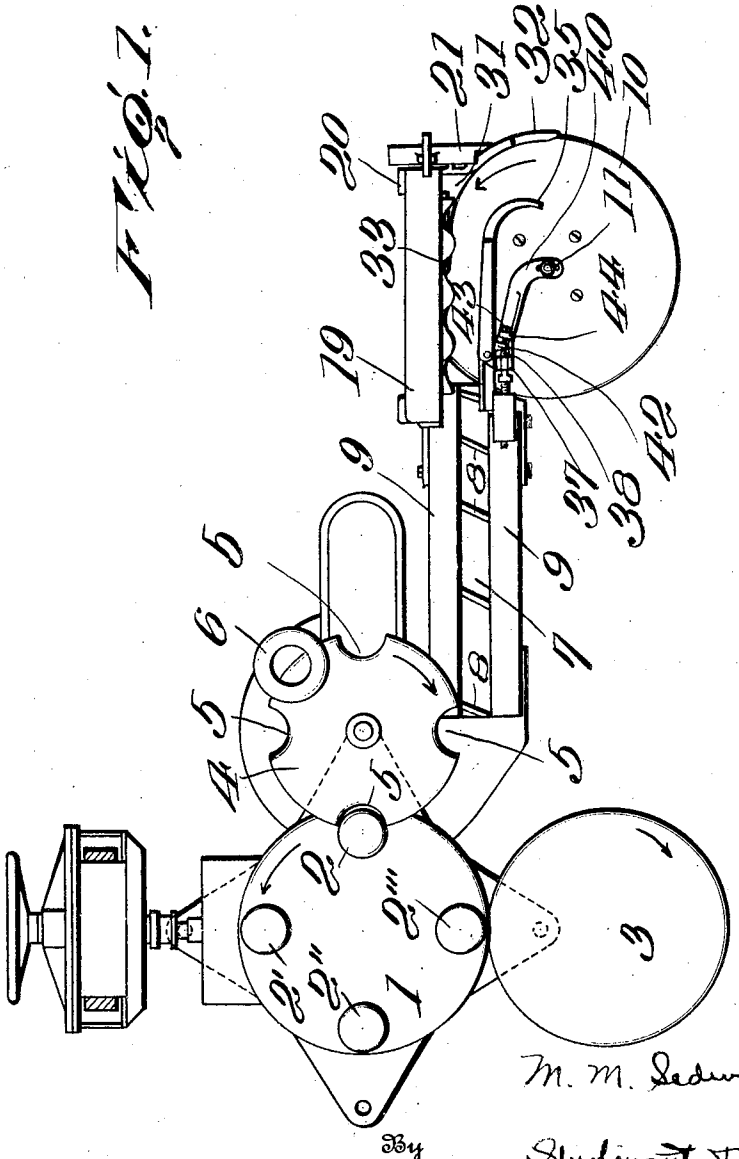
May 17, 1927. 1,628,919

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MECHANISM FOR FEEDING FILLED CANS TO CLOSING MACHINES

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Fig. 1.



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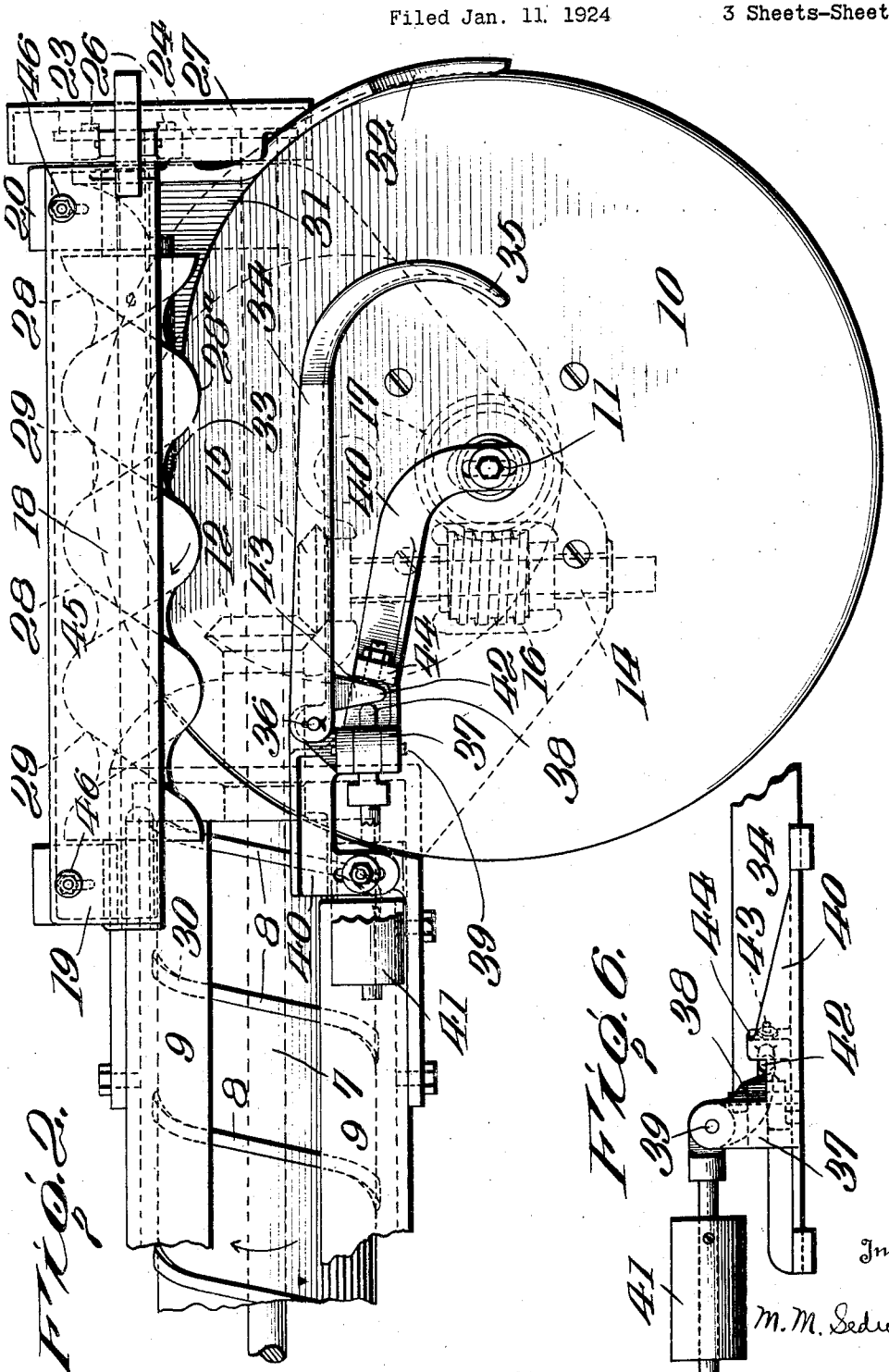


FIG. 2.

FIG. 6.

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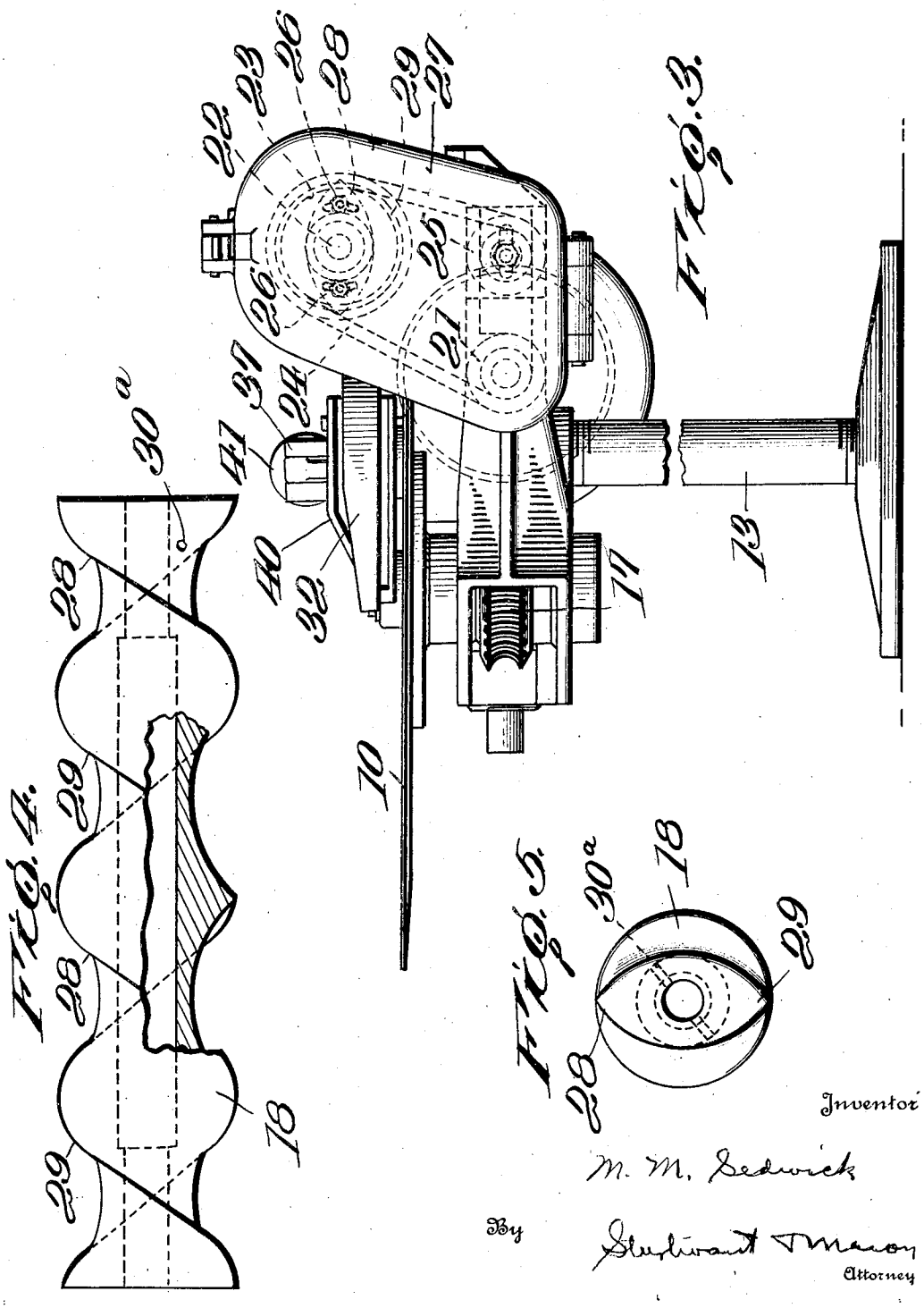
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MECHANISM FOR FEEDING FILLED CANS TO CLOSING MACHINES

Filed Jan. 11. 1924 3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR FEEDING FILLED CANS TO CLOSING MACHINES.

Application filed January 11, 1924. Serial No. 685,599.

The invention relates to new and useful improvements in feeding mechanisms for feeding filled cans to a closing machine, and more particularly a feeding mechanism for delivering the filled cans continuously and in succession one after the other in proper spaced relation for the seaming operations of a rotary closing machine.

An object of the invention is to provide a feeding mechanism which is adapted to receive the filled cans promiscuously; to space the cans from each other, and to accelerate said cans so as to properly space the same for the seaming operations of a closing machine.

A further object of the invention is to provide a feeding mechanism of the above character, with a timing device which receives the cans promiscuously fed thereto, and which separates the cans and feeds them one at a time into the feeding mechanism which delivers the cans to the closing machine.

A further object of the invention is to provide a feeding mechanism of the above type having a rotating feed drum with a spiral thread thereon for delivering the filled cans to the closing machine with a rotating member having a plurality of spiral threads thereon, which receives the filled cans, separates one from the other, and delivers said cans one at a time, to the feed drum.

A still further object of the invention is to provide a machine of the above type with a rotating disk on to which the cans are fed, which disk is so positioned as to carry the cans laterally into engagement with a rotating timing member, said rotating disk having a cam ledge associated therewith which guides the filled cans and directs the same so that they will be engaged by the timing member.

A still further object of the invention is to provide a yielding guide arm which cooperates with said cam ledge in placing the cans in proper position relative to the timing member.

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 plan view showing more or less diagrammatically a closing machine having my improved feeding mechanism applied thereto;

Fig. 2 is an enlarged plan view of the receiving end of the feed drum and the means for timing and delivering the filled cans thereto;

Fig. 3 is an end view of the parts shown in Fig. 2;

Fig. 4 is an enlarged view partly in section and partly in plan showing the double spiral timing element;

Fig. 5 is an end view of the timing element; and

Fig. 6 is a detail view showing in side elevation the manner of mounting the yielding guiding arm.

The invention is directed particularly to a feeding mechanism for feeding filled cans to a closing machine. The closing machine as illustrated is of the rotary type and is provided with a turret which receives the filled cans and delivers said filled cans to the seaming stations of the closing machine. Associated with the rotating turret is a feed drum which has a spiral thread wound thereon, and the filled cans are fed along a support by this spiral thread and are accelerated so that they are brought to the proper spacing of the half molds of the rotating turret so as to be taken up by the turret without any sudden movements of the filled cans which might cause spilling of the contents thereof.

The filled cans are delivered to the rotating drum by the combined action of a rotating disk and spiral timing element. The spiral timing element is mounted to rotate about an axis parallel with the axis of the feed drum and is preferably so disposed as to engage the side of the can while the feed drum engages the bottom flange of the can. The rotating disk is located with its center at one side of the spiral timing element, and is thus so positioned that the rotation of the disk will convey the filled cans laterally into the timing element and thence move the cans along with the timing element. Associated with the rotating disk is a stationary cam ledge with which the cans make engagement, one at a time, and this ledge not only lets the cans easily into the rotating spiral timing element, but also retards the cans and aids in properly spacing the cans to be received by the timing element. Associated

with the stationary cam ledge is a yielding curved arm which cooperates with the rotating disk and the cam ledge so that the cans are fed, one at a time, into the timing element. This rotary timing element as illustrated is driven at half the speed of the rotating drum and is provided with two spiral threads inter-related, so that first one and then the other delivers the cans to the feeding drum. By this slow rotating movement of the spiral timing element, I am able to bring about a proper placing of the can against the thread of the spiral element without any sudden jerks or movements of the cans.

Referring more in detail to the drawings, I have shown in Fig. 1, more or less diagrammatically, a closing machine indicated at 1, which is provided with four closing stations 2, 2′, 2″ and 2‴. It will be understood that the machine rotates. The filled can is received at the station 2 and while it is rotating around to the position of the station 2‴, it will be closed, and then delivered on to the rotating disk 3. Associated with the closing machine is a rotating turret 4 which is formed with a plurality of half molds or pockets 5 which are spaced the same distance as the seaming stations of the closing machine. This rotating turret also is provided with a cover feed 6. These parts are preferably of the construction shown in the Patent #1,348,650, granted August 3, 1920, to Kronquest & Taliaferro, and further detailed description thereof is not thought necessary.

The filled cans are delivered to the rotating turret by a rotating drum 7. Said drum has a spiral thread 8 formed thereon and associated with the drum are supports 9, 9. A can is slid along the supports 9, 9 by the spiral thread and placed in the pockets of the turret. It will be noted that this spiral thread as clearly shown in the drawings has its pitch increased toward the delivery end of the drum, and this is for the purpose of speeding up the filled cans and properly spacing the same so that they will be placed in the pockets of the rotating turret without any sudden jerks or jars. The drum is rotated by suitable connections to the operating mechanism of the closing machine.

The principal part of the invention is directed to the means for feeding the filled cans to the rotating drum 7. At the receiving end of said drum there is a disk 10 mounted to rotate about a center 11. The shaft of the rotating drum 7 is extended and provided with a bevel gear 12. The end of the frame is mounted on an auxiliary standard 13. A cross shaft 14 carried in suitable bearings mounted on the standard 13 carries a bevel gear 15 which meshes with the bevel gear 12. This shaft 14 also carries a worm 16 which meshes with a worm gear 17 mounted on a vertical shaft which carries the disk 10. The pivot 11 is the axis of this vertical shaft. By the above mechanism, as the drum is rotated, the disk 10 will be likewise rotated.

At the receiving end of the drum there is a rotating spiral timing element 18. Said timing element is mounted to rotate about an axis parallel with the axis of the rotating drum. The shaft of the spiral timing element is journaled at one end in a bracket 19 and at the other end in a bracket 20. The shaft of the feed drum 7 is extended beyond the gear 12 and is provided with a sprocket wheel 21 on this end. The shaft 22 of the spiral timing element is likewise provided with a sprocket wheel 23 and a sprocket chain 24 runs over the sprocket wheels 21 and 23. Said sprocket chain also runs over an idler 25 mounted for adjustment on the frame of the machine so as to take up slack in the sprocket chain. Through this sprocket chain, the rotating timing element 18 is rotated from the mechanism which operates the feed drums.

The rotating timing element is in the form of a sleeve as shown in Fig. 4, and said sleeve is secured to the shaft 22 by means of a bolt or pin 30ª. The sprocket wheel 23 is secured by bolts 26 to a flange on the shaft 22. There are curved slots in the sprocket wheel as shown in Fig. 3, and these bolts pass through the curved slots. Said slots are curved about the center of the shaft 22 and thus provide a means whereby a slight adjustment of the sprocket wheel relative to the timing element may be had so as to insure the proper setting of the timing element relative to the spiral thread on the feed drum 7. The sprocket chain and sprocket wheels are enclosed by a casing 27.

The rotary timing element 18 is provided with two spiral threads 28 and 29. Between the threads 28 and 29 there is a spiral recess and between the threads 29 and 28 there is another spiral recess, so that the timing element has two spiral recesses or sets of spiral threads, first one of which becomes active to receive and feed a filled can and then the other. The spiral thread 8 on the feed drum at the receiving end thereof is spaced so that the distance from one thread to the other is the same as the distance between the spiral threads 28 and 29. The circumference of the sprocket wheel 23 is twice that of the sprocket wheel 21, and therefore, the rotating timing element will travel at half the speed of the feed drum, and therefore, first one spiral recess or spiral thread will place a can between the spiral threads on the feed drum, and then the other spiral recess or spiral thread places a can between the threads on the feed drum. Associated with the rotating disk 10 is a fixed cam ledge 31. The receiving end 32 of this cam ledge is lo-

cated at the outer periphery of the disk 10, while the delivery end 33 of the cam ledge is considerable distance in from the extreme edge of the disk 10. It will be noted therefore, that as the disk rotates, a can placed on the disk will be brought into contact with this cam ledge as the cam face of said ledge is eccentric to the axis of rotation of the disk. Furthermore, it will be noted that the cam ledge will crowd a filled can in toward the center of the disk so that when a can first comes into contact with the cam ledge, it is farther from the center of the disk than when it leaves said cam ledge. As a result, the can is retarded and travels comparatively slow when it comes in contact with the rotary timing element 18. Associated with this cam ledge is a yielding arm 34, the receiving end 35 of which is curved. Said arm is pivoted at 36 to a bracket 37. Said arm 34 is turned on its pivot and pressed toward the cam ledge by means of a weighted arm 38 (see Figures 2 and 6). This weighted arm 38 is pivoted at 39 to the bracket 37 and carries a weight 41 which is adjustable toward and from the pivot 39. The arm 38 bears against a projecting lug 42 formed integral with the swinging arm 34. An adjustable stop 43 carried by a perforated lug 44 mounted on the bracket 37 limits the outward movement of the swinging arm 34 through the action of the weighted arm 38 thereon. When said arm 34 is swung to its extreme outer position, the distance between the curved portion 35 thereof and the receiving end 32 of the cam ledge 31 is considerably greater than the diameter of a can. It will be noted that the disk 10 has its center considerably at one side of the longitudinal axis of the rotating spiral timing element, and therefore, the cans are moved by said disk laterally toward said timing element. As the disk travels the cans will come into contact with the curved ledge 31 and will be retarded thereby slightly. This slows up the travel of the cans somewhat, and aids in the preliminary lining up of the cans for reception by the rotating timing element. When the can comes in contact with a spiral thread, if it engages said thread on the crown 28ª or in rear thereof as viewed in Fig. 2, it will be retarded and forced back into the spiral recess in rear of the thread 28. The swinging arm 34 aids in this retarding and placing of the can in rear of the thread 28. If, on the other hand, the crown of the thread engages a can back of the center point, then a can will be moved forward by the thread, in combination with the disk 10 and by the swinging arm gradually forced into the spiral recess in front of said thread 28, or the can may come into contact with the rotating spiral timing element so as to engage the spiral recess between the threads. This spiral timing element as above stated, rotates at half the speed of the feed drum and therefore, the can will be brought into contact therewith with comparatively little jar for the reason of its slow movement, and for the further reason that the spiral thread engages the can by more or less of a wedging movement. After the can has been seated between the spiral threads on the rotating timing element, it will of course, be moved along by the combined action of said timing element and the rotating disk 10, and will be placed so as to be received between the adjacent threads on the rotating drum. As has already been stated, first one thread and then the other thread places a can between threads on the rotating drum, assuming of course, that the cans are coming into the machine as fast as they can be taken care of by the rotating timing element. While the rotating timing element 18 rotates at half the speed of the feed drum, the thread on the timing element is twice the pitch of the thread on the feed drum so that a can really is advanced by the timing element at the same speed as it is received and fed along by the thread on the feed drum. Inasmuch, however, as first one thread and then the other becomes effective for delivering the cans to the feed drum, I have provided a timing mechanism which will receive the cans promiscuously and with little or no jar or sudden movement of the cans, put them into line and properly space the same for the feed drum. It will be noted in Fig. 4 that a longitudinal sectional view through the timing element shows that the sections are curved to conform in a general way to the curvature of the can so that there are no sharp angular parts to strike into a can or cause a jam in any way. The yielding of arm 34 prevents any possible jam of the cans between the same and the crown of the thread on the timing element. If the rounding crown of the thread on the timing element in combination with disk 10 does not force a can forward into the spiral recess in front of said thread, this arm 34 will give until the crown passes the can center, when the arm by its yielding motion gradually will move the can into the recess in rear of this thread.

By my improved timing mechanism, I am able to take cans promiscuously from one or more filling machines, properly time and deliver the same to the feeding mechanism of a single closing machine which is provided with a plurality of closing stations. After the cans reach the receiving disk associated with the timing mechanism, they are moved continuously until they are closed and delivered from the closing machine. The timing mechanism will receive the cans promiscuously and will space them and deliver them to the drum, and the drum will in turn accelerate the cans so as to increase the

spacing to conform to the proper spacing of the seaming stations of the closing machine.

While I have described the timing element as having two spiral threads for engaging and moving the cans, it will be understood from certain aspects of the invention that a single thread may be used, and particularly is this of use where the cans are relatively large in diameter. The rotating disk on which the cans are received, together with the stationary cam ledge and the yielding arm will insure that the cans will be properly nested in the spiral recess of the timing element and delivered thereby between the threads on the rotating feed drum. It will also be understood that more than two threads may be used, if desired, in which case, of course, the rotating spiral element will have to be driven at a relatively slower speed so as to deliver one can at a time between the threads of the drum. In other words, if three threads are used, on the timing element, the speed of the timing element must be as one to three compared with the speed of the feed drum.

While I have shown my improved timing element as used in conjunction with the feed drum of a multiple closing machine, it will be understood, of course, that it may be equally used with advantage, in connection with a single station closing machine wherein the cans are received one at a time and closed, and then discharged from the machine. The spiral feed drum rotates continuously and the threads on the drum are so arranged at their delivery end as to feed the cans directly into the closing machine. A machine such as referred to is shown in the patent to Krummel & Taliaferro, #931,434, granted August 17, 1909. In this use of the timing element, the cans have to be delivered at spaced intervals. The threaded drum accomplishes this result, while the timing element takes the cans promiscuously and places them in proper spaced relation to be received by the feed drum.

It is also obvious that the timing element may be used in conjunction with other types of feeding mechanisms wherein the cans are moved in predetermined spaced relation to each other.

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 thus described the invention, what I claim as new and desire to secure by Letters-Patent, is—

1. In a closing machine, the combination of means for feeding the filled cans in predetermined spaced relation, a rotating disk onto which the filled cans are fed at random, a rotating shaft located above said disk and having a spiral thread for engaging the cans on the disk intermediate the ends of the cans for spacing the cans and delivering the same to said feeding means, a cam ledge associated with said disk for directing the filled cans on the disk into the thread of the shaft and yielding means located on the other side of the cans from said cam ledge for directing one can at a time to said threaded shaft.

2. In a closing machine, the combination of means for feeding the filled cans in predetermined spaced relation, a rotating disk onto which the filled cans are fed at random, a rotating shaft located above said disk and having a spiral thread for engaging the cans on the disk intermediate the ends of the cans for spacing the cans and delivering the same to said feeding means, a cam ledge associated with said disk for directing the filled cans on the disk into the thread of the shaft, and yielding means located on the other side of the cans from said cam ledge for directing one can at a time to said threaded shaft, said can feeding means including a drum having a spiral thread thereon.

3. In a closing machine, the combination of means for feeding the filled cans in predetermined spaced relation, a rotating disk onto which the filled cans are fed at random, a rotating shaft located above said disk and having a spiral thread for engaging the cans on the disk intermediate the ends of the cans for spacing the cans and delivering the same to said feeding means, a cam ledge associated with said disk for directing the filled cans on the disk into the thread of the shaft, and yielding means located on the other side of the cans from said cam ledge for directing one can at a time to said threaded shaft, said can feeding means including a drum having a spiral thread thereon, and said threaded shaft being disposed in a line parallel with the axis of said drum.

4. In a closing machine, the combination of means for feeding filled cans in predetermined spaced relation to each other to the closing machine, means for receiving the filled cans and delivering the same to the feeding means, including a timing screw having a plurality of spiral threads in which the distance between the centers of adjacent threads is that of the spacing of the cans at the receiving end of the feeding means, means for rotating said delivering member so that first one spiral thread and then another becomes effective for delivering a can to the feeding means, a rotating disk associated with said rotating member for moving the filled cans laterally into engagement with said rotating member, and a stationary cam ledge associated with the disk against which the cans are carried by the disk and by the aid of which the cans are directed into the timing screw, said cam ledge being shaped so as to move the cans on the disk

toward the center thereof as they are directed into the timing screw so as to slow down the cans and gradually lead the cans to travel in a direction parallel to the timing screw and thus avoid any jar or jerking of the can as it comes into engagement with the threads on the rotating element.

5. A closing machine including in combination a rotating drum having a thread thereon for delivering the filled cans in proper spaced relation to each other to the closing mechanism, means for receiving and delivering the cans to said drum including a rotating multiple thread timing element in which the space between adjacent threads is substantially the same as the space between the adjacent threads on the drum at the receiving end thereof, and means for rotating said timing element so that first one thread and then another becomes effective for delivering a can to the threaded drum.

6. A closing machine including in combination, a rotating drum having a thread thereon for delivering the filled cans in proper spaced relation to each other to the closing mechanism, means for receiving and delivering the cans to said drum including a rotating multiple thread timing element in which the space between adjacent threads is substantially the same as the space between the adjacent threads on the drum at the receiving end thereof, means for rotating said timing element so that first one thread and then another becomes effective for delivering a can to the threaded drum, and a rotating disk associated with the timing element and disposed so as to support the cans and to deliver the cans by the lateral movement thereof to the timing element.

7. A closing machine including in combination, a rotating drum having a thread thereon for delivering the filled cans in proper spaced relation to each other to the closing mechanism, means for receiving and delivering the cans to said drum including a rotating multiple thread timing element in which the space between adjacent threads is substantially the same as the space between the adjacent threads on the drum at the receiving end thereof, means for rotating said timing element so that first one thread and then another becomes effective for delivering a can to the threaded drum, a rotating disk associated with the timing element and disposed so as to support the cans and to deliver the cans by the lateral movement thereof to the timing element, and a cam ledge associated with said disk for directing the cans into the timing element and for retarding the same so as to insure that only one can at a time will be received by the timing element.

8. A closing machine including in combination, a rotating drum having a thread thereon for delivering the filled cans in proper spaced relation to each other to the closing mechanism, means for receiving and delivering the cans to said drum including a rotating multiple thread timing element in which the space between adjacent threads is substantially the same as the space between the adjacent threads on the drum at the receiving end thereof, means for rotating said timing element so that first one thread and then another becomes effective for delivering a can to the threaded drum, a rotating disk associated with the timing element and disposed so as to support the cans and to deliver the cans by the lateral movement thereof to the timing element, a cam ledge associated with said disk for directing the cans into the timing element and for retarding the same so as to insure that only one can at a time will be received by the timing element, and a yielding curved arm disposed on the other side of the path of travel of the cans from the cam ledge for aiding in positioning the cans in the timing element.

9. In a closing machine, the combination of means for feeding cans in a predetermined spaced relation to the closing mechanism, of means for receiving and delivering the filled cans to the feeding means including a rotating multiple thread timing element in which the distance between adjacent threads is similar to the spacing of the cans at the receiving end of the feeding mechanism, means for rotating said timing element so that first one thread and then another becomes effective for delivering a can, the space between adjacent threads being curved to conform substantially to the transverse curvature of the filled cans, and the crown of each thread being convexed in cross section so as to aid in the placing of the cans between the threads.

10. In a closing machine, the combination of means for feeding cans in a predetermined spaced relation to the closing mechanism; of means for receiving and delivering the filled cans to the feeding means including a rotating multiple thread timing element in which the distance between adjacent threads is similar to the spacing of the cans at the receiving end of the feeding mechanism, means for rotating said timing element so that first one thread and then another becomes effective for delivering a can, the space between adjacent threads being curved to conform substantially to the transverse curvature of the filled cans, the crown of each thread being convexed in cross section so as to aid in the placing of the cans between the threads, a rotating disk for receiving the filled cans and for moving the same laterally toward the timing element and thence along with the timing element, a stationary cam ledge disposed so

as to engage the cans on the rotating disk and gradually direct the same into position to be engaged by the threads of the timing element, and a yielding curved arm associated with said cam ledge and engaging the cans on the opposite side from the cam ledge for yieldingly forcing the cans toward the rotating timing element and thus causing the cans to move into the space between the threads, said rounded crowns of the thread operating to move the can either forward or rearwardly, depending upon the point of engagement of the thread of the can.

11. In a closing machine, the combination of a feeding means for feeding the cans in spaced relation to each other to the closing mechanism, a rotating timing element having a plurality of threads in which the space between adjacent threads is similar to the spacing of the cans at the receiving end of the feeding means, a rotating disk on which the cans are supported at random, a curved ledge associated with the disk for retarding the cans so that they are delivered one at a time to the rotating timing element, said timing element being disposed in a plane above the rotating disk so as to engage the cans intermediate the ends thereof.

12. In a closing machine, the combination of a feeding means for feeding the cans in spaced relation to each other to the closing mechanism, a rotating timing element having a plurality of threads in which the space between adjacent threads is similar to the spacing of the cans at the receiving end of the feeding means, a rotating disk on which the cans are supported at random, a curved ledge associated with the disk for retarding the cans so that they are delivered one at a time to the rotating timing element, said timing element being disposed in a plane above the rotating disk so as to engage the cans intermediate the ends thereof, and a yielding curved arm suspended over said rotating disk for bringing the cans against the curved ledge and rotating timing element.

13. In a closing machine, the combination of a feeding means for feeding the cans in spaced relation to each other to the closing mechanism, a rotating timing element having a plurality of threads in which the space between adjacent threads is similar to the spacing of the cans at the receiving end of the feeding means, a rotating disk on which the cans are supported at random, a curved ledge associated with the disk for retarding the cans so that they are delivered one at a time to the rotating timing element, said timing element being disposed in a plane above the rotating disk so as to engage the cans intermediate the ends thereof, the space between the threads on the timing element being curved in a horizontal section so as to correspond substantially to the curvature of the cans being delivered to the feeding means.

14. In a closing machine, the combination of means for feeding the cans in spaced relation to the closing mechanism, comprising a rotating drum having a spiral thread thereon shaped so as to receive the cans in a predetermined spaced relation and for delivering the cans to the closing machine in proper spaced relation for the seaming stations, and means for receiving and delivering the cans to said drum including a rotating timing element having a plurality of spiral threads, in which the distance between adjacent threads is similar to the distance between the threads at the receiving end of the drum, means for rotating said timing element so that first one thread and then another becomes effective for delivering the cans to the threaded drum, a rotating disk associated with said timing element for receiving the cans at random and delivering the same, to said rotating timing element, and devices associated with said disk for retarding said cans and moving the same laterally into engagement with the timing element and insuring that the cans will be placed between the threads of the timing element whereby said cans are properly spaced for delivery to the feeding drum.

15. In a closing machine the combination of a rotating drum having spiral threads, a rotating disk onto which the filled cans are fed at random associated with said drum, a rotating shaft having a spiral thread located above said disk for engaging the filled cans intermediate the ends of the filled cans and spacing and delivering the filled cans from said disk onto said threaded drum, a cam ledge associated with said rotating shaft having the spiral threads, said threads and said shaft being so disposed relative to the ledge that the disk carries the cans against said ledge and along the ledge into contact with the spiral thread on the rotating shaft, said spiral thread on the rotating shaft operating to space the cans and to convey the cans from the disk onto the rotating drum.

16. In a closing machine, the combination of a rotating drum having a spiral thread thereon, a rotating disk for receiving the cans at random, a rotating shaft having a sleeve provided with a spiral thread disposed above said disk, said shaft having its axis substantially parallel with the axis of the rotating drum, a stationary cam extending over said rotating disk for aiding said threaded shaft and said disk to receive the cans at random and deliver the same, one at a time, to the threaded drum.

In testimony whereof, I affix my signature.

MATTHEW M. SEDWICK.