

P. W. HODGKINSON.
MACHINE FOR AFFIXING CLOSURES TO BOTTLES.
APPLICATION FILED MAR. 25, 1910.

985,803.

Patented Mar. 7, 1911.

3 SHEETS-SHEET 1.

Fig. 1.

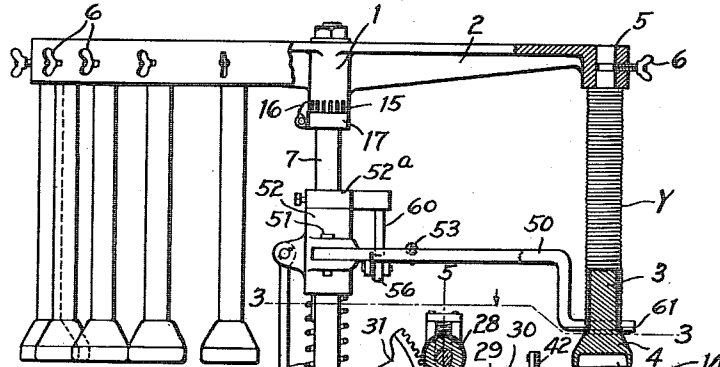


Fig. 3.

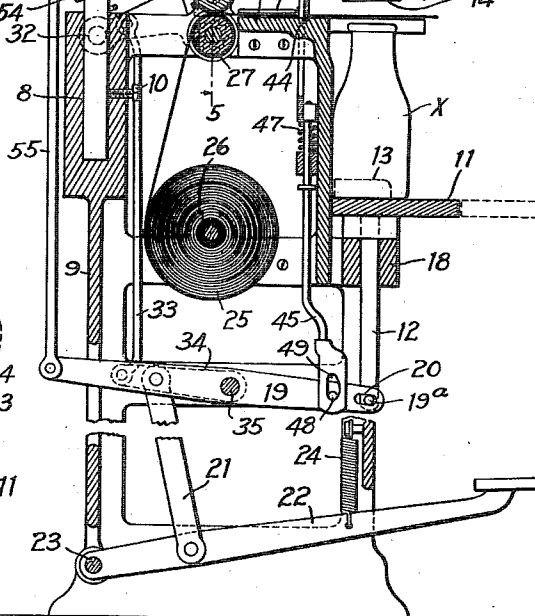
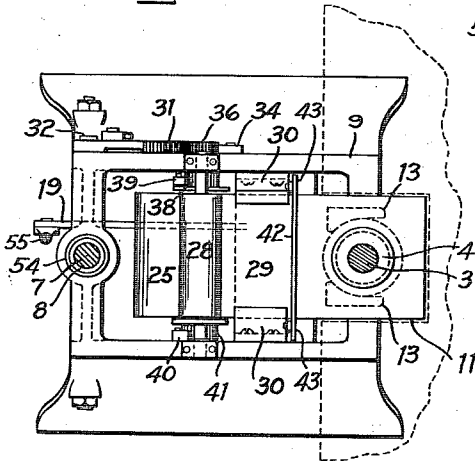
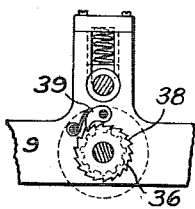


Fig. 6.



WITNESSES:

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Fig. 5.

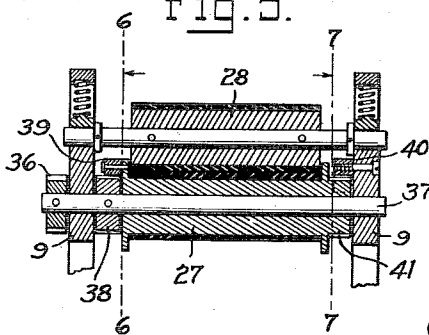
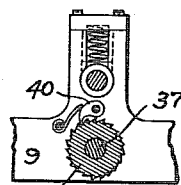


Fig. 7.



INVENTOR:

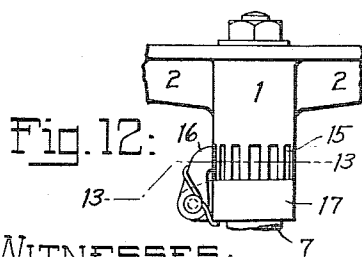
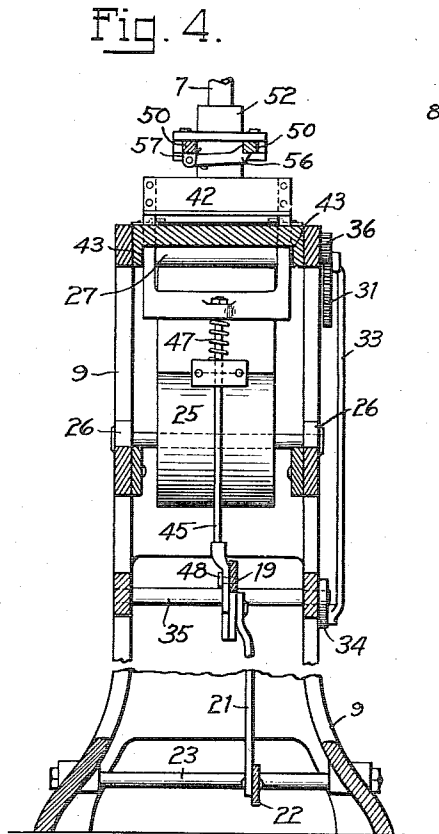
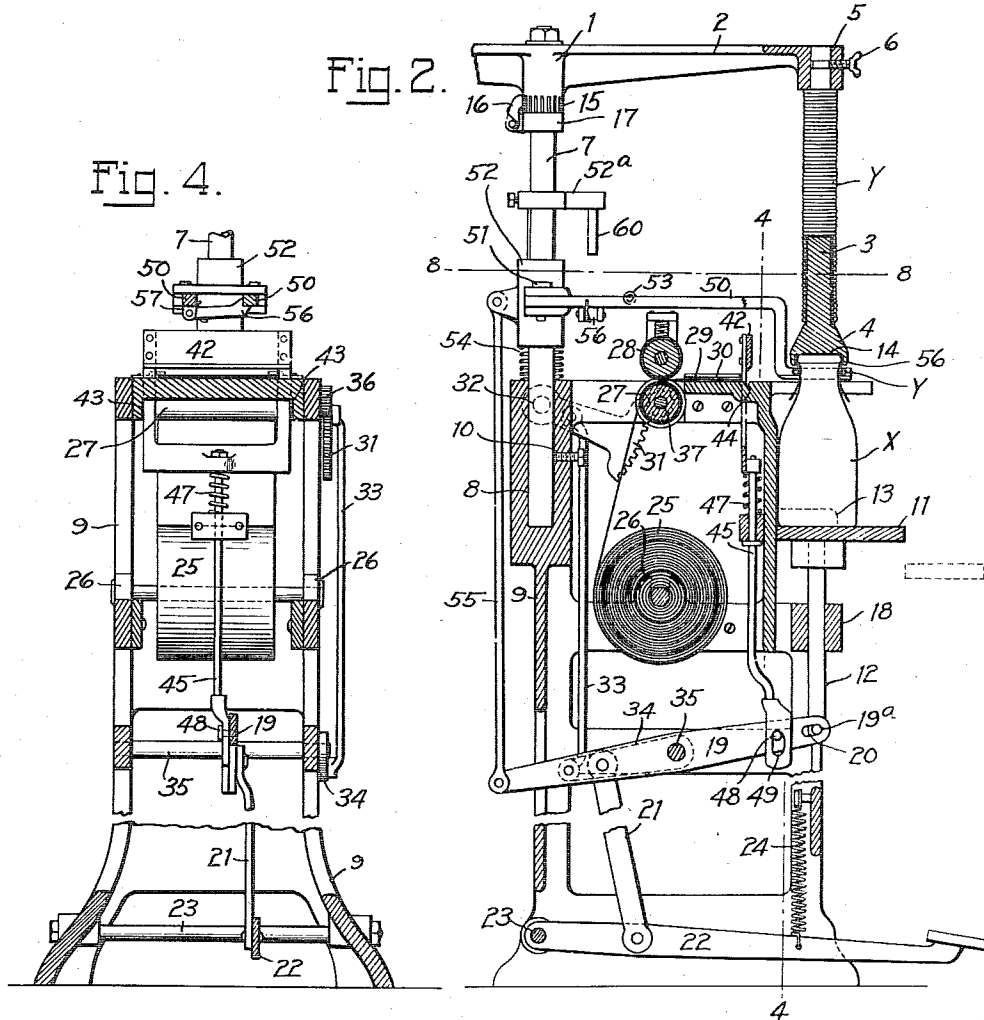
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his attorneys

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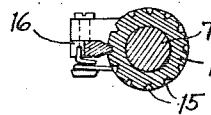
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3 SHEETS—SHEET 2.



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3 SHEETS-SHEET 3.

Fig. 8.

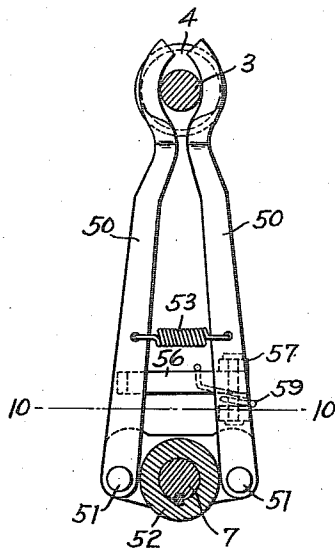


Fig. 9.

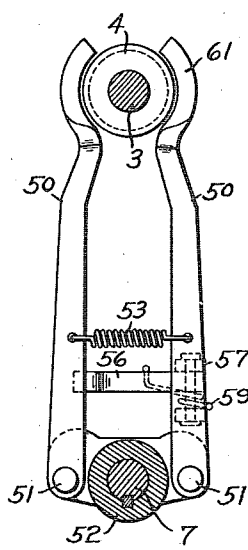


Fig. 10.

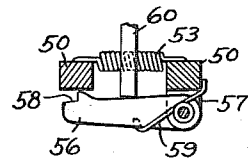


Fig. 11.

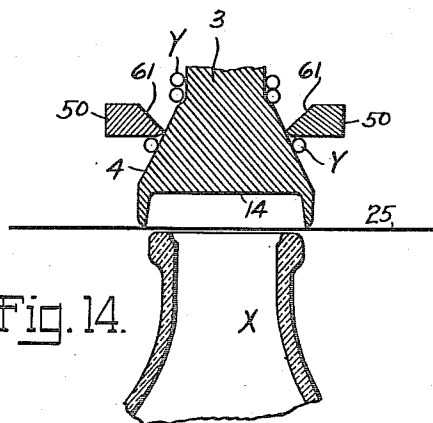
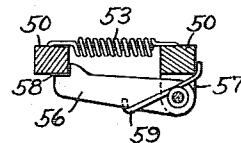


Fig. 14.

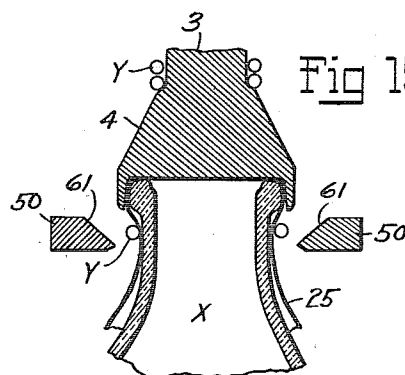
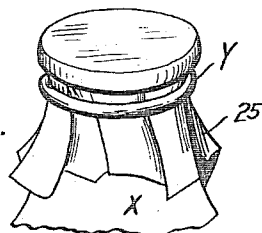


Fig 15.

Fig. 16.



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UNITED STATES PATENT OFFICE.

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WILLIAM J. BURDEN, OF ROCHESTER, NEW YORK.

MACHINE FOR AFFIXING CLOSURES TO BOTTLES.

985,803.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed March 25, 1910. Serial No. 551,588.

To all whom it may concern:

Be it known that I, PERCY W. HODGKINSON, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Machines for Affixing Closures to Bottles, of which the following is a specification.

This invention relates to machines for affixing closures to bottles, and the object of the invention is to afford time-saving means for performing this work.

The machine is specially adapted to closures of flexible material that are folded down over the top of the bottle and secured in place by an elastic band.

In the drawings:—Figure 1 is a central vertical section of the machine with the parts in normal position; Fig. 2 is a similar view, with the parts in operative position; Fig. 3 is a horizontal section on the line 3—3 of Fig. 1; Fig. 4 is a vertical section on the line 4—4 of Fig. 2; Fig. 5 is an enlarged section on the line 5—5 of Fig. 1; Fig. 6 is a section on the line 6—6 of Fig. 5; Fig. 7 is a section on the line 7—7 of Fig. 5; Figs. 8 and 9 are enlarged plan views of the parts immediately below the line 8—8 of Fig. 2, in different operative positions; Figs. 10 and 11 are vertical sections on the line 10—10 of Fig. 8 showing the parts in operative positions corresponding to Figs. 8 and 9, respectively; Fig. 12 is an enlarged side elevation of certain parts shown in Figs. 1 and 2; Fig. 13 is a horizontal section on the line 13—13 of Fig. 12; Fig. 14 is an enlarged vertical section of a bottle with the closure placed over it, as in Fig. 1; Fig. 15 is a similar view showing the closure completed, as in Fig. 2; and Fig. 16 is a perspective view of a bottle with the closure in place.

Primarily the machine consists of three cooperating mechanisms, namely, a frame that holds the elastic bands ready to be transferred to the bottles; a paper-feeding mechanism whereby the paper of the proper dimensions is cut from a roll and carried to the bottle; and capping mechanism whereby the severed sheet of paper is folded down over the bottle and an elastic band transferred from the frame to the neck of the bottle, around the paper.

The frame 1 that holds the elastic bands is preferably revoluble and in the form of a

spider having radial, equidistant arms, from each of which depends a detachable bar 3 on which bands are strung, as indicated in Fig. 1. The lower end 4 of each bar is enlarged to retain the bands, and is conical in form so that each band as it is forced in turn from the bar is expanded sufficiently to pass over the head of the bottle. The drawings show the bars removably secured in sockets 5 in the ends of the arms by bolts 6.

The spider frame 1 is adapted to revolve upon a post 7 that is supported in a socket 8 in the frame 9 of the machine and secured against rotation by a set-screw 10.

The bottle X that is to be closed is placed upon a table 11 that is carried on the upper end of a vertically movable rod 12. It is placed between guides 13, 13, shown in dotted lines in Fig. 3, which brings it radially into proper position with reference to the band-carrying bar 3, so that when elevated by the mechanism presently to be described, the mouth of the bottle enters a recess 14 (Fig. 1) in the under side of the conical end 4 of the bar.

The band-carrying bars 3 are successively alined with the bottle in position on the table 11 by suitable means, such as teeth 15 on the hub of the spider frame 1 and a spring-pressed dog 16 on a ring 17 that is fixed to the shaft 7, the teeth being so spaced that the dog will lie between two of them whenever one of the bars 3 is directly over the position of the bottle on the table 11, between the lugs 13, 13. This device is shown in Figs. 12 and 13.

The rod 12 by which the bottle is elevated is guided in a bearing 18 in the frame 9 of the machine, and is elevated by a lever 19, with which it has a suitable connection, such as a pin 19^a and slot 20. The lever 19 is in turn operated by a link connection 21 with a treadle 22, that is pivoted at one end to the frame at 23, and is normally held in raised position by a spring 24. When pressure is removed from the treadle the spring 24 returns it to its elevated position, and in so doing moves the table 11 back to its initial position, shown in Fig. 1, and withdraws the bottle from the end 4 of the ring-carrying rod.

The paper is drawn from a roll 25 that is supported in horizontal bearings 26, 26 in the frame 9 of the machine. The paper is

fed horizontally by rollers 27 and 28, toward and above the position occupied by the top of the bottle when the table 11 is in its lower position. A horizontal table 29 serves to support the paper, and guides 30, 30 direct it toward the bottle.

The feed rollers 27 and 28 are revolved by a segmental gear 31 that is pivoted at 32 to the frame of the machine 9 and is swung up and down by a connection with a lever 34 on a rock shaft 35, which latter supports and is rotatably connected with the lever 19. The segmental gear 31 meshes with a pinion 36 fast on the shaft 37 of the lower feed roller 27 (Fig. 5). A ratchet 38 also fast on the shaft 37 (Fig. 5) in conjunction with a pawl 39 carried by the lower roller 27 (Fig. 6) constitutes a connection between said shaft 37 and roller 27 that rotates the feed rollers only on the upward, or return movement of the segment, under the action of the spring 24, when the treadle is released and the bottle-carrying table 11 sinks to its lower position. Not only is the shaft 37 independent rotatively of the feed roller 27 when rotated from right to left in Figs. 1 and 6 by the downward movement of the treadle which raises the bottle up to receive its paper cap and band, but the feed roller is held positively against accidental rotation in this direction by a spring-controlled pawl 40 on the frame 9 of the machine and a ratchet 41 on the feed roller 27 (Fig. 7).

The paper for each cap is severed from the strip after it has been fed as above described by the return movement of the treadle to its uppermost position. This is accomplished by a horizontal knife blade 42 that is supported by a yoke movable vertically in guides 43, 43 in the frame 9 of the machine (Fig. 4). The knife is arranged across the horizontal paper-supporting table 29, and enters a transverse recess in said table. The knife is actuated by a rod 45 connected with the inner arm of the lever 19 (Figs. 1 and 2). A spring 47 tends to retain the knife in its elevated position, and its operative connection with the lever 19 is so arranged, as by a pin 48 and slot 49, that the knife is operated at the end of the upward movement of the treadle 22 (under action of its spring 24) which lowers the bottle-supporting table 11, and extends the paper over the position of the bottle on said table, as explained above.

The extensible bands carried by the arms 3 of the rotative spider frame are removed one at a time from whichever arm overlies the bottle on the table 11, by a pair of horizontal, separable fingers 50, 50 (Figs. 8 and 9) that are pivoted at 51, 51 to ears on a sleeve 52 that is slidable on the vertical shaft 7, and which are normally pulled toward each other by a spring 53. The outer ends of these fingers 50, 50 are shaped to conform

them to the rods 3, and the spring 53 yields to permit them to slide down over the conical ends 4 of said rods.

A spring 54 between the frame 9 of the machine and the sleeve 52 tends to hold the latter against a collar 52^a at an elevation that will bring the ends of the fingers 50, 50 between the lowermost band Y on the rod 3 and the one next above it, as they hang on the arms 3. The sleeve 52 is moved downwardly by a link 55 that connects it with the rearward arm of the lever 19. When the treadle 22 is depressed so that it raises the bottle X up into the recess 14 in the under side of the rod 3, as explained before, it also pulls down the sleeve 53 that carries the fingers 50, 50, so that they slide over the conical end 4 of the rod 3, and off from it into the position shown in Fig. 2, and in doing so force the lowermost band Y over the cone 4 and thence over the head of the bottle, till it lies around the paper which has previously been folded down over the top of the bottle by the circumferential flange 56 that bounds the recess 14 in the end 4 of the rod 3, into which the head 7 of the bottle enters.

To reset the fingers above another band Y on the arm 3 it is necessary to lock the fingers in their separated positions till they have been raised again. This is accomplished by a dog 56 (Figs. 8 and 9), that is pivoted at one end between lugs 57 on one of the fingers 50, and is recessed at 58 at its other end to receive the other finger 50. The dog is forced upwardly against the last mentioned finger by a spring 59 (Figs. 10 and 11). The spring causes the dog to engage the finger 50 that is adjacent its free end when the fingers are spread to their most extended positions by the conical end 4 of the rod 3. As the fingers 50, 50 are raised and come into their initial position the dog 56 holds them separated as aforesaid until it encounters a stop 60 which depresses the dog and releases the fingers, and, as the fingers come together around the rod 3, under the tension of the spring 53, their beveled ends 61 enter between the two lowest bands. When all the bands have been removed from one of the rods 3, the spider frame 1 is rotated till another rod takes its place over the position of the bottle upon the table 11.

I claim:—

1. In a machine for affixing closures to bottles, the combination with a support for a supply of elastic bands, of a support for the bottle to be closed; means for folding a wrapper down over the mouth of the bottle; and means for stretching the bands and transferring them, one at a time, from their support to the neck of the bottle, around the wrapper; substantially as shown and described.

2. In a machine for affixing closures to bottles, the combination with a support for a supply of elastic bands, of a support for the bottle to be closed; feeding mechanism adapted to deliver a wrapper above the position of the bottle on its support; means for turning the wrapper down over the bottle; and means for transferring a band from the support to the neck of the bottle around the wrapper; substantially as shown and described.

3. In a machine for affixing closures to bottles, the combination of a band-supporting bar supported in upright position and provided at its lower end with an enlargement adapted to retain bands upon the bar, and means operating automatically to enter between the lowermost two bands on the bar and move downwardly so as to separate the lowermost band from the superposed bands, and force it over said enlargement; substantially as shown and described.

4. In a machine for affixing closures to bottles, the combination of a band-supporting bar supported in upright position and provided at its lower end with a cup-shaped enlargement adapted to retain bands upon the bar, and means operating automatically to enter between the lowermost two bands on the bar and move downwardly so as to separate the lowermost band from the superposed bands, and force it over said enlargement; substantially as shown and described.

5. In a machine for affixing closures to bottles, the combination of a band-supporting bar rigidly supported at its upper end and provided at its lower end with an enlargement adapted to retain bands upon the bar, and means operating automatically to enter between the lowermost two bands on the bar and move downwardly so as to separate the lowermost band from the superposed bands, and force it over said enlargement; substantially as shown and described.

6. In a machine for affixing closures to bottles, the combination with a support on which elastic bands can be strung and having an end tapered inwardly that is adapted to expand the bands when and as removed therefrom, of fingers adapted to close yieldingly around said support, above the outermost band; means for reciprocating said fingers longitudinally with respect to said support, whereby the band is expanded and transferred from said support onto the neck of a bottle adjacently positioned with reference to said support; and means for retaining said fingers in their extended positions after passing the tapered end of the support till returned to their said initial position; substantially as shown and described.

7. In a machine for affixing closures to bottles, the combination of an upright bar, supported at its upper end, on which elastic

bands can be strung, the bar being provided at its lower end with an enlargement to stretch such bands when and as removed from the bar, a support for the bottle to be closed, means for moving one of said members vertically toward and from the other, and means operating automatically to enter between the lowermost two bands on the bar and move downwardly so as to separate the lowermost band from the superposed bands, and force it downwardly over the lower end of the bar and the neck of a bottle on the bottle support when the bottle support is adjacent to the bar; substantially as shown and described.

8. In a machine for affixing closures to bottles, the combination of a support on which elastic bands can be strung, and which at one end is provided with means adapted to stretch such bands when and as removed therefrom, and which also is provided at its said end with a device for turning down upon the bottle a wrapper placed over its mouth; a support for the bottle to be closed, adapted to move to and from said support for the bands; and means for transferring a band from the support to the neck of the bottle around the wrapper; substantially as shown and described.

9. In a machine for affixing closures to bottles, the combination of an upright bar, supported at its upper end, on which elastic bands can be strung, the bar being provided at its lower end with a cup-shaped enlargement to stretch such bands when and as removed from the bar, a support for the bottle to be closed, means for moving one of said members vertically toward and from the other, and means operating automatically to enter between the lowermost two bands on the bar and move downwardly so as to separate the lowermost band from the superposed bands, and force it downwardly over the lower end of the bar and the neck of a bottle on the bottle support when the bottle support is adjacent to the bar; substantially as shown and described.

10. In a machine for affixing closures to bottles, the combination of an upright bar, supported at its upper end, on which elastic bands can be strung and provided at its lower end with a cup-shaped enlargement to stretch such bands when and as removed therefrom, a support for the bottle to be closed, means for moving one of said members vertically toward and from the other, means for feeding a wrapper to a position above the mouth of a bottle on said support, and means operating automatically to engage the lowermost band on said bar, separate it from the superposed bands, and force it downwardly over the lower end of the bar and the neck of said bottle; substantially as shown and described.

11. In a machine for affixing closures to

bottles, the combination of a support on which elastic bands can be strung, and having an end tapered inwardly and also recessed to receive the mouth of a bottle; a
 5 support for the bottle, adapted to move it into and out from said recess in the end of the support for the bands; of spring-controlled fingers held yieldingly around said support for the bands; means for moving
 10 said fingers along said support for the bands over its tapered end and returning them to their initial positions; means for retaining said fingers in their extended positions till returned to their initial positions; and
 15 means for moving said bottle support toward and from the recess in the tapered end of said band support; substantially as shown and described.

12. In a machine for affixing closures to
 20 bottles, a support for elastic bands comprising a bar having an enlarged cup-shaped lower end, and means for supporting the bar removably at its upper end; substantially as shown and described.

25 13. In a machine for affixing closures to bottles, a support for elastic bands comprising a plurality of bars having enlarged cup-shaped lower ends, and means for supporting said bars, said means being movable to
 30 bring the bars selectively into operating position; substantially as shown and described.

14. In a machine for affixing closures to bottles, the combination of a support for a

supply of elastic bands, of a support for the bottle to be closed; means for moving said
 35 bottle support toward and from said support for the elastic bands; means for withdrawing paper from a roll and delivering it above said bottle support in its retracted position;
 40 means for severing the paper above the bottle support from the roll; means for folding the paper down over the bottle; and means for transferring a band from the support to the neck of the bottle around the wrapper; substantially as shown and de-
 45 scribed.

15. In a machine for affixing closures to bottles, the combination of a band-supporting bar supported in upright position and provided at its lower end with an enlarge-
 50 ment adapted to retain bands upon the bar, a finger, and means for actuating the finger, said means operating to move the finger into engagement with the bands at a distance
 55 above said enlargement substantially equal to the thickness of a single band, so as to cause the finger to enter between the lowermost band and the one next above and thus separate the bands, said means operating thereafter to depress the finger and thus
 60 force the lowermost band over said enlargement; substantially as shown and described.

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Witnesses:

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