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H. L. GUENTHER

CAN FEEDING AND TIMING DEVICE

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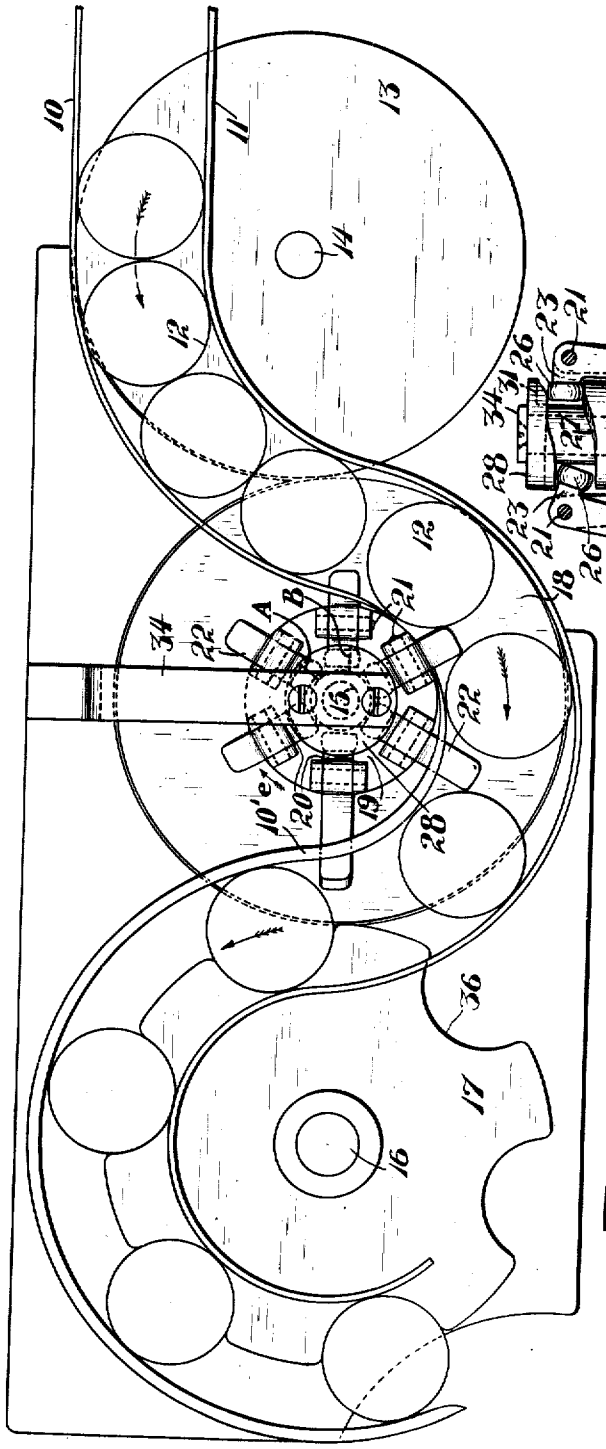


Fig. 1.

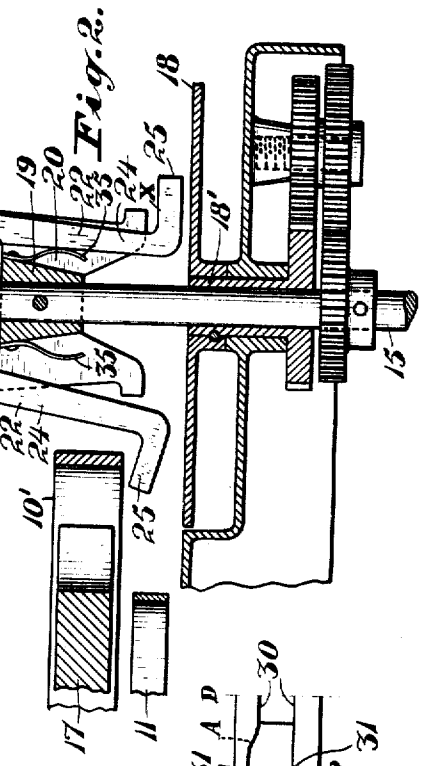


Fig. 2.

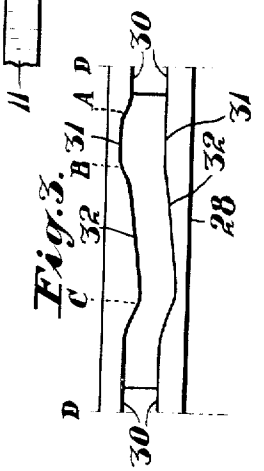


Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY L. GUENTHER, OF LOS ANGELES, CALIFORNIA.

CAN FEEDING AND TIMING DEVICE.

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To all whom it may concern:

Be it known that I, HENRY L. GUENTHER, a citizen of the United States, residing at Los Angeles, county of Los Angeles, and State of California, have invented new and useful Improvements in Can Feeding and Timing Devices, of which the following is a specification.

This invention relates to can machinery, and particularly pertains to means for feeding cans to a machine in proper synchronism with the operation of the machine.

In canning machinery, and particularly in connection with high speed can capping machines it is desirable to feed the cans to the capping machine in proper timed relation and to insure that the speed of the can will be gradually accelerated in its path of travel, thus preventing spilling of the contents of the can during transit. With this idea in view, it is the principal object of the present invention to provide a can feeding and timing device which will operate to space the cans in proper relation to each other and feed them forwardly to a machine at a gradually accelerating rate of speed and in step with the machine to which the cans are delivered.

The present invention contemplates the use of means for delivering the flow of cans to a combined feeding and timing disk, around the rotary axis of which disk a series of feed arms are carried, said arms yieldably operating to position themselves between the cans being fed onto the feed disk, and thereafter positively acting to feed the cans forward to a can receiving member.

The invention is illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a view in plan showing the application of the present invention.

Fig. 2 is an enlarged view in vertical section showing the operating mechanism of the timing and feeding device.

Fig. 3 is a view in elevation showing the developed circumferential face of the timing cam.

Referring more particularly to the drawing, 10 and 11 indicate guide tracks forming a runway along which cans 12 are fed in a continuous flow. These two tracks extend horizontally above an initial feed disk 13 mounted to rotate with its shaft 14. The tracks are parallel to each other and are arranged concentric with the axis of the disk, thus leading the cans around the disk on a concentric path of travel for substantially one-third of the rotation of the disk and then swinging off of the disk and along a path of travel eccentric to a timing shaft 15. The track 10 is interrupted for a distance near the timing shaft 15 and is continued by a track portion indicated at 10'. The track 11 may continue parallel to the track portion and its extension 10' and may then swing around a partial circle concentric with the shaft 16 carrying a final rotary can receiving disk 17, the tracks 10 and 11 being substantially parallel to each other throughout their lengths.

In the type of machine with which the present invention is intended to operate, the disk 17 receives the cans consecutively and carries them to a double seaming mechanism not shown in the present drawings, while the cans are supplied with can caps. It is to be understood, however, that the timing mechanism here disclosed may be of any design, and that the cans are caused to accelerate in their speed from a slow undetermined speed on the disk 13 to a relatively fast positive speed and in fixed sequence on the disk 17. The structure by which this is accomplished is carried by the timing shaft 15 and comprises a feed disk 18 carried on a hub 18' through which shaft 15 extends and by which hub it is driven at a different rate of speed from that of the shaft. Secured upon an extension of the shaft is a hub 19 having a plurality of longitudinally extending and radially arranged slots 20 therearound. The metal upon the opposite sides of the slots or grooves and at the top of the hub provide bearings for pivot pins 21, which pins carry the feed device 22. These members are in the shape of bell cranks having short horizontal extensions 23 and long vertical arms 24, which extend down along the grooves of the hub and terminate in outwardly projecting can engaging fingers 25. The short lever arms 23 carry rollers 26 which are adapted to travel along the groove 27 of a cylindrical cam 28. The shape of the groove is indicated in Fig. 3, where it will be seen that a straight line 30 extends substantially from A to D and from D to C, it being understood that small fillets are formed at points A and C to unite with continuations of the upper groove face. At A the face is led upwardly and merges into a straight relieved

portion 31 extending from A to B. The upper face of the groove then inclines downwardly, as indicated at 32, crossing the plane of the face 30 and returning to this plane near the line C. The lower face of the groove will be seen to be parallel to the upper face throughout its length, with the exception of the portion from A to B, at which point it will be noted that the upper face 31 is removed from the lower face 31 a greater distance than the remaining parallel faces of the groove, thus providing a certain amount of play or lost motion for the rollers 26. The cam 28 is held against motion by a supporting arm 34, so that the rollers may be carried along the cam grooves as the timing shaft 15 and the structure 19 are rotated. This action will cause the feed device 22 to be positively swung outwardly at certain points during the rotation of the shaft. It is intended that the relieved portion 31 of the cam shall occur at a point slightly in advance of an intersecting line drawn through the axes of shafts 14 and 15. This makes it possible for the fingers 25 to yield when a can encounters them and which can is out of step with the feed device. Springs 35 are disposed in the rear of each of the members 22 and normally hold them in the positions shown at X in Fig. 2, while permitting them to yield sufficiently to allow a can to be crowded forwardly and between two adjacent feeding devices. This yieldable mounting of the members 22 will insure that the cans will be properly timed and fed forwardly in spaced relation to each other, at the same time eliminating the possibility of crushing the cans when they are not fed to the feeding device in proper step. Coincident with this operation the disk 18 is traveling at a speed of about ten per cent slower than that of the shaft 15, thus making it possible for the fingers to gradually catch up with the cans on the disk.

As the hub 19 continues to rotate in the direction of the arrow —*e*—, the rollers which have passed along the portion A—B of the cam groove will then encounter the downwardly inclined length 32 by which they will be gradually lowered to positively swing the members 22 outwardly until the respective rollers reach the end of the inclined groove portion 32, when the fingers 25 will be caused to recede. This movement will begin to take place approximately when the feed devices 22 cross a line intersecting the axes of shafts 15 and 16, at which points the cans will be delivered and positioned within semi-circular pockets 36 formed around the circumference of the disk 17. It is to be understood that various feed devices might be used as substitutes for the disk 17, but that in each instance they will be operating in synchronism with the shaft 15 and will be positively supplied with a can as the can receiving members move to a receiving position.

Attention is directed to the fact that there are no can engaging members disposed in the floor or upon the disks over which the cans travel, thus eliminating the possibility of spilling the contents of the cans when they are not accurately positioned relative to the feeding and timing device.

It will thus be seen that the mechanism here disclosed provides means automatically adapting themselves to the successive cans in a flow of cans to time the cans, and to thereafter positively operate to feed the cans forwardly from a relatively slow speed can delivery device, to a relatively high speed can receiving device.

While I have shown the preferred form of my invention as now known to me, it will be understood that various changes might be made in the combination, construction and arrangement of parts by those skilled in the art, without departing from the spirit of the invention, as claimed.

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

1. The combination of two can carrying devices which respectively transport cans at a slow speed and at a faster speed, and an intermediate can timing and feeding device for transferring the cans from the slower carrier to the faster carrier, said feeding devices having yieldably cushioning means at the limit of their inward movement for spacing the cans and movable outwardly beyond the cushioning means for thereafter positively feeding the cans at a uniform speed of acceleration.

2. The combination of two can carrying devices which respectively transport cans at a slow speed and at a faster speed, and an intermediate transfer device embodying means for automatically spacing the cans as they are delivered from the slow speed carrying device and thereafter positively actuated to transfer the cans to the second carrying device at a uniform rate of acceleration, and cushioning means mounted independently of the spacing means and operating on the said spacing means only when first engaging the can, said spacing means being moved beyond the cushioning means when positively actuating the cans.

3. The combination of two can carrying devices which respectively transport cans at a slow speed and at a faster speed, the slow speed carrying device feeding a continuous flow of cans and the faster speed carrying device feeding the cans in equal spaced relation to each other, and an intermediate timing and feeding device adapted to both space the cans relative to each other as they are delivered from the first carrying device and to deliver the cans to the second carry-

ing device while traveling at a uniform rate of acceleration, and cushioning means operating on the transfer device only when first engaging the cans, the transfer device being movable beyond the cushioning means to positively actuate the cans.

4. A can feeding mechanism comprising can carrying devices, one of which receives a continuous flow of cans and feeds them at a slow rate of speed, and the other of which receives the cans in timed sequence, positively feeding them forward in spaced relation to each other at a high rate of speed, an intermediate can timing and feeding device comprising a plurality of feed members individually acting to space the cans and thereafter positively acting to feed the cans forwardly at a uniformly accelerated rate of speed and means for cushioning the feed members while the same are engaging a can, said members being movable outwardly beyond the cushioning means.

5. A can feeding mechanism comprising can carrying devices, one of which receives a continuous flow of cans and feeds them at a slow rate of speed, and the other of which receives the cans in timed sequence, positively feeding them forward in spaced relation to each other at a high rate of speed, an intermediate can timing and feeding device comprising a plurality of feed members individually acting to space the cans and thereafter positively acting to feed the cans forwardly at a uniformly accelerated rate of speed, and means for cushioning the feed members while the same are engaging a can, said members being movable outwardly beyond the cushioning means and guide rails between which the cans travel while being transported by said feed means.

6. A can feeding mechanism comprising two can carrying devices, one of which feeds a flow of cans at a slow rate of speed, and the other of which receives the cans in separate timed relation to each other and feeds them forwardly at a fast rate of speed, guide tracks concentric with the axes of said can carrying devices, and along which the cans travel as they are being carried, said track portions being united by an intermediate trackway along which the cans are transported from one carrying device to the other, and a combined can timing and feed device engaging the cans and transporting them along the intermediate trackway from one can carrying device to the other, said can feeding device having a plurality of can engaging members yieldably operating to dispose the cans in spaced relation to each other and thereafter positively operating to feed the cans forwardly at a uniform speed of acceleration from the speed of the first can carrying device to that of the second.

7. A can feeding device comprising a rotary disk having a plane horizontal face upon which cans may rest and by which they may be transported, a horizontal trackway extending across the disk and by which cans are guided onto the disk and off therefrom, a set of arms mounted upon a rotatable support above the disk and movable radially thereof and independently of each other in vertical planes, said arms acting to positively propel the cans along the trackway at a uniformly accelerating speed of travel while the arms and their support and the disk are rotating around a common axis and in the same direction.

8. In a can feeding mechanism, substantially parallel tracks between which a can may be guided and by which the path of travel of the can may be determined, a plane surface over which the can moves, a rotary can feeding device disposed adjacent said trackway and above said surface, said device comprising a hub rotating around a vertical axis, a series of separately and radially movable can propelling members operating in vertical planes to propel the cans along said trackway and at a uniformly accelerating speed of travel, and means for separately actuating the said members in said movement whereby they will separately move cans along the trackway at the gradually accelerating speed of travel.

9. In a can feeding device, horizontally extending parallel trackways for guiding a can along an arcuate path of travel, a rotary feed device eccentric of said path of travel, and disposed at one side of the track, a plurality of independently movable members adapted to separate the successive cans fed onto the trackway and positive means for causing the cans to be propelled along the trackway thereby and cushioning means operating while the said members are moving into engagement with the cans, said members being movable outwardly beyond the cushioning means.

10. In a can feeding device, horizontally extending parallel trackways for guiding a can along an arcuate path of travel, a rotary feed device eccentric of said path of travel, and disposed at one side of the track, a plurality of independently movable and yieldable members adapted to separate the successive cans fed onto the trackway, positive means for swinging the said members vertically for causing the cans to be propelled along the trackway thereby, and at a gradually accelerated speed.

11. A can feeding mechanism comprising a pair of spaced rails forming a horizontal trackway along which cans may be guided, said rails lying along arcs of concentric circles, a combined feed and timing device disposed to rotate on a vertical axis on one side of the rails, said device comprising a plurality of radially moving arms swinging in

vertical planes, means for permitting the arms to individually yield while moving into engagement with the cans and to dispose cans in spaced relation to each other along the trackway, and means acting upon said arms for causing them to positively feed the cans forwardly along the trackway as the feed device rotates, said means being adapted to carry the arms outwardly beyond the yieldable means.

12. A can feeding mechanism comprising a pair of spaced rails forming a horizontal trackway along which cans may be guided, said rails lying along arcs of concentric circles, a combined feed and timing device disposed to rotate on a vertical axis on one side of the rails, and eccentric of the path of travel, said device having vertically swinging arms moving outwardly to accelerate the speed of the cans and cushioning means operating only at the inward limit of the movement of the arms.

13. A can feeding mechanism comprising a pair of spaced rails forming a horizontal trackway along which cans may be guided, said rails lying along arcs of concentric circles, a combined feed and timing device disposed to rotate on a vertical axis on one side of the rails, and eccentric of the path of travel, and having radially movable arms arranged to swing outwardly in vertical planes to accelerate the speed of the cans and a feed disk extending beneath the track and rotating with the feed device and upon which the cans rest.

14. A can feeding mechanism comprising horizontally extending guide means along which a can may travel, a constantly rotating support onto which the cans are delivered, and positive timing means for advancing the cans carried by said support, the support and timing means moving at different rates of speed, and cushioning means operating only while the timing means is moving into engagement with the cans, said timing means being movable outwardly beyond the cushioning means.

15. A can feeding mechanism comprising horizontally extending guide means along which a can may travel, a constantly rotating support onto which the cans are delivered, positive timing means for advancing the cans carried by said support, the supporting means traveling at a slower rate of speed than the positive feed means, and cushioning means operating only while the timing means is moved into engagement with the cans, said timing means being movable outwardly beyond the cushioning means.

HENRY L. GUENTHER.