

Sept. 1, 1936.

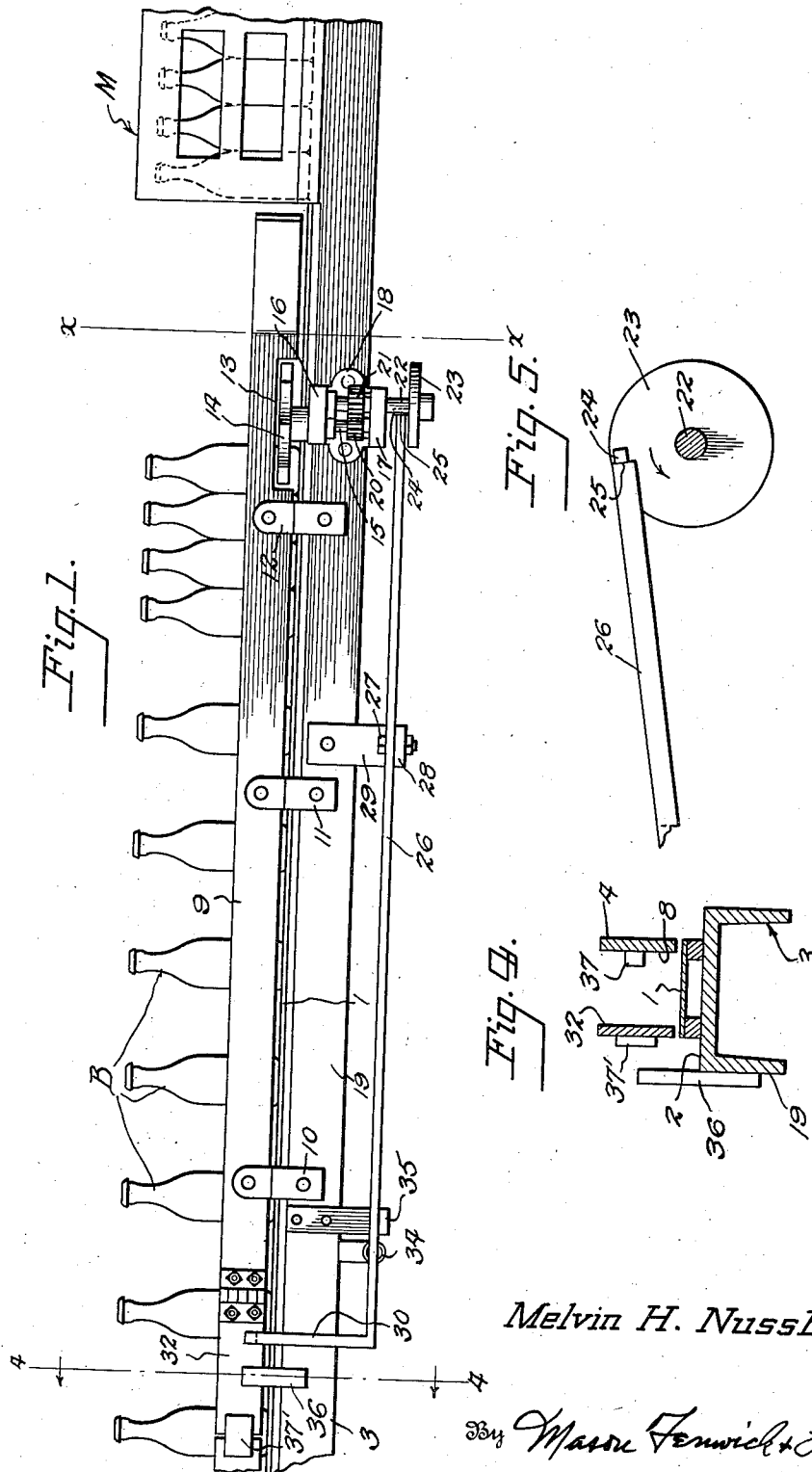
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CONTROL MECHANISM FOR BOTTLE FEEDING CONVEYERS

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2 Sheets-Sheet 1



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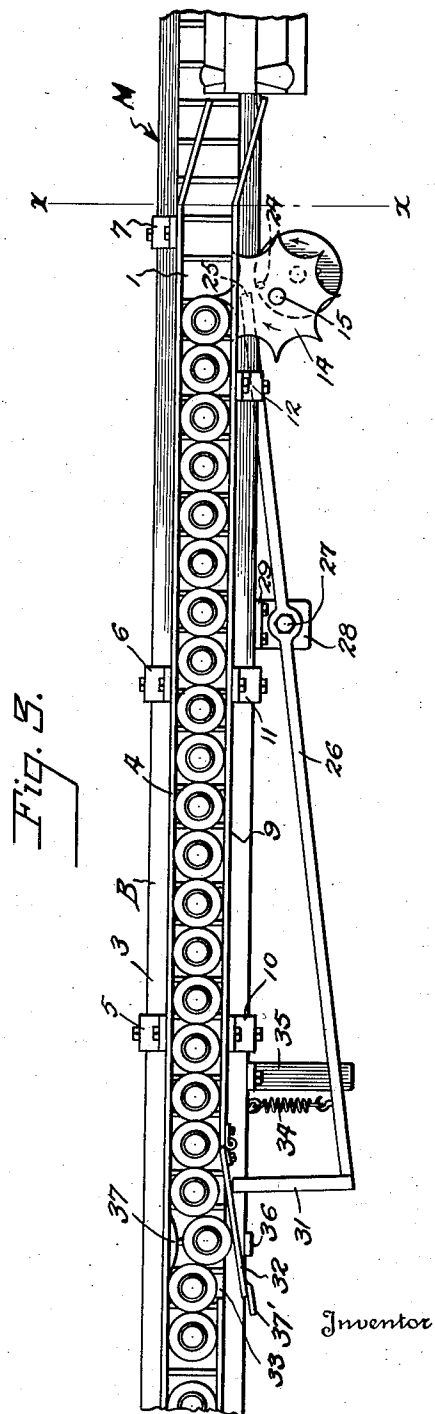
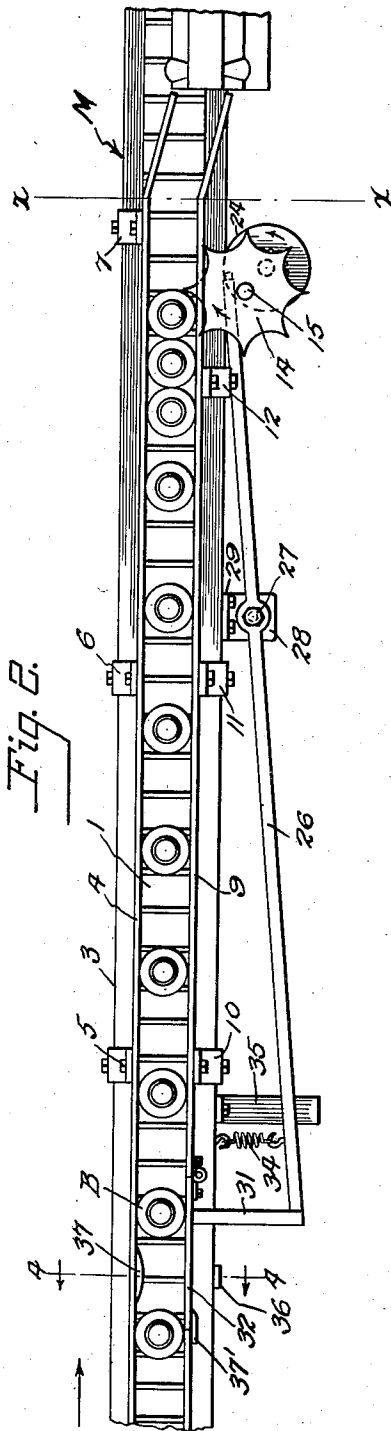
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CONTROL MECHANISM FOR BOTTLE
FEEDING CONVEYERS

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4 Claims. (Cl. 198—40)

This invention relates generally to apparatus for separating bottles and similar objects, in movement on a conveyer, into batches of predetermined number, preparatory to feeding said batches to mechanism for crating, filling, mixing or otherwise operating upon the bottles and their contents.

The main object of the invention is to provide apparatus of the type referred to, which can be cheaply manufactured and readily applied to any conveyer for the purpose of automatically separating bottles and the like into batches of predetermined number.

Other objects of the invention will become apparent as the detailed description thereof proceeds.

In the drawings:

Figure 1 is a fragmentary side elevation of one embodiment of the invention as applied to a conveyer used to feed bottles toward a mixing machine;

Figure 2 is a plan view of the mechanism shown in Figure 1;

Figure 3 is a plan view of the same mechanism but with the parts thereof moved to different operative positions;

Figure 4 is a vertical transverse section taken on the line 4—4 of Figure 1; and

Figure 5 is a fragmentary plan view to an enlarged scale of stop mechanism forming part of the present invention.

As shown in the drawings, the invention is used in connection with an endless conveyer belt 1, slidably supported on the horizontal face 2 of a channel iron 3 forming part of supporting framework (not shown). A rear guide plate 4 is suitably supported by brackets 5, 6, and 7, with its face 8 perpendicular to the plane of the conveyer belt 1. So far as the invention proper is concerned, the guide plate 4 terminates at the line $x-x$, which forms the entrance of mechanism designed to receive batches of bottles or the like for crating or filling or mixing the contents of the bottles fed by the conveyer beyond the plane of the line $x-x$. The mechanism to the right of the line $x-x$ and designated generally by the reference character M forms no part of the present invention, but is merely shown in the drawings diagrammatically to indicate generally some type of mechanism used to receive the bottles in batches as they are fed along the conveyer by the control mechanism.

A front guide plate 9 is secured, parallel to the rear guide plate 4, on the channel iron 3 by means of the brackets 10, 11, and 12. Near the

right hand end of the apparatus, the plate 9 is provided with a slot 13 through which projects part of a star wheel 14, which is suitably secured to a shaft 15 journaled in bearing lugs 16 and 17 projecting from a bracket 18 suitably secured to the vertical flange 19 of the channel iron 3. The shaft 15 is provided with a pinion 20 meshing with a spur gear 21 fixed to a counter shaft 22, likewise journaled in the bearing lugs 16 and 17, and having a stop disc 23 suitably secured to the lower end thereof.

A stop pin 24 is fixed to the upper face of the disc 23 in such position as to rotate into contact with one end 25 of a lever 26, which is pivoted between its ends to rotate about a stud 27 projecting upwardly from the horizontal flange 28 of an L-shaped bracket 29 fixed to the flange 19 of the channel iron 3. The other end of the lever 26 is bent to form an upstanding arm 30, which in turn, is bent at its upper end to form an inwardly projecting arm 31 held normally in yielding contact at its inner end with a gate 32 forming part of the guide plate 9.

The gate 32 forms a closure for the opening 33 in the guide plate 9, and is held normally in closed position by the inward pressure of the arm 31 under the action of a tension spring 34, one end of which is secured to the lever 26, while the other end is secured to the flange 19. A bracket 35 extends horizontally from the flange 19 and forms a support for the lever 26. A stop plate 36 limits the outward movement of the gate 32, and a stop plate 37' on the striking edge of the gate 32 forms a rabbet to receive the end of the guide plate 9 defining one edge of the opening 33. Directly opposite to the stop 36, the rear plate 4 is provided with a cam 37 to control the operation of the gate 32 and lever 26 under conditions hereinafter described.

In the normal operation of conveyer devices for feeding bottles to filling or mixing machines, the bottles B are spaced apart at predetermined intervals on the conveyer belt 1. As shown in the drawings, they are fed from left to right toward the machine M. When the gate is closed, as shown in Figure 2 of the drawings, the end 25 of the lever 26 is in contact with the pin 24 on the disc 23, and prevents anti-clockwise rotation of disc 23 and mechanism connected thereto.

As shown in the drawings, the star wheel 14 is provided with eight arcuate recesses; and the gearing 20 and 21 connecting the shafts 15 and 22 are proportioned so as to cause the star wheel to rotate twice during each complete rotation of the control disc 23. When the control mechanism

is positioned as shown in Figure 2 of the drawings, the star wheel 14 is locked against rotation in clockwise direction; and continues locked until the bottles B fed by the conveyer belt 1 are crowded into contact with each other as shown in Figure 3 of the drawings.

As each bottle passes the cam 37 it gives a slight opening movement to the gate 32 and causes a slight oscillation of the lever 26 about its pivot 27. The end 25 of the lever 26 is wide enough to permit this slight oscillation without moving out of stopping contact with the stop 24 on the disc 23. However, when the bottles become crowded into contact with each other, as shown in Figure 3, the pressure of the bottles to the left of the cam 37 forces the bottle directly opposite the cam 37 outwardly against the gate 32 to cause an oscillation of the lever 26 large enough to move the end 25 out of contact with the pin 24. When this occurs, the pressure of the bottles against the star wheel caused by friction of the conveyer belt 1 against the bottoms of the bottles, forces the star wheel to rotate in clockwise direction until sixteen bottles have been passed toward the mixing machine M. When the sixteenth bottle shall have passed the star wheel, the stop pin 24 is in contact with the end 25 of lever 26; and the star wheel is again locked against clockwise rotation.

It will be apparent from the drawings that as soon as the star wheel begins its counting operation, the outward pressure on the gate 32 ceases and the gate moves the bottles into alignment with the row of bottles on the conveyer. This movement permits the gate 32 to close under the action of the spring tension arm 31 and moves the end 25 of the lever 26 into the path of rotation of the stop pin 24 so as to cause a locking of the star wheel 14 immediately after the passage of the predetermined number of bottles, which in this case is sixteen.

It will be noted from Figure 3 of the drawings, that there are twenty bottles arranged between the gate 32 and the star wheel just prior to the operation of the star wheel. This arrangement is designed to ensure that there will always be at least sixteen bottles in that particular space to actuate the star wheel when the latter is released from its locked position.

It will be obvious that this counting mechanism is not limited to use with any particular type of machine designed to receive bottles or the like in batches of predetermined number. The counting mechanism is operable solely by the pressure due to friction of the conveyer against the bottoms of the objects on the conveyer, to separate the objects positively into batches of predetermined number.

What I claim is:

1. A substantially horizontal support, a conveyer moving continuously along said support, guide plates fixed to said support and extending along opposite edges of said conveyer, one of said guide plates being provided with a slot, a counting wheel rotatably mounted on said support and having a part thereof projecting through said slot into the space between said guide plates, said slotted guide plate having a gate spaced apart from said slot by a distance sufficient to permit

a predetermined number of conveyed objects to accumulate therein, stop mechanism connecting to said gate and counting wheel, means for normally holding said gate closed and said mechanism in position to prevent operation of said wheel, and means on the other guide plate to deflect a conveyed object against said gate to open the gate and thereby effect release of said wheel.

2. A substantially horizontal support, a conveyer moving continuously along said support, guide plates fixed to said support and extending along opposite edges of said conveyer, a lever pivoted between its ends to said support and extending lengthwise thereof, a counting wheel mounted to rotate on said support near one end of said lever and having a part thereof extending into the space between said guide plates, said lever being normally positioned to lock said wheel against rotation, and means connected to the other end of said lever and operable by the pressure of a conveyed object to move said lever from locking engagement with said wheel, said means and wheel being spaced apart a distance sufficient to permit a predetermined number of conveyed objects to accumulate therein, and a cam on one of said guide plates for deflecting the conveyed objects against said means.

3. A substantially horizontal support, a conveyer moving continuously along said support, a guide plate fixed to said support and extending along one edge of said conveyer, a second guide plate mounted on said support parallel to the first named guide plate, said second guide plate having a gate hinged to swing outwardly from the space between said guide plates, means on the first guide plate to deflect conveyed objects against said gate and counting mechanism operably connected to said gate for separating objects on said conveyer into batches of predetermined number, said gate and counting mechanism being separated by a distance sufficient to permit the accumulation of said predetermined number of conveyed objects therein, said mechanism being operable only when the gate is swung outwardly by the said deflecting means and by contact with the last object of said predetermined number nearest said gate.

4. A substantially horizontal support, a conveyer moving continuously along said support, a guide plate fixed to said support and extending along one edge of said conveyer, a second guide plate mounted on said support parallel to the first named guide plate, said second guide plate having a gate hinged to swing outwardly from the space between said guide plates, a stop rotatable on said support and extending across said conveyer at a distance from said gate sufficient to permit a predetermined number of objects to accumulate therein, means operably connected to said gate for releasably locking said stop normally in its position across said conveyer, and means on the first guide plate and opposite said gate to deflect conveyed objects against said gate and cooperating with the last of the accumulated objects to swing said gate and operate said means to release said stop.

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