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CONE CUP DISPENSING MACHINE

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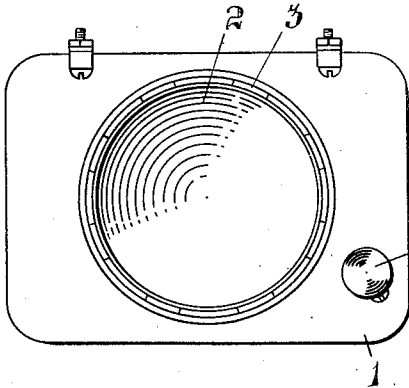


Fig. 1.

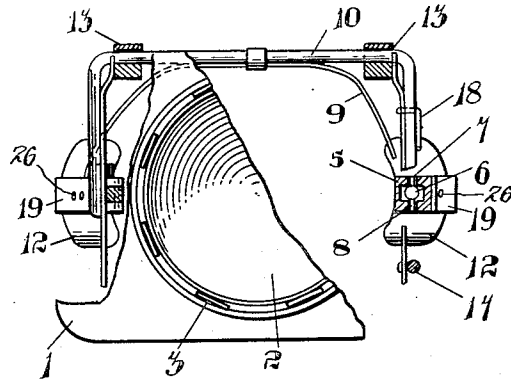


Fig. 2.

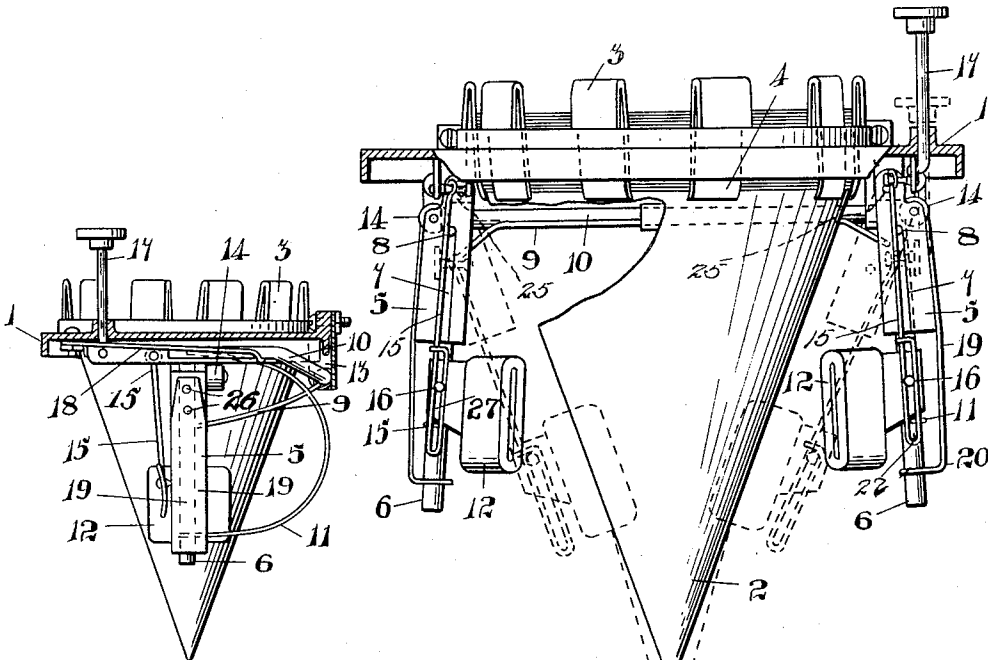


Fig. 3.

Fig. 4.

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CONE-CUP-DISPENSING MACHINE.

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This invention relates to machines for dispensing paper cups and with respect to its more specific features to machines of the character referred to adapted to dispense conical paper cups from a column of nested cups.

One of the objects of the invention is the provision of a practical dispenser for the purpose which will be reliable in action, of strong and relatively inexpensive construction and which will not injure the cups.

Another object of the invention is the provision of a simple and practical mechanism which will operate in an efficient manner although the cups vary slightly in dimension, and in which the effect of erroneous positioning of the cups for the dispensing operation is minimized.

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.

In the accompanying drawing forming a part of this specification, and in which similar reference characters refer to similar parts throughout the several views,

Fig. 1 is a top plan view of my improved dispensing apparatus;

Fig. 2 a plan view of the same, partly in section;

Fig. 3 a side elevation, partly in section; and

Fig. 4 a similar view on an enlarged scale, partly broken away and illustrating in full and dotted lines two different positions of the parts of the apparatus.

1 is a frame having a central opening therein through which the coned cups 2 pass. Round this opening is located the support for the column of nested cups consisting of a series of spring fingers 3. It will be noted that these spring fingers are connected at one end to the frame, extend upwardly and then downwardly, the vertically extending parts being substantially in parallelism. The free end of each spring is formed with an inwardly turned lip 4 to engage the nest of cups. I find that with this arrangement of the holding means for the cups that a single cup

may be drawn away even though the cups are not all of the same diameter and though the nest may not have its axis exactly vertical, the remaining cups being firmly held.

To draw off the cups one by one I provide the following cup drawing mechanism. Two depending oscillatable swinging arms 5 are pivoted at 25 to the under side of the frame 1 at opposite sides of the cup passage or opening therein, so as to oscillate transversely of the longitudinal axis of the column of nested cups, the axes of oscillation being stationary. On each arm a gripper carrying rod 6 is arranged to slide longitudinally and also to swing in and out independently of the arm. For this purpose each arm is formed of channel shape and in the sides of the channel or chamber formed by the opposite sides of the arm, are slots 7 into which projects the pin 8 passing through the rod 6. Flat springs 19 are secured by their upper ends to the arms 5 as indicated at 26 and each is formed with a lug 20 through which the adjacent rod 6 passes.

The arms 5 are yieldingly impelled around their pivotal axes 25 in directions to move the cup grippers 12 away from the cup column, by the bent springs 9 secured to any suitable part. I show these springs as secured to the bail 10, the arrangement and functions of which will be hereinafter described. Bent springs 11 are provided, each connected at one end with one of the rods 6 and at the other end to a suitable stationary part, such, for example, as the pivot 25 of the arm carrying the particular rod with which it is engaged. These springs tend to retain the rods in the position preliminary to their cup drawing stroke, as shown in Fig. 3 and in full lines in Fig. 4.

To each rod is secured a stripper or cup gripper 12, which is suitably shaped to engage the rounded tapering sides of the cups and which is preferably, though not necessarily, provided with rubber surfaces for frictional engagement with and gripping of the cups. The bail 10 is pivoted on lugs 13 formed on or connected to the frame 1, and its free ends are adapted to wipe over the shoulders provided by the rollers 14 journaled on the arms 5. By rocking the bail therefore it is evident that the arms may be swung inwardly to cause the grippers or strippers 12 to engage and grip the sides of

the lowermost cup. Each arm of the bail also is pivotally connected with a cup drawing rod 15, the other end of which is provided with a guide slot 27 with which is engaged a pin 16 projecting from the adjacent gripper or stripper 12. The result of this arrangement is that, as soon as the strippers are engaged with the side of the cup, continued movement of the bail presses the strippers downwardly and causes them to strip off the lowermost cup. The upper walls of the slots in the rods move into contact with the pins 16 to thrust the grippers 12 downwardly, the slots in the rods 15 guiding these rods during the interval of necessary lost motion to permit of the inward swing of the strippers taking place before their downward movement. The springs 19 yieldingly maintain the strippers in engagement with the cups.

The bail is operated by the plunger 17 passing through an opening in the plate and pivotally connected with one of the free ends of the bail. A spring 18 secured to the frame and engaging over one of the arms of the bail tends to return the bail to its normal position as soon as the plunger is released. On the return of the bail to its normal position, the springs 9 and 11 return the arms 5 and the strippers 12 to their normal inoperative position.

From the above description it will be perceived that the gripper carrying members, or rods 6 are supported and guided respectively by the pivot arms 5, and are operatively connected to said arms so that the grippers are moved by the arms toward and from the outer surface of the lateral wall of the column of cups, the rods 6 also having reciprocal movement relative to the arms 5 both transversely of the pivotal axes 25 of said arms and transversely of the reciprocal movement of the rods 6 on the arms 5. By this construction the grippers 12 are moved by the arms 5 toward the cup to be drawn and may be moved by the cup drawing rods 15 longitudinally of the axis of the column of cups to effect cup drawing. When the cup grippers, on their cup approaching movement, meet the cup, the springs 19 cooperate to cause the cup to be gripped with resilient gripping effect, and furthermore, during cup drawing, these springs resiliently oppose movement of the rods 6, and consequently of the grippers, transversely of the drawing movement, so as to maintain the grippers in frictional contact with the cup during cup drawing. In this wise the gripper may follow up the cup wall should the wall yield, and the cup grippers are also impelled by the springs 19 further inwardly so as to contact the conical wall of the cup further down should the grippers by any possibility slip longitudinally of the cup.

The bail 10 constitutes a power member

to actuate the arms 5 on their pivotal axes and to cause the cup drawing stroke of the rods 6 transversely of said axes. When the bail is power actuated, as by depressing the plunger or key 17, the arms of the bail wipe against the shoulders or cam portions of the arms 5 formed by the rollers 14, and thus force the arms 5 toward the column of cups. Following these cup approaching movements of the grippers, the reciprocal cup drawing rods 15 contact the abutments or pins 16 on the rod 6 and cause the latter, and the grippers therewith, to make cup drawing strokes, the springs 11 subsequently moving the rods 6 in the direction opposite to their cup drawing movement so as to position the grippers for a subsequent cup gripping and cup drawing stroke.

What I claim as my invention is:—

1. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, means adapted frictionally to grip and to draw cups from said column including a cup gripper, an arm oscillatable on a stationary axis transversely of the longitudinal axis of said column, means operatively connecting said gripper to said arm for movement of said gripper toward and from the outer surface of the lateral wall of the cup to be drawn, and for permitting cup drawing movement of said gripper relative to said arm, a roller on said arm, and a pivoted bail adapted to co-act with said roller to oscillate said arm and to effect said cup drawing movement of said gripper.

2. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, means adapted frictionally to grip and to draw cups from said column including a cup gripper, an arm oscillatable on a stationary axis transversely of the longitudinal axis of said column, means including a gripper carrying member having reciprocal movement relative to said arm transversely of the axis of oscillation of said arm, operatively connecting said gripper to said arm for movement of said gripper toward and from the outer surface of the lateral wall of the cup to be drawn, and a unitary mechanism to oscillate said arm, to bring said grip into contact with a cup and subsequently to effect said transverse relative movement of said gripper to exert withdrawing action on the cup.

3. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, means adapted frictionally to grip and to draw cups from said column including a cup gripper, an arm oscillatable transversely of the longitudinal axis of said column, means including a gripper carrying member having reciprocal movement relative to said arm

transversely of the axis of oscillation of said arm, operatively connecting said gripper to said arm for movement of said gripper toward and from the outer surface of the lateral wall of the cup to be drawn, and means adapted to oscillate said arm and to effect said reciprocal movement of said member, said member comprising a rod supported by and guided on said arm.

4. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted frictionally to grip and to draw cups from said column including a pivoted arm, a cup gripper, a gripper carrying member reciprocally movable on said arm transversely of the pivotal axis of said arm, means including a power member adapted to actuate said arm to effect movement of the arm on its pivotal axis toward the cup to be drawn and to cause subsequently the cup drawing stroke of said member transversely of said pivotal axis.

5. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, frictional gripping mechanism for withdrawing cups from said column, including a pivoted arm, a roller thereon, a cup gripper, a gripper carrying member mounted upon said pivoted arm for movement thereon to and from gripping relation with a cup and for cup withdrawing movement transversely to its cup gripping movement, a resilient connection between said pivoted arm and said gripper carrying member and a unitary operating mechanism adapted to be operated to engage said roller to swing said pivoted arm, and thereby bring said gripper into yielding contact with a cup, and subsequently to impart said cup withdrawing movement thereto.

6. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted to grip and to draw cups from said column including a pivoted arm, a roller thereon, a cup gripper, a gripper carrying member reciprocally movable on said arm transversely of the pivotal axis of said arm, means including a pivoted bail adapted to engage said roller to actuate said arm to effect movement of the arm on its pivotal axis toward the cup to be drawn and to cause the cup drawing stroke of said gripper carrying member transversely of said pivotal axis, said last mentioned means including an abutment on said carrying member, and a reciprocal rod actuated into and out of operative contact with said abutment adapted to effect said cup drawing stroke.

7. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted to grip and to draw cups from said column including a pivoted arm,

a roller thereon, a cup gripper, a gripper carrying member reciprocally movable on said arm transversely of the pivotal axis of said arm, means including a power member, a plunger for operating the same to cause said power member to co-act with said roller to actuate said arm to effect movement of the arm on its pivotal axis toward the cup to be drawn and to cause the cup drawing stroke of said gripper carrying member transversely of said pivotal axis, said last mentioned means including an abutment on said carrying member, and a reciprocal rod actuated into and out of operative contact with said abutment adapted to effect said cup drawing stroke, said rod being connected to be reciprocated by said power member.

8. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted to grip and to draw cups from said column including a pivoted arm, a roller thereon, a cup gripper, a gripper carrying member mounted upon said arm for a cup withdrawing stroke thereon transversely of the pivotally axis of said arm means including a pivoted member, a plunger for operating the same to cause said pivoted member to co-act with said roller to actuate said arm to effect movement of the arm on its pivotal axis transversely of the longitudinal axis of said column toward the cup to be drawn and to cause the cup drawing stroke of said carrying member, and a spring for effecting the return stroke of said carrying member.

9. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted to grip and to draw cups from said column including a pivoted arm, a cup gripper, a gripper carrying member mounted upon said arm for a cup withdrawing stroke thereon transversely of the pivotal axis of said arm, means including a power member adapted to actuate said arm to effect movement of the arm on its pivotal axis toward the cup to be drawn and to cause the cup drawing stroke of said carrying member, and a spring to effect movement of said arm away from the path of the cups.

10. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted to grip and to draw cups from said column including a pivoted arm, a cup gripper, a gripper carrying member mounted upon said arm for a cup withdrawing stroke thereon transversely of the pivotal axis of said arm, means including a power member adapted to actuate said arm to effect movement of the arm on its pivotal axis toward the cup to be drawn and

to cause the cup drawing stroke of said carrying member, a spring for effecting the return stroke of said carrying member, and a spring to effect movement of said arm away from the path of the cups.

11. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted to draw cups from said column including an arm oscillatable on a stationary axis transversely of the longitudinal axis of said column, a cup gripper reciprocally movable on said arm transversely of the axis of oscillation of said arm and movable relative to said arm transversely of said reciprocal movement, and means including a power member adapted to oscillate said arm on its pivotal axis and effect said reciprocal movement of said gripper.

12. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, mechanism adapted to grip and to draw cups from said column including an oscillatable arm, a frictional cup gripper reciprocally movable on said arm transversely of the axis of oscillation of said arm and movable relative to said arm transversely of said reciprocal movement, means including a power member adapted to oscillate said arm on its pivotal axis and effect said reciprocal movement of said gripper, and a spring, carried by said arm, in position resiliently to oppose said movement of said gripper transversely of said reciprocal movement during cup drawing.

13. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, and mechanism adapted to grip and to draw cups from said column including an oscillatable arm, a cup gripper reciprocally movable on said arm transversely of the axis of oscillation of said arm and movable relative to said arm transversely of said reciprocal movement adapted to effect cup drawing, and means, including a power member, adapted operatively to wipe against and oscillate said arm on its pivotal axis and effect said reciprocal movement of said gripper.

14. A dispenser for cups of the character described including, in combination, a support for a column of nested cups, mechanism adapted to grip and to draw cups from said column including a pivoted arm having a cam portion and a chamber, a gripper carrying rod having one end reciprocal in said chamber transversely of the pivotal axis of said arm, means operatively connecting said rod and arm permitting oscillatory movement of the rod relative to said arm transversely of said reciprocal movement, a spring carried by said arm and adapted to contact the other end of said rod thereby

resiliently to urge the gripper against the cup during cup drawing, means, including an oscillatable member adapted to wipe against said cam and oscillate said arm on its pivot, a reciprocal rod connected to said oscillatable member for actuation, and means, including a lost motion connection, operatively coupling said carrying rod and said oscillatable member, whereby cup drawing movement of said gripper is effected.

15. A dispenser for cups of the character described including, in combination, a plurality of spring fingers disposed to contact the outer wall of a column of nested cups and thereby support the column with the outer wall of the end cup exposed, and means adapted to draw cups from said column including a cup drawing stripper, having a rubber cup stripping surface, oscillatable toward and from the outer side wall of the end cup of said column and toward and from the support formed by said fingers, and means adapted to oscillate said stripper including an arm pivoted for oscillation transversely of the longitudinal axis of said end cup, and a rod, carrying said stripper, reciprocal on said arm toward and from said springs and toward and from said longitudinal axis.

16. A dispenser for cups of the character described including, in combination, a plurality of spring fingers disposed to contact the outer wall of a column of nested cups and thereby support the column with the outer wall of the end cup exposed, means adapted to draw cups from said column including a cup drawing stripper, having a rubber cup stripping surface, oscillatable toward and from the outer side wall of the end cup of said column and toward and from the support formed by said fingers, means adapted to oscillate said stripper including an arm pivoted for oscillation transversely of the longitudinal axis of said end cup, and a rod, carrying said stripper, reciprocal on said arm toward and from said springs and toward and from said longitudinal axis, and a spring mounted on said arm disposed resiliently to resist movement of said rod relative to said arm away from said longitudinal axis during cup drawing.

17. A dispenser for cups of the character described including, in combination, a plurality of spring fingers disposed to contact the outer wall of a column of nested cups and thereby support the column with the outer wall of the end cup exposed, means adapted to draw cups from said column including a cup drawing stripper, having a rubber cup stripping surface, oscillatable toward and from the outer side wall of the end cup of said column and toward and from the support formed by said fingers, means adapted to oscillate said stripper including an arm pivoted for oscillation trans-

versely of the longitudinal axis of said end cup, and a rod, carrying said stripper, reciprocal on said arm toward and from said springs and toward and from said longitudinal axis, and an oscillatable power actuated member, said arm and member having wiping parts adapted to cooperate to effect movement of said arm on its axis of oscillation to cause said stripper to approach the end cup.

18. A dispenser for cups of the character described including, in combination, a plurality of spring fingers disposed to contact the outer wall of a column of nested cups and thereby support the column with the outer wall of the end cup exposed, means adapted to draw cups from said column including a cup drawing stripper, having a rubber cup stripping surface, oscillatable toward and from the outer side wall of the end cup of said column and toward and from the support formed by said fingers, means adapted to oscillate said stripper including an arm pivoted for oscillation transversely of the longitudinal axis of said end cup, a rod, carrying said stripper, reciprocal on said arm toward and from said springs and toward and from said longitudinal axis, an oscillatable power actuated member, said arm and member having wiping parts adapted to cooperate to effect movement of said arm on its axis of oscillation to cause said stripper to approach the end cup, and means operatively coupled to said power actuated member and to said stripper for effecting the cup drawing stroke of said rod.

19. A dispenser for cups of the character described including, in combination, a plurality of circumferentially spaced 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 col-

umn 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, and 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.

20. A dispenser for cups of the diameter described including, in combination, a support for a column of nested cups including a frame, a ring stationary on said frame having a plurality of inwardly projecting thin cup supporting fingers, and cup gripping and drawing mechanism including an arm pivoted on said frame, adapted to swing transversely of the cup path and having relatively stationary gripper guides, a carrying rod slidable on said guides transversely of the pivotal axis of said arm and held against oscillatory movement relative to said arm around said pivotal axis, a cup gripper movable with said rod, a crank coupled to oscillate said arm and rod, and a spring operatively disposed resiliently to transmit thrust of said crank to said rod on the movement of said rod in one direction around said pivotal axis.

Signed at Orillia Canada this 27th day of May, 1921.

WENTWORTH A. SMITH.