Oct. 13, 1925. 1,556,857

F. L. LLOYD

PACKAGING APPARATUS

Filed Aug. 16, 1922 2 Sheets-Sheet 1

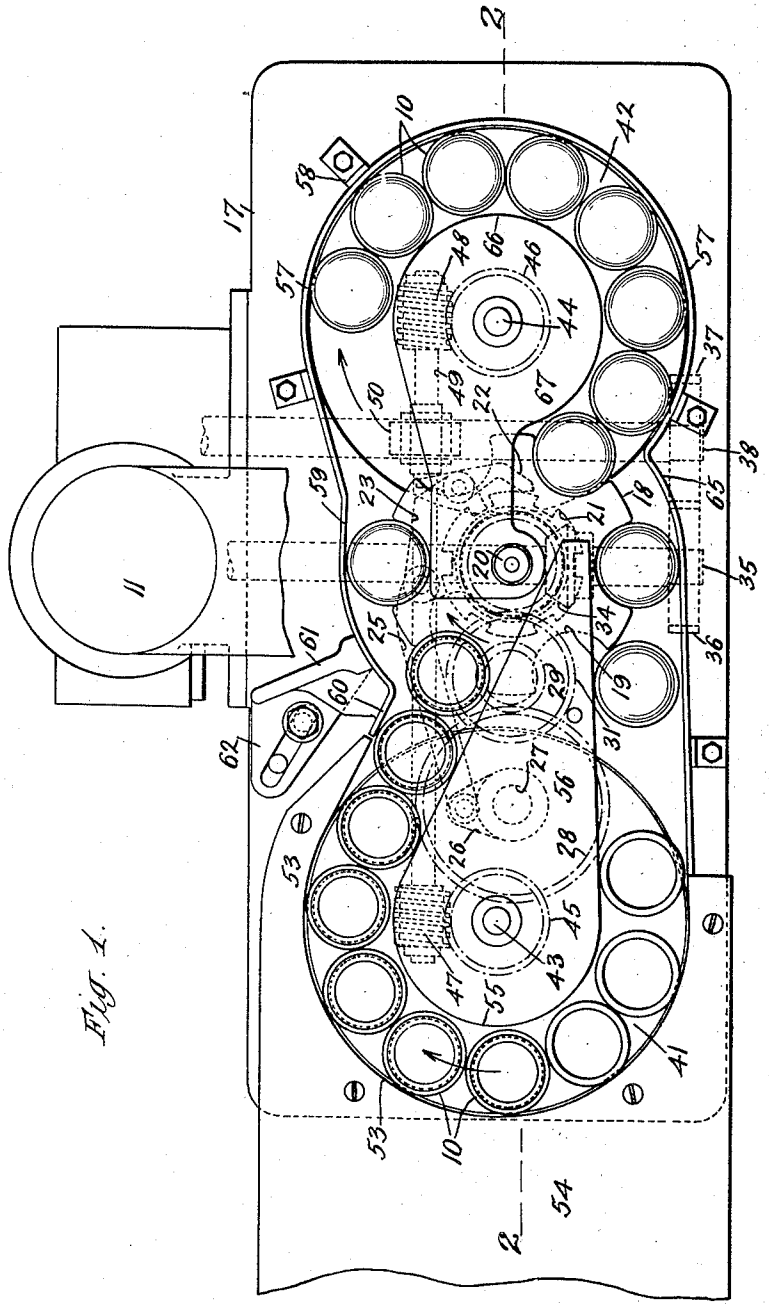


Fig. 1.

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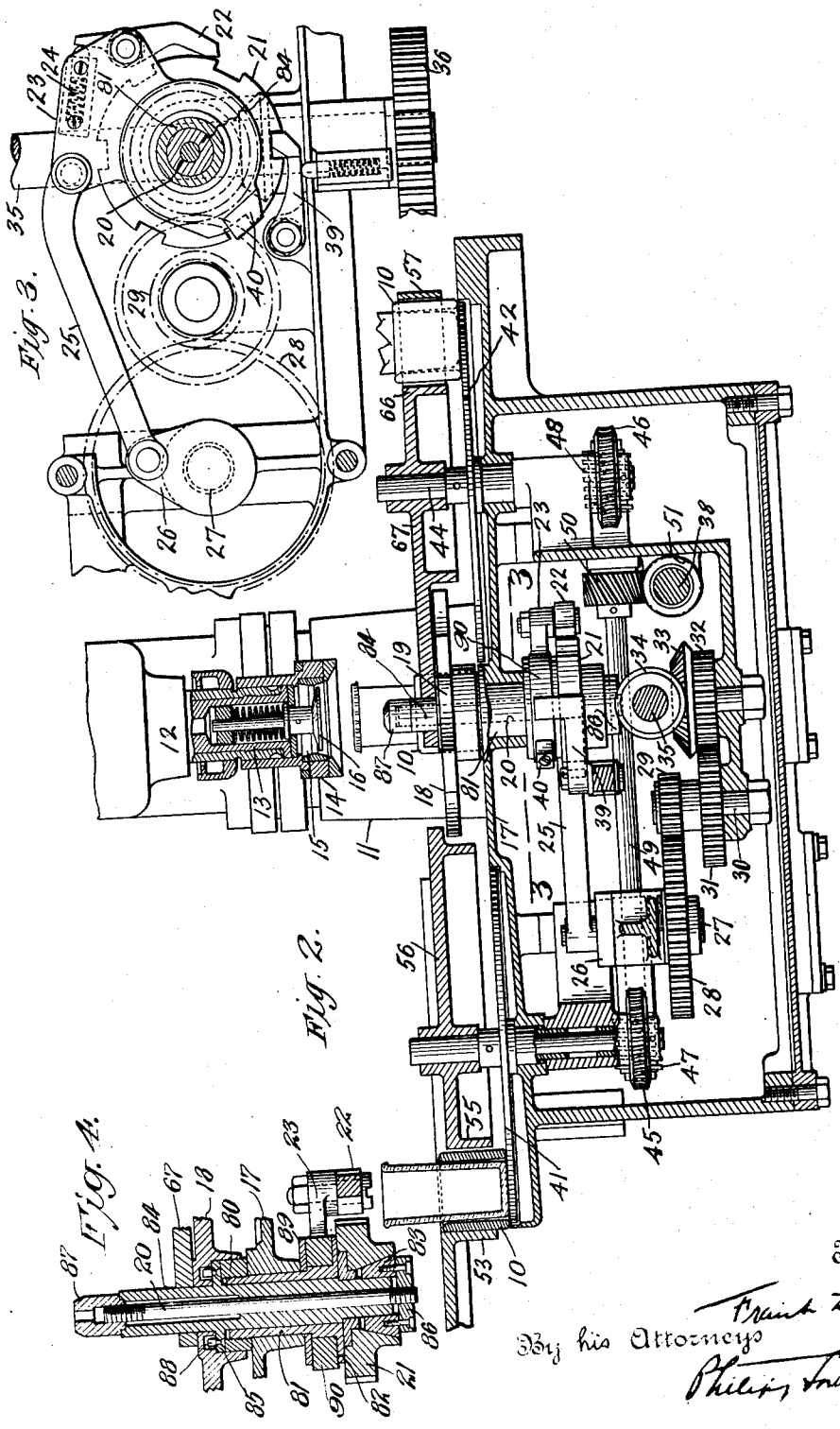


Fig. 2.

Fig. 3.

Fig. 4.

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Patented Oct. 13, 1925. 1,556,857

UNITED STATES PATENT OFFICE.

FRANK L. LLOYD, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE CROWN CORK AND SEAL COMPANY OF BALTIMORE CITY, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

PACKAGING APPARATUS.

Application filed August 16, 1922. Serial No. 582,169.

To all whom it may concern:

Be it known that I, FRANK L. LLOYD, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Packaging Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to packaging apparatus, and more particularly to apparatus for feeding receptacles to packaging position.

In packaging machines, such, for example, as machines for applying crown corks to receptacles, the receptacles are successively centered beneath the capping head during the capping operation. For feeding bottles of the standard type, various feeding mechanisms have been devised. These mechanisms, however, being designed for bottles of more or less standard shape, are ordinarily not adapted to feeding odd shaped receptacles, such, for example, as preserve glasses.

It is one of the principal objects of the present invention to provide an effective feeding apparatus for receptacles other than ordinary straight-sided bottles. It is a further object of the invention to provide a feeding apparatus of the type mentioned that is adapted for use with existing packaging mechanisms.

With these general objects in view, the invention consists in the combinations, details of construction and arrangement of parts which will first be described in connection with the accompanying drawings and then more particularly pointed out.

In the drawings—

Fig. 1 is a top plan view, with parts broken away, of an apparatus constructed in accordance with the invention;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1,

Fig. 3 is a similar view taken on the line 3—3 of Fig. 2, and Fig. 4 is a vertical sectional view through the spider drive.

Referring to the drawings, in the embodiment here illustrated as an example, a base 11 supports a capping head 12 in which is slidable a capping plunger 13. This plunger carries a throat 14 in which is a throat ring or capping die 15, and movable within the throat is a presser foot 16. No further description of the capping mechanism is here necessary as this element is well known in the art, it being noted, however, that the throat, die and presser foot here shown are of large diameter to accommodate large size crowns. When a receptacle bearing a cap, such as a crown cork, is centered beneath the capping head, the capping plunger is lowered by any suitable means to seal and affix the cap on the receptacle in the well known manner.

There is provided a plurality of adapter cups and means for moving said cups progressively beneath the capping head and intermittently centering successive cups in a given position beneath the capping head. In structures embodying the invention to what is now considered the best advantage a number of cups are moved in an endless path and the moving and centering means includes an intermittently rotating spider having a plurality of cup-receiving pockets. Although capable of various constructions, in that here shown as an example, below the capping head is a stationary table 17. Rotating over this table is a centering spider 18 having a plurality of spaced open-faced pockets 19. Means is provided for giving the ratchet a step-by-step rotation. Although capable of various constructions, in that here shown as an example, hung from the stationary table 17, by a threaded bearing collar 80 is a cylindrical bearing 81 having a bottom radial flange 82. Below the flange 82 is a notched ratchet 21 having a frustro-conical recess (Fig. 4). In this recess is a frustro-conical plug 83, in which is stepped a long sleeve 84 rotatable in bearing 81 and extending above the spider 18. This sleeve has a collar or flange 85 rotatably seated on bearing collar 80. Secured to plug 83 is a plate 86 into which is threaded the end of a shaft 20 extending up through the sleeve 84. A nut 87 is threaded onto the upper end of shaft 20 and seats on the upper end of sleeve 84. Shaft 20, sleeve 84 and

plug 83 are suitably connected to rotate together, the plug being frictionally connected to ratchet 21. The spider 18 is connected to collar 85 of the sleeve by pins 88, to rotate therewith.

Oscillative on bearing 81 and located between the flange 82 and a bearing plate 89 is a ringlike element 90, part of which is a pawl carrier 23 to which is pivoted a pawl 22 held to its duty by a spring 24. The pawl carrier 23 is actuated by a link 25 connected to a crank arm 26 on a shaft 27. This shaft is rotated, to reciprocate the pawl carrier, by means of intermeshing gears 28, 29, stud 30, intermeshing gears 31, 32, bevel gears 33, 34 and shaft 35. The latter shaft has a gear 36 meshing with a pinion 37 on a drive shaft 38 to which power may be applied in any suitable manner.

For every rotation of shaft 27 the ratchet is notched ahead one step thereby advancing a spider pocket 19 to a centering position beneath the capping head.

There is provided means for locking the ratchet thereby to accurately position a spider pocket. As here shown as an example, cooperating with the ratchet is a spring-pressed locking pawl 39 arranged to enter a ratchet notch and hold the ratchet against either forward or backward movement. To dislodge the locking pawl 39 to permit the ratchet to be moved by the next stroke of the operating pawl, the pawl carrier has a cam block 40 which engages and dislodges the locking pawl on the back stroke of the pawl carrier.

In the present embodiment, flush with the stationary table 17 are two rotary tables or dials 41, 42, the latter extending slightly under the spider. These tables are mounted on shafts 43, 44, respectively, driven through worm gears 45, 46 and worms 47, 48 from a cross shaft 49. This cross shaft has a spiral gear 50 meshing with a similar gear 51 on drive shaft 38. As shown by the arrows in Fig. 1, the spider and two rotary tables all rotate the same way, e. g., clockwise, the tables having a continuous rotation while the spider has a step-by-step movement.

The stationary table and the rotary tables form a support for the adapter cups. These, as shown, are substantially cylindrical, open ended shells 10 adapted to receive the receptacles to be fed to the capping head. The drawings show, as an example, wide-mouth and slightly tapered receptacles commonly known as jelly or preserve jars. It is to be understood, however, that various other receptacles may be fed, the adapter cups being formed to correspond with the shape and size of the particular receptacle.

As is hereinafter more fully described, the spider and the rotary tables cause a progressive movement of the adapter cups and there is provided guide means for causing the cups to circulate in a given endless path. As here shown as an example, around the edge of rotary table 41 is an arcuate guide wall 53 formed as a skirt on a platform or shelf 54 later referred to. A short distance beyond the top of the circle as viewed in Fig. 1, the guide wall 53 turns off tangentially and terminates. The other or outer end terminates at about the bottom of the circle with a short tangent. To cooperate with the guide 53, is a guide wall 55 having an arcuate portion concentric with part of guide 53 and tangential portions paralleling the tangential portions of guide 53 but extending beyond the same, as clearly appears in Fig. 1. This guide wall 55 is formed, as here shown, as a skirt on a plate 56 supported by table 17 and shaft 43.

Extending around the outer edge of table 42 is an arcuate guide wall 57 secured to table 17 by brackets 58. As appears in Fig. 1, this guide wall has an extension 59 running off at a tangent and then curving slightly beneath the capping head. This extension 59 terminates in a bent back end 60 aligning with the straight end of guide 53. The outer part of guide 59 is carried, as here shown, by an arm 61 on an adjustable bracket 62, whereby the position of this part of the guide may be adjusted to obtain accurate centering of the cups. At a point somewhat beyond the bottom of table 42 as viewed in Fig. 1, the guide 57 turns off abruptly into a portion 65 substantially concentric with the spider and curving into a straight portion which joins the end of guide 53 and parallels the outer tangent of guide 55.

Concentric with the arcuate portion of guide 57 is a guide wall 66 formed as a skirt on a plate 67 supported from shaft 44 and shaft 20.

The guide elements described define an endless path for the adapter cups, as clearly appears in Fig. 1, the cups having a continuous support on stationary table 17 and the two inlaid rotary tables 41, 42.

In operation, the endless path is supplied with enough adapter cups to prevent crowding and the various driven parts are operated as described by the rotation of the main shaft 38. The connections for the rotary tables may conveniently be designed to rotate these tables at a speed slightly in excess of that necessary to supply the spider. Considering the course of any given cup and starting, for example, at the extreme left of Fig. 1, the cup is carried around by table 41, between guides 53 and 55, until the tangents of the guides direct it onto stationary table 17 and toward the spider. By the pressure of succeeding cups, the first cup is moved into a spider pocket. Such a pocketed cup is shown adjacent the arrow in Fig. 1. With the proper number of

cups and the slight excessive speed of the rotary table this pressure of the row of cups will always be available.

By the next movement of the spider, the pocketed cup is carried to a position beneath the capping head, centering of the cup in the pocket being assured by the extension 59 of guide 57. This same movement of the spider places the next pocket in position to receive the next succeeding cup. During the following pause in the rotation of the spider, the capping head makes its capping stroke. The next step of the spider carries the first cup away from capping position and onto the rotary table 42, the next succeeding cup being centered in capping position.

Although cups are being continuously carried toward the intermittently rotated spider, as the cups are in a free relation with the circulation system the forward cup merely waits until a spider pocket is in position to receive it.

The cup discharged from packaging position onto table 42 is carried around between guides 57 and 66 to a point where it is again taken by a spider pocket, this pocket, as shown, being opposite the pocket first receiving a cup. The next movement of the spider carries the cup to a position opposite capping position, the cup being held in the pocket by the part 65 of guide 57. By the next stroke of the spider the cup is moved on toward table 41 and is discharged from the pocket by the outer tangent of guide 55. The cup is moved across the stationary table onto table 41 by the pressure of succeeding cups and table 41 carries it around between guides 53 and 55 to the assumed starting point, thus completing the cycle. It will be obvious that the course of the cup described is the course of each cup, the cups circulating in endless progression.

It will be noted that the cups are fed to and from packaging position regardless of the presence of the receptacles. While the receptacles may be placed in the cups in any manner and at any point that may be suitable, in the exemplification illustrated, shelf 54 is located in a plane slightly above the rims of the cups. Receptacles are moved across this shaft by hand and dropped into the passing cups, the shelf serving as a support and guide. The caps may be supplied as desired, as by hand between the loading station and capping position. Fig. 1 shows the receptacle in packaging position bearing a cap. The capped receptacles may be removed as desired, Fig. 1 indicating removal just before the cups reach table 41.

What is claimed is:

1. In a packaging apparatus, and in combination, a packaging head, a plurality of free adapter cups, a rotary spider having a plurality of cup-receiving pockets for centering said cups successively beneath the packaging head, means for giving said spider a step by step rotation, and means for feeding the cups successively into the spider pockets.

2. In a packaging apparatus, and in combination, a packaging head, a plurality of free adapter cups, a rotary spider having a plurality of cup-receiving pockets for centering the cups beneath the packaging head, means for giving said spider a step by step rotation, guide means defining an endless path for the cups, and means in addition to the spider for causing the cups to be circulated around said path.

3. In a packaging apparatus, and in combination, a packaging head, a plurality of free adapter cups, a rotary spider having a plurality of cup-receiving pockets for centering the cups beneath the packaging head, means for giving said spider a step by step rotation, guide means defining an endless path, and a rotary table at each side of the spider for aiding in circulating the cups about said path.

4. In a packaging apparatus, and in combination, a packaging head, a plurality of free adapter cups, a stationary table beneath said packaging head, a rotary spider above said table and having a plurality of cup-receiving pockets, means for giving the spider a step by step rotation, a rotary table at each side of the spider and flush with the stationary table, means for rotating said tables continuously and in the same direction of rotation as the spider, and guide means for defining the path of the cups.

5. In a packaging apparatus, and in combination, a packaging head, a plurality of free adapter cups, a rotary spider having a plurality of cup-receiving pockets for centering the cups beneath the packaging head, means for giving said spider a step-by-step rotation, a rotary table at each side of the spider, means for giving said tables a continuous rotary movement, and guide means defining an endless path for the cups around which the cups are circulated.

6. In a packaging apparatus, and in combination, a packaging head, a plurality of free adapter cups, a rotary spider having a plurality of cup-receiving pockets for centering the cups beneath the packaging head, means for giving said spider a step-by-step rotation, guide means defining an endless path for the cups and including a portion for positioning successive cups in the spider pockets in packaging position, and a rotary table at each side of the spider for aiding in circulating the cups about said path.

7. In a packaging apparatus, and in combination, a packaging head, a plurality of free adapter cups, a rotary spider having a plurality of cup-receiving pockets for centering the cups beneath the packaging head,

a stationary table beneath said spider for supporting the cups, a rotary table at each side of the spider and flush with the stationary table, a pawl and ratchet mechanism for giving said spider an intermittent rotation, a drive shaft, a connection from said drive shaft, including a crank arm and link for operating said pawl and ratchet mechanism, a cross shaft, an operative connection between the cross shaft and the respective rotary tables.

In testimony whereof, I have hereunto set my hand.

FRANK L. LLOYD.