two lowermost cups and the wedge extensions 26 of the members B are about ready to be projected through the open spaces 14. During the final rotational movement of the ring 4, as illustrated in Figures 7 and 10, the wedge extensions 26 on the members B are projected through the spaces 14 between the flanges of the two lowermost cups. The elements A and B thus operate sequentially so far as wedging action is concerned, the wedge extensions of the elements A first engaging with the flange of the lowermost cup to impart a light wedging and downward pressure thereagainst, and then the wedge extensions on the element B engage the cup flange and exert further and final wedging and downward pressure. The wedge extensions 26 on the members B are thicker or deeper than the wedge extensions on the members A, so that the wedge extension 26 will continue the downward pressure on the lowermost cup after the cup has been given a preliminary downward pressure and shift by the cam extensions 20 on members A, this continued and final wedging action by the members B assuring complete release and freedom of the lowermost cup from the stack so that it will be free to drop for delivery to the user. When the finger plate is released, the spring 10 will return the ring 4 to its normal position, and during this return movement the wedge extensions will be withdrawn from below the stack of cups remaining in the dispenser and the escapement ledges 19 on members A will come back into position to receive and support the stack.

It will be noted that when the members A and B are rotated for ejection of a cup from the stack, the points of the wedge members move transversely into position between the flanges of the two lowermost cups and then the wedges travel substantially circumferentially relative to the cups to bring the full lengths of the wedges between the cup flanges. This insures entry of the wedges between the cup flanges and a gradual but powerful separation of the lower cup from the stack.

As shown in Figures 1 and 2, the tube 1 and the dispensing structure thereon may be enclosed by a shell or housing 27 which forms a support for a tubular container 28, usually of glass, for receiving a stack of cups and guiding them into the dispensing tube 1.

In Figures 13 to 18 a modified arrangement is shown. Here, instead of employing escapement members with light wedge extensions and auxiliary members with heavy wedge extensions as shown in Figures 1 to 12, only one set of members is shown, each having an escapement ledge and a heavy or deep wedge extension. In the modified arrangement the dispensing members are mounted on the stationary ring 29 secured to the tube 1. The actuating ring 30 is rotatable on the tube 1 above the ring 29, and between the rings the tube 1 has four equally circumferentially spaced apart open spaces or slots 31, a dispensing member D being supported on the ring 29 adjacent to each of said open spaces for projection into the tube. Each member D comprises a hub 32 pivoted for rotational movement by a pin 33 extending therefrom into a bearing opening 33' in the ring 29. An arm 34 extending radially from the hub carries a pin 35 for engaging in a radial slot 36 in the actuating ring 30, so that when this ring is turned, the members D will be given rotary movement. Extending substantially tangentially on the lower part of the hub 32 is a horizontal escapement ledge 37, and the hub has also the substantially tangential wedge extension 38 which is flat or horizontal on top and presents the lower inclined or wedging surface 39 whose point is at the upper face of the hub, partially overhanging the inner end of the escapement ledge 37, the base of the incline 39 being at the lower face of the hub 32, so that a comparatively deep wedgement is provided. In the normal position of the parts, as shown in Figure 13, the members D are in position to extend their escapement ledges 37 through the slots 31 into the interior of the tube 1 for receiving the flange of the lowermost cup of a stack of cups to be supported. The actuating ring 30 carries a stop pin 40 normally engaging the stop shoulder 41 on the stationary ring 29, and when the ring 30 is rotated in counter clockwise direction, the members D will be rotated in counter clockwise direction to withdraw the escapement ledges 37 from the tube 1 and to swing in the wedge extension 38 between the flanges of the two lowermost cups, the tops of the wedge extensions receiving the flange of the next lowermost cup so as to support the stack thereabove while the wedge surfaces 39 engage along the top of the flange of the lowermost cup to wedge it loose from the stack and to shift it downwardly to be entirely free of the stack and to fall by gravity for delivery to the user. As the wedge extensions are comparatively deep, and the wedging action is very pronounced, the lowermost cup will be positively moved a considerable distance below the stack, so that there will be nothing

to hinder the cup from falling freely by gravity for delivery to the user.

In the structures shown and described, the upper surfaces of the wedge extensions are in planes which are at right angles to the axes of rotation of the dispensing members, so that these upper surfaces serve merely to receive the stack above the lowermost cup after release of this cup from the escapement ledges; and therefore the members D are not required to exert any lifting action on the stack.

I have shown practical and efficient embodiments of the various features of my invention but I do not desire to be limited to the exact construction, arrangement and operation shown and described, as changes and modifications may be made which would still be within the scope of my invention.

I claim as my invention:

1. In a dispenser for flanged cups, a frame forming a vertical passageway for delivery of cups from a stack extending into the passageway, a series of escapement members mounted on said frame adjacent to said passageway, each member having a lower and an upper escapement ledge, actuating means for actuating said members for sequential entry of the lower and upper ledges into said passageway into engagement respectively with the lower side of the flange of the lowermost cup and the lower side of the flange of the next cup whereby to control the one by one escapement of cups from the stack, the upper ledges on said members having the form of comparatively thin wedges for exerting preliminary downward pressure against the flange of the lowermost cup for loosening of the cup from the stack after release of the cup from the lower ledges, supplemental members mounted on said frame intermediate said escapement members and each provided with a comparatively thick wedge extension, said supplemental members being connected for actuation by said actuating means to project said wedge extensions into said passageway for engagement with the top of the flange of the lowermost cup to effect a final wide separation of the lowermost cup from the stack to entirely free the cup for discharge through said passageway.

2. In a dispenser for flanged cups, a frame affording a passageway for delivery of cups from a stack extending into said passageway, a main series of separating members having comparatively thin wedge projections and an auxiliary series of separating members having comparatively thick wedge projections, said main separating members having supporting ledges for engagement below the flange of the lowermost cup for normally supporting a stack of cups, and actuating means for said members operable to cause alternate entry of said supporting ledges and wedge projections into said passageway to control the one by one escapement of cups from the stack and to apply said thin and thick wedge projections sequentially against the top of the flange of the lowermost cup for positive separation and freeing of the lowermost cup from the stack after release of said cup from said supporting ledges.

3. In a dispenser for flanged cups, a frame forming a passageway for delivery of cups from a stack extending into the passageway, a series of escapement members on said frame, each having a lower supporting ledge and an upper supporting ledge for engagement respectively with the underside of the flange of the lowermost cup and

the underside of the flange of the next cup, actuating means for said members for causing alternate entry of the lower and upper ledges into said passageway for controlling the one by one escape of cups from the stack, a series of separate supplemental members on said frame each having a wedge projection reaching below that of said escapement members, said supplemental members being connected with said actuating means to be operated thereby sequentially with respect to said escapement members to project the wedge extensions between the flanges of the lowermost and next cup and impart extra downward force on the lower cup for positive separation of this cup from the stack after release of the cup from the lower ledges of the first set of members.

4. In a dispenser for flanged cups, a frame affording a passageway for delivery of cups from a stack extending into said passageway, a series of separating members having means thereon for normally supporting the stack of cups and means for exerting initial downward pressure against the flange of the lowermost cup, a second series of separating members having means thereon to exert further and greater downward pressure on the flange of the lowermost cup to positively free the same from the stack, and actuating means associated with both said series of separating members for removing said stack supporting means and sequentially move said pressure means between the flanges of the two lowermost cups.

5. In a cup dispenser, a frame forming a passageway for delivery of cups from a stack extending into said passageway, a series of movable escapement members on said frame having means thereon for normally supporting a stack of cups and means for initially starting the lowermost cup in motion when the stack supporting means are moved away from engagement with the stack, a second series of escapement members movable into position to assure the freeing of the lowermost cup, and actuating means to move said two series of escapement members sequentially into position to separate the lowermost cup from the stack.

6. In a cup dispenser, a frame forming a passageway for delivery of cups from a stack of cups extending into said passageway, an escapement member designed when actuated to initially exert a downward pressure on the lowermost cup of the stack, another escapement member designed to exert a further and greater downward pressure on said lowermost cup to positively free the cup from the stack, and actuating means for sequentially moving said escapement members into operating positions.

7. In a cup dispenser, a frame forming a passageway for delivery of cups from a stack of cups extending into said passageway, two separate series of escapement members in said frame arranged to sequentially enter said passageway and engage the lowermost cup, each series exerting a different degree of downward pressure on said lowermost cup, and means to actuate said escapement members.

8. In a cup dispenser, a frame forming a passageway for delivery of cups from a stack extending into said passageway, a series of movable escapement members carried by said frame each having a ledge for supporting the stack of cups and another ledge offset from the first ledge and tapered to pry the lowermost cup from the stack, a second series of escapement members each carrying means to insure the expulsion of the lower-

most cup, and means for operating both said series so that the means carried by the second series become effective contemporaneously with the tapered ledges of the first said series.

- 5 9. In a cup dispenser, means defining a passageway for delivery of cups from a stack extending into said passageway, two separate series of escapement members adjacent said passageway, one series including members arranged to support

the stack of cups and to start expulsion movement of the lowermost cup from the stack, the other series including members effective contemporaneously with the starting of the lowermost cup to augment this action by positively forcing the cup from the stack, and means for actuating said members. 8

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