Oct. 20, 1931. M. M. SEDWICK 1,828,624

FEEDING AND TIMING MECHANISM FOR CONTAINERS

Filed Dec. 16, 1929 3 Sheets-Sheet 1

Fig.1.

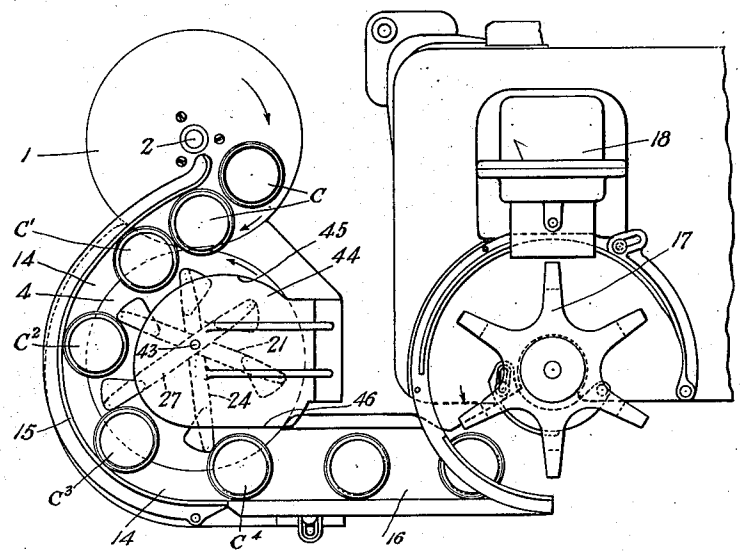


Fig.4.

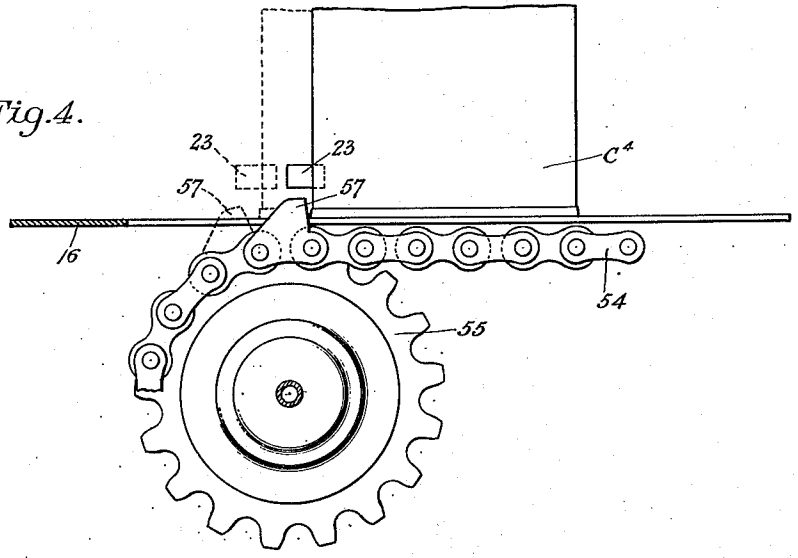
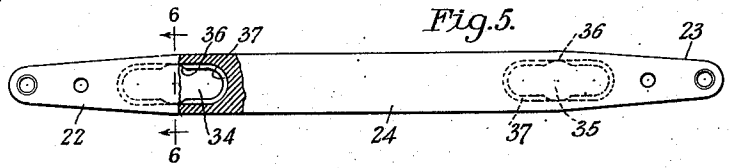


Fig.5.



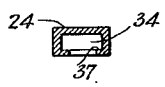


Fig.6.

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FEEDING AND TIMING MECHANISM FOR CONTAINERS

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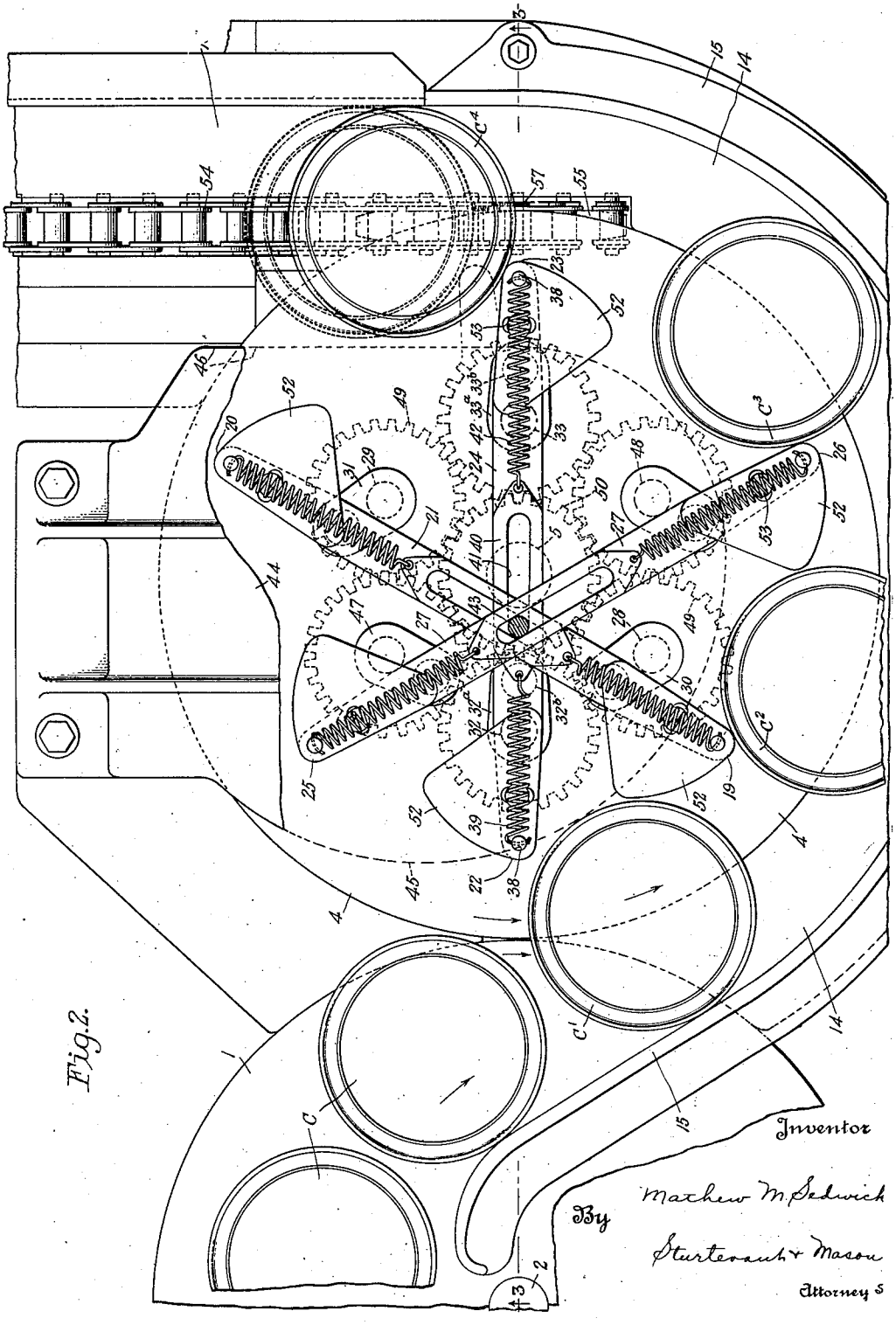


Fig. 2.

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FEEDING AND TIMING MECHANISM FOR CONTAINERS

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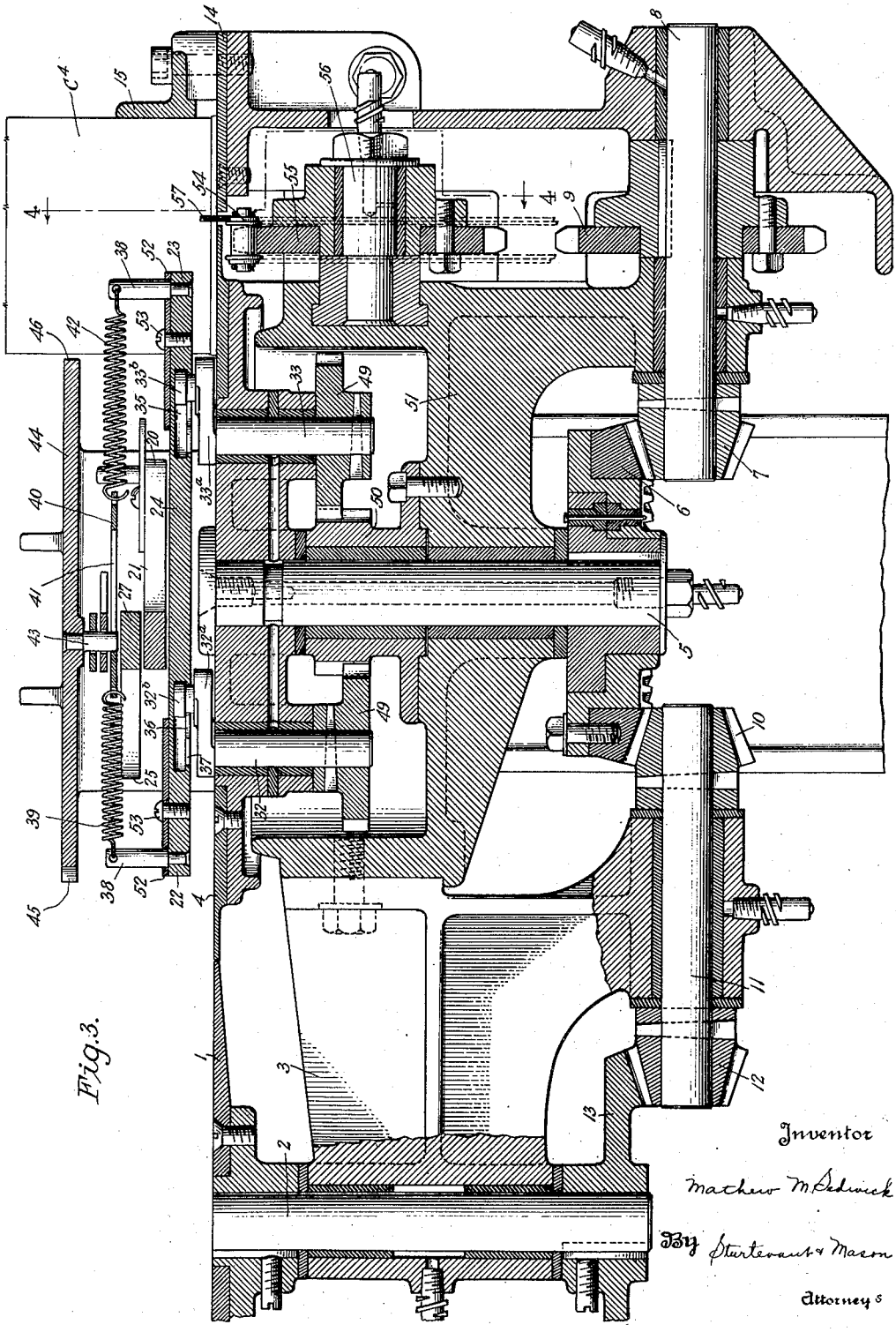


Fig. 3.

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Patented Oct. 20, 1931 1,828,624

UNITED STATES PATENT OFFICE

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FEEDING AND TIMING MECHANISM FOR CONTAINERS

Application filed December 16, 1929. Serial No. 414,431.

The invention relates to new and useful improvements in a feeding and timing mechanism for containers, for delivering the same to a machine for attaching a cover or end to the container body.

An object of the invention is to provide a feeding and timing mechanism for containers wherein the timing fingers are supported and operated directly by rotating members which are so constructed and arranged as to impart to said fingers accelerating and retarding movements during each cycle of rotation of said timing fingers.

A further object of the invention is to provide a feeding and timing mechanism of the above character wherein the timing fingers cooperate in the selecting of a single container from containers fed at random thereto.

A further object of the invention is to provide a feeding and timing mechanism of the above character wherein the timing fingers are so mounted as to yield provided they are brought into engagement with the container end on.

A further object of the invention is to provide a feeding and timing mechanism of the above character wherein the cam plate is associated with each timing finger on the rear side thereof for aiding in the positioning of the container for engagement with the following timing finger.

A still further object of the invention is to provide a feeding and timing mechanism of the above character wherein diametrically opposed timing fingers are formed integral with each other and are mounted for limited yielding movement on rotating cranks which travel bodily and impart to said timing fingers accelerating and retarding movements during the rotation of the timing fingers.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention:—

Figure 1 is a view showing more or less diagrammatically a portion of a machine for attaching ends to containers which embodies the improved feeding and timing mechanism.

Fig. 2 is an enlarged plan view of the timing mechanism, the top plate being broken away to show the timing fingers.

Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a detail on the line 4—4 of Fig. 3, showing a portion of the endless conveyor which receives the containers from the feeding and timing mechanism.

Fig. 5 is a view partly in plan and partly in section of a pair of integral timing fingers.

Fig. 6 is a section on the line 6—6 of Fig. 5.

The invention is directed to a feeding and timing mechanism for feeding containers or container bodies to a means for attaching a cover or an end thereto. The feeding and timing mechanism includes a rotating disc or some similar feeding device which receives the containers and delivers the same at random to the improved feeding and timing mechanism. This feeding and timing mechanism comprises a rotating member which travels at a uniform speed. Mounted on this rotating member are a series of vertically disposed shafts symmetrically arranged relative to the center of the rotating member. Each shaft carries a crank. On the lower end of each shaft is a gear which meshes with a stationary gear disposed centrally of the axis of rotation of said supporting member. These cranks are arranged in pairs and on each pair are two timing fingers which are formed integral and which extend substantially diametrically across the rotating member.

First one end of this bar forming the timing fingers is effective for engagement with and the moving of a container, and then the other end becomes effective for engagement with and the moving of a container. The cranks are so disposed that these diametrically opposed pairs forming the retaining fingers cross each other at a point between the center of rotation of the supporting member and the point where the containers are delivered to the feeding and timing mechanism. As a result the timing fingers at the receiving point are moving at their slowest speed and adjacent timing fingers are relatively close together so that the timing fingers co-

operate in the selecting of a single container from the containers delivered at random thereto.

As the member rotates these fingers will be moved outward away from the center of rotation of the member and the end thereof accelerated and thus it is that the containers are accelerated, spaced and delivered in proper timing to a conveying mechanism which in turn delivers the containers to the machine which attaches the end to the body of the container.

Each retaining finger has associated therewith a cam plate projecting rearwardly from the finger which aids in the placing of the container against the following timing finger. The bars forming the timing fingers are mounted on the cranks so that they can yield at the time when the timing finger first comes into engagement with the container if it should strike the container end on.

Referring more in detail to the drawings, the improved timing mechanism includes a disc 1 carried by a shaft 2 mounted for rotation in a bracket 3 attached to the frame of the machine. This disc 1 receives the containers and delivers the same at random to the improved feeding and timing mechanism. As shown in the drawings, the containers are represented at C. They are the type in which a friction plug is to be seated. It is understood, however, that containers may be received and fed and timed by the improved timing mechanism to which an end is double seamed. This end may be double seamed to the body portion for the forming of the container or it may be double seamed to the container for the closing of the same after it has been filled. It is understood, therefore, that the term "container" as used throughout the description is intended to cover either a body portion alone to which an end is to be attached or a body portion with the end attached to which a cover is to be applied or to which an end is to be double seamed for the closing of the container.

The feeding and timing mechanism includes a rotating table 4 which is attached to a shaft 5. The shaft 5 carries a gear 6 which meshes with a gear 7 on a shaft 8. The shaft 8 carries a sprocket wheel 9 to which power is applied from any suitable mechanism. The gear wheel 6 also meshes with a gear wheel 10 carried by a shaft 11 mounted in the bracket 3 and the shaft 11 carries a second gear wheel 12 meshing with a gear wheel 13 attached to the lower end of the shaft 2. Thus it is that the disc 1 and the support 4 are rotated.

Associated with this rotating support 4 is a supporting table or bracket 14. Attached to this table or supporting bracket 14 is a guide 15. The guide 15 is curved about the center of rotation of the support 4. The supporting table or bracket 14 is provided with an extension 16 which leads to the machine which attaches the ends to the containers as shown in Fig. 1. In this figure a cover feed turret is indicated at 17 and a marker at 18. The covers or ends are assembled with the containers and carried into the machine where they are attached to the containers.

The containers are fed along the supporting bracket 14 in part by the rotating support 4 and in part by the timing fingers. As shown there are six timing fingers. The timing fingers 19 and 20 are formed by a bar 21 which extends substantially diametrically across the rotating support 4. The timing fingers 22 and 23 are formed as a part of an integral bar 24 and the timing fingers 25 and 26 are formed as a part of an integral bar 27. Mounted in the rotating support 4 is a pair of shafts 28 and 29. The shaft 28 carries a crank 30 and the shaft 29 carries a crank 31. There is a pair of shafts 32 and 33 which carry cranks 32*a* and 33*a* which support the bar 24 (see Fig. 3). On the outer end of the crank 33*a* is a headed stud 33*b*. On the outer end of the crank 32*a* is a headed stud 32*b*. The bar 24 is provided with a recess 34 in its under face adapted to receive the headed stud 32*b* and a recess 35 adapted to receive the headed stud 33*b*. These recesses 34 and 35 as shown in Fig. 5 have a central cut out portion 36 which enables the bar to be placed on the headed studs when the stud is central of the slot.

There is an overhanging ledge 37 which retains the bar on the stud when the stud is at either end of the recess. At the outer end of the bar is a pair of posts 38, 38. A spring 39 is attached to one of these posts and to a plate 40 provided with a longitudinal slot 41. A spring 42 is attached to the other post and to the other end of this plate. The bars forming the timing fingers are all similarly constructed and the detailed description of one will apply to the others.

There are springs 39 and 42 and a slotted plate 40 for each bar. These slotted plates engage a pin 43 attached to a stationary cover plate 44 overlying the rotating table. This stationary plate 44 has a curved guiding face 45 which leads to a tangential straight guiding face 46 parallel with the path of travel of the containers after they are moved onto the extension 16 and taken by the conveyor which delivers the same to the machine for attaching the ends to the containers.

There is a pair of shafts 47 and 48 having headed studs which support the bar 27, and the cranks 31 and 30 also have headed studs for supporting the bar 21. On the lower end of each shaft there is a gear 49. These gears mesh with a gear 50 which is attached to the frame 51 of the machine and is held stationary during the rotation of the support.

This gear 50 is centered relative to the axis of rotation of the support 4.

On each timing finger there is a cam plate 52. This cam plate 52 is secured to the timing finger in part by a screw 53 and in part by the post 38. The support 4 rotates in a counterclockwise direction, as indicated by the arrow. Each crank rotates also in a counterclockwise direction and this cam plate is on the rear or trailing side of the timing finger. The timing finger 22 is about to engage the container C'.

The container has been fed by the rotation of the disc 1 onto the support 4 and the finger is about to engage the container for imparting to the container an accelerating motion. The containers are received on this support 4 by the timing fingers at random. The cam plate 52 associated with the timing finger 19 will engage the container and crowd the same rearwardly into contact with the finger 22. The container C^2 is shown as in contact with this timing finger 19, and the container C^3 is shown as in contact with the timing finger 26. There is a container C^4 in contact with the timing finger 23.

The cranks 32*a* and 33*a* are shown in Fig. 2 as in line with the longitudinal axis of the bar 24. As the support 4 rotates these cranks will take an angular position relative to the bar, that is, they will move the bar to the position now occupied by the bar 21 in said figure, and then as the support continues its rotation it will move so as to take the position indicated by the bar 27. Thus it is that the bar in effect rotates about the center of the pin 43, while the support 4 rotates about the center of the shaft 5. The center of the pin 43 lies between the center of the shaft 5 and the point where the containers are fed onto the traveling support 4. As a result, the timing fingers 19 and 22 are closely spaced at the time when the containers are fed thereto. This together with the cam plates 52 causes the timing fingers to select one container only from the containers fed at random thereto. If the end of the timing finger strikes the container end on, the bar can move endwise.

The plate 40 is limited in its endwise movement by the pin 43. The cranks cause the bars to move endwise relative to the center of the pin 43. In other words, the slot will shift along the pin so that the pin will engage first one end of the slot and then the other. As the bar 24 is moved outward to the right as viewed in Fig. 3 it will move the plate 41 until the end of the slot engages the pin 43 and then a further movement of the bar 24 will put the spring 42 under tension. This is the condition as illustrated in Fig. 3.

It will readily be seen that if the container should strike the left hand end of the bar 24, said bar can move endwise to the right and yield so as not to crush the container. As each bar passes the point where the containers are received, the same condition is obtained in connection with the springs and said bar can yield if it strikes the container end on.

As the support 4 rotates the cranks are continually moving the rods endwise during the bodily travel with the support. The end of the timing finger 22 when the parts are positioned as shown in Fig. 2 is near the center of the shaft 5 and the end of the timing finger 23 is the farthest from this shaft 5. Therefore, the timing finger 22 will be moving at the minimum speed of travel while the timing finger 23 will be moving at the maximum speed of travel. The timing finger 19 has moved outward a slight distance from the center of the shaft 5, and is, therefore, moving at a slightly greater speed than the timing finger 22. The timing finger 26 has moved outward a considerably greater distance from the center of the shaft 5, and is, therefore, traveling at a much greater speed than the timing finger 19 or the timing finger 22. The timing finger 22 will, therefore, begin an acceleration in its motion just after it passes the position shown in Fig. 2 and will continue to increase or accelerate its speed of travel until it reaches the position of the timing finger 23. From this point on around until it reaches again the position shown in Fig. 2 it will be retarded in its movement. So it is that each finger in succession is accelerated through substantially 180 degrees rotation of the support 4 and is retarded through the remainder of the rotation of the support. The containers placed against the timing fingers will, therefore, be accelerated and spaced and delivered in proper timing to the means which receives and conveys the containers away.

This conveying means, as shown in Fig. 4, consists of a traveling chain 54 running over a sprocket wheel 55. The sprocket wheel 55 is mounted on a stud 56 adjustably mounted in the frame member 51. This traveling chain 54 is provided with lugs 57. The container 4 is fed by the timing finger along the support 16 and as the lug 57 comes up through the support it moves in behind the container and will convey the container away from the timing finger.

From the above it will be apparent that a timing mechanism has been provided wherein the timing fingers are supported and operated entirely by rotating parts and these rotating parts are so constructed that the timing fingers are first accelerated and then retarded during each cycle of rotation of the fingers. It will also be noted that the fingers cooperate in the selecting of a single container from the containers fed thereto at random at the receiving side of the feeding and timing mechanism. It will also be noted that the timing fingers can yield if they strike the

container end on when it is fed thereto so as not to crush the container.

It is obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

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

1. A feeding and timing mechanism for containers comprising a rotating support, a series of timing fingers, rotating devices traveling bodily with said support and carrying said timing fingers, said rotating devices being constructed and operated so as to impart first an accelerating and then a retarding movement in succession to the timing fingers as said support rotates, means for mounting said timing fingers on said rotating devices so that the timing finger can yield if it strikes a container end on at the time of receiving the container, a projecting cam plate on the rear face of each timing finger and cooperating with the timing fingers in the selecting of one container from the containers fed at random to the timing mechanism, a rotating disc for feeding the containers at random to said timing mechanism, and a traveling conveyor having spaced lugs thereon for receiving the containers from the timing mechanism.

2. A feeding and timing mechanism for containers comprising a rotating support, a series of pairs of rotatable shafts mounted in said support and disposed symmetrically relative to the center of the support and at a distance therefrom, each shaft having a crank, a bar mounted on each pair of cranks and having each end thereof disposed so as to form a timing finger, said cranks being so disposed on the shafts that said bars cross each other at a fixed point located between the center of rotation of the support and the point where the containers are delivered to the timing mechanism.

3. A feeding and timing mechanism for containers comprising a rotating support, a series of pairs of rotatable shafts mounted in said support and disposed symmetrically relative to the center of the support and at a distance therefrom, each shaft having a crank, a bar mounted on each pair of cranks and having each end thereof disposed so as to form a timing finger, said cranks being so disposed on the shafts that said bars cross each other at a fixed point located between the center of rotation of the support and the point where the containers are delivered to the timing mechanism, a rotating disc for delivering containers at random to said timing mechanism, and a guide rail for guiding the containers onto and through the timing mechanism.

4. A feeding and timing mechanism for containers comprising a rotating support, a series of pairs of rotatable shafts mounted in said support and disposed symmetrically relative to the center of the support and at a distance therefrom, each shaft having a crank, a bar mounted on each pair of cranks and having each end thereof disposed so as to form a timing finger, said cranks being so disposed on the shafts that said bars cross each other at a fixed point located between the center of rotation of the supports and the point where the containers are delivered to the timing mechanism, and means for yieldingly supporting said bars on the cranks whereby a timing finger can yield if it strikes a container end on.

5. A feeding and timing mechanism for containers comprising a rotating support, a series of pairs of rotatable shafts mounted in said support and disposed symmetrically relative to the center of the support and at a distance therefrom, each shaft having a crank, a bar mounted on each pair of cranks and having each end thereof disposed so as to form a timing finger, said cranks being so disposed on the shafts that said bars cross each other at a fixed point located between the center of rotation of the support and the point where the containers are delivered to the timing mechanism, said bars having longitudinal recesses in their under faces engaging the cranks whereby each bar has a limited movement on the cranks, a plate associated with each bar, a post at the end of each bar, a spring between each post and the adjacent end of the plate, said plate having a slot therethrough, a fixed pin passing through the slots in the plates and so disposed as to limit the movement of the plate and place under tension the proper spring for yieldingly holding the bar pressed toward the container at the time when the timing finger is receiving the container.

6. A feeding and timing mechanism for containers comprising a rotatable support, a series of pairs of connected timing fingers disposed substantially diametrically of the center of said support, rotating shafts carried by said rotating support and arranged in pairs, each shaft having a crank, each pair of connected timing fingers being mounted on a pair of said cranks, said shafts and cranks being so disposed during the rotation of the support as to impart first an accelerating and then a retarding movement to the timing fingers in succession, means for feeding the containers at random to said timing mechanism, a guide rail associated with the timing mechanism, and a conveying mechanism for receiving the containers from the timing mechanism.

7. A feeding and timing mechanism for containers comprising a rotating shaft, a support carried thereby, a series of pairs of

shafts mounted in said support and symmetrically disposed at a distance from the center of the support, a stationary gear, a gear carried by said shaft meshing with said stationary gear whereby as the support rotates the shafts are rotated, a crank on each shaft, a bar carried by each pair of cranks, the end of which operates as a timing finger, said cranks being so disposed as to impart first an accelerating and then a retarding movement in succession to the timing fingers as the support rotates.

8. A feeding and timing mechanism for containers comprising a rotating shaft, a support carried thereby, a series of pairs of shafts mounted in said support and symmetrically disposed at a distance from the center of the support, a stationary gear, a gear carried by said shaft meshing with said stationary gear whereby as the support rotates the shafts are rotated, a crank on each shaft, a bar carried by each pair of cranks, the end of which operates as a timing finger, said cranks being so disposed as to impart first an accelerating and then a retarding movement in succession to the timing fingers as the support rotates, a cam plate associated with each bar and disposed in rear of the timing fingers for cooperating with said timing fingers in selecting a single container from containers fed at random to the timing mechanism.

9. A feeding and timing mechanism for containers comprising a rotating shaft, a support carried thereby, a series of pairs of shafts mounted in said support and symmetrically disposed at a distance from the center of the support, a stationary gear, a gear carried by said shaft meshing with said stationary gear whereby as the support rotates the shafts are rotated, a crank on each shaft, a bar carried by each pair of cranks, the end of which operates as a timing finger, said cranks being so disposed as to impart first an accelerating and then a retarding movement in succession to the timing fingers as the support rotates, a cam plate associated with each bar and disposed in rear of the timing fingers for cooperating with said timing fingers in selecting a single container from containers fed at random to the timing mechanism, said bar being mounted on said crank so that it may yield in an endwise direction if it strikes a container end on at the time of receiving the container.

10. A feeding and timing mechanism for containers comprising a rotating support, a series of pairs of rotatable shafts mounted on said support and disposed symmetrically relative to the center of the support and at a distance therefrom, each shaft having an eccentric portion, a member mounted on each pair of eccentric portions and having the ends thereof disposed so as to form timing fingers operating in succession upon the containers, said eccentric portions being so disposed and timed as to impart accelerating and retarding movements in succession to the timing fingers as the support rotates.

11. A feeding and timing mechanism for containers comprising a rotating support, a series of pairs of rotatable shafts mounted on said support and disposed symmetrically relative to the center of the support and at a distance therefrom, each shaft having an eccentric portion, a member mounted on each pair of eccentric portions and having the ends thereof disposed so as to form timing fingers operating in succession upon the containers, said eccentric portions being so disposed and timed as to impart accelerating and retarding movements in succession to the timing fingers as the support rotates, said means for mounting the timing fingers being constructed so as to permit the timing finger to yield if it strikes a container end on.

12. A feeding and timing mechanism for containers comprising a rotating support, a series of pairs of rotatable shafts mounted on said support and disposed symmetrically relative to the center of the support and at a distance therefrom, each shaft having an eccentric portion, a member mounted on each pair of eccentric portions and having the ends thereof disposed so as to form timing fingers operating in succession upon the containers, said eccentric portions being so disposed and timed as to impart accelerating and retarding movements in succession to the timing fingers as the support rotates, said means for mounting the timing fingers being constructed so as to permit the timing finger to yield if it strikes a container end on, and a projecting cam plate on the rear face of each timing finger and cooperating with the timing fingers in selecting one container only for a timing finger from the containers fed at random to the timing mechanism.

In testimony whereof, I affix my signature.

MATHEW M. SEDWICK.