Jan. 27, 1925. 1,524,420

G. J. BOHLMAN

DISPENSING APPARATUS

Filed Sept. 29, 1921 3 Sheets-Sheet 1

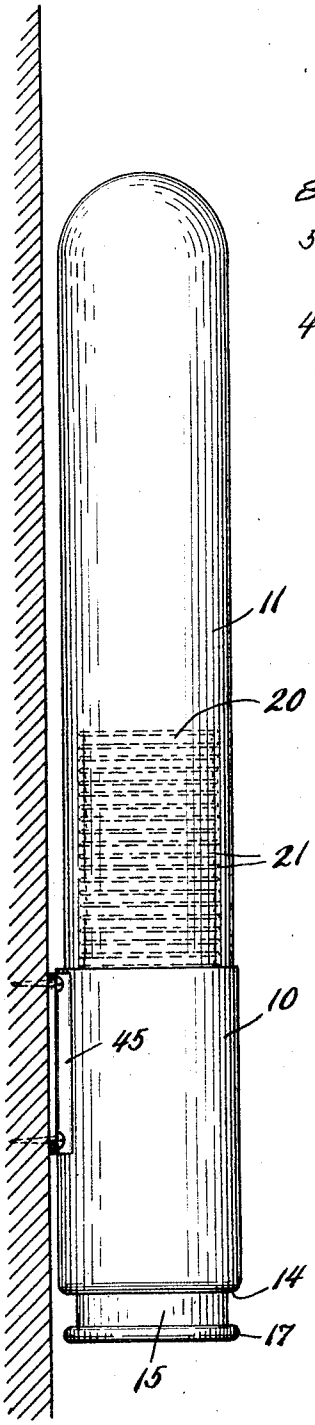


Fig. 1.

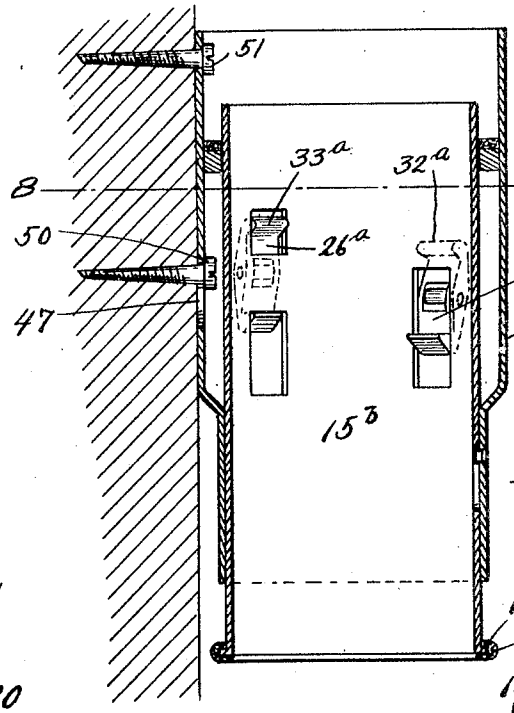


Fig. 7.

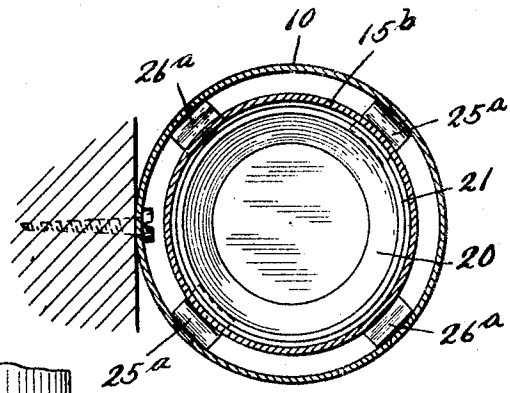


Fig. 8.

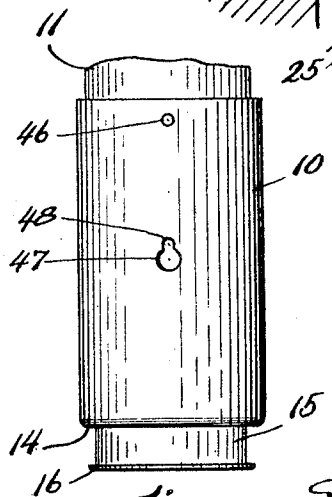


Fig. 9.

Inventor,

George J. Bohlman

by

T. Greenwood

Atty

Jan. 27, 1925. 1,524,420

G. J. BOHLMAN

DISPENSING APPARATUS

Filed Sept. 29, 1921 3 Sheets-Sheet 2

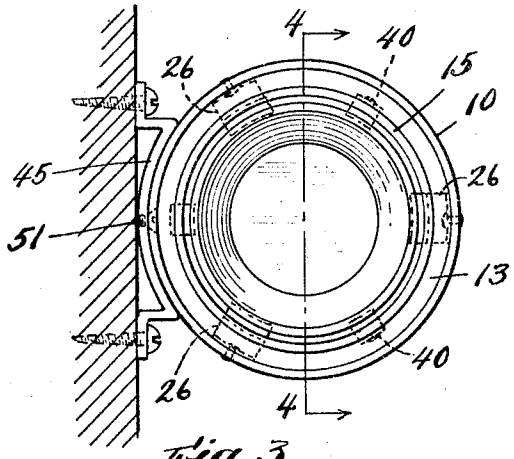


Fig. 3.

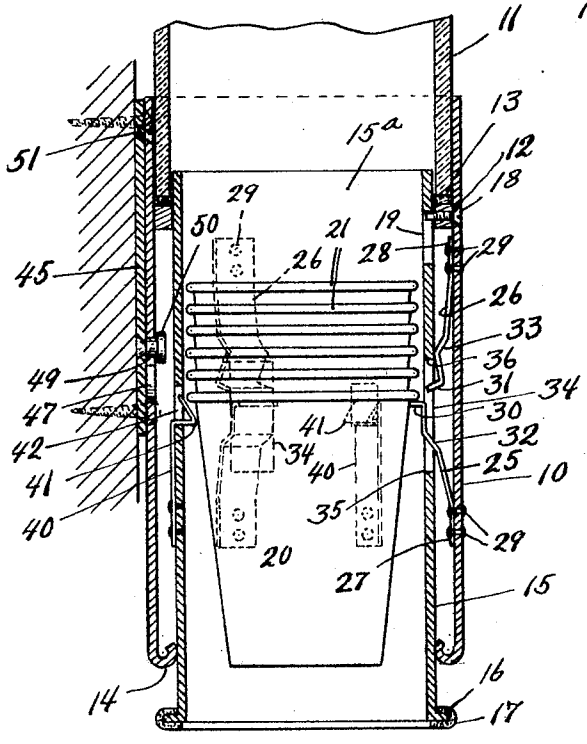


Fig. 2.

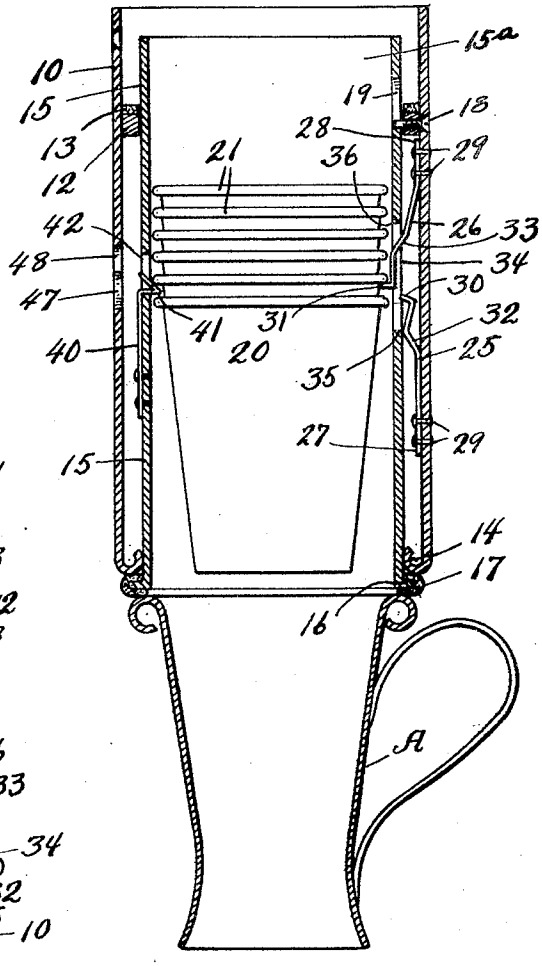


Fig. 5.

Inventor,
George J. Bohlman
by
Atty

Jan. 27, 1925. 1,524,420

G. J. BOHLMAN

DISPENSING APPARATUS

Filed Sept. 29, 1921 3 Sheets-Sheet 3

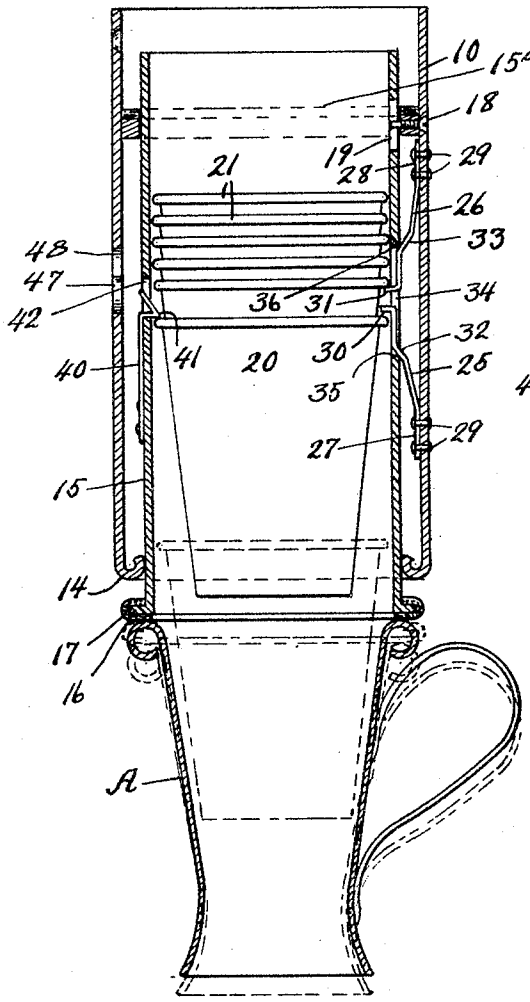


Fig. 6.

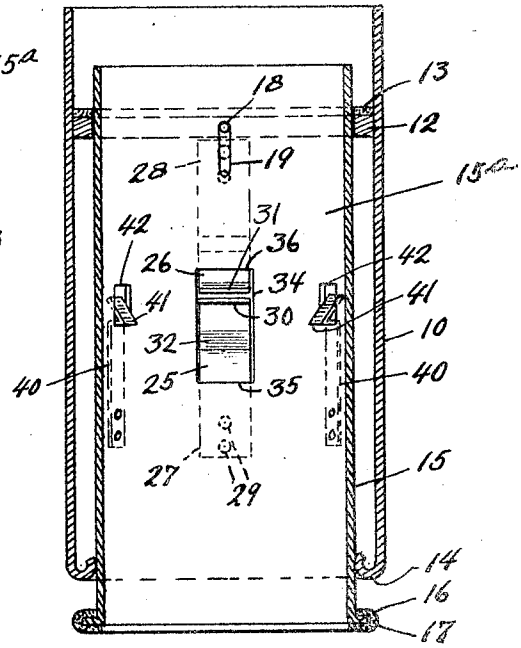


Fig. 4.

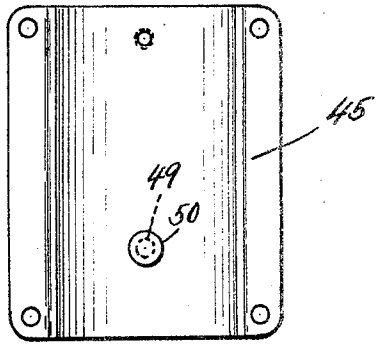


Fig. 10.

Inventor,
George J. Bohlman
by
Attorney

Patented Jan. 27, 1925. 1,524,420

UNITED STATES PATENT OFFICE.

GEORGE J. BOHLMAN, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO AMERICAN WATER SUPPLY CO., OF CAMBRIDGE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

DISPENSING APPARATUS.

Application filed September 29, 1921. Serial No. 504,066.

To all whom it may concern:

Be it known that I, GEORGE J. BOHLMAN, a citizen of the United States, residing at Medford, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Dispensing Apparatus, of which the following is a specification.

This invention relates to dispensing apparatus and has especial reference to a dispensing device adapted to hold a nested supply of paper cups having outwardly flared upper edges and deliver them one at a time.

An object of this invention is to provide a paper cup dispenser in which the cups are entirely enclosed and protected from soil and which has means arranged to deliver a single cup at a time.

A further object of the invention is to provide a cup dispenser in which but one hand of the operative is required to effect the delivery of a cup and the cup is delivered into that hand; or in which a cup holder may be employed to effect the delivery of a cup and the cup will be delivered into the holder.

A further object of the invention is to provide simple and effective means positively to deliver a single cup at an operation.

A further object is generally to improve the construction and operation of dispensing apparatus for paper cups.

Fig. 1 is a side elevation of a dispensing apparatus embodying the invention.

Fig. 2 is a sectional elevation of the dispensing apparatus illustrated in Fig. 1 with the tubular glass container broken away.

Fig. 3 is a plan view of the dispensing apparatus with the glass container removed.

Fig. 4 is a vertical section along line 4—4 of Fig. 3.

Fig. 5 is a sectional view similar to Fig. 2 and illustrating the manner of operating the dispensing apparatus with a cup holder and the position of the latches when the lowermost cup of the stack is released to drop into the cup holder.

Fig. 6 is a view similar to Fig. 5 and illustrating the position of the latches in which the support of the stack of cups is about to be transferred from the upper to the lower latches.

Fig. 7 is a sectional elevation of the dispensing apparatus illustrating more particularly a modified form of latch.

Fig. 8 is a section along line 8—8 of Fig. 7.

Fig. 9 is an elevation of the dispensing apparatus illustrating more particularly means for attaching it in vertical position to a support.

Fig. 10 is a front view of a supporting bracket for the dispensing apparatus.

As here shown, the dispensing apparatus embodying the invention includes the tubular housing 10 adapted to contain the cup delivery mechanism; and said housing is adapted to be secured in vertical position to a support by any suitable means. Said housing is open at the top and a tubular glass container 11, preferably closed at its upper end, is adapted to be received removably in inverted position within the open end thereof to rest upon an internal ring or annular ledge 12 formed on or secured to the inner face of said housing. Preferably a resilient gasket 13 is interposed between said ring and the end of said glass container. The lower end of the side wall of said housing is formed with an internal bead 14 or otherwise arranged to form a guide for an operating member; and the diameter of the housing at said ring 12 and bead 14 are adapted to be substantially equal whereby to cooperate in supporting the operating member movably in position within the housing.

The operating member comprises the tube 15 vertically disposed within said housing and guided for vertical reciprocatory movement by said bead 14 and ring 12. Said tube has the cup delivery passage 15^a therein and the lower portion of said tube 15 is extended below the lower end of said housing for manual engagement for vertical movement within the housing to effect the delivery of cups from the bottom opening of said delivery passage. Preferably the side wall of said tube 15 is flared outwardly to form an external annular flange 16; and a ring 17 of rubber or other suitable yielding material may be arranged thereon to be engaged by the hand or by a cup-holder for the operation of said tube for the delivery of cups into the hand or holder. Means,

as the screw 18, may be secured in said housing 10 and project into a slot 19 in said tube whereby to limit the extent of reciprocatory movement of the tube and retain the tube against angular movement in the housing.

A vertical stack of nested cups 20 is adapted to be contained in the dispensing apparatus within the glass container 11, the housing 10 and within the upper portion of the delivery passage 15^a of said tube 15; and the diameter of said delivery passage is adapted to be such that the cups fit freely therein.

The cups here shown have frustro-conical body-portions and the rolled-over or beaded top edges 21 which project outwardly beyond the cup bodies; and the dimensions of the cups are such that, when nested one within the other, the beaded top edges are separated one above the other a substantial distance. While I have herein illustrated a specific type of cup, other types of cups may be dispensed by my apparatus, and the specific type of cup is unimportant.

The tubular operating member 15 is adapted to extend downwardly below the bottom of the lowermost cup of the stack whereby the exterior of said cup will be protected from soil and from manual engagement; and the cups are adapted to be discharged from the open bottom of said operating member into that hand of the the operative which manipulates the operating member or into a cup holder which is pressed upwardly against said operating member.

Means are provided to effect the delivery of the lowermost cups of the stack one by one through the open end of said operating member 15. Said means includes the lower set of latches 25 and the upper set of latches 26 arranged in three groups equally spaced about the housing 10. The latches of each set are substantially identical and are formed of strips of spring material having end-portions 27 and 28 secured to the inner face of the side wall of said housing 10 intermediate the ends thereof by suitable means as the rivets 29. The free end-portions are reflexed to form the latch-portions 30 and 31 and the spring-tension of said latches is adapted to be such that the latch-portions thereof are normally pressed toward a position to engage the under side of the beads 21 of the cups 20 contained within the tube 15. The latch-portion 31 is adapted to be disposed above the latch-portion 30 and the distance between said latch-portions is preferably slightly greater than the thickness of a bead 21 of the cups. Said latches 25 and 26 are reflexed to provide the inclined cam-portions 32 and 33 intermediate the ends of the latches by which said latches are operated to retain and release the cups. Said tube 15 is formed with slots 34 in its side wall intermediate the ends thereof through which the latches are adapted to project to engage the cups; and the lower edges 35 and the upper edges 36 of said slots are adapted to form cam-faces to engage the cam-portions 32 of the lower latches and cam-portions 33 of the upper latches respectively by a reciprocatory movement of said tube in both directions to effect the operation of the latches.

In the normal condition of the dispensing apparatus, the tube 15 is in its lowest position, see Fig. 2, with the upper edge of the slot 19 against the screw 18. In such position the upper edges 36 of the slots 34 in said tube are in engagement with the cam-portions 33 of the upper latches 26 to withdraw and hold said latches from engaging position with the cups 20. The length of said slots 34 is such, however, that the lower latches 25 are extended within said slots and in position beneath and in engagement with the bead of the lowermost cup of the stack; and the stack is supported in position in the dispensing apparatus by said lower latches.

To effect the delivery of the lowermost cup of the stack the tube 15 is moved upward by pressing the hand, or it may be the rim of a cup holder A against the lower and exposed edge of the tube, or against the resilient ring 17. In the upward movement of the tube, the lower edges 35 of the slots 34 are moved against the cam-portion 32 of the lower latches 25 to effect the withdrawal of the latch-portions 30 thereof from engagement with the bead of the lowemost cup of the stack. At the same time, the upper edge portions 36 of the slots 34 move over the cam-portions 33 of the upper latches 26 and permit them to extend to a position under the bead of the next lowermost cup of the stack, as illustrated in Fig. 5. The timing of the operation of said latches is such that the upper latches are in position beneath the bead of the second lowermost cup to support the stack before the lower latches have been withdrawn from supporting position. Preferably the timing is such that one set of latches is in position before the other set is moved; or the sets of latches are operated in succession. When the tube 15 has been moved upwardly sufficiently to move the lower latches from engagement with the lowermost cup, the stack will drop down and rest upon the upper latches and the lowermost cup is free to drop downwardly through the open bottom of the tube 15 and into the hand or into the cup holder that has pressed the tube upwardly, as illustrated in Fig. 6. The tube 15 may now be released and will drop by its weight and in moving to its low position will operate the latches to position the lower latches into a cup-engaging

and stack-supporting position and therefrom withdraw the upper latches from engaging and supporting position with the cups, and the stack will drop down upon and be supported by the lower latches. Each operation of the tube 15 to reciprocate the tube vertically in both directions will effect the discharge of a single cup.

Means may be provided to strip the lowermost cup positively from the stack to effect its delivery and said means may be desirable especially if the cups are coated with paraffin and consequently have a tendency to adhere when nested, especially in hot weather. Said means may comprise the spring finger 40 having one end thereof suitably secured to the outer face of the side wall of the tube 15 intermediate the ends thereof and having its free end reflexed to provide the latch-portion 41 which is adapted to extend through a slot 42 into the interior of said tube. Said latch-portion 41 is adapted to be moved outwardly in the slot 42 by the bead of the lowermost cup of the stack when the tube 15 is moved upward and then spring into a position above the bead of said cup as shown in Fig. 6. When the tube 15 is released and drops downwardly by its weight, said latch portion 41 will engage the upper face of the bead of the cup and positively remove or strip it from the stack.

When the dispensing apparatus is manipulated to deliver a cup directly into a cup holder, for which it is particularly adapted, the cup-holder A will be placed with its rim against the lower end of the tube 15, and the interior of the holder aligned with the interior of the tube 15 as illustrated in Fig. 6. By pressing said holder upwardly the lowermost cup of the stack is caused to drop downwardly directly into the cup-holder without further manipulation on the part of the operative. In practice the positioning of the cup-holder against the tube 15 and the following upward movement of said tube will be performed in an uninterrupted manner and as one motion, and the holder will be withdrawn with the cup in position therein.

In the modification illustrated in Fig. 7, the latches 25^a and 26^a, corresponding to the latches 25 and 26 respectively, are formed as non-resilient members pivotally supported by the housing 10. The end-portions of said latches comprise cam-portions 32^a and 33^a and are arranged to be engaged by the tube 15^b, corresponding to tube 15, for operation in a manner which is obvious when considered in connection with the operation of the latches 25 and 26 above set forth.

The dispensing apparatus is adapted to be secured in a vertical position to a support by suitable means as the bracket 45. Said bracket may be secured permanently to the support and the dispensing apparatus secured removably to said bracket. For this purpose the housing 10 may be provided with the upper screw hole 46 in its side wall and the lower and enlarged hole 47 having the slot 48 in communication with said hole. The bracket 45 may have extended therefrom the screw or rivet 49 provided with the enlarged head 50, and the head 50 is adapted to enter the hole 47 and the housing may then be moved downwardly to cause the body of said screw or rivet 49 to enter the slot 48. The head 50 will retain the housing in engagement with said bracket. The upper screw hole 46 may align with a corresponding threaded hole in the bracket and a screw 51 may be passed through said hole 46 and threaded into the hole in the bracket whereby finally to secure said housing and bracket together.

For some purposes the bracket may be omitted and the housing 10 secured directly to a support in a similar manner.

The invention may be contained in other modifications without departing from the spirit thereof.

I claim:

1. A dispensing apparatus including, in combination, a support for a stack of articles such as cups and having a delivery opening through which the cups may fall freely by gravity when released, cup releasing mechanism including a plurality of detents, one of which is adapted to engage with a terminal cup for restraining the stack in supported position and another of said detents being adapted to engage with the next successive cup to restrain the stack when the terminal cup is released, and mechanism for operating said detents to stack releasing and supporting positions respectively in alternation to release successive terminal cups while continuously supporting the stack, said detent operating mechanism including a movable operating member slidably mounted for movement longitudinally of the stack support and having a manually engageable operating part lying in juxtaposition to said delivery opening so a manual operating agency engaging with said operating part may catch the cup as it falls freely through the delivery opening.

2. Dispensing apparatus having means to contain a supply of cups and provided with a delivery opening, means to effect the delivery of single cups from said containing means through said delivery opening including a tubular manually-operable operating member, said operating member being movable in the delivery opening, and extending beyond the cup containing means to be engaged at its outer end by the hand thereby to operate the member and to re-

ceive a cup delivered through the said member.

3. Dispensing apparatus having means to contain a supply of cups and provided with a delivery opening, means to effect the separation of single cups from the supply and the delivery of said cups by gravity through said delivery opening, said separating means including a tubular manually-operable operating member extending through said delivery opening and operable to cause a cup to fall into the hand that operates said operating member.

4. A dispensing apparatus including, in combination, a support for a stack of articles such as cups and having a delivery opening through which the cups may fall freely by gravity when released, cup releasing mechanism including a plurality of detents, one of which is adapted to engage with a terminal cup for restraining the stack in supported position and another of said detents being adapted to engage with the next successive cup to restrain the stack when the terminal cup is released, and mechanism for operating said detents to stack releasing and supporting positions respectively in alternation to release successive terminal cups while continuously supporting the stack, said detent operating mechanism including a tabular operating member mounted for telescopic movement with said stack support and extending beyond said delivery opening, said tabular operating member having a manually engageable operating part lying in juxtaposition to said delivery opening so a manual operating agency engaging with said operating part may catch the cup as it falls freely through the delivery opening.

5. A dispensing apparatus including, in combination, a support for a stack of articles such as cups and having a delivery opening through which the cups may fall freely by gravity when released, cup releasing mechanism including a plurality of detents, one of which is adapted to engage with a terminal cup for restraining the stack in supported position and another of said detents being adapted to engage with the next successive cup to restrain the stock when the terminal cup is released, and mechanism for operating said detents to stack releasing and suporting positions respectively in alternation to release successive terminal cups while continuously supporting the stack, said detent operating mechanism including a movable operating member having a manually engageable operating part lying in juxtaposition to said delivery opening so a manual operating agency engaging with said operating part may catch the cup as it falls freely through the delivery opening.

6. A dispensing apparatus including, in combination, a support for a stack of articles such as cups and having a delivery opening through which the cups may fall freely by gravity when released, cup releasing mechanism including a plurality of detents, one of which is adapted to engage with a terminal cup for restraining the stack in supported position and another of said detents being adapted to engage with the next successive cup to restrain the stack when the terminal cup is released, mechanism for operating said detents to stack releasing and supporting positions respectively in alternation to release successive terminal cups while continuously supporting the stack, said detent operating mechanism including a movable operating member slidably mounted for movement longitudinally of the stack support and having a manually engageable operating part lying in juxtaposition to said delivery opening so a manual operating agency engaging with said operating part may catch the cup as it falls freely through the delivery opening, and a detaching member operable by said slidably mounted member for engagement with and positive detachment of a terminal cup from the stack.

7. A dispensing apparatus including, in combination, a support for a stack of articles such as cups and having a delivery opening through which the cups may fall freely by gravity when released from said support, escapement mechanism including a plurality of detents for continuously restraining said stack in supported position, and means for operating said escapement mechanism to release the terminal cup while the stack is still supported by one of said detents, said escapement operating mechanism including a movable member having a manually engageable operating part lying in juxtaposition to said delivery opening so a manual operating agency engaging with said operating part may catch the cup as it falls freely through the delivery opening.

8. A despensing apparatus including, in combination, a support for a stack of articles such as cups and having a delivery opening through which the cups may fall freely by gravity when released, cup releasing mechanism including a plurality of detents, one of which is adapted to engage with a terminal cup for restraining the stack in supported position and another of said detents being adapted to engage with the next successive cup to restrain the stack when the terminal cup is released, and mechanism for operating said detents to stack releasing and supporting positions respectively in alternation to release successive terminal cups while continuously supporting the stack, said detent operating mechanism including a movable operating

member slidably mounted for movement longitudinally of the stack support and having a manually engageable operating part lying in juxtaposition to said delivery opening so a manual operating agency engaging with said operating part may catch the cup as it falls freely through the delivery opening, said slidably mounted member having cam formations cooperating operatively with said detents.

9. A dispensing apparatus including, in combination, a support for a stack of articles such as cups and having a delivery opening through which the cups may fall freely by gravity when released, cup releasing mechanism including a plurality of detents, one of which is adapted to engage with a terminal cup for restraining the stack in supported position and another of said detents being adapted to engage with the next successive cup to restrain the stack when the terminal cup is released, mechanism for operating said detents to stack releasing and supporting positions respectively in alternation to release successive terminal cups while continuously supporting the stack, said detent operating mechanism including a movable operating member slidably mounted for movement longitudinally of the stack support and having a manually engageable operating part in lying in juxtaposition to said delivery opening so a manual operating agency engaging with said operating part may catch the cup as it falls freely through the delivery opening, said slidably mounted member having cam formations cooperating operatively with said detents, and a detaching member operable by said slidably mounted member for engagement with and positive detachment of a terminal cup from the stack.

10. Dispensing apparatus having a vertically-disposed tubular container adapted to receive a vertical stack of nested cups, a tubular operating member vertically reciprocably received in the lower portion of said container adapted to enclose the lower portion of the cup stack, said tubular operating member having a slot therein, and cup-delivery mechanism including latches carried by said tubular container having latch-portions arranged to extend through said slot for engagement with cups of the cup stack and cam-portions engageable with said tubular operating member to effect the delivery of the lowermost cup of the stack and the retention of the remaining cups of the stack.

11. Dispensing apparatus having a vertically-disposed tubular container adapted to receive a vertical stack of nested cups, a tubular operating member vertically reciprocably received in the lower portion of said container adapted to enclose the lower portion of the cup stack, said tubular operating member having a slot in its side wall, and cup-delivery mechanism including upper and lower latches carried by said tubular container having latch-portions arranged to extend through said slot for engagement with the cups of the cup stack and having cam-portions arranged to be engaged by the edge-portions of said slot, said operating member arranged to operate said latches in an upward movement thereof to cause the upper latch to engage the next to the lowermost cup of the stack and cause the lower latch to release the lowermost cup of the stack whereby it will drop through said operating member and in a downward movement of said operating member effect the movement of said lower latch into cup-engaging position and remove said upper latch from cup-engaging position to permit the cup stack to drop down upon and be supported by said lower latch.

12. Dispensing apparatus having a vertically-disposed tubular container adapted to receive a vertical stack of nested cups, a tubular operating member vertically reciprocably received in the lower portion of said container adapted to enclose the lower portion of the cup stack, said tubular operating member having a slot in its side wall, and cup-delivery mechanism including latches comprising spring-members secured to the side walls of said tubular container having latch-portions adapted to project through said slot into the interior of said tubular operating member for engagement with the cups of the stack, said latches also having intermediate cam-portions arranged to be engaged by the edge-portions of the slot in said tubular operating member, said tubular operating member arranged to be moved upwardly to transfer the support of the cup stack from the lower to the upper latch and remove the support from the lowermost cup of the stack to effect the delivery thereof through said tubular operating member, and arranged to move downwardly to transfer the support of the cup stack from the upper to the lower latch.

In testimony whereof, I have signed my name to this specification.

GEORGE J. BOHLMAN.