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AUTOMATIC BOTTLE FEED MECHANISM FOR LABELING MACHINES.

APPLICATION FILED JAN. 16, 1915.

1,203,676. Patented Nov. 7, 1916.

4 SHEETS—SHEET 1.

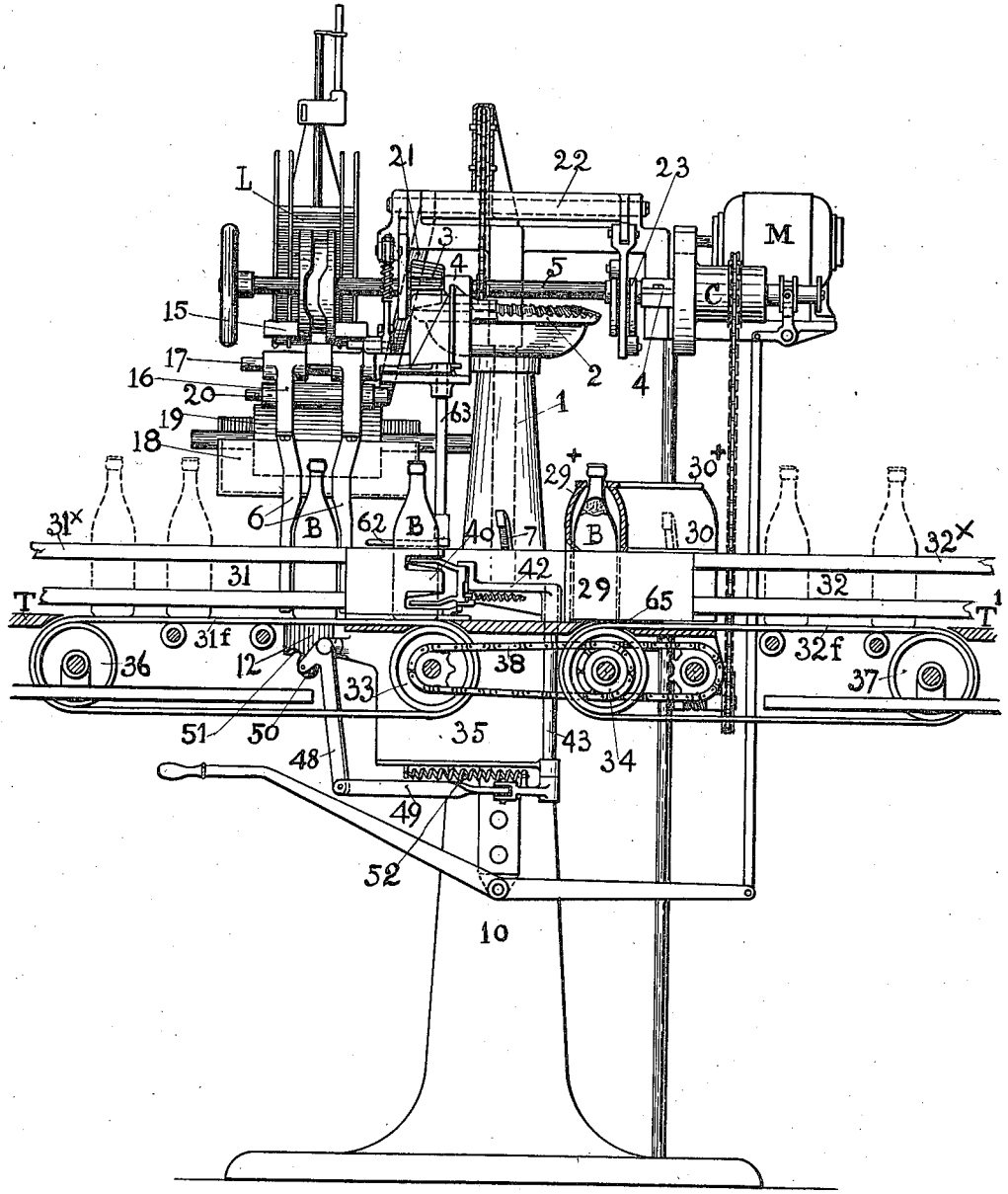

FIG. 1.

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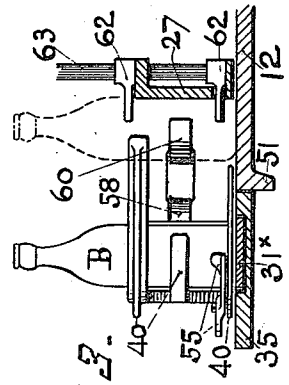

FIG. 3.

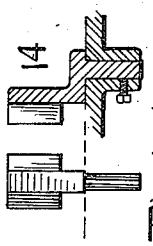

FIG. 4.

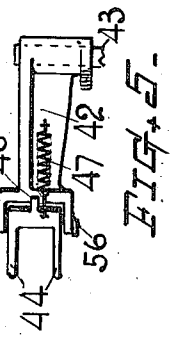

FIG. 5.

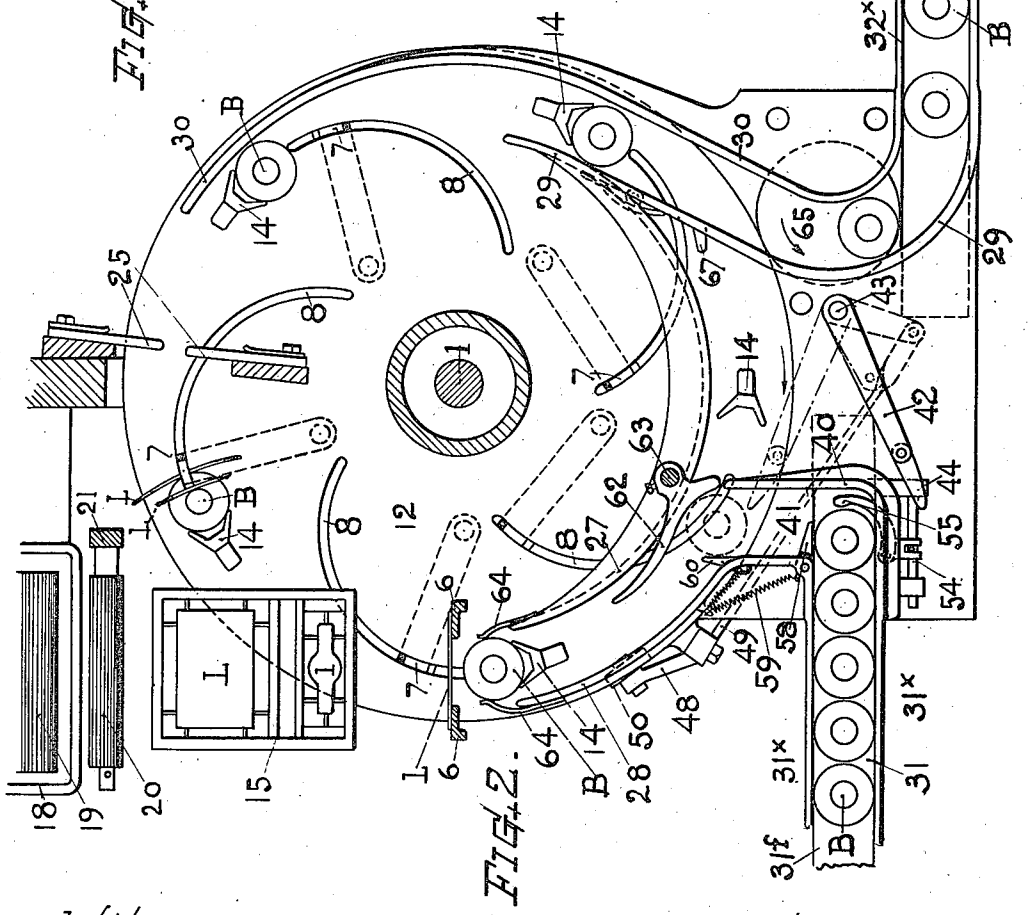

FIG. 2.

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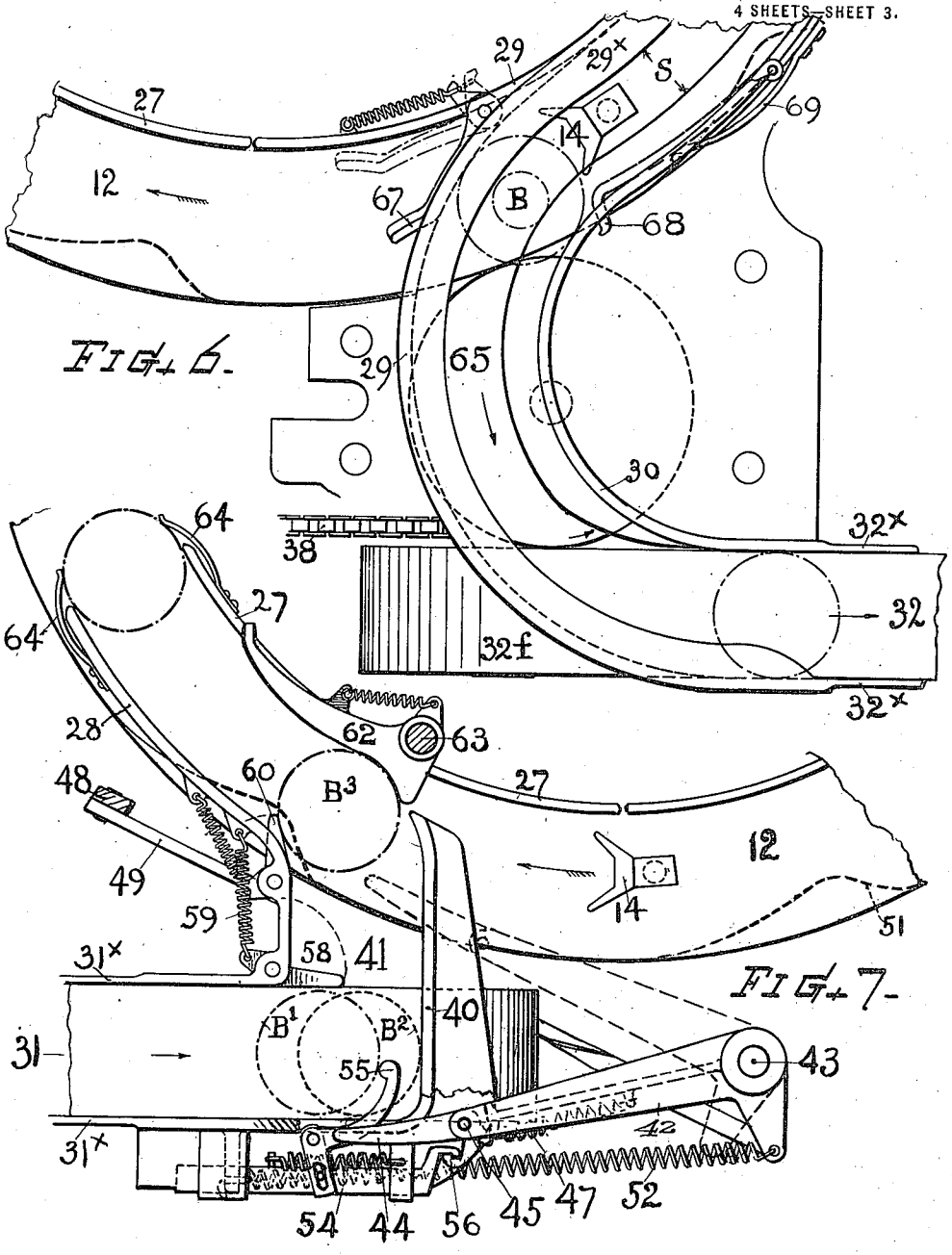

FIG. 6.

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4 SHEETS—SHEET 4.

FIG. 9.

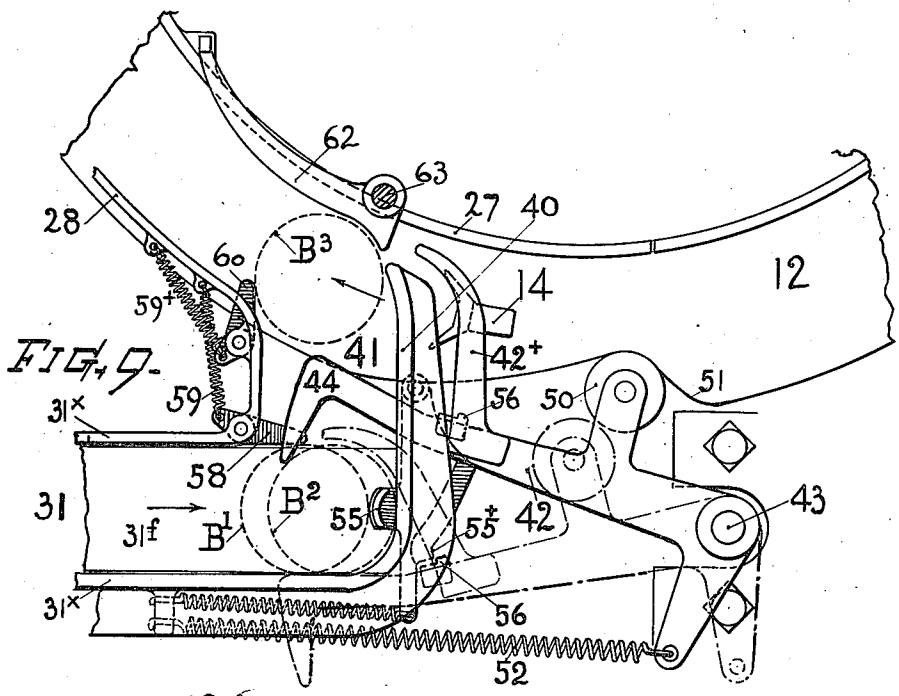
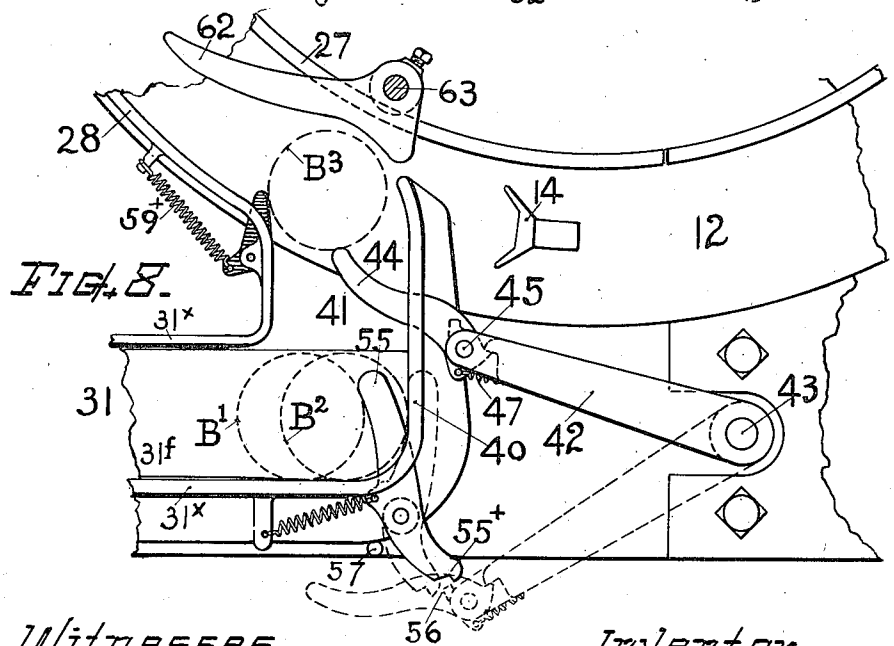


FIG. 8.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC BOTTLE-FEED MECHANISM FOR LABELING-MACHINES.

1,203,676. Specification of Letters Patent. Patented Nov. 7, 1916.

Application filed January 16, 1915. Serial No. 2,746.

To all whom it may concern:

Be it known that I, FRANK O. WOODLAND, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Automatic Bottle-Feed Mechanism for Labeling-Machines, of which the following is a specification.

My present invention relates to a novel construction and organization of mechanism, more especially adapted for automatically conducting and feeding bottles or other containers and similar articles, in labeling machines, in which a rotary or traveling carrier is employed; the prime object being to provide a mechanism which can be operated at a high rate of speed with practical efficiency.

Another object is to provide an automatic bottle feeding means actuated by the moving bottle carrier, and controlled by approaching bottles or the like, as more fully hereinafter explained.

Minor objects and features of invention are set forth in the following detailed description; the particular subject matter claimed being hereinafter definitely specified.

In the accompanying drawings, Figure 1 represents an elevation view of mechanism embodying my invention as applied to a labeling machine. Fig. 2 represents a horizontal section or plan view of the conveyer, rotary carrier and adjacent parts, on a somewhat larger scale. Fig. 3 is a sectional view showing the barrier at the end of the feed-way. Fig. 4 shows the front and side of the pushing rest separate from other parts. Fig. 5 is a separate front view of the feeding-in lever. Fig. 6 is a plan diagram on somewhat larger scale illustrating the action of the discharging devices. Fig. 7 is a plan diagram illustrating the action of the feeding devices. Figs. 8 and 9 are plan views illustrating modifications in the construction of the feeder element and its locking devices.

The labeling mechanism to which my invention as herein illustrated is applied, is in general character substantially as described in my prior Letters Patent, numbered 1,113,854 and 1,113,855; but it will be understood that the invention may be employed with labeling mechanism of other construction, and of a character to which the same may be applied without substantial change in the nature of the invention defined in the subjoined claims.

Referring to the drawings, the numeral 10 indicates the frame or supporting column having a broad foot or base; 12 indicates the moving carrier or rotary table mounted to revolve about a vertical axis or shaft 1 fixed in said column. The carrier has an annular horizontal top surface that is provided with a series of rests or pusher devices 14 fixed thereon and arranged at intervals near its periphery, and adapted for supporting bottles or the like in upright position, to move or travel in a predetermined path as the carrier is operated.

5 indicates the operating shaft to which power is applied from an electric motor M or other driving means, through a suitable clutch C that may be thrown into and out of action by a lever or other means. Said shaft is connected for operating the carrier by a beveled pinion 3 and gear 2, as shown on Fig. 1.

15 indicates the label-supply holder; 16 the picker-carrier mounted on the axis-shaft 17 and having glue-applying pickers 6 attached thereto, which take labels from the label holder and move to meet the advancing bottle B upon the carrier, for presenting the label or labels thereto, and 7 indicates the grip-devices that primarily clamp the labels to the bottles and assist in stripping the freshly glued labels from the faces of the pickers 6.

18 indicates the reservoir for the glue, gum, or adhesive substance; 19 the delivering roller, and 20 the distributing or transfer roll that deposits the film of glue or adhesive upon the faces of the pickers. The distributing roller is carried by an arm 21 attached to the rocker shaft 22 which is actuated by suitable cam mechanism 23 in connection with the operating shaft.

25 indicates the label affixing wipers which may be arranged in any suitable manner for wiping on the labels as the traveling carrier passes the bottle between them.

Above and adjacent to the face of the car-

rier 12, along the portions where the bottles or articles to be labeled are entered thereon, and where discharged therefrom, I provide curved stationary guards or fenders 27, 28, 29 and 30, forming inner and outer walls inclosing the carrier path or way along which the bottles are advanced; said guards being of suitable form and height to prevent the bottles from tipping over or from lateral displacement as they are moved along by the propelling mechanism.

Near the side of the carrier there is arranged a feed-way 31 and a discharge-way 32 relatively disposed substantially as shown; the feed-way comprising suitable side guards 31^x and a traveling conveyer or endless belt 31^t that runs over a pulley 33 having its axis support mounted upon the stationary frame or stand 35, connected with the machine standard 10, or some permanent part of the frame. The discharge-way 32 is arranged in connection with the carrier exit, and comprises side guards 32^x and a traveling conveyer or endless belt 32^t that runs over a pulley 34 having its axis shaft supported upon the stand 35, preferably parallel with the axis of pulley 33. The outer end loops of said conveyer belts respectively run over pulleys 36 and 37, which can be located at any convenient distance away from the stand 35; and suitable intermediate supports or rollers are provided for sustaining the upper run of said belts. The conveying surfaces are disposed approximately level with the top face of the carrier 12.

The parallel guards 31^x and 32^x are arranged on either side of and above the conveyer-belts to embrace a guide-way space, the width of which is slightly greater than the diameter of the bottles or containers to be conveyed, and within said space the bottles are caused to travel while standing upon the moving belt. The driving power for operating the conveyer-belts is applied to the axle of one of the pulleys, by any suitable means, while the axles of the pulleys 33 and 34 at the adjacent ends of the conveyers are provided with sprocket gears and connected by a drive-chain 38 or other suitable operating connections. The proportion of the sprockets, or connecting gearing, is preferably made so that the feed-way conveyer will travel at slightly greater velocity than the discharge-way conveyer; such velocity being gaged at a speed sufficient to normally bring forward a supply of bottles or the like equal to the full capacity of the carrier and labeling mechanisms.

Suitable tables T T^1 may be provided at the outer ends of the feed-way and discharge-way conveyers, to facilitate handling the bottles, or said conveyers may be arranged to take and deliver directly from and to other machines in a bottling plant.

At the inner end of the feed-way 31 a transverse guard or barrier 40 is provided, and a lateral pass-way 41 leading from the conveyer to the carrier path or into the space between the curved guards 27 and 28, as best shown in Figs. 6 and 7. An intermittently operating means is combined with the pass-way and carrier for automatically forcing successive bottles from the feed-way conveyer to the carrier. The inner end of said pass-way is preferably curved or inclined toward the direction in which the carrier moves, thus giving a forward trend to the incoming bottle as it is projected onto the carrier.

The barrier 40 is preferably of skeleton structure, (see Fig. 3) and the feeding-in device 42 is arranged adjacent thereto for driving or shunting the bottles successively from the feed-way 31 through the passage 41 and into the path of the advancing pushing rests 14. In the present instance said feeding-in device consists of a horizontally swinging arm or lever fulcrumed upon an upright shaft or axis stud 43, and provided at its end with fingers or prongs 44 that extend between the bars of the barrier and sweep along the passage way 41, when operating.

The furcated end of the lever is made of suitable shape and size for taking or shunting a single bottle only at each forward stroke thereof. The fingers 44 may be stiff, or can be jointed to the arm by a hinge or pivot 45 and provided with a back stop 46 and a retracting spring 47, (see Fig. 5) so that during the backward swing of the arm the fingers 44 can fold inward to pass any obstruction and then assume normal relation as the arm reaches its primal position. Actuating means is provided for working the feeding-in devices in coöperation with the carrier 12, and at intervals to correspond with the spaces of bottle-pushing rests 14. Said means includes a roller 50 that runs against cams or shaped surfaces 51 upon the rim or periphery of the movable carriers 12, and having suitable connection with the feeder, either directly, or as illustrated in Fig. 1, by an angle lever 48 fulcrumed upon a stationary support, one of its arms being connected by a rod 49 to an arm fixed on the upright shaft 43, while its other arm has the roll pivoted thereon. A spring 52 is suitably combined with the feeding-in devices for exerting pressure and moving the lever in opposition to the cam.

A bottle-actuated catch device is arranged at or near the end of the feed-way 31 for holding the feeding-in arm 42 at outward idle position, except when a bottle or the like is brought into position to be transferred to the carrier. As shown in Fig. 7, a spring-pressed movable catch-member 54 is arranged to move past a lug or detent on

the arm 42 when the latter swings back, and to thus prevent action of the feeding device until said catch is retracted; the retraction being effected by a feeler member 55 that projects into the feed-way and is engaged by the approaching bottle just previous to its reaching the barrier 40. The faces of the engaging members may in some instances be made to merely latch one against the other as a stop; but preferably said parts are formed as interlocking members or counter-matching offset lugs, as best shown in Fig. 7 at 56, so that the arrested feeding-in lever 42 temporarily prevents withdrawal of the catch-device and feeler 55, while the catch-device prevents forward movement of the feeding-in lever. A slight backward movement of the feeding-in lever 42 is required for disengaging the interlock of the lugs from each other, and then the catch device can be retracted to permit the feeding-in lever to swing forward and propel the bottle through the lateral pass-way. A peculiar feature of this means is the dual locking effect which not only holds back the feed lever, but simultaneously prevents retraction of the catch device until the predetermined instant. The locking means or catch lug 56 can, if desired, be formed upon the same part which serves as the bottle-actuated trip-finger; said part 55 being made in suitable shape to bring its end 55^{x} into proper relation for engaging with the feeding-in member, an example of which is illustrated in Figs. 8 and 9.

58 indicates a swinging guard member or gate hingedly supported upon the inner guiding wall 31^{x} and projecting in alinement therewith partially across the lateral opening at the junction of the feed-way 31 and pass-way 41; the purpose of which gate is to keep the bottles in line until they reach the barrier 40. A spring 59 is provided for giving a yielding force upon said gate sufficient to normally maintain the alinement, but weak enough to permit the gate to swing out of the passage when the feeder lever 42 acts.

60 indicates a swinging spring-pressed gate or member arranged to project into the passage at the position where the pass-way merges with the carrier path; the purpose thereof is to obviate any liability of the bottle escaping from the end of the feeding-in device before it has been fed fully into alinement with the pushing rests 14, or is completely up to the required position before taking the carrier movement.

62 indicates the feeler devices for actuating the picker-stop and controlling the label-feed action. Said feeler extends into and along the carrier-path in such manner that an advancing bottle or the like as it comes through the guiding pass-way 41 and assumes its position and advancing motion in the carrier path will force back the feeler and thereby control the acting engagement or non-engagement of the stop members.

64 indicates spring fingers, or means arranged upon the fenders 27 and 28 for giving a moderate degree of friction against the moving bottle or article, to insure that the bottle is close seated against the pushing rest 14 before the label-gripping device is brought into contact therewith.

For discharging the bottles from the carrier 12 the fenders or guards 29 and 30 are continued in a compound curve to connect with the guiding members 32^{x} of the discharge-way, as illustrated in Figs. 2 and 6.

Between the side of the carrier 12 and the discharge conveyer there is arranged a whirler disk 65 or flat horizontal circular plate that is rotatable on a vertical axis spindle, and operated by having its peripheral edge in rolling contact with the edge of the carrier, or by other means, whereby rotary motion is imparted to said whirler in the direction indicated by arrow. The flat top surface of the whirler is substantially level with the surface of the carrier and conveyer.

The guard fenders 29 and 30 inclose a curved exit-way from the path of the carrier to the discharge-way across the advancing side of the whirler. The fender 29 is provided with an opening to allow the series of pushing rests 14 to pass through, but is made continuous above the height of said rests. It is provided with a swinging spring-pressed gate 67 at its lower edge that keeps the bottle in proper relation to follow the discharge passage, but allows the pusher rests to pass in their regular path.

The portion of the guiding fender at the outer curve near the whirler may be provided with a swinging bar or section 68 (see Fig. 6) pivoted at its leading end and adapted to swing inward at its other end, and having a spring 69 combined therewith for giving a yielding inward pressure that tends to force the bottles toward the opposite guard as they leave the pusher rest and approach the whirler plate. In Fig. 2 the guard fender 30 is shown with the swinging bar 68 omitted, since such construction may in some instances be employed.

The curved guards or fenders 29 and 30 may in some instances be made of the same height as that shown for the in-feed guards 27 or 28, which is about the height of the body of the bottle, more or less. But as an effective improvement said guards, along the discharging side of the carrier, or a portion thereof, may be provided with upwardly extended inwardly overhanging top portions 29^{x} and 30^{x}, each having a guiding edge disposed at about the height of the neck of the bottle just below the swell of its head; (see Figs. 1 and 6) the two opposite

members being arranged with a space S between their top edges sufficient for loosely embracing and guiding the necks of the bottles; thereby obviating liability of a bottle being tipped over while carried rapidly along the path and across the whirler 65 to the discharge conveyer 32.

Fig. 2 illustrates the guards as made without, and Fig. 6 as made with the extended top or neck-guiding portion.

Fig. 8 illustrates a modification in the construction of the feed-controlling catch and interlock members; wherein the feeler 55 and catch-member are made as a single piece lever, the engaging lug on said part and the feeding-in lever being formed as indicated at 56^{x}. Dotted lines show the lever 42 as swung back for releasing the interlock of the lugs. Fig. 8 also shows an instance omitting the swing gate at the back of the feed-way. 57 indicates a pin for limiting the range to which the arm may be thrown back. Other forms of catch devices performing similar function, may in some instances be used if desired.

Fig. 9 illustrates a modification in which the feeding-in lever 42 is provided with rigid instead of hinged prongs 44, and with a forwardly projecting member or finger 42^{x} that extends in front of the bottles and serves to facilitate the rapid transfer of the single bottles. The lever is also made with an attached arm or member having the cam-contacting roll 50 mounted thereon for actuating the feeding-in lever directly from the cam surfaces 51 formed on the edge of the rotating bottle carrier 12. The catch-piece 55 is also made of somewhat modified shape and its inner end pivotally fulcrumed upon the barrier frame, the engaging lug 56^{x} being at the outer end of said catch-piece.

The portion of the fender 30 along the edge of the carrier 12, may be of skeletonized structure, or formed of a number of longitudinal ribs with open spaces between them, so that any waste material or chips of glass falling upon the carrier, will be thrown off through or beneath the open fender, and without passing to the bottle-delivering conveyer.

In the operation; the bottles are placed in any manner in upright position upon the moving feed-way conveyer, and are thereby brought forward to the barrier or position B^{1} indicated by dotted lines on Fig. 7 where they are temporarily arrested by the locked catch device until the feeding-in lever or member 42 is, by the action of cam 51 and connections 48—49, moved slightly backward sufficient to release the interlock. Then the traveling conveyer-belt 31^{t} causes an advance of the bottle up to the barrier, or to position B^{2}, forcing back the finger 55 and unlocking the catch device 54; thus permitting the spring 52 to throw forward the feeding-in lever 42, the movement of which projects the bottle along the face of the barrier 40 through the pass-way 41 to the position B^{3} within the path of the carrier as defined by the guard fenders 27 and 28, and in line with advancing pushers or rests 14, one of which then pushes the bottle forward with the movement of the carrier until the bottle passes between the guards or fenders 29 and 30, which guards crowd the bottle from in front of the pusher 14 and shunts it onto the whirler 65, the rotary motion of which gives to the bottle an impetus that delivers it onto the traveling belt 32^{x} of the discharge-way conveyer 32, by which it is carried to the packers' table T^{1}, or any predetermined place of delivery. In like manner successive bottles are passed through the operation as fast as the series of pushing rests 14 on the moving carrier can take them away from the position B^{3}, to which they are continually successively fed by a synchronous action of the automatic feed mechanism. If a bottle is absent from the position B^{1} on the conveyer the feeding-in lever 42 and trip 55 remain locked and there is no action of the feeding-in mechanism. Hence, while the mechanism can operate fed to the full capacity of the series of pushing rests, no derangement in the perfection of action, or quality of the work, is liable to occur should the supply of bottles be irregular, or occasional bottles missing from the regular succession.

When the machine is running at a very high speed the bottles come to the barrier 40 with such velocity that there is practically no delay by the locking action of the catch-device 56 and feeding-in device 42, except when the approaching bottles are at some distance apart, or varying in such distances, then the locking and unlocking is effective for regulating the instants of feeding-in action to properly correspond to positions of supporting or pushing rests on the continuously moving carrier.

As I am aware that some mechanical changes and modifications may be made in practising my invention, by persons skilled in the art, without departing from the spirit and scope of the invention as expressed in the claims, it will be understood that I do not wish to be limited to the particular form of construction herein shown.

What I claim and desire to secure by Letters Patent, is—

1. In a feed mechanism for bottle labeling machines, in combination, a rotary carrier table having upright bottle pushing and centering rests fixed thereon, inner and outer stationary curved fenders forming upright walls adjacently above the carrier table and defining the path in which said pushing rests are carried, a feed-way having a trav-

eling bottom, a transverse barrier and a lateral pass-way at the end of said feed-way; a horizontally swinging feeder-fork fulcrumed in line with the feed-way, its furcated end extending through the barrier into the pass-way and adapted for contact with a bottle and to move it along said pass-way, a catch device engageable with a lug on the feed-fork at its outward position, a bottle actuated means for releasing said catch, means for operating said feeder-fork including a spring for giving forward movement to said fork, and connections actuated by a cam-surface on the carrier for controlling the movement thereof.

2. In a machine for the purpose described, in combination, a rotary carrier having upright rests thereon for the support of bottles or the like at pre-determined intervals, stationary path-defining fenders adjacently above the carrier, a traveling-bed feed-way terminating with a laterally offset pass-way into the path of the carrier, a swinging feed-lever fulcrumed at a position beyond the barrier and in alinement with said feed-way, its free end extending through said barrier into the pass-way and adapted to swing across the end of said feed-way for forcing the foremost bottle from said feed-way to the carrier-path, and means for automatically arresting action of said feed-lever except when a bottle or the like is positioned in the feed-way at the pass-way.

3. In a mechanism of the character described, in combination, with a rotary carrier provided with means for supporting and advancing bottles or the like, a feed-way comprising guides and a traveling conveyer, said feed-way provided with a terminal barrier and a pass-way from said conveyer to said carrier, and a movable feeding-in element adapted for transferring a bottle through said pass-way, of a detaining catch for said feeding-in element, said parts having counter engaging members that mutually interlock to prevent withdrawal of said catch, but are releasable by slight backward movement of the feeding-in element, means including a cam carried upon said rotary carrier adapted for effecting such backward movement of said feeder-in element, and a catch-actuating member that contacts with the bottles when at or near the terminal end of the feed-way.

4. In a mechanism of the class described, a bottle-feeding device, comprising a swinging lever fulcrumed upon an upright axis-member, and having a furcatedly pronged end adapted for supporting and moving single bottles in upright relation, in combination with an in-coming feeding conveyer alined directly toward the fulcrum of said lever, but terminating with a transverse skeleton barrier and pass-way, through and along which the furcatedly pronged end of said feeding-device swings across the conveyer, a moving carrier that receives the bottles therefrom, means including cam surfaces upon said carrier for operating said feeding-devices, and means for controlling the instant of feeding action.

5. In a mechanism of the class described, the combination with a rotary carrier, path defining guards adjacent thereto, and a traveling-belt feed-way having a barrier and pass-way, of a swinging transferring-lever or arm provided with a hingedly connected end member adapted for moving a bottle or the like from said feed-way through said pass-way onto the carrier, said hinged end member being adapted to fold inward during the return stroke of said arm, means for returning said hinged member to normal relation, and means for operating said carrier, and for controlling the action of said transferring lever.

6. In a machine of the class specified, in combination, with a rotary table carrier, stationary curved guiding fenders above said table along the carrier path, a feed conveyer terminating with a lateral barrier and rear wall from said conveyer to the outer guide fender, inclosing a passage-way for conducting bottles or the like onto said carrier; of a swinging gate member extending into said passage-way from the line of the rear wall and adapted for directing the bottles and for temporarily yielding to permit passage of the bottle, a spring connected therewith for returning said gate member to normal position, and means for forcing the bottle through said passage-way.

7. In a machine of the character described, in combination with a rotary bottle-supporting carrier, bottle-pushing rests thereon, stationary fenders adjacently above the carrier along the path for the bottles, a traveling feed-conveyer, and pass-way guides for directing bottles from said conveyer to said carrier; of a bottle-shifter-element at said pass-way, and a bottle-controlled catch-device for detaining said shifter-element in retracted relation, and having a member adapted for contact with the advancing bottles within and near the end of the conveyer, said catch-device and the bottle-shifter-element being provided with engaging means adapted for dual counter locking action, whereby the catch-device is locked by the shifter element and the shifter element is locked by the catch-device for temporarily preventing their tripping and feeding action, and means controlled by the rotary carrier for primarily backing off said shifter element to partially unlock the engaging parts and permit action of the clutch-device to release the shifter element, and means for operating said shifter element.

8. In a feeder mechanism for bottle labeling machines, the combination with a rotat-

ing carrier table having a seating surface with standing pushing rests thereon, stationary fenders adjacently above the table, a traveling bed conveyer with side guards and terminating with an offset skeleton barrier and passway, said guards, barrier and fenders forming a laterally inclosed continuous way from the path of the conveyer to the path of the carrier, a swinging feeder-arm having extended fingers that project through the skeleton barrier, and swing along the passway, a spring connected for moving said feeder-arm in one direction, cam surfaces upon said rotary carrier for moving said feeder arm in the other direction, a bottle releasable catch device for retaining said arm retracted, the feeder-arm and catch device having engaging members adapted for temporarily locking the feeder-arm and for being in turn locked by the feeder-arm.

9. In mechanism of the character described, in combination with means for delivering and affixing labels, a rotary carrier having a work-supporting surface with pushing rests fixed thereon, stationary inner and outer fenders of the character described, adjacently above the surface of the carrier and including a curved space through which the pushing rests travel, a traveling feed-conveyer, conveyer guides having a lateral passway, a swinging feed-transferring arm adapted for propelling a bottle or the like from said traveling feed-conveyer onto the rotary carrier, a swinging stop-controlling feeler pivotally supported upon the fender, and against which the bottle presses as it comes from said pass-way and receives advancing motion by the rotary carrier, and feed-actuating devices for imparting forward and backward movement to said transferring means.

Witness my hand this 11th day of January, 1915.

FRANK O. WOODLAND.

Witnesses:
CHAS. H. BURLEIGH,
ARTHUR W. SNOW.