M. P. HENVIS.

DISPENSING APPARATUS.

APPLICATION FILED AUG. 1, 1913.

1,144,764.

Patented June 29, 1915.

2 SHEETS—SHEET 1.

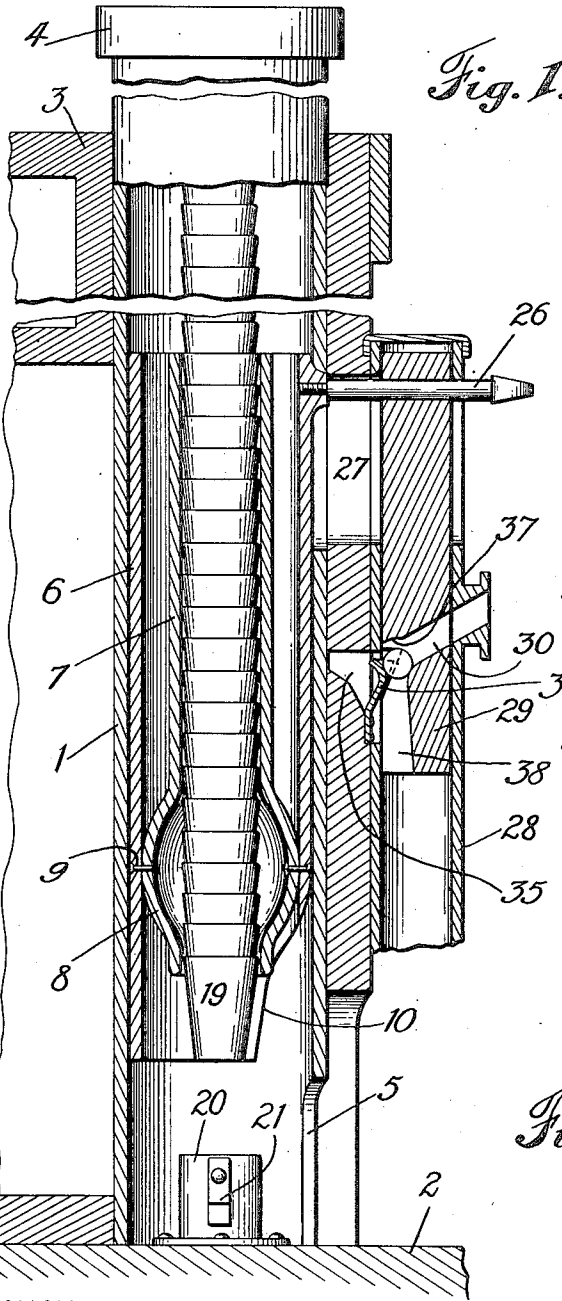


Fig. 1.

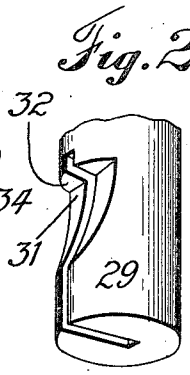


Fig. 2.

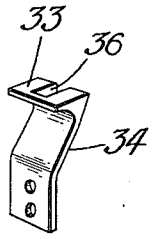


Fig. 3.

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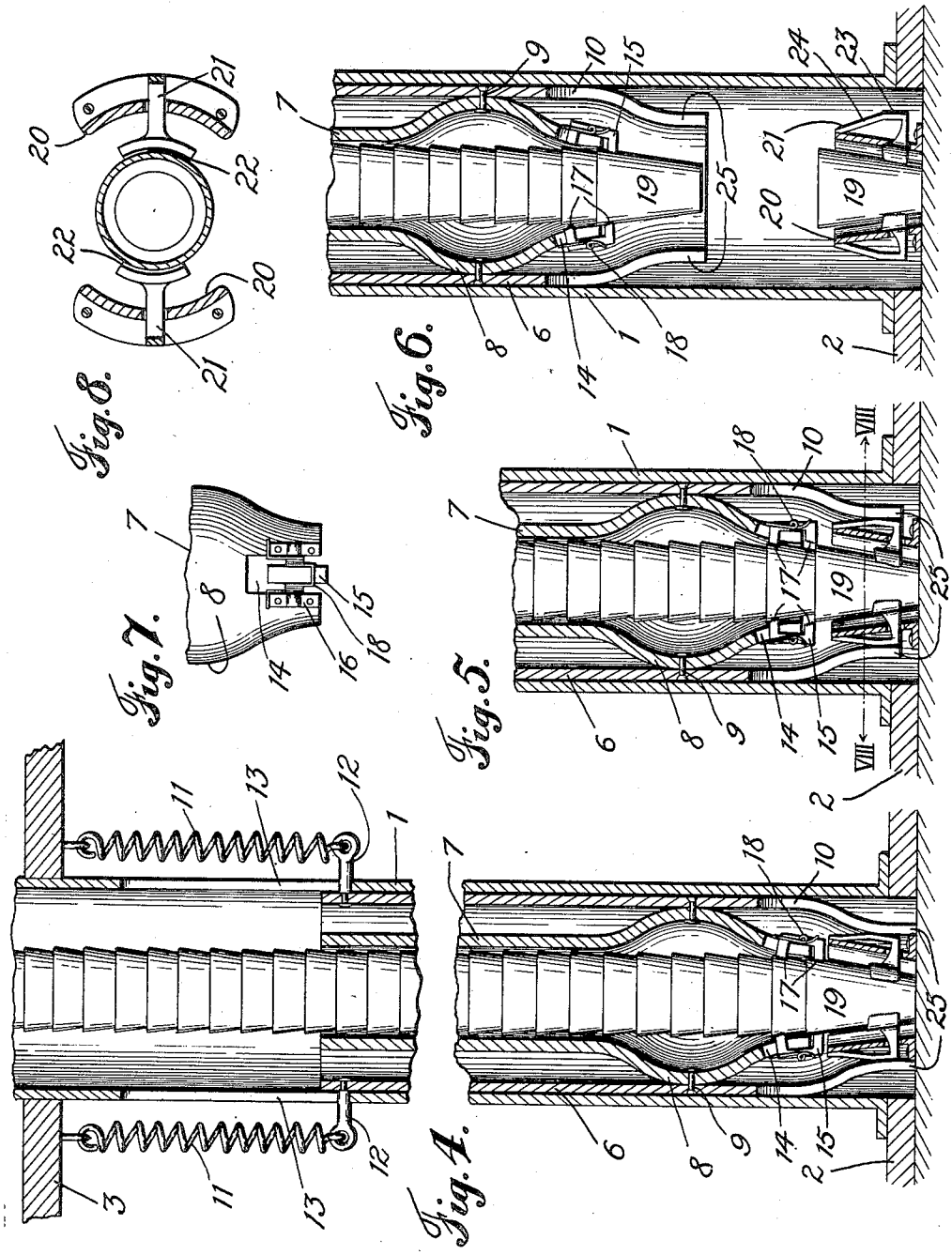
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UNITED STATES PATENT OFFICE.

MAURICE P. HENVIS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO INDIVIDUAL DRINKING CUP COMPANY, OF NEW YORK, N. Y., A CORPORATION OF MAINE.

DISPENSING APPARATUS.

1,144,764. Specification of Letters Patent. Patented June 29, 1915.

Original application filed June 1, 1909, Serial No. 499,342. Divided and this application filed August 1, 1913. Serial No. 782,415.

To all whom it may concern:

Be it known that I, MAURICE P. HENVIS, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Dispensing Apparatus, of which the following is a full, clear, and exact description.

This invention relates to dispensing apparatus and particularly to devices intended to dispense individual drinking cups or other receptacles.

Cups or receptacles which are intended to be dispensed through automatic dispensing apparatus are usually most conveniently stacked within the apparatus in nested relation, as they thus take up much less room and accordingly a larger number of them may be placed in the apparatus at one time. The delivery of an article from a series of nested articles, however, involves certain peculiarities not present in handling merchandise of other forms; for example the articles must be removed longitudinally of the stack and the articles are likely to stick together so as to require the application of some positive force other than gravity in order to separate an article from the stack and make possible its removal. This is particularly the case where the articles are of light material, such as paper, which is commonly used for making individual drinking cups.

The present invention provides means for positively gripping the article to be removed and the stack adjacent to such article and for causing relative longitudinal movement between such gripping devices so as to separate the article from the stack. In the preferred form of the invention, the gripping device for the article to be removed has no longitudinal movement and holds the article stationary while the stack is moved longitudinally away from it. This mode of operation namely, holding the terminal article and lifting the stack out of it or away from it sufficiently to loosen the article from the stack involves a principle which I believe is broadly new with me. It is also broadly new, so far as I am aware to provide relatively movable gripping devices for separating the adjacent cups of a stack.

My invention also involves certain improved forms of gripping means for the articles and other structural improvements, the nature and objects of which will clearly appear from the following detailed description.

This application is a division of my application Serial No. 499,342, filed June 1st, 1909 for water venders.

In the drawings which show one preferred embodiment of my invention by way of illustration: Figure 1 is a vertical section through the cup magazine and delivering mechanism, showing in connection therewith a coin controlled locking device for the delivering mechanism. Fig. 2 is a detail rear perspective view of the lower portion of the plunger of the coin chute. Fig. 3 is a detail perspective view of the detent which cooperates with this plunger. Fig. 4 is a vertical section through the cup delivering means showing the lower-most cup clamped to the base. Fig. 5 is a similar view with the cup retaining slide partially raised. Fig. 6 is a like view with the slide completely raised, showing the lower cup of the stack retained by the dogs and the cup which has been detached from the stack standing in position to be removed. Fig. 7 is a detail side elevation of the lower end of the cup guiding cylinder showing one of the retaining dogs. Fig. 8 is a horizontal section on an enlarged scale through the stationary cup holding clamps and the cup held thereby taken on line VIII—VIII of Fig. 5.

Referring to the drawings in detail the numeral 1 designates a tubular cup magazine or receiver which is preferably mounted vertically in any suitable manner as by being supported on a base 2 and retained in upright position by a suitable framework or casing 3. The upper end of the magazine is preferably closed by means of a removable cover 4, which excludes dirt from the casing and prevents contamination of the cups. The magazine has a suitable delivery opening 5 at its lower end through which the cups may be removed as delivered. Mounted within the magazine 1 is a cup delivering slide 6 in which is secured a cup guiding cylinder 7. The latter may be secured in the slide in any suitable manner, as by having its lower part enlarged as indicated at 8 and connected to the slide by suitable means, such as rivets 9. The lower

portion of the slide is cut away as indicated at 10 to provide an opening for the removal for the cups. The slide is normally held in raised position by springs 11 extending from pins 12 on the slide to the top of the casing 3 or by other suitable means. These pins 12 project from the sides of the slide through slots 13 in the magazine 1. The lower end of the guide cylinder 7 is provided with slots 14 in which are mounted cup gripping dogs 15, the latter being pivoted in bearings 16 at the sides of the slots. Each dog is formed at its opposite ends with gripping or retaining means, such as teeth 17 adapted to engage the outer surfaces of the cups. The dogs are adapted to swing from engagement with one cup into contact with a succeeding cup, their lower gripping faces being normally urged inward into engagement with a cup by springs 18. The cups 19 may be of any suitable construction and shape, preferably tapered or conical, and in the form of the invention illustrated are adapted to be arranged in the device with their bottoms downward.

Beneath the cup delivering slide, a cup clamping device is located, which is adapted to grip the bottom cup of the pile in the slide, when the latter is moved downward, and to hold the same while the cup slide and pile of cups therein is raised, thus separating the bottom cup from the pile. This cup clamping device may be of any suitable construction adapted to perform the desired purpose, but in the illustrated form it comprises a pair of rigid metal segmental frames 20 mounted upon the base 2, each frame having secured to its outer face a spring member 21. The end of each spring member is bent to extend through an opening in the frame and carries a segmental clamping plate 22, which is adapted to grip the outer surface of the bottom cup of the pile when moved into contact therewith. The outer face of each spring member 21 is formed with a straight holding portion 23 to retain the clamp plate in contact with the cup during the initial upward movement of the cup slide and with an inclined portion 24 adapted to be engaged by an inwardly bent portion 25 of the lower part of the cup slide. As the cup slide moves downward, it will be seen that these portions 25 engage the inclined portions 24 of the springs 21 and thus force the springs inward and cause the clamp plates 22 to grip the lower-most cup carried by the cup slide, as shown in Fig. 4. A space is left between the frames and clamps on the front side, sufficient to permit the direct removal of the cup therefrom through the delivery opening 5 in the magazine after the cup has been released from the pile of cups in the slide.

Any suitable means may be provided for causing the downward movement of the cup slide. As shown, the cup slide is provided with an operating handle 26 rigidly attached thereto and projecting through the slot 27 in the casing 3. I have shown in Fig. 1 a coin controlled device for locking the cup slide against movement except when a coin is inserted into the device, but this coin controlled means forms no part of the invention herein claimed. Any other coin controlled mechanism may be utilized for this purpose or no such device may be employed and the delivery of cups made to depend merely upon the movement of the operating handle. In the structure shown a coin chute 28 is secured to the front of the casing 3 and has mounted in it a sliding plunger or pusher 29, through a hole in the upper end of which passes the handle 26. The handle also passes through slots in the walls of the coin chute. The plunger also has a coin feeding passage 30 passing transversely therethrough and inclined downward. At the rear of this passage a notch 31 is formed in the plunger, the upper wall of which forms a shoulder 32 adapted to contact with the upper angular face 33 of a spring detent 34, which is mounted upon the casing 3 and which is capable of being forced backward into a recess 35 therein. The detent is formed with a coin holding groove or slot 36 having a curved contact face to facilitate the passage of the coin therefrom when forced downward by the contact face 37 of the plunger. The coin when forced past the detent 34 is discharged through a passage 38 in the plunger.

In the operation of the apparatus, if the operating handle 26 be pushed downward without the insertion of a coin in the coin slot of the plunger the shoulder of the plunger engages the detent 34 and prevents operation of the device. When a proper coin rests in contact with the detent, however, it is engaged by the contact face 37 and serves to force the detent backward into the recess 35 in the casing and thereby permits free downward movement of the plunger. When the operating handle and plunger are forced down the cup delivering slide, which is connected to the handle also moves down until it occupies the position shown in Fig. 4, at which time the bottom cup is positioned between the clamping plates 22, which are forced into gripping contact therewith by reason of the engagement of the inwardly bent portions 25 of the cup slide with the outer surfaces of the springs 21. The lower clamping faces of the dogs 15 are still held in engagement with the upper part of the bottom cup by the springs 18. The operating handle 26 being now released, the cup slide is raised by the springs 11, and as the clamping plates 22 hold the bottom cup more firmly than the spring pressed dogs 15, the bottom cup is

held stationary and the dogs slide up the tapering surface of the cup wall, which causes them to swing about their pivots and brings the other gripping faces thereof into gripping engagement with the next to the bottom cup of the series. As the cup slide and dogs move up, the dogs are caused to lift the series of cups away from the bottom cup and so positively separate the bottom cup from the series. This initial lifting of the series of cups is illustrated in Fig. 5, in which it is seen that the inwardly bent portions 25 of the cup slide are still in engagement with the springs 21 and so hold the bottom cup firmly clamped in position. Further upward movement of the slide carries the lower clamping faces of the dogs above the edge of the bottom cup whereupon the dogs are swung about the pivots by the springs 18 and caused to seize the next lower cup of the series with their lower gripping faces. The dogs are swung about their pivots so quickly that the series of cups is permitted to drop only a very short distance between the time in which it is gripped by the upper gripping surfaces of the dogs and the time when it is taken hold of by the lower gripping surfaces of the dogs. The cups as held by the lower gripping surfaces of the dogs and as supported in position for the next operation of the machine are shown in Fig. 6. It will be seen that the upward movement of the slide also releases the springs 21, which draw the clamping plates 22 out of engagement with the bottom cup so as to permit the latter to be removed through the opening 5. When the slide and plunger 29 have been completely raised, the detent 34 springs beneath the shoulder on the plunger and prevents another operation of the device until another coin is inserted into the coin slot.

It will thus be seen that the invention provides mechanism operated by a single movement for delivering a single cup from a stack of nested cups and effects positive separation of the terminal cup from the stack by holding such cup against movement, while lifting the stack away from the same. It also provides relatively movable clamping devices for positively gripping the terminal and adjacent cups of the stack.

While I have illustrated in the drawings and described in detail but one preferred embodiment of my invention, I do not desire to be limited to such specific embodiment, but intend to cover the principle of my invention broadly.

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

1. In a dispensing apparatus, the combination of a sliding cup delivering device adapted to carry a series of cups and means beneath said delivering device, toward and from which said device is movable, for holding a cup during one movement of said device.

2. In a dispensing apparatus, the combination of a cup magazine having means to retain the lowermost cup therein, said means being movable up and down, and means to hold said cup against upward movement during the upward movement of said retaining means.

3. In a dispensing apparatus, the combination of a cup slide having means to retain the lower-most cup therein and clamping means for the base of said cup open at the delivery side to permit the lateral removal of the cup therefrom, said cup slide being movable toward and from said clamping means.

4. In a dispensing apparatus, the combination of a cup magazine, a delivery slide mounted thereon and provided with a pivoted dog to retain the lower-most cup therein, a fixed support beneath said slide toward and from which the latter is movable, and means for retaining said cup in contact with said fixed support.

5. In a dispensing device, the combination of a cup magazine, a delivery slide mounted thereon and movable up and down, and a pivoted dog having retaining means at opposite ends and mounted at the lower end of said slide to engage and hold successive cups therein.

6. In a dispensing device, the combination of a cup magazine, a delivery slide mounted thereon and movable up and down, and a pivoted dog mounted at the lower end of said slide and having teeth at opposite ends to engage successive cups.

7. In a dispensing device, the combination of a cup magazine, a delivery slide mounted thereon and movable up and down, means upon said slide for retaining the cups therein, and means beneath said slide for clamping the base of a cup delivered thereto by the downward movement of said slide.

8. In a dispensing device, the combination of a cup magazine, a delivery slide mounted thereon and movable up and down, means upon said slide for retaining cups therein, means beneath said slide for clamping the base of a cup, and means upon the slide for releasing said clamping means upon the upward movement of the slide.

9. In a dispensing device, the combination of a cup magazine, a cup delivery slide mounted thereon, means upon said slide for holding the cups therein, spring actuated clamping means beneath said slide having an opening for the withdrawal of a cup therefrom, and projections carried by said slide to engage and release said clamping means.

10. In a dispensing device, the combination of a cup delivery slide, a pivoted dog

thereon having gripping faces at its opposite ends, and a spring for forcing the lower end of said dog inward.

11. In a dispensing device, the combination of a cup delivery slide, and a clamping device beneath said slide comprising a fixed frame and spring actuated clamping plates mounted upon said frame.

12. In a dispensing device, the combination of a cup delivery slide, a fixed frame beneath said slide, clamping plates mounted upon said frame and provided with holding faces, and depending projections from said slide to engage said faces.

13. In a dispensing device, the combination of a reciprocable cup delivering device, and a cup holding means fixed against movement in the direction of reciprocation of the delivering device, but movable laterally thereto.

14. In a dispensing device for nested articles, the combination of means for holding the terminal article and means for moving the series of nested articles away from said terminal article.

15. In dispensing apparatus, the combination of a device for holding a series of articles, a device for engaging the terminal article of the series, and means for separating said devices in a direction longitudinally of the series while said devices are in operative engagement with said articles, whereby the positive separation of the terminal article from the series is effected.

16. In dispensing apparatus, the combination of a device for holding a series of nested articles, a device for engaging the terminal article of the series, and means for moving one of said devices longitudinally of the series while the other device remains stationary and while each of said devices is in operative engagement with an article or articles whereby a positive separation of the terminal article from the series is effected.

17. In dispensing apparatus, the combination of a device for holding a series of nested articles, a device for engaging the terminal-article of the series, and means for moving the series holding device away from the terminal article engaging device while said devices are in operative engagement with said series and terminal article respectively, whereby said series is positively separated from said terminal article.

18. In dispensing apparatus, the combination of a device for holding a series of nested articles, a clamp for engaging the terminal article of the series, means for moving said series holding device toward and from said clamp, and means controlled by the movements of said series holding device for operating said clamp.

19. In dispensing apparatus for conical cups, the combination of a gripping device adapted to engage the outer conical surface of the cup, and means for causing the gripping device to engage and release the cup surface.

20. In dispensing apparatus for nested conical cups, the combination of means for engaging the terminal cup of a series of nested cups, and a gripping device for engaging the exposed portion of the conical surface of an intermediate cup of the series.

21. In dispensing apparatus for nested conical cups, the combination of means for engaging an intermediate cup of a series of nested cups and a gripping device for engaging the outer conical surface of the terminal cup of the series.

22. In a dispensing device for nested articles, the combination of means for supporting a series of such articles in substantially vertical position, means for supporting the lowermost article, and means for lifting the series of articles away from the lower-most article.

23. In apparatus for delivering cups one at a time, with their closed ends down, from a series of cups nested with their closed ends down, the combination of means for supporting the series of cups, and means for positively effecting relative longitudinal movement between the lowermost cup and the remainder of the stack to positively separate said lowermost cup from the stack.

24. In a device for dispensing nested articles, the combination of means for supporting a series of such articles in a substantially upright position, and mechanism for positively separating the lowermost article from the stack by a lifting movement of the stack, said mechanism including means for lifting the stack and for holding said lowermost article against upward movement with the stack when the stack is lifted.

25. In a dispensing device, the combination of a reciprocating carrier for a series of nested cups, a relatively stationary cup support, means for moving the carrier toward the cup support, and a spring for moving said carrier away from said support.

26. In a dispensing apparatus, the combination of a reciprocating carrier for a series of nested cups, a relatively stationary cup clamp, means for moving said carrier toward and from said clamp and coöperating means on said carrier and clamp for actuating the latter by the movements of the former.

27. In a dispensing apparatus, the combination of a reciprocating carrier for a series of nested cups, a relatively stationary cup clamp adapted to engage the terminal cup of the series of cups carried by said carrier, means for moving said carrier toward said clamp, means for operating said clamp to cause it to engage the bottom cup of the series of cups when said carrier is moved toward said clamp, means for mov-

ing said carrier away from said clamp and means for releasing said cup from said clamp after said carrier has started on its movement away from said clamp.

28. In a dispensing apparatus, the combination of a reciprocating carrier for a series of nested cups, a relatively stationary cup support toward and from which said carrier is movable, a clamping member for engaging a cup and holding it upon said support, a spring acting to normally retract said clamp out of engagement with said cup and a member on said carrier adapted to cooperate with said clamp to force the same into clamping engagement with a cup upon the downward movement of said carrier and to hold said clamp in engagement with said cup during the first part of the upward movement of said carrier, said member releasing said clamp and permitting the spring to retract the same upon the further upward movement of said carrier.

29. In a dispensing device, the combination of a vertically slidable tube adapted to carry a series of nested cups, means for releasably retaining cups in such tube, a relatively stationary cup support, means for clamping a cup to said support, means for moving said tube toward said support, a spring for moving said tube away from said support and means associated with said tube for operating the clamping means on said support to cause the same to engage the terminal cup of the series carried by said tube and hold the same against movement upon the upward movement of the tube, whereby said terminal cup is freed from the releasable holding means on said tube.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses this 1st day of August, 1913.

MAURICE P. HENVIS.

Witnesses:
L. L. BACON,
CALVIN T. MILANS.