

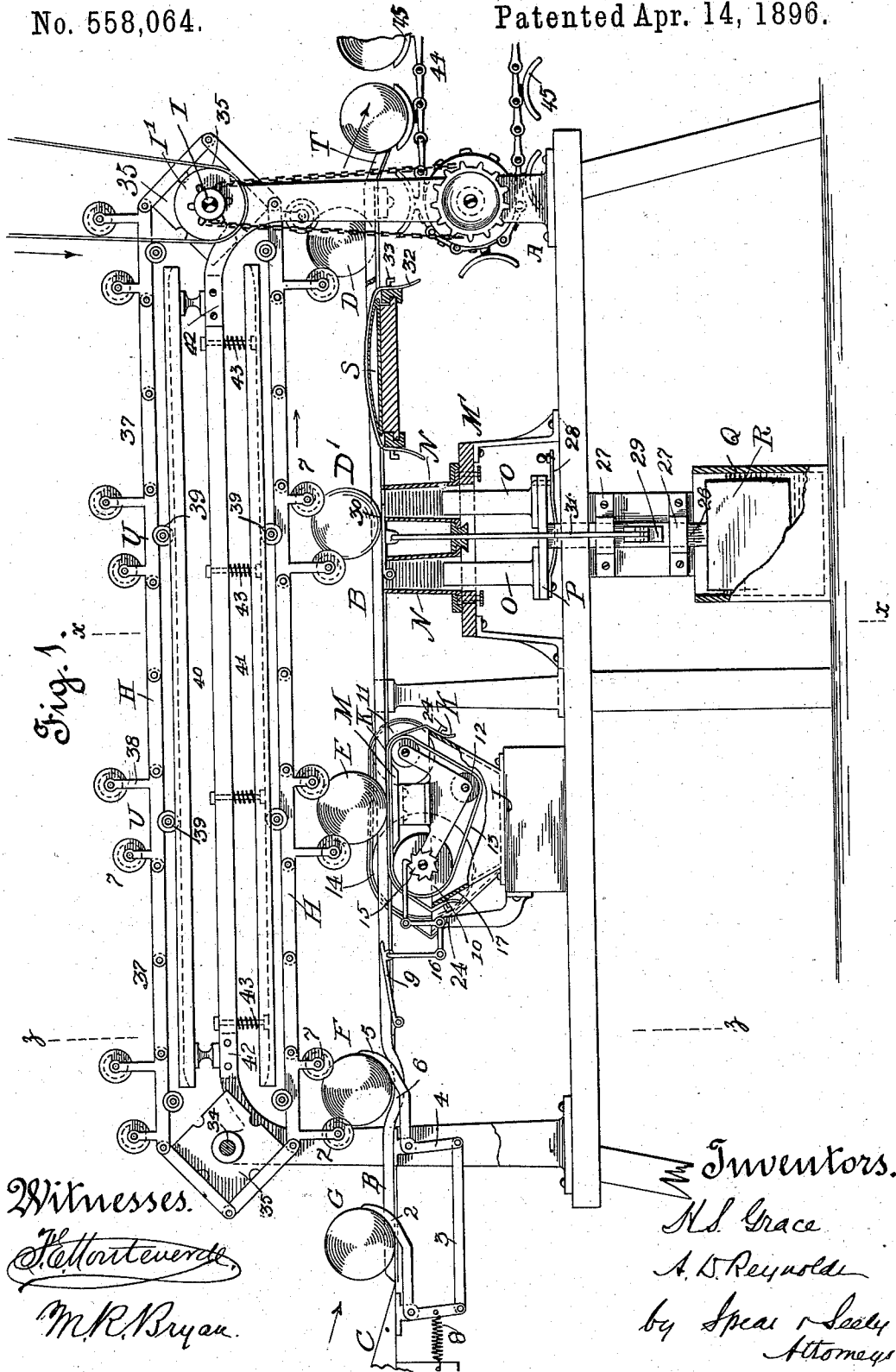
(No Model.)

3 Sheets—Sheet 1.

H. S. GRACE & A. D. REYNOLDS.
BOTTLE LABELING MACHINE.

No. 558,064.

Patented Apr. 14, 1896.



Witnesses.
J. H. Harte
M. R. Bryan

Inventors.
H. S. Grace
A. D. Reynolds
by *Spears & Seely*
Attorneys

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Fig. 2.

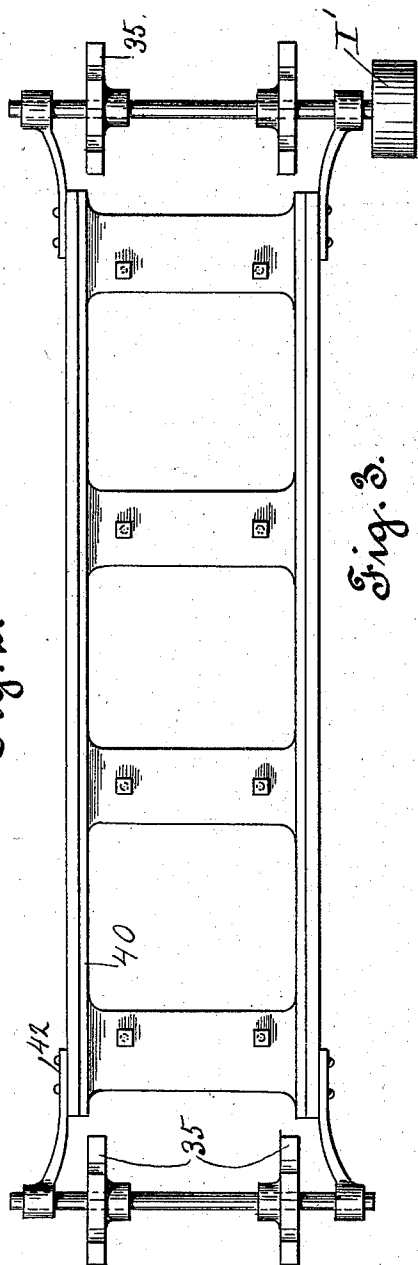
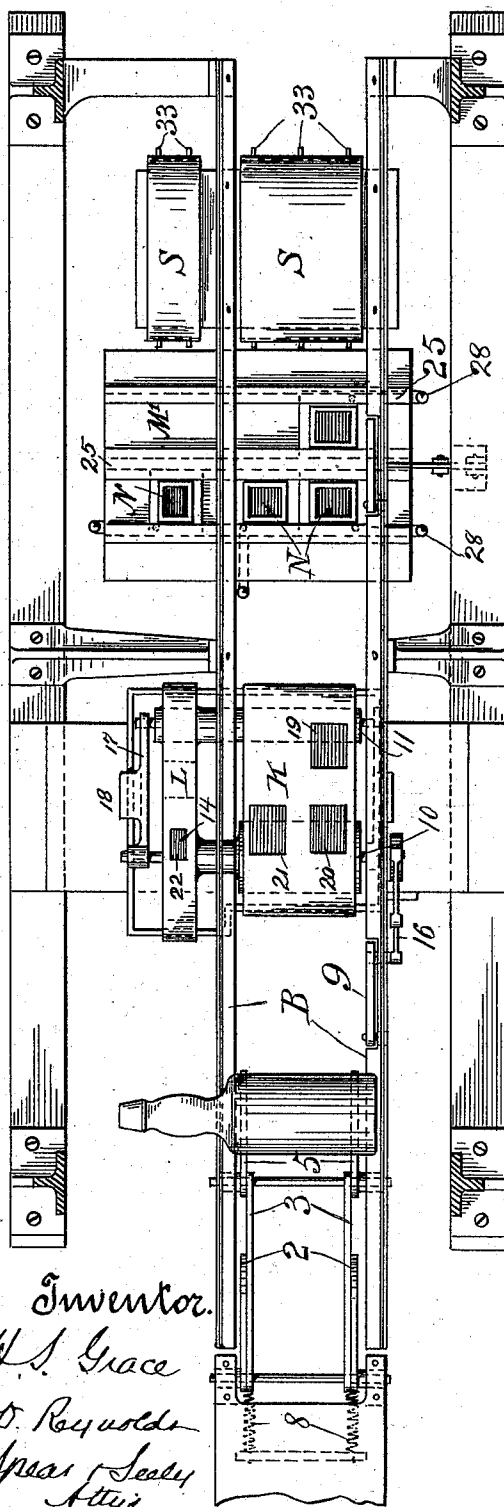


Fig. 3.



Witnesses.

J. H. Monteverde.

M. R. Bryan

Inventor.

H. S. Grace

A. D. Reynolds

By Spear & Seale,
Attys

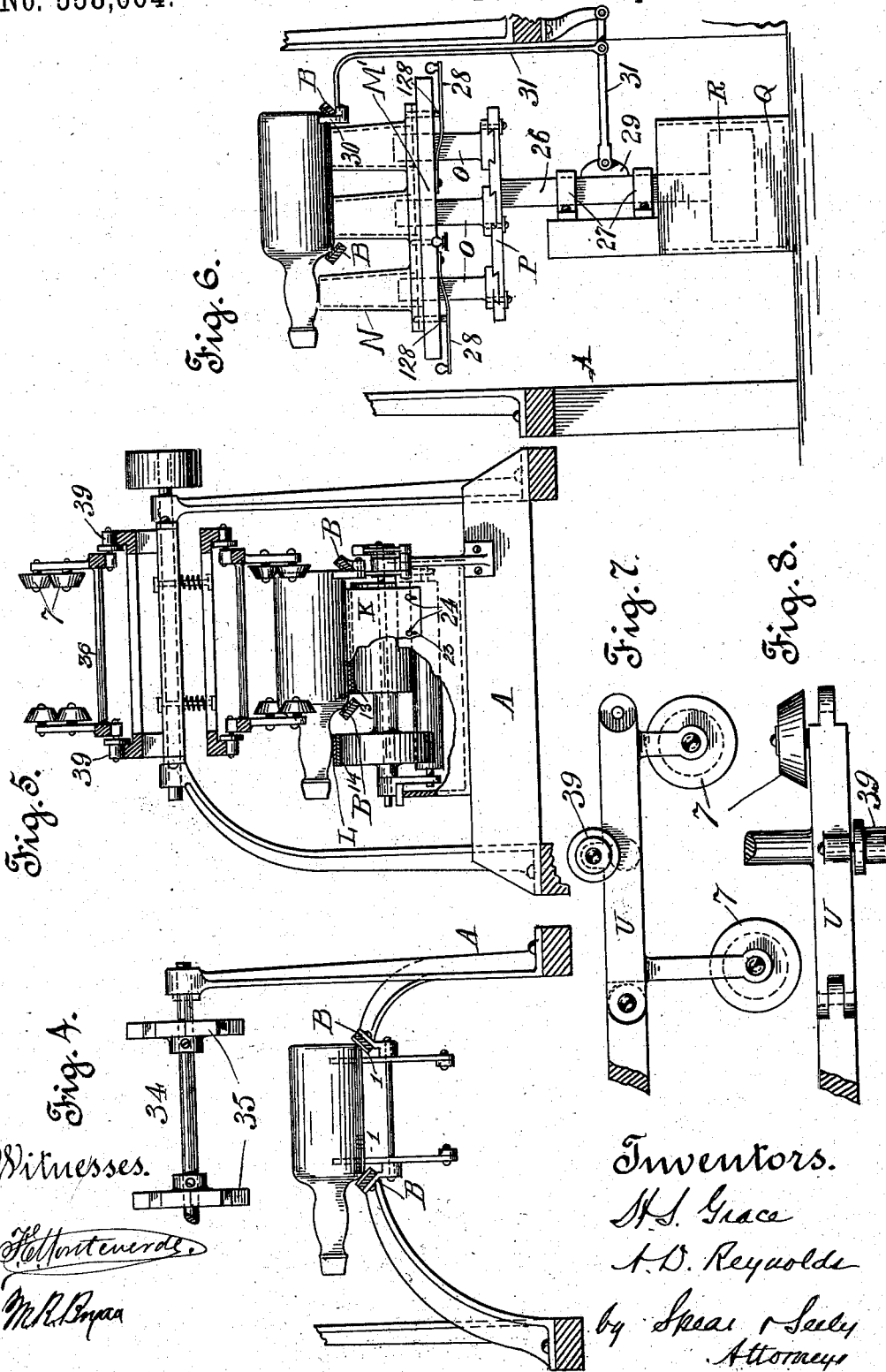
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UNITED STATES PATENT OFFICE.

HENRY S. GRACE AND ARTHUR D. REYNOLDS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNORS TO THE GRACE-REYNOLDS LABELING MACHINE COMPANY, OF SAME PLACE.

BOTTLE-LABELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,064, dated April 14, 1896.

Application filed October 18, 1894. Serial No. 526,284. (No model.)

To all whom it may concern:

Be it known that we, HENRY S. GRACE, a citizen of the United States, and ARTHUR D. REYNOLDS, a subject of the Queen of Great Britain, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Bottle-Labeling Machines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to an apparatus or machine for placing paper labels upon bottles, jars, or other round receptacles. Heretofore machines have been made for placing labels upon cans. These can-labels encircle the cylindrical body of the can and are pasted or secured by a line of paste at the point where they are caused to overlap. This enables the labels to be easily stripped off the can, which is then ready to receive a new label.

In labeling bottles, jars, &c., of the kind above mentioned a different procedure is required. Here the labels are not intended to be stripped off, but are pasted firmly to the bottle by paste applied to the entire meeting surfaces of glass and paper. Moreover, there are usually several labels to be applied. In some beer-bottles, for instance, four or more separate labels must be applied to the front, to the back, and to the neck. These labels are customarily applied by hand-labor, which is slow and expensive.

The object of our invention is to provide an automatic machine for affixing labels to bottles in such numbers and in such positions as may be required.

To assist the intelligent comprehension of the detailed description which follows, it may be stated at this point that the bottles travel or, rather, are propelled by a rolling motion through the machine. A paste-pot is provided which by means of proper apparatus supplies to the bottle on certain parts of its surface deposits of paste. From this the bottle travels to and over a label bed or holder, which is so arranged that the bottle picks up its own labels, which are thus affixed accurately to the surfaces of paste previously supplied. Thus if a thousand bottles are to be

labeled in a particular way the parts of our apparatus can be arranged so as to receive the bottles successively, apply paste to them in the proper places upon the surfaces, cause them to pick up labels adapted to each surface of paste, and then discharge them dry and with every label in place at an immense saving from the cost of hand-pasting. In addition the work of labeling is done better, more accurately, and far more quickly.

For a full comprehension of our invention reference is made to the accompanying drawings in connection with the following detailed description.

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view of the means for driving the propelling-chain and of the upper tracks for guiding it. Fig. 3 is a general plan view of the whole machine. Fig. 4 is an end elevation from the left side of Fig. 1. Fig. 5 is a cross-section on the line *z z*, Fig. 1, showing a bottle in position on the paste-stencil. Fig. 6 is a cross-section on the line *x x*, Fig. 1, showing a bottle in position upon the label-holders. Fig. 7 is a side elevation of a link of the propelling-chain. Fig. 8 is a top plan of the same.

A represents a frame and support which sustains the operative parts of our machine.

B B is a guideway composed of two rails of angle-iron secured to the frame and forming together an inclined track, as shown in Figs. 4, 5, and 6. These guides form the continuous path upon which the bottles are carried from their entrance to their discharge from the machine. Their inclined shape causes the bottles, which fit them at the base and near the neck, to center or adjust themselves, so as to roll steadily as they are propelled forward. The angular or inclined faces of the guides are lined with some flexible or yielding material 1—such as cork, felt, rubber, cloth, or leather—which has sufficient frictional hold upon the surface of the bottles to prevent them from slipping and to insure their progress by a rolling movement.

The bottles are fed to the machine by an incline C, Fig. 1, which carries them directly to the guides B B.

It is here necessary to refer to the left-hand

end of Fig. 1, which shows an automatic mechanism by which one bottle opens the way for its successor. First, however, it must be noticed that five bottles—D D' E F G—are in the machine at the same time, as shown in the figure last referred to. The bottle D has been completely labeled and is ready to be discharged. The bottle D' is taking its labels. The bottle E is receiving its supply of paste. The bottle F is just at the point where it is seized by the propelling-rollers, to be hereinafter described. The bottle G has just come down the incline C, where it has been stopped by the arms 2 2, Figs. 1 and 4. These arms, upon each side of the runway, are bell-cranks, which by links 3 are connected to another bell-crank 4, the forward end 5 of which projects up in front of the bottle F at the point where the propelling-rollers seize the latter. At this point the runway is depressed, as at 6, to make a rest for the bottle just before the beveled rollers 7 seize it. These rollers are carried by endless chains II, running parallel and at the same speed and driven by a suitable shaft I, having a belt-pulley I'. When the four rollers (two on each side of the chain) come in contact with the bottle F, they cause it to roll forward upon the guides, at the same time pressing it firmly against the guides, the inclined or trough-like form of which and the beveled shape of the rollers above keep it in proper position. As soon, however, as this bottle commences to move it passes over the pivoted bell-cranks 4, and thus depresses the bell-cranks 2, which allows the bottle G to roll into the depression 6 in the guideway. A spring 8 restores the holding-arms to their original position in readiness to receive another bottle from the main incline or feed-chute. It should here be noted that, since the accurate operation of the machine requires that the bottles shall roll upon the guideway without slipping, the rollers 7 are, like the guides B, provided with frictional peripheral surfaces of the kind before mentioned.

Still assuming that the bottles are carried along the guideway by the chain and rollers, it will be seen by reference to Figs. 1 and 5 that the bottle E has been carried forward to a position above the pasting-stencil and has passed over the arms 9. A permanent paste-pot J is secured to the frame, within which are paste-rollers 10, 11, and 12, which carry paste-belts 13 and 14. (See Fig. 5.) These rollers are moved intermittently by the passage of successive bottles over the arms 9, the depression of which operates a ratchet-wheel 15, fixed upon the shaft of one of the rollers, by means of a system of levers 16, connected to the arms 9. This insures a fresh surface of paste as each bottle is presented. The paste-rollers are mounted in a frame 17, which by means of clips or projections 18 is hung upon the edges of the paste-pot and is therefore independent of the latter. The frame 17 and rollers can thus be removed bodily from

the paste-pot for purposes of cleaning or repairing. The paste-rollers may be corrugated on their peripheries or provided with sharp points to give a good hold to the paste-belt and prevent it from slipping. A rigid table M keeps the paste-ribbon in horizontal position beneath the bottle and insures a proper contact of the ribbon with the surface of the bottle to be covered.

The paste is supplied to each bottle in turn in the proper quantities and in the proper places through stencil-plates K L, having openings arranged so as to admit paste for the proper combination of labels. In the drawings, Fig. 3, it is proposed to apply three body-labels and one neck-label, and hence the stencil K has three openings 19 20 21 and the stencil L one opening 22. The stencils are of thin sheet metal and are secured to the paste-pot by slots and hooks 23 24, Figs. 1 and 5. It will be understood that the stencils shown are easily removable and are interchangeable with others, thereby producing any desired combination of pasted surface ready to receive labels.

Now as the bottle is propelled along the guideway and passes over the stencil it receives upon its body and neck deposits of paste according to the relative situation of the holes in the particular stencils in use, and it is now ready to receive its labels, which correspond in their positions with those of the paste surfaces. It must be understood by this statement that each bottle, having received through the stencil sufficient supplies of paste for one, two, or more labels, as the case may be, is propelled forward by the chain and rollers to an apparatus consisting of a label-bed having label-holders, and that these holders are so placed that the bottle as it passes over them picks up the appropriate label or labels, which are pressed against the particular parts of the surface of the bottle where the paste has been previously applied. In this connection special reference is made to Figs. 1 and 6, and also to the top plan, Fig. 3. Before, however, describing the label bed and holders it should be stated that the stencil is supposed to stand a shade higher than the paste-belt, so as to allow the belt to travel freely underneath. The object of this is to prevent the stencil from scraping the paste off the paste-belt, as it would do if the stencil rested directly upon the belt. The pressure of the bottle passing over the stencil will, however, depress it sufficiently to enable the paste to be applied directly to the bottle while the latter is passing over the stencil.

The label-bed is a table M', secured to the main frame and carrying label holders or boxes N, which are slightly conical or tapering in shape and are open at top and bottom. In the drawings, Fig. 3, four of such boxes are shown, corresponding to the positions of the openings in the stencil, and each one forms a magazine for labels, which are taken one by one as the bottle is moved across their open

tops. These label-boxes are adjustable in guides 25, Fig. 3, in the label-bed, so that they can be made to correspond with the pattern of the pasting-stencils. They are made of slightly-tapering form in order to enable them to be filled more easily from the bottom and also so that as each label comes to the top it shall be held at its edges and have barely space to leave the box. This insures the correct placing of each label upon its appropriate deposit of paste and makes a better and more accurate fit than would be possible if the labels were loose in boxes having open discharge ends of such size as to allow them any side or end motion.

The pile of labels in all the boxes is forced upward by plungers O, one of which enters each box. These plungers are all adjustably dovetailed in a plate P, Fig. 6, so that they move upward simultaneously against the piles of labels in the boxes. In preference to using springs or weights to accomplish the upward movement of the plungers we have adopted the water-tank Q and submerged float R, Fig. 1, which give a constant upward pressure whether the label-boxes be full or partly empty. The float is attached to a stem 26, which moves in stationary guides 27 and is secured at its upper end to the plate P. The label-boxes, which slide in the guides 25, are held in place by springs 28, having pins 128, which register with holes in the table and in the bases of the label-boxes. This construction is best shown in Fig. 6. These pins prevent the withdrawal of the label-boxes until the springs are depressed so far as to release the pins from the holes just mentioned. Similar springs 28, having pins 129, are used to hold the plungers in their dovetailed guides in the same manner.

The upward feed of the piles of labels is regulated by a brake-shoe 29, released by the movement of the bottle as it passes over the label-bed, but normally bearing against the stem 26. As each bottle passes over the bed the plungers must be permitted to rise by the thickness of one label and no higher, so as to be in readiness to supply labels to the next bottle. While the bottle is upon the label-bed—that is, before it is driven off the bed—it depresses an arm 30 and a connecting-rod 31, which releases the brake and permits the table and plungers to be moved upward by the float the thickness of one label. As the bottle commences to depress the arm 30, and so gradually to release the brake, the float commences to rise, pushing up the plungers and the piles of labels and pressing the topmost label gradually against the rolling bottle with a strong pressure, which at the same time places it neatly and truly in position upon the pasted surface. As the bottle rolls along it continues to depress the arm 30 until it has passed over its end, at which time it has taken a label from the other box or boxes. Before the bottle has rolled off from the last label-boxes and while the last label is being pressed

against it it releases the arm 30, and the upward movement of the stem causes the brake to be immediately applied. The motions are so timed that up to the time when the bottle leaves the last label-box it has been under pressure, and as it rolls off, the plungers have only been allowed to rise by the thickness of one label—viz., the thickness of those labels taken off the piles by the particular bottle. The plungers cannot move now until the succeeding bottle commences to depress the arm 30.

By reference to Fig. 6 it will be seen that the brake-shoe is pivoted to a lever 129, which is fulcrumed to a bracket 130, secured to the main frame, and is also connected to the rod 31. As the rod 31 is depressed by the bottle it depresses the inner end of the lever 129, which, moving on the arc of a circle, eases the brake from the stem 26. The bottle, however, holds the float down until it (the bottle) has entirely left the label-boxes. When it has cleared the arm 30, the brake-shoe immediately returns to its position against the stem 26, and is locked there by the slight upward movement permitted the float before locking the brake. The bottle itself thus becomes a part of the mechanism for controlling the feeding of the labels, and we are able to dispense with special adjustments or feed-regulating devices. The label-feeding devices require no adjustment or regulation, being entirely automatic, and this no matter what the thickness of labels may be.

The advantage of using a float instead of springs or weights to carry the labels upward is obvious and definite in a machine of this character. When the label-boxes are full, they have a certain weight, and in using a spring or weight it must be strong enough and exert enough pressure to push the loaded boxes upward. As the labels are taken off the weight in the boxes decreases, while the spring or weight still exerts the original pressure. The contents of the partly-emptied box are thus forced upward by an excessive pressure and the labels are pressed so strongly against the bottle that the latter, instead of taking up the label, has a tendency to push it ahead off the pile. The result is that the label does not exactly fit the opposite pasted surface of the bottle and the labeling is therefore defective. The pressure exerted by a float is not constant, but is regulated by the displacement of the float and the label-boxes, whether full, empty, or partly empty, and this being the case there can never be an excess of pressure, nor can the pressure be decreased below that required to properly apply each label.

It may also be mentioned that where weights, springs, or other mechanism have been used to raise the labels it has been necessary to provide special mechanical means to prevent the labels from being forced above the runway. Such devices are objectionable, and we have overcome these objections by the

use of our float and brake, as will be readily understood from the description of the latter and from the drawings.

The bottle has now received its labels in their proper positions upon its surfaces of paste. Still propelled by the chain and rollers it passes from the labeling-bed over a flexible surface S, which we prefer to make a rubber air-cushion capable of yielding in all directions. This cushion is covered with a piece of any kind of cloth 32, secured by hooks 33, so as to be easily removed and replaced. Over this flexible surface the labeled bottle is rolled and given a gentle pressure, which sets all its labels firmly. The guides B terminate in a chute or incline T, through which the completed labeled bottle is discharged.

Heretofore we have assumed the forward movement of the bottles upon the guideway by means of an endless chain belt carrying rollers which propel the bottles. We now describe these special means of propulsion.

At each end of the main frame and mounted one upon the driving-shaft I and the other upon a transverse shaft 34 are two sprocket-wheels 35, Fig. 4, over which extend the endless chain belts II, the main links of which are formed with transverse rods 36, Fig. 5, to insure their parallel motion and uniform speed, so that they move as a single chain belt or carrier. Figs. 7 and 8 represent in detail the main links U of these chains, each of which is connected longitudinally to its neighbor by two straight links 37, pivoted together and also to the main links, so as to make the chain flexible. To each link used are secured two hangers 38, in which are journaled the cone-shaped and friction-surfaced rollers 7 before mentioned, which bear upon and propel the bottles, as before described. Each main link used also carries a guide-roller 39, which travels upon upper and lower tracks or guide-rails 40 and 41, Figs. 1 and 5, extending throughout the length of the machine. The upper of these guide-tracks, which is composed of two simple angle-rails, is secured rigidly to the main frame, as at 42. The lower is a yielding track and is hung from the main frame by springs 43, so as to have a yielding motion upward. Upon this yielding track the chains run while the rollers are propelling the bottles, and hence if a bottle should not be perfectly round, or should have a mold-seam, so as to resist the propelling action of the chain, the tracks 42 will allow the flexible chain to yield upward, thereby removing the resistance, while the rollers still hold and propel the bottle along the guideway.

When we state that this machine will secure any number of labels to a bottle, in all positions desired, automatically, and with accuracy and speed, we have summed up its advantages, and no detailed recital of them could add to the force of this statement.

We have shown in Fig. 1, connected to the discharge-chute, a belt 44, supposed to be endless, which receives the bottles as they are discharged. This belt is provided with cups 45, which are preferably lined with some soft material, such as flannel or felt, cork or rubber. The delivery of the bottles separately into these cups prevents them from colliding with one another by gravity discharge and reduces to a minimum all chances of breakage to which they might be subjected in their discharge by rolling against one another forcibly. This insures the delivery of the bottles, completely labeled, from the machine and prevents all chance of the bottles coming in contact with one another while they are being discharged.

What we claim is—

1. A machine for labeling bottles, comprising a continuous guideway having inclined sides and along which the bottles are propelled, a series of beveled rollers for propelling said bottles, paste-supplying mechanism, and label-holders, substantially as described.

2. In a machine for labeling bottles, the combination with a guideway for bottles, of a paste-belt, removable and interchangeable stencils through which the paste-belt is applied to different parts of the bottles, and removable and interchangeable label-holders arranged in the same relative positions as the said stencils, substantially as described.

3. In a machine for labeling bottles, a continuous guideway, means for rolling a bottle along the guideway, a device for applying paste to different parts of the bottle through a stencil, and label-holders arranged in the same relation as the openings in the stencil, substantially as set forth.

4. In a machine for affixing labels to bottles, a guideway, mechanism for rolling the bottles along the guideway a paste-belt and removable and interchangeable stencils for admitting paste to the surface of the bottles, substantially as set forth.

5. In a machine for labeling bottles a guideway, means for propelling the bottle along the guideway, a paste-belt, mechanism connected to said paste-belt and operated by the bottle for moving said belt and a stencil-plate having openings and located just above the paste-belt, substantially as set forth.

6. In a labeling-machine, a guideway, a label-holder, a float below the label-holder for automatically raising said labels, a locking device or brake for locking said float, and means operated by the passage of the bottle over the label-holder for releasing said brake to allow the float to move upward, substantially as described.

7. In a machine for labeling bottles, and in combination, a guideway for the bottles extending through the machine in combination with a flexible chain belt or carrier for prop-

5 pelling the bottle along the guideway, a paste-
pot, a paste-belt working in said pot, a re-
movable stencil above said paste-belt, and
means for driving the chain belt and propel-
ling the bottles, substantially as set forth.

10 8. In a machine for labeling bottles, a guide-
way along which the bottles are propelled, re-
movable and interchangeable label-holders,
plungers for entering said holders, and a float
for pressing said plungers upward, substan-
tially as set forth.

15 9. In a machine for labeling bottles, label-
boxes having open tops, a float connected to
said plungers, and an automatic brake adapt-
ed to be released by the movement of each
bottle over the label-bed, and to be set against
the float by the upward movement of the
float, substantially as set forth.

20 10. In a machine for labeling bottles, and in
combination, a pasting device and a labeling
device, inclined guideways for the bottles
above said devices, and a propelling chain
belt running upon a yielding track above
said guideway, said belt having beveled roll-

ers and adapted to propel the bottles, sub- 25
stantially as set forth.

11. In a machine for labeling bottles, and in
combination with pasting devices and label-
ing devices, a propelling-chain having rollers 30
adapted to bear upon the bottles, and a guide-
way having inclined sides provided with a
frictional surface, substantially as set forth.

12. In a bottle-labeling machine and in com-
bination, a continuous guideway having in-
clined sides provided with frictional surfaces, 35
and a propelling-chain above said guideway,
having beveled rollers also provided with
frictional surfaces, such guideway and roll-
ers forming in combination a guide-track for
the bottles, substantially as set forth. 40

In testimony whereof we have affixed our
signatures, in presence of two witnesses, this
30th day of June, 1894.

HENRY S. GRACE.

ARTHUR D. REYNOLDS.

Witnesses:

F. H. SEELY,

L. W. SEELY.