July 5, 1927.

1,634,566

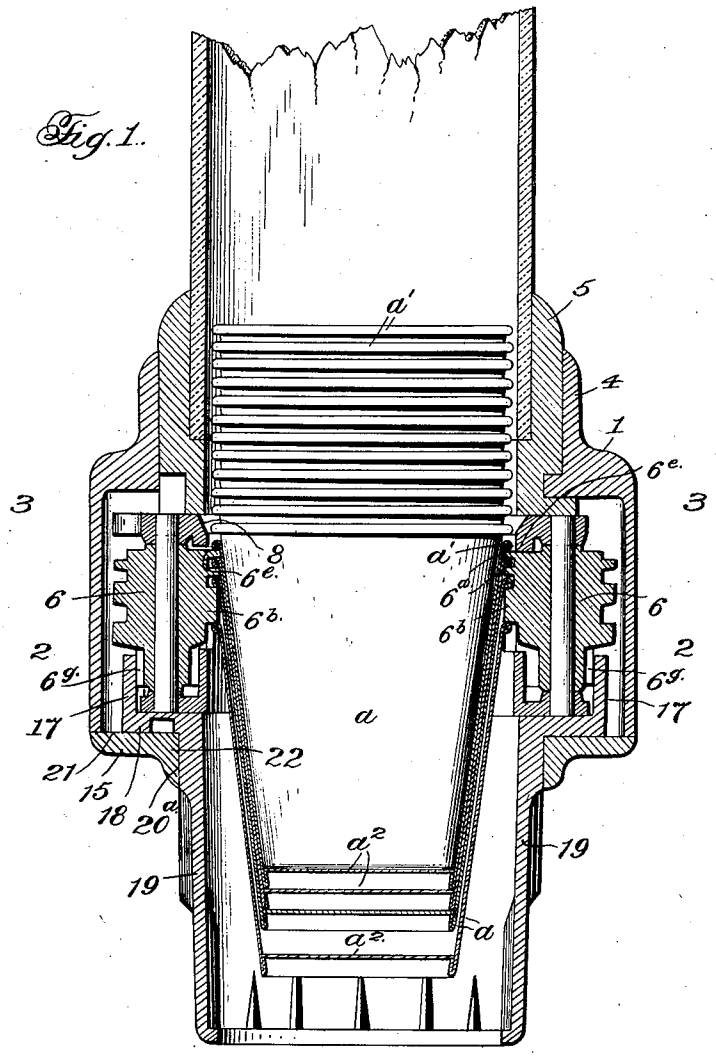
E. G. WESSMAN

CUP DISPENSER

Filed April 3, 1923

3 Sheets-Sheet 1

Fig. 1.



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CUP DISPENSER

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Fig. 2.

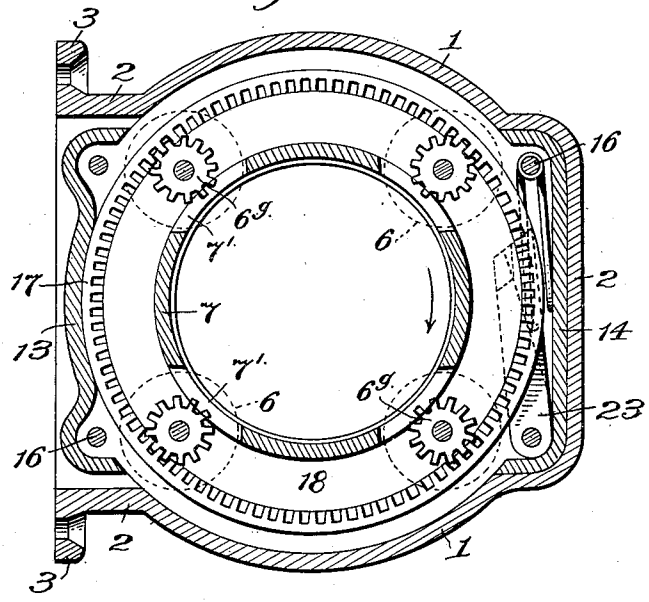
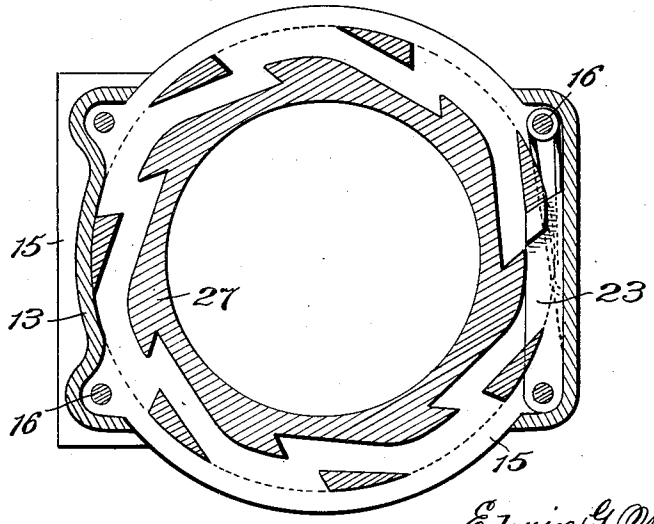


Fig. 3.



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Fig. 4.

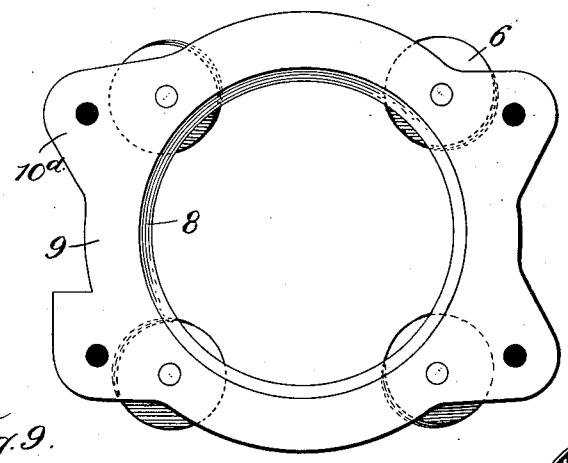


Fig. 8.

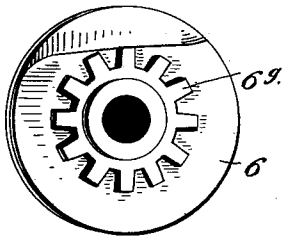


Fig. 9.

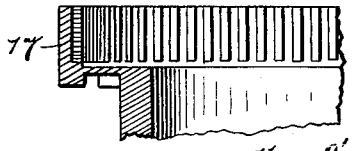


Fig. 5.

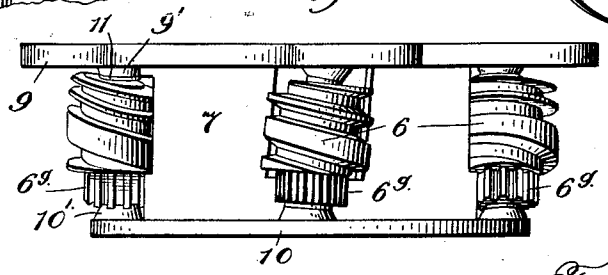


Fig. 7.

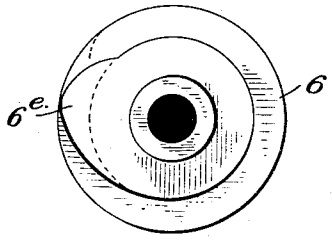
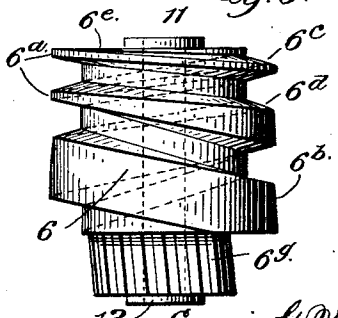


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDWIN G. WESSMAN, OF EASTON, PENNSYLVANIA, ASSIGNOR TO INDIVIDUAL DRINKING CUP COMPANY, INC., OF EASTON, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CUP DISPENSER.

Application filed April 3, 1923. Serial No. 629,611.

This invention relates to dispensing devices, and more particularly to cup dispensers of the type comprising a container for a stack of nested cups and mechanism for delivering the cups singly therefrom, the present invention being an improvement on the cup delivery mechanism disclosed in my application Serial No. 486,071.

In my prior application, referred to above, is disclosed mechanism for feeding the cups from the nested stack within the container and for separating and ejecting the terminal cup of the stack, said mechanism comprising a plurality of rotary worm members. A particularly important novel characteristic of the present invention resides in an improved modified construction of rotary worm member whereby a more perfect, accurate, and dependable feeding of the cups from the nested stack is obtained.

The invention, with other objects and advantages thereof, and the particular construction, combination and arrangement of parts comprising the same will be understood from the herein after contained detail description, when considered in connection with the accompanying drawings, forming part hereof and illustrating one embodiment of the invention.

In the drawings:

Figure 1 is a vertical longitudinal section of a cup dispenser constructed in accordance with the present invention.

Fig. 2 is a horizontal section on the line 2—2 of Figure 1.

Fig. 3 is a horizontal section on the line 3—3 of Figure 1.

Fig. 4 is a detail top plan of the delivery worms and carrier therefor.

Fig. 5 is a detail side elevation of the delivery worms and carrier.

Fig. 6 is a detail side elevation of one of the delivery or feed worms.

Fig. 7 is a detail plan view of one of the feed worms.

Fig. 8 is a detail inverted plan view of one of the feed worms.

Fig. 9 is a detail sectional view of a portion of the actuator member for the feed worms.

The type of cup a illustrated in the drawings is a commercial form of paper cup, frusto-conical in shape and provided with an outwardly directed flange a' at the top. The bottom a^2 is slightly above the lower end of the cup, the flanges a' of the cups being spaced, as shown (see Figure 1 of the drawings), when the cups are nested.

Referring to a detail description of the cup dispensing apparatus illustrated in the drawings, 1 designates a casing preferably of metal which forms a support for the cup container, and the delivery mechanism. The casing 1, which is shown as of general cylindrical form with substantially rectangular extensions 2 at the front and rear, has integral flanges or bracket portions 3, adapted to be secured by screws or other suitable fastening members (not shown) to any suitable support. Extending upwardly from the top of the casing 1 is a socket 4 in which the lower end of the cup container 5 is detachably seated, the latter being preferably of glass.

The mechanism for feeding the cups singly from the container 5 comprises a plurality of rotary escapements or feed worm members 6 disposed about the discharge end of the container in position to engage the flanges a' of the cups, four of said worm members being shown in the present instance, equally spaced from each other.

In accordance with my present improvements, the worm members 6, which are all of the same construction, are provided with initial turns or thread portions 6^a of the same pitch spaced to correspond to the spacing of the flanges a' of the nested cups within the container 5 (see particularly Figures 1, 5 and 6 of the drawings) and with succeeding thread portions or turns 6^b of increased pitch.

The turns or thread portions 6^a, 6^b, of the feed worm members 6 have upper outwardly and downwardly inclined or beveled cup flange engaging faces 6^c, 6^d, and the worm or escapement members are arranged with their axes of rotation extending at an inclination in planes substantially parallel with the longitudinal axis of the container (see particularly Fig. 5), so that said inclined or beveled cup flange engaging faces 6^c, 6^d of the worm members 6 are disposed in planes parallel with the horizontal planes of the flanges of the cups. In the particular construction shown, the worm members have a six degree tilt from the vertical. The worm members 6 have at the beginning of their initial thread portions or turns 6^a a portion 6^e, which as shown have upper flat horizontal extending face portions.

The worm members 6 are associated with a cylindrical part or member 7, the interior diameter of which is substantially equal to that of the cup container 5, and which is arranged with its upper part immediately below the position occupied by the lower end of the container and in axial alignment therewith, said cylindrical part or member at its upper end having a beveled face 8 and forming substantially a continuation of the container 5. The cylindrical member 7 has a plurality of openings 7′ one for each of the worm members 6, and the latter are supported with portions thereof extending inwardly through said openings 7′ beyond the inner face of the cylindrical part 7, as shown. The feed worms or escapement members 6 are adapted to support the stack of nested cups as indicated in Figure 1 of the drawings, the flange a' of the lowermost cup of the nested stack resting upon the top face portion 6^e of the uppermost thread portion or turn 6^a of the worm members. The feed worm members or escapements are operated in unison and upon rotation thereof from the position shown in Figure 1 the top face portion 6^e of the feed worm members or escapements move out of engagement with the flange a' of the lowermost cup of the stack. and the cup flange is engaged by the thread portions or turns 6^a, 6^b, of the feed worms or escapement members, and the cup advanced, the flange of the succeeding cup being caught and temporarily held by the uppermost face portions 6^e of the worm members, as illustrated in Figure 1 of the drawings, the stack of cups being fed by gravity onto the upper topmost face portion 6^e of the feed worms. During the first part of the feeding operation of the cups by the worms or escapement members 6, while they are in engagement with the initial thread portions or turns 6^a, the same spacing of the flanges of the cups fed forward is maintained, until the cups are well engaged by the worm members, the separating action not occurring until after the cups pass from said initial thread turns 6^a to the thread portions or turns 6^b of increased pitch.

The special construction and arrangement of the feed worm members or escapements 6 provided with initial thread turns or portions of the same pitch spaced to correspond with the spacing of the flanges of the cups when nested, and with succeeding thread turns or portions of increased pitch affords a construction that operates with great accuracy and certainty, the proper engagement of the worms with the flanges of the nested cups within the stack being insured, the preliminary or initial step of the feeding of the cups from the container 5 being effected in a smooth easy gradual way.

The feed worm or escapement member 6 should have at least one and one half turns or thread portions of the same pitch corresponding to the spacing of the flanges a' of the nested cups, and preferably they should have more of such turns. In the preferred construction shown in the drawings, which has proven very satisfactory in operation, the feed worm members or escapements 6 have two of such turns 6^a, and a succeeding thread turn 6^b of gradually increasing pitch, the first two turns 6^a being on a scale of six threads per inch, and the following thread portion or turn 6^b being on a scale of two and one half threads per inch.

In the particular construction illustrated in the drawings, the feed worms or escapements 6 and cylindrical part or member 7 are combined as a single unit. The cylindrical part or member 7 is provided with upper and lower lateral flanges 9, 10, between which the worm members 6 are supported, said flanges 9 and 10 having bearings 9′, 10′ that are engaged by journals 11, and bearing faces 12 at the upper and lower ends of the worm members, the cylindrical part or member 7 serving as a carrier for the worms. The carrier with the worm members is supported within the casing 1 upon upstanding walls 13, 14 on a bottom plate 15 of the casing, the upper flange 9 having corner extensions 10^a resting upon the upper ends of said walls. The bottom plate 15, corresponding in shape to the contour of the casing, is removably secured in place by screws 16 passing through openings in the bottom thereof and at their upper portions engaging threaded openings in lugs on the casing 1, said screws 16 also engaging openings in the corner extensions 10^a of the worm carrier, and serving to firmly secure the parts together.

The operating means for the rotary feed worms or escapements 6 includes an actuator ring in the form of an internal gear 17 which meshes with pinions 6^g on the lower ends of the worm members 6. In the particular construction shown the actuator gear ring 17 is fixed to and extends upwardly from a collar 18 on a tubular part 19, the latter being supported for axial rotation on the bottom plate 15 of the casing. The bottom plate 15 has a circular opening and an annular bearing 22, and the tubular part 19, at its upper portion is provided with an outer cylindrical bearing face 20^a rotatably engaging said annular bearing 22 of said bottom plate. As will be understood, upon rotation of the tubular part 19 the feed worms or escapement members 6 will be simultaneously rotated, said tubular part 19 being adapted to be grasped by the hand of the operator and turned. The teeth of the pinions 6^g on the lower ends of the worm members 6 are given a slight pitch or inclination to the axis of the pinions, as shown, to accommodate for the arrangement of the

feed worm members 6 at an inclination while at the same time providing for the proper meshing of the worm pinions 6^a with the teeth of the internal gear or actuator ring 17.

The tubular part 19 is adapted to be operated in one direction (that indicated by the arrow in Fig. 2 of the drawings), the operative connection between said tubular part 19 and the worm members 6 being such that only a relatively small amount of turning movement of the tubular part 19 is sufficient to effect the delivery of a cup. In the particular construction shown, one seventh turn of the tubular part is sufficient.

In Figures 2 and 3 of the drawings, is illustrated in a general way means for automatically determining and limiting the extent of continuous rotation of the tubular operating part 19 whereby said tubular part can only be rotated a predetermined amount and the delivery mechanism is only operated to deliver a single cup upon each operation or stroke of the tubular operating member. The means for this purpose comprises a pawl 23, and a ratchet 24. This mechanism is fully disclosed and claimed in my copending application Serial No. 486,071 and a more detailed description of the same is believed unnecessary in the present case.

While a specific embodiment of the invention is illustrated in the drawings, it will, of course, be understood that this is by way of example, and that changes and variations in the particular construction illustrated, and the carrying out of the invention in other forms, as will appeal to those skilled in the art and falling within the scope of the appended claims may be practiced without departing from the spirit of the invention.

What I claim is:

1. In an apparatus for dispensing cups having lateral flanges spaced apart when the cups are nested, a container for a stack of cups, a plurality of rotary worm members disposed about the discharge end of the container and adapted to feed the cups singly from a stack of nested cups within the container, said worm members having initial thread turns of the same pitch spaced to correspond to the spacing of the flanges of the nested cups, and with a succeeding thread turn portion of increased pitch, and operating means for the rotary worm members.

2. In an apparatus for dispensing cups having lateral flanges spaced apart when the cups are nested, a container for a stack of cups, a plurality of rotary worm members disposed about the discharge end of the container and adapted to feed the cups singly from a stack of nested cups within the container, each of said worm members having initial thread turns of the same pitch spaced to correspond to the spacing of the flanges of the nested cups, and with a succeeding thread turn portion of increased pitch, said worms being arranged with their axes of rotation extending at an inclination in planes substantially parallel with the longitudinal axis of the container, and operating means for the worm members.

3. In an apparatus for dispensing cups having lateral flanges spaced apart when the cups are nested, a container for a stack of cups, a plurality of rotary worm members disposed about the discharge end of the container and adapted to separate and feed the cups singly from a stack of nested cups within the container, each of said worm members having initial thread turns of the same pitch spaced to correspond to the spacing of the flanges of the nested cups, and with a succeeding thread turn portion of increased pitch, said threads turns of the worm members having cup engaging surfaces disposed in planes parallel with the planes of the flanges of the cups said worms being arranged with their axes of rotation extending at an inclination in planes substantially parallel with the longitudinal axis of the container, and operating means for the worm members.

4. In an apparatus for dispensing cups having lateral flanges spaced apart when the cups are nested, a container for a stack of cups, a plurality of rotary worm members disposed about the discharge end of the container and adapted to feed the cups singly from a stack of nested cups within the container, said worm members having initial thread turns of the same pitch spaced to corresponds to the spacing of the flanges of the nested cups, and with a succeeding thread turn portion of increased pitch, the thread turns of the worms having transversely beveled faces to engage the flanges of the cups, said worms being arranged to extend at an inclination with said beveled faces extending in planes substantially parallel with the planes of the flanges of the cups, and operating means for the worms.

5. In an apparatus for dispensing cups having lateral flanges spaced apart when the cups are nested, a container for a stack of cups, a plurality of rotary worm members disposed about the discharge end of the container and adapted to feed the cups singly from a stack of nested cups within the container, said worm members having at least one and one half initial thread turns of the same pitch spaced to correspond to the spacing of the flanges of the nested cups, and with a succeeding thread turn portion of increased pitch, and operating means for the rotary worm members.

In testimony whereof I hereunto affix my signature.

EDWIN G. WESSMAN.