April 10, 1928. 1,666,008

F. GRAFFENBERGER

CUP DISPENSING MACHINE

Filed Oct. 6, 1926 2 Sheets-Sheet 1

Fig. 1.

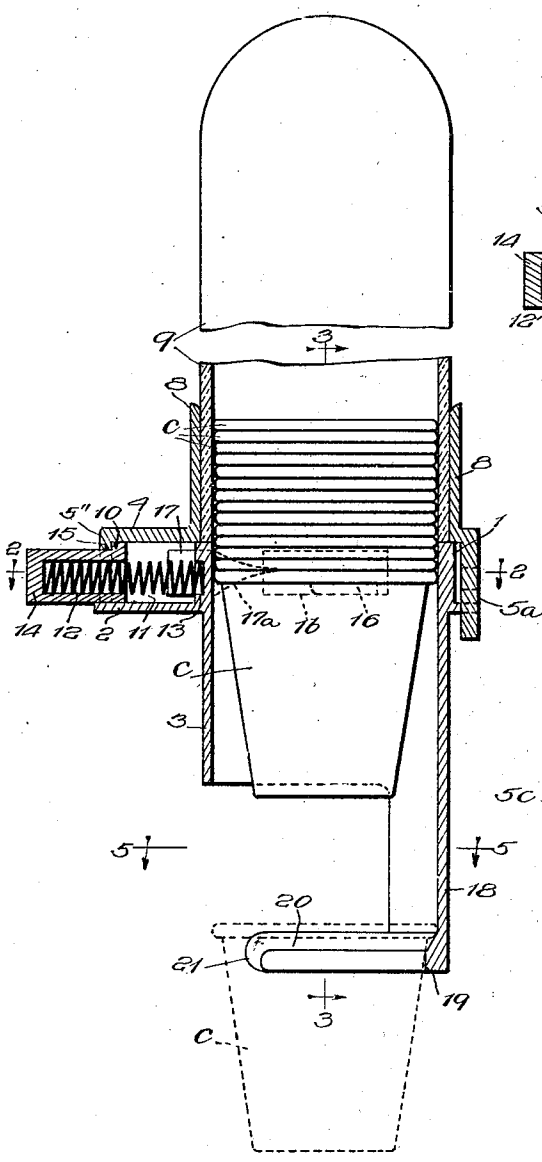

Fig. 2.

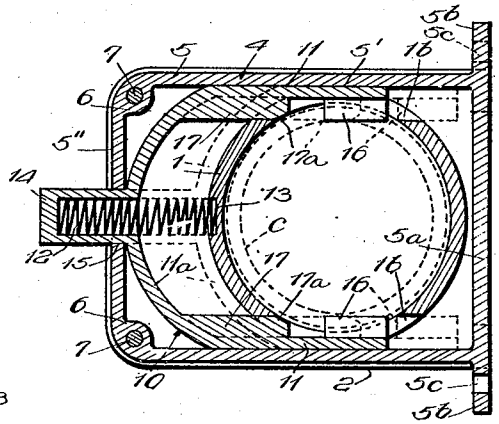

Fig. 3.

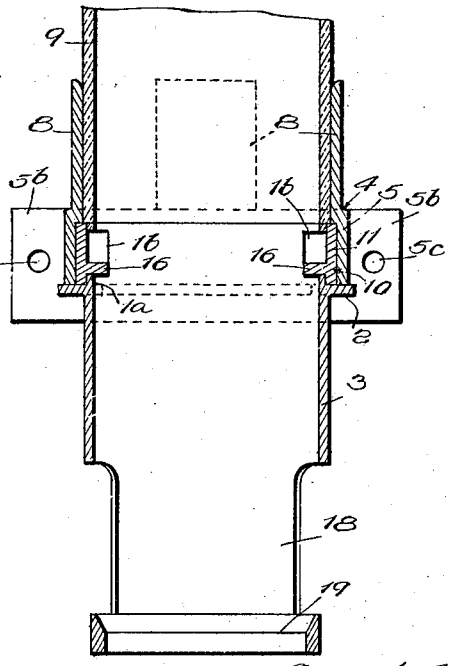

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Fig. 4.

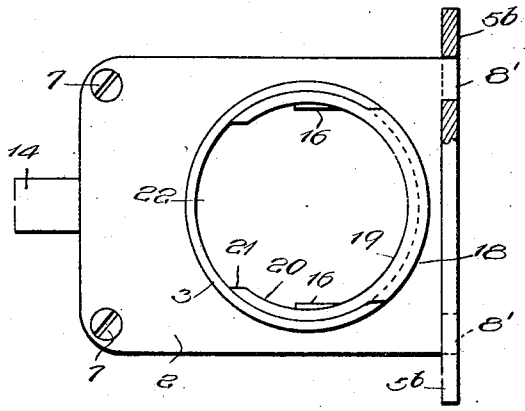


Fig. 5.

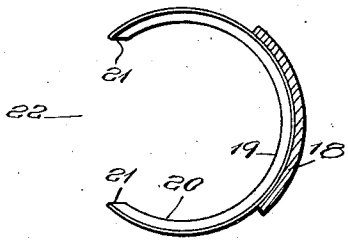


Fig. 6.

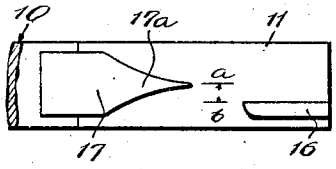


Fig. 7.

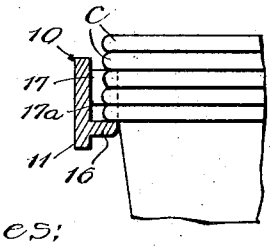
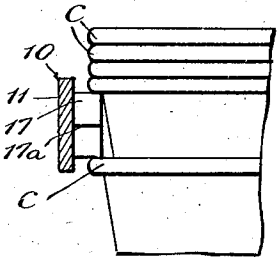


Fig. 8.



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Patented Apr. 10, 1928. 1,666,008

UNITED STATES PATENT OFFICE.

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CUP-DISPENSING MACHINE.

Application filed October 6, 1926. Serial No. 139,793.

This invention relates to dispensing means and more particularly to a cup dispensing machine.

My invention is intended for use in dispensing cups which are disposed in stacks and in nested relation. I am aware that numerous machines for dispensing cups arranged in stack and nested relation have been used, but the machines of this character now in use are open to numerous objections. In such machines it is a common practice to employ gear actuated elements for supporting and separating the cups or, in some cases, pivoted latches or equivalent members for this purpose. As a general rule the construction of the dispensing mechanism is complicated and expensive and involves an unnecessary number of parts, so that the likelihood of binding or disarrangement of parts is always to be feared. Aside from the objections noted there is, necessarily, a very appreciable expense incurred in the accurate fitting and machining of the various parts, rendering the cost of the completed machine excessive, which necessarily results in its use being restricted.

In my machine I avoid the numerous objections above noted regarding the machines of this general type now in common use by reducing the number of movable parts to a minimum and having such parts so constructed and related as to eliminate all probability of binding or inaccuracies in operation of the dispensing mechanism. I also provide my dispensing machine with a receiving element so disposed as to receive cups discharged vertically from the machine, this element being so arranged as to permit ready removal of the cups by slight distortion thereof. In constructing my machine I have taken care to have all surfaces of the dispensing mechanism so constructed as to enable the same to be readily formed without the necessity of absolute accuracy and careful machining of the parts, the cup supporting members and the cup separating members being spaced an appreciable distance apart to facilitate and insure ready and accurate discharge of the cups.

Further objects of my invention will appear from the detail description.

In the drawings:—

Figure 1 is a central vertical sectional view, partly shown in elevation, through a cup dispensing machine constructed in accordance with my invention taken from front to back of the dispensing mechanism;

Fig. 2 is a section taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a section taken substantially on line 3—3 of Fig. 1;

Fig. 4 is an underneath view, partly in section;

Fig. 5 is a section taken substantially on line 5—5 of Fig. 1;

Fig. 6 is an inner face view of one arm of the slide;

Fig. 7 is a diagrammatic view showing the position of the primary cup supporting members when the slide is in its outer or normal position; and

Fig. 8 is a diagrammatic view showing the position of the cup separator and secondary supporting members when the slide is in its inner position, this view being considered as looking toward the outer or bight portion of the slide.

The machine includes a cylindrical neck 1 defining a dispensing opening. A rectangular flange 2 extends from the lower end of the neck and an outlet member 3 extends from this flange, the outlet member forming, in effect, a continuation of neck 1 and defining therewith the dispensing and outlet opening of the machine. Plate 2 forms the base upon which is secured a cover member 4 having a depending peripheral flange or wall 5 and provided at each outer corner with a boss 6 which is bored and threaded for reception of securing screws 7 passing through suitable openings provided in base plate 2. Wall 5 of the cover member 4 is widened at the inner end thereof to provide a securing flange 5^a which is provided with openings receiving lugs 8 extending rearwardly from base plate 2 at each rearward corner thereof. The lugs 8 together with bosses 6 and screws 7 serve to effectually secure the cover to the base plate in fixed relation thereto. Flange 5 extends beyond the side walls of cover member 4 to provide ears 5^a having opening 5^c for reception of securing screws by means of which the machine can be readily secured to a suitable support. The cover is further provided with upwardly extending fingers 8 which are disposed in circular arrangement and snugly receive the

lower portion of an elongated cylindrical cover or container 9 of glass or other suitable material. The container 9 seats upon the upper end of neck 1, the inner peripheral surface of the container being flush with the inner peripheral surface of the neck so as to form a continuation thereof. The cups C to be dispensed are arranged within the container 9 in a stack and in nested relation. The cups employed are preferably constructed in accordance with the cup disclosed in the patent to Ernest R. Huntley for paper cup, No. 1,497,755 issued June 17, 1924, though any other suitable or preferred form of paper cup may be employed. Cup C is provided at its upper end with an outwardly turned bead or shoulder *c* of appreciable thickness or height and the body of the cup is of frusto-conical shape being inverted or tapering downwardly when the cups are supported in the container. The dispensing mechanism which I employ is so constructed as to readily enter between the flanges of two adjacent cups when these flanges are disposed closely adjacent or in contact with each other. I consider this an important feature of my invention as permitting the cups to be nested with the flanges *c* thereof in contact with each other. By this arrangement it is possible to include in a single stack a much larger number of cups than can be done when the cups are stacked in the ordinary manner now necessary in machines at present commonly used, in which machines the cups are so stacked or arranged that the upper ends of the cups are spaced a very appreciable distance apart to permit operation of the separating and dispensing mechanism. With the separating and dispensing mechanism which I employ this objection is avoided and a very considerable saving in space necessary to accommodate a stack of cups is effected, which is an important consideration.

The base plate 2 and the cover member 4 cooperate to form a housing for reception of a U-shaped slide 10 which is slidably mounted on the upper face of base plate 2 and is confined between this plate and the top wall of the cover so as to be held thereby against all vertical looseness or play. The arms 11 of this slide are confined between the outer flat surfaces of flattened side portions 1^a of neck 1 and the side wall 5′ of cover member 4. The cover member and the plate thus cooperate with each other and with the neck to form guideways for the slide and the arms thereof and effectually prevent looseness or play of the slide. This is an important feature in the construction of my machine as it insures accuracy in operation of the slide and proper entry of the cup separating and dispensing means between the flanges of the cups rendering it possible to stack the cups with their flanges *c* closely adjacent and in contact with each other, as above noted. The front wall 5″ also acts as a stop element to limit outward movement of the slide 10 which is urged outwardly by an expansion coil spring 12 seated at its inner end in a recess 13 provided in neck 1. The outer portion of spring 12 is seated in a hollow stud 14 extending from the center of the bight portion 11^a of slide 10 and operating through an opening provided through wall 5″ at 15. When the slide 10 is in its outer position, the inner ends of arms 11 are spaced away from wall 5^a of the housing, this distance being sufficient to permit inward movement of the slide into position to bring the bight portion 10 thereof into contact with the outer or forward portion of neck 1 as indicated in Fig. 2.

Each arm 11 of slide 10 is provided on its inner face with a primary cup supporting member 16 and with a secondary cup supporting and separating member 17. Member 16 is positioned at the rearward or inner end of arm 11 and is of rectangular outline with a straight and flat inner face. Member 17 is provided with a double point radius inner portion 17^a, the apex of which is disposed above and remote from the outer end of member 16. It will also be noted that member 17 is of much greater width vertically than member 16, member 16 having its lower or under face in the plane of the under face of the body portion of member 17. The members 16 and 17 project inwardly of the neck 1, the flattened portions 1^a of which are provided with slots 1^b to accommodate such members. Normally, the slide 10 is held in its outer or projected position, at which time the primary cup supporting members 16 are disposed to project through slot 1^b into the neck opening at diametrically opposite sides thereof. With the slide 10 in this position, the primary supporting members 16 extend beneath the flange *c* of the lowermost cup of the stack of cups C, as illustrated in Figs. 1 and 7, thus supporting the stack within the container or cover 9. The distance between the apex of wedge element 17^a and the upper face of the primary supporting member 16, indicated by the line *a*—*b* in Fig. 6, corresponds approximately to the width or height of shoulder *c* of cup C. It will be apparent, therefore, that the apexes of the inner portions 17^a will enter between the shoulders of the lowermost cup of the stack and the next to the lowermost cup when the slide 10 is forced inwardly by pressing on stud 14. The distance between the apex of inner portion 17^a and the outer end of the primary supporting member 16 is relatively great and is sufficient, in view of the inclination of the upper face of portion 17^a, to insure that the lowermost cup detached from the stack will be free from members 16 so as to be dis-

charged through the neck and the outlet member 3 at about the time that the inner portion 17ª has entered fully between the two lower cups of the stack. As the slide is forced inwardly the inner portion 17ª enters between the two cups slightly raising the stack and swinging the forward portion of the lowermost cup downwardly and, as this cup passes off of the member 16, the inner portion enters fully between the cups forcing the lowermost cup off of the stack, as illustrated in Fig. 8. This cup is thus completely released from the stack and drops downwardly thru the neck and the outlet member. At this time, the stack is supported upon the members 17, as illustrated in Fig. 8 and upon release of the slide 10, it is moved outwardly by spring 12 into its normal inoperative position. During the outward movement of the slide, the members 17 are withdrawn from the flange or shoulder of the lowermost cup of the remaining stack and the primary supporting members 16 pass beneath the shoulder of this cup, before complete withdrawal of members 17, the stack being then supported by the members 16 as shown in Fig. 1. This provides a supporting and dispensing mechanism which is composed of a minimum number of parts and is of very simple and inexpensive construction while being accurate in its operation.

As the slide 10 is effectually held against all looseness or play, as previously pointed out, and the supporting and dispensing elements are integrally connected with the slide, accuracy in operation is assured permitting the cups to be stacked in close relation and effecting a very material saving in the space required for the stack of cups, which is an important consideration in this art.

The outlet member 3 is provided with a depending arm 18 carrying at its lower end a receiving member or collar 19 which is disposed in concentric relation to the member 3. The upper inner portion 20 of member 19 is flared and the forward ends of the arms of this member are beveled or inclined outwardly and forwardly at 21. The cup discharged through neck 1 and outlet member 3 is directed into the member 19 where it is supported by means of its shoulder *c*. This cup may be readily removed from member 19 by being raised slightly therein and then moved outwardly through the space or opening 22 between the ends of the arms of the receiving member. The flare 20 at the upper end of member 19 serves to direct the cup into such member and the inclined or beveled surfaces 21 permit the cup to be readily withdrawn from the receiving member without excessive distortion of the cup or danger of injury thereto. This provides simple and efficient means whereby the cups, as they are dispensed, are received and held in position to be readily removed from the machine.

What I claim is:—

1. In means for dispensing flanged cups arranged in a stack in nested relation, a neck defining a dispensing opening and having flattened and slotted side portions, a base plate extending from the neck, a cover member secured to the base plate and forming therewith a housing, a slide mounted on the base plate for movement toward and away from the neck and straddling the same, the arms of the slide being confined between the flattened side portions of the neck and the side walls of the cover member and guided and held against play thereby, means carried by the arms of the slide and operable through said slots for supporting a stack of cups when the slide is in its outer position and for releasing the lowermost cup of the stack and permitting it to be dispensed through the neck when the slide is moved inwardly across the neck into its inner position.

2. In means for dispensing flanged cups arranged in a stack in nested relation, a neck defining a dispensing opening, a slide straddling the neck and having its outward movement limited, primary cup supporting members with flat inner faces at the inner end of the slide and disposed to project inwardly of the neck opening when the slide is in its outer position, and cup separating and secondary supporting members with inner faces at the outer end of the slide disposed to project inwardly of the neck opening when the slide is in its inner position, said separating and secondary supporting members being tapered and with their apexes directed toward the primary supporting members and remote therefrom, the neck having slots accommodating the primary cup supporting members and the separating and secondary cup supporting members.

3. In means for dispensing flanged cups arranged in a stack in nested relation, a neck defining a dispensing opening and having flattened side portions, a base plate extending from the neck, a cover member secured to the base plate and forming therewith a housing, a U-shape slide mounted on the base plate for movement toward and away from the neck and straddling the same, the arms of the slide being confined between the flattened side portions of the neck and the side walls of the cover member and guided and held against play thereby, an expansion spring confined between the neck and the bight portion of the slide and normally holding the slide in its outer position, outward movement of the slide being limited by the cover, and means for supporting a stack of cups when the slide is in its outer position and for separating the lowermost cup from the stack and permitting it to be

dispensed through the neck when the slide is moved to its inner position.

4. In means for dispensing flanged cups arranged in a stack in nested relation, a neck defining a dispensing opening and having flattened side portions, a base plate extending from the neck, a cover member secured to the base plate and forming therewith a housing and guideways, a U-shaped slide mounted on the base plate for movement toward and away from the neck and straddling the same, the arms of the slide operating in the guideways and the slide being held against vertical and lateral movement by the cover and the base plate, means urging the slide outwardly away from the neck while permitting it to be moved inwardly toward the neck, outward movement of the slide being limited by the cover, and means for supporting a stack of cups when the slide is in its outer position and for separating the lowermost cup from the stack and permitting it to be dispensed through the neck when the slide is moved to its inner position.

5. In combination with means for dispensing cups vertically, a vertically arranged outlet member disposed to receive cups from the dispensing means, and a receiving member carried by the outlet member and spaced away from the lower end thereof, said receiving member being concentric with the outlet member and having its upper portion flared.

6. In combination with means for dispensing cups vertically, a vertically arranged outlet member disposed to receive cups from the dispensing means, and a receiving member carried by the outlet member at the lower end thereof and disposed concentric with the outlet member, the ends of the receiving member being spaced apart a sufficient distance to permit ready withdrawal of the cup between said ends with but slight distortion of the cup while normally retaining the cup in the receiving member, the inner faces of the ends of the receiving member being inclined outwardly to facilitate withdrawal of the cup.

In witness whereof, I hereunto subscribe my name this 1st day of October, 1926.

FRIEDRICH GRAFFENBERGER.