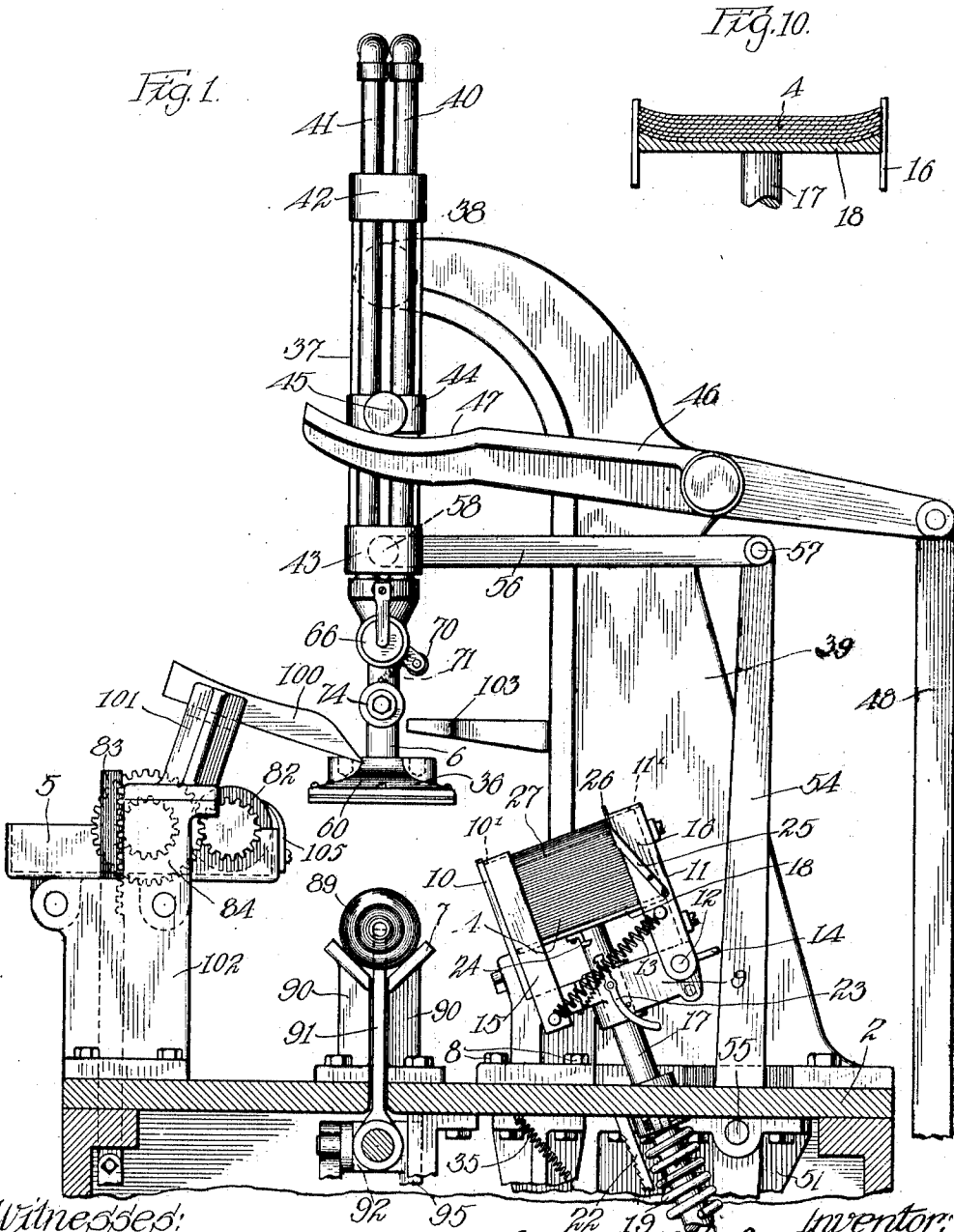


M. J. MILMOE.
 AUTOMATIC LABELING MACHINE.
 APPLICATION FILED JAN. 18, 1915.

1,315,737.

Patented Sept. 9, 1919.
 4 SHEETS—SHEET 1.



Witnesses:
 Leo J. DuMars.
 R. L. Livingston

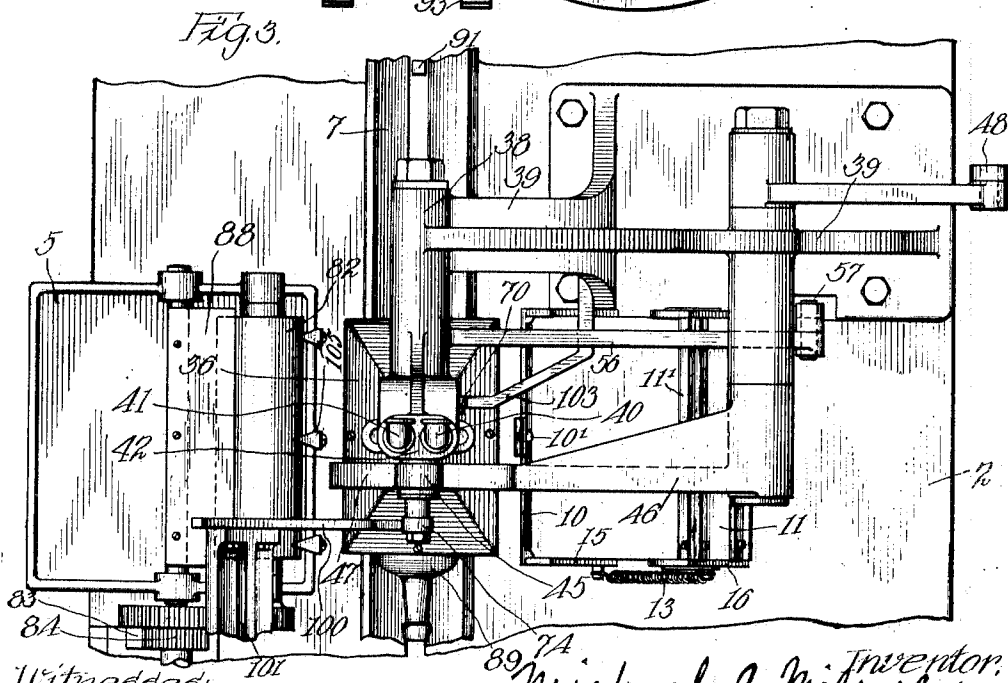
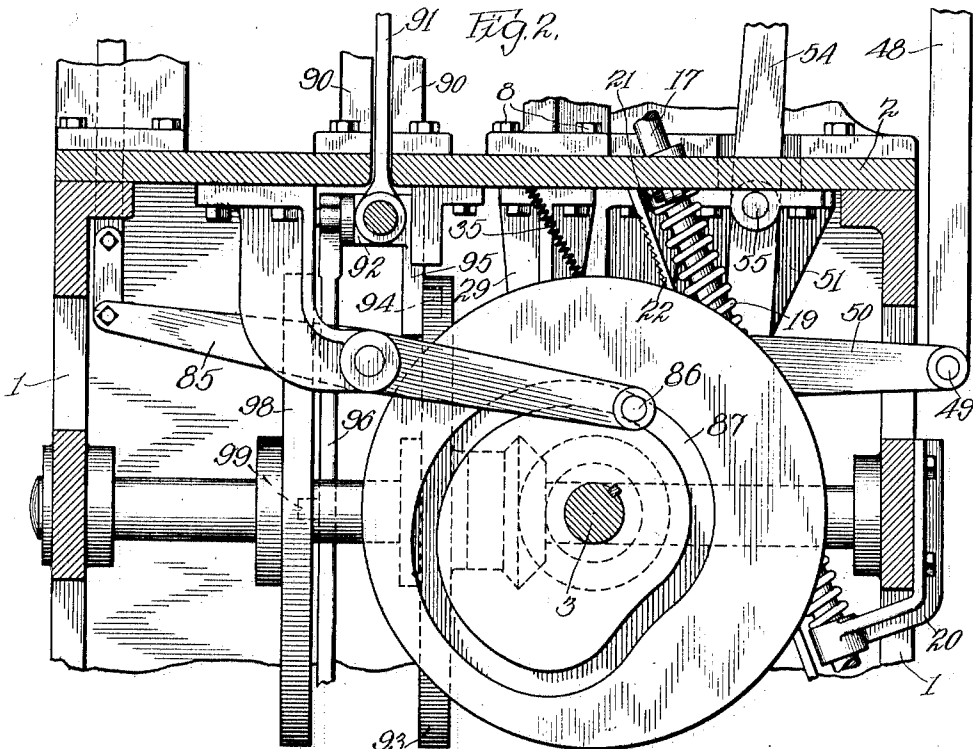
Inventor:
 Michael J. MilmoE by
 Brown, Nelson & Sprinckle Attys

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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 4.

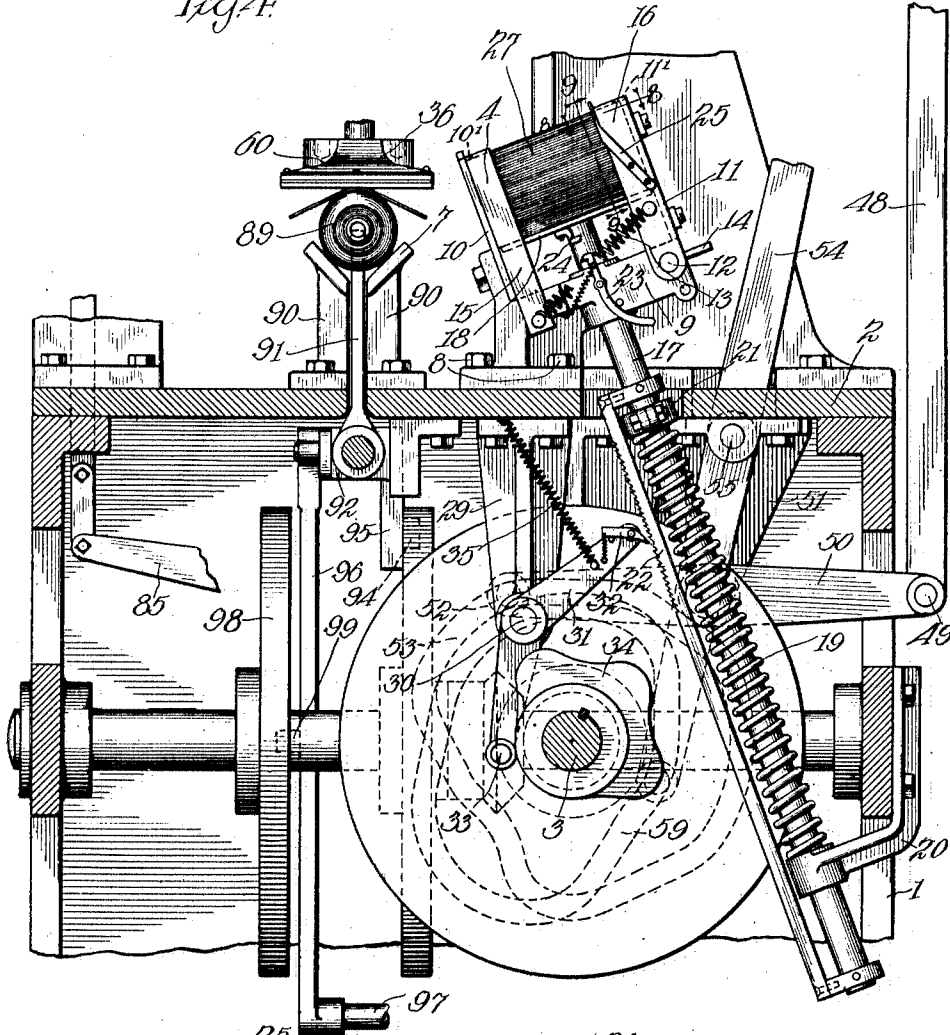


Fig. 8.

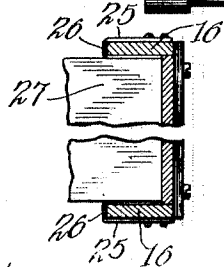
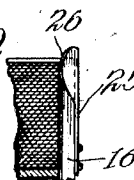


Fig. 9.

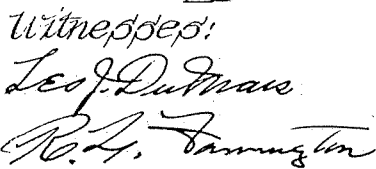


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1,315,737.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

MICHAEL J. MILMOE, OF CHICAGO, ILLINOIS, ASSIGNOR TO F. B. REDINGTON COMPANY,
OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC LABELING-MACHINE.

1,315,737.

Specification of Letters Patent.

Patented Sept. 9, 1919.

Application filed January 18, 1915. Serial No. 2,887.

To all whom it may concern:

Be it known that I, MICHAEL J. MILMOE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Labeling-Machines, of which the following is a specification.

This invention relates to machines for automatically extracting labels, one at a time, from a supply, placing the mucilage upon the labels, and applying them to the articles to be labeled.

The invention consists substantially in the combination and arrangement hereinafter described, illustrated in the accompanying drawings, and more particularly set forth in the appended claims.

In the drawings:

Figure 1 is a fragmentary side elevation, partly in section, of the upper portion of the invention.

Fig. 2 is a fragmentary vertical section of the lower portion of the invention.

Fig. 3 is a top plan view of a portion of a machine to which the invention is applied.

Fig. 4 is a vertical sectional view of a portion of the machine to which the invention is applied.

Fig. 5 is a fragmentary side elevation of the suction-head of the invention as it is about to lift a label from the supply magazine.

Fig. 6 is a longitudinal sectional view of the suction-head.

Fig. 7 is a sectional view on line 7—7 of Fig. 6.

Fig. 8 is a section on line 8—8 of Fig. 4; and,

Fig. 9 is a sectional view on line 9—9 of Fig. 4.

Fig. 10 is a fragmentary transverse sectional view of the label-holding magazine showing the shape of the surface of the bottom plate.

The frame-work on which the labeling mechanism of this invention is carried consists of a supporting portion 1 carrying a horizontal table-like top 2. The labeling mechanism includes a main drive shaft 3, a label-holding magazine 4, an adhesive holder 5, a label-handling device 6, and a work feeding device 7, together with various operating means and accessories for these devices. The label holder 4 is fastened to the

table top 2 by means of suitable fastening devices, such as lag screws 8, and comprises a bottom member 9 and side members 10 and 11. The side member 10 is pivoted to the bottom member 9 by a pivotal connection 12, and is held in an upright position by a spring 13. It may be swung to the right as viewed in Fig. 4 to open one side of the magazine, the amount of swing being limited by a stop 14. The side members 10 and 11 carry lateral flanges 15 and 16, respectively, to hold the labels in place in the magazine. Inwardly projecting lugs 10' and 11' are carried by side members 10 and 11, respectively, to contact with the upper edge of the top label and limit the upward movement of the labels in the magazine. As shown in Fig. 3, the lug 10' is simply a narrow projection while the lug 11' extends the full width of the magazine. Passing freely through a circular opening in the bottom member 9 is a rod or shaft 17 shown more clearly in Fig. 4. Carried on the upper end of the rod 17 is a plate 18 on which the labels rest. The plate 18 is curved upwardly at two of its edges, as shown in Fig. 10, to give a concave formation to the upper surface of the pile of labels. This formation resists, to a certain extent, lifting of the labels by the suction-head since the "buckle" must be taken out of each label as it is lifted, and thus the liability of lifting more than one label at a time is decreased. The rod 17 is free to slide up and down through the member 9, and is resiliently held in an upper position with the plate 18 at the top of the magazine by means of a spring 19. The spring 19 surrounds the rod 17, and is supported at its lower end by a bracket 20 through an opening in which the rod 17 passes. The collar 21 is adjustably mounted on the rod 17 and forms an abutment for the upper end of the spring 19. Rigidly fastened to the rod 17 and parallel therewith is a ratchet-bar 22, the purpose of which will be later pointed out. The rod 17 and plate 18 may be locked in a lowered position by means of the latch 23 and catch 24. Mounted on the flanges 16, as shown more clearly in Figs. 4, 8 and 9, are spring members 25, which carry knife-like projections 26 arranged to bear against the edges of the labels 27 carried in the magazine, for a purpose to be later explained. A bracket 29 fastened to the lower side of the table-top

2 and depending therefrom, as shown more clearly in Fig. 4, has a pivot 30 at its lower end on which is mounted a bell crank lever 31. On the upper end of the bell-crank lever 31 is a spring pawl or detent 32 adapted to engage the ratchet-teeth on the bar 22. On the lower end of the lever 31 is mounted a roller 33, adapted to contact with the cam 34 carried by the shaft 3. A spring 35 is provided for holding the roller 33 in resilient contact with the cam 34. It will be seen that a rotation of the cam 34 will force the detent 32 downwardly and to the right into contact with the teeth on the ratchet-bar 22, and thus give a downward motion to the shaft 17 and plate 18. In its extreme upper position the detent 32 is brought entirely out of contact with the ratchet-bar 22, leaving the shaft 17 free to move upwardly under the pressure exerted by the spring 19. This up and down motion of the plate 18 is for the purpose of adjusting any of the labels in the magazine that may have become displaced, as will be more fully explained. For the purpose of extracting labels from the magazine 4 and placing them upon the article to be labeled, mechanism is provided, including a suction-head 36, shown more clearly in Figs. 1, 5, 6 and 7. This suction-head is supported upon an arm 37, pivotally mounted as at 38 upon a standard 39 carried by the table-top 2, and securely fastened thereto in any suitable manner. Connected with the suction-head and leading upwardly therefrom, are tubes or pipes 40 and 41. The pipes 40 and 41 are mounted to slide freely through the projections 42 and 43 carried by the arm 37. Fastened to the pipes 40 and 41 to move therewith is a collar 44 carrying a stud 45. It will be seen that the suction-head 36 may be moved up and down by raising or lowering the stud 45. This up and down motion is produced by the lever 46, which has at one end a cam track 47, upon which the lug 45 is adapted to rest. Pivotally secured to the other end of the lever 46 is a bar 48 which extends downwardly therefrom, and is secured by means of a pivot 49 at its lower end, as shown in Fig. 4, to a lever 50. The lever 50 is pivotally mounted on a bracket 51 secured to the lower side of the table-top 2, and has a roller 52 working in a groove 53 in a cam carried by the main shaft 3. It will be apparent that rotation of the cam member will produce a reciprocatory motion of the lever 46, causing a vertical reciprocation of the suction-head 36, for a purpose to be more fully explained. Transverse reciprocation of the suction-head 36 is secured by means of the lever 54. This lever 54 is pivoted at 55 on a bracket secured to the under side of the table-top, and is connected to the arm 37 by means of a link 56. The link 56 is pivoted to the lever 54 by means

of a pivot 57, and to the arm 37 by means of a pivot 58. Reciprocatory motion is imparted to the lever 54 by means of a cam groove 59 carried by a cam secured to the main shaft 3. By means of the combined action of the lever 46 controlled by the cam groove 53, and the link 56 controlled by the cam groove 59, the desired motion of the suction-head 36 can be obtained.

The construction of the suction-head 36 is shown more clearly in Figs. 5, 6 and 7. A hollow casting 60 carries at its lower end a flattened bell or contact portion 61. This portion 61 is made of the proper size and shape to fit upon the labels to be handled. A perforated plate 62 is secured to the bell 61, and a cushion member 63 of yielding frictional material, such as rubber, is fastened to the bottom of the plate 62 and has perforations 64 registering with the perforations in the plate 62. The perforations 64 at one side of the suction-head have grooves 65 cut in the cushion member 63, as shown in Figs. 6 and 7, to increase the suction area on the left side of the suction-head, as viewed in Fig. 5. The upper end of the suction-head 36 has a screw-threaded connection with the pipes 40 and 41. The pipe 40 has its upper end connected in any suitable manner to a vacuum device, not shown, for exhausting the air from the suction-head. The pipe 41 has similar connection with the compression pump for the purpose of supplying compressed air to the suction-head at suitable intervals, for purposes to be explained. A valve 66 has an opening 67 therethrough, adapted to connect the interior of the head, 36, with either the pipe 40 or the pipe 41. The valve 66 is held in place by means of the spring 68, and has secured on the end opposite the spring 68 a crank 69 carrying at its end a cam roller 70. A coil spring 71 is attached to the crank 69, and normally holds the valve 66 in position to connect the head 36 with the suction-pipe 40. The head 36 carries a projection 170, shown more clearly in Fig. 6. In the projection 170 is a cylindrical opening 171, in which is mounted for reciprocation a piston or plunger 72. This plunger is normally pressed outwardly by a spring 73, and carries at its outer end a cam roller 74. The opening 171 is covered by a plate 75. The opening in the plate 75 does not fit closely about the plunger, but allows free passage of air to and from the opening 171. The plunger 72, however, makes air-tight connection with the opening 171. To prevent any oil from reaching the cushion member 63 and the labels which are being handled, a plug 76 and wells 77 are provided. The plug 76 is hollow and has at its upper end a covering 78. Perforations 79 permit free passage of air, but are so located that any oil that may be found in the head will not pass there-

through. Openings 79 and ball-valves 80 are provided to permit oil to drain from the interior of the head 36 into the well 77, the valves closing the openings against the entrance of air from the outside. A circular groove 81 extends around the head 36 to catch any oil that may run down the outside of the head.

At the left of the machine, as shown at Figs. 1 and 3, is an adhesive receptacle 5, and an adhesive applying roller 82. Any suitable means for rotating the roller may be provided. A rack 83 and gearing 84 will be shown for this purpose in the drawing. The rack 83 is reciprocated by a lever 85 having a cam roller 86 working in the cam slot 87 shown in Fig. 2. The gears 84 may, if it is desired, be provided with any well-known form of pawl and ratchet mechanism, so that the roller 82 will be driven in one direction only. A scraper 88 bears against the roller 82 to remove any excess adhesive that may adhere to the roller.

The specific mechanism for feeding the articles to be labeled, such as the bottles 89, forms no part of the present invention, and any suitable and well-known mechanism may be used for this purpose. In the form shown in the drawing two supports 90 are provided forming a trough-shaped guide at their upper ends, in which the articles to be labeled rest and are moved along. The feeding of the bottles is accomplished by an arm 91 secured to a head 92, which is mounted in any suitable manner for vertical and longitudinal motion. Vertical motion is imparted to the head 92 by means of the cam 93 working on the cam roller 94 carried by the arm 95. Longitudinal motion is imparted to the head 92 by the arm 96 supported on the fixed pivot 97, and operated by the cam 98. The cam 98 has a groove which coöperates with the cam roller 99, as shown in Figs. 2 and 4. By this mechanism a four-way motion is imparted to the arm 91 which travels forwardly in its upper position, and backwardly in its lower position, moving one bottle into position beneath the suction-head 60 each time the suction-head moves into the label-applying position. A cam track 100 shown in Figs. 1 and 3 is mounted on a bracket 101 supported in any suitable manner upon the mucilage supporting stand 102. This cam track 100 coöperates with the cam roller 74 to prevent the suction-head 60 from contacting with the mucilage roller 82, under certain conditions, as will be explained. Another cam track 103, shown in Figs. 1, 3 and 5, is carried by the upright 39, and is adapted to coöperate with the cam roller 70 to shift the valve 66 during the downward movement of the suction-head 60. The cam track 103 is off-set, as shown in Fig. 3, so that the suction-head may pass the track on its upward motion without the

roller 70 striking the track, since this upward motion takes place while the suction-head is swung to the right, as shown in Fig. 5.

The operation of the labeling machine is as follows:—

Starting with the suction-head 36 in the position shown in Fig. 1, power is applied to the main shaft 3, and the upper end of the lever 54 is thrown to the right, as viewed in Fig. 1, by the action of the cam upon its lower end. At the same time, the portion 47 of the lever 46 is lowered, and the suction-head is thus brought into contact with the labels 27 in the label holding magazine, as shown in Fig. 5. The suction-head 36 does not rest flat upon the labels 27, but contacts only at the rear edge near the retaining lug 11'. During this time the valve 66 is held in position by the spring 71 to connect the suction-head 36 with the suction-pipe 40. As soon as the head 36 comes in contact with the uppermost label, this label is drawn upwardly to lie flat upon the rear portion of the face of the head. The front portion of the label is prevented from rising into contact with the head 36, by means of the retaining lug 10'. After the head 36 has thus come into contact with the labels, it then moves a short distance to the left into the position shown in Fig. 5, the result of this action being to draw the rear portion of the label from under lug 11', and buckle the front portion slightly, as shown in the figure. The head is now lifted, and the front portion of the label drawn from under the lug 10'. This upward motion by means of the lug 10' produces an action similar to that produced by turning a bunch of cards held between the thumb and finger for separating the top card from those underneath. In this way the top label is separated from those below. During the forward motion previously mentioned, by which the labels are drawn from under the lug 11', the knife edges 26 are pressed in contact with the edges of the label, and tend to hold them from sliding forwardly with the suction-head. The top label, however, being firmly held against the suction-head, is brought forward, its edges being slightly mutilated as it is freed from the knife edges. Since the labels below are not held by the air pressure as is the top label, they are retained in their position by means of the knife edges against any tendency to move forwardly caused by adhesion to the top label. During the upward movement of the head 36 which draws the label from under the lug 10', there is, of course, a tendency for the lug 10' to strip the label from the suction-head. This tendency is especially strong at the front or left side of the suction-head, as shown in Fig. 5. To overcome this tendency the

openings 64 on this side of the suction-head are grooved, as shown at 65, in Fig. 7, to increase the effective area on this portion of the head. After the upper label has been withdrawn from the magazine, the head 36 travels upwardly, still remaining in its rearward position until the cam roller 70 has reached a position above the track 103. The head is then swung forwardly to a position over the roller 82, and is then moved downwardly and backwardly across the roller 82, thus applying the adhesive to the under surface of the label. The head now moves downwardly into contact with the article to be labeled, as shown in Fig. 4. During this downward motion the cam roller 70 strikes the track 103, and shifts the valve 66 so that at the same time the label comes into contact with the bottle, the head 36 is disconnected from the suction-pipe 40 and connected with the compression pipe 41. Air is then forced outwardly through the openings 64 in the suction-head, and the label is forcibly removed from the suction-head and wrapped partially around the bottle, as shown in Fig. 4. The suction-head then moves upwardly until the roller 70 is freed from the track 103, and the spring 71 returns the valve to its original position. The head then moves back to the magazine for another label, and the action is repeated. The article 89 is moved forwardly under any suitable mechanism for completing the application of the label. As the mechanism for accomplishing this forms no part of the present invention, it is not shown or described. During the time that the label is being supplied with adhesive and applied to the article to be labeled, the cam 34 operates upon the lever 31 to throw the detent 32 forwardly and downwardly a number of times. This motion brings the detent 32 into contact with the ratchet teeth on the bar 22, and gives the plate 18 a downward motion, and reciprocates it up and down a number of times while held in a slightly lowered position. The object of this reciprocation is to readjust any of the upper labels that may have been disarranged by the action of the suction-head in removing the upper label. The lowering of the plate 18 and its reciprocation allows any such disarranged label to drop back into its proper position. As the labels are removed from the top of the stack, the spring 19 forces the plate 18 upwardly so that at each cycle of operation a new label is held in position against the lugs 10' and 11' to be removed by the suction-head. The bar 22 is provided with a series of ratchet teeth so that there will be a tooth in position to contact with the detent 32 regardless of the position of the rod 17.

Provision is made for preventing the head 36 from contacting with the adhesive apply-

ing roller in case the head should fail to pick up a label at any operation. This result is accomplished by the roller 74 and the cam track 100. At each operation when a label is picked up, it closes all of the openings 64 against entrance of air into the suction-head. This produces a partial vacuum within the suction-head which continues as long as the label remains in place over the holes 64. Because of this partial vacuum within the suction-head, air pressure on the plunger 72 forces the plunger inwardly against the action of the spring 73 and the roller 74 is thus held close to the projection 70. In this position the cam roller during the downward motion of the suction-head toward the mucilage roller is free to pass the cam track 100, and the label is brought into contact with the mucilage roller, and the mucilage applied. If, however, the suction-head has failed to pick up a label, air has free passage to the interior of the head, and the plunger 72 will not be withdrawn. In this case the roller 74 is held in an outer position, as shown in Fig. 3, and on the downward motion of the head the roller strikes the cam track 100, and the head is prevented from coming into contact with the adhesive applying roller. As the labels are moved over the mucilage roller, they are prevented from adhering thereto by fingers 105 secured to the adhesive holder, and bearing against the roller 82.

I claim:

1. In a labeling device, a source for supplying labels arranged to hold the labels in approximately horizontal position, means for lifting labels upwardly from said source and presenting said labels to adhesive applying mechanism, and means for positively forcing said labels downwardly from said first mentioned means onto articles to be labeled.

2. In a device of the class described, a source for supplying labels, an adhesive applying mechanism, a support for articles positioned intermediate the said source and said adhesive applying device, and means for carrying labels from the said source past the said article support and the adhesive applying device and then back in contact with the adhesive applying device, and finally to the article held in the said article support.

3. In a labeling machine, a lifter having a suction-head, an exhaust pipe connected with said lifter, a compression pipe connected with said lifter, and a three-way valve in said lifter adapted to connect said suction-head with either said exhaust pipe or said compression pipe, said valve being arranged to change the connection between said pipes and the operating surface of the entire head at one time.

4. In a label-handling device, a support, an arm pivoted to said support, a lifting

mechanism slidably mounted on said arm, means for sliding said lifting mechanism on said arm into and out of contact with an article to be labeled, and means for rocking said arm on its pivot to move said lifting mechanism into position to receive a label.

5. In a labeling device, a support, an arm pivoted on said support, a lifter slidably mounted on said arm, a lever pivoted on said support for sliding said lifter upwardly and downwardly on said arm to move it away from and into contact with an article to be labeled, a second lever pivoted on said support, a link pivotally connected to said arm and said second lever, and cam means for operating said levers.

6. In a labeling device, a support, an arm pivoted on said support, a lifting device slidably mounted on said arm, a lever for sliding said lifting device on said arm, a lever for swinging said arm on said pivot, a label-holding mechanism, an adhesive applying mechanism, an article-holding mechanism, and cam means for operating said levers and moving said lifter successively into position over said label-holding mechanism, said adhesive applying mechanism and said article-holding mechanism.

7. In a labeling machine, means for holding an article to be labeled, a label-carrier, mechanism for moving said carrier and means in the path of movement of said label-carrier to cause disconnection of the label carried thereby from the label-carrier, when the label-carrier reaches a position over the article to be labeled.

8. In a labeling machine, a label-holding device, a label carrier, means for moving said carrier, a stop on said label carrier, and means in the path of movement of said label carrier to operate said stop to cause the label to be discharged from said label carrier when said label carrier has reached a predetermined position in its cycle.

9. In a labeling machine, the combination of a magazine for holding a supply of labels, a suction-head for removing the top labels of said supply, one at a time, an air exhaust pipe adapted to be connected with said suction-head, a compression air pipe adapted to be connected with said suction-head, means for selectively connecting said pipes with said head, an adhesive applying roller, a support for articles to be labeled, mechanism for moving the suction-head with the label carried thereby from the label magazine upwardly and forwardly past the article support and adhesive applying roller, thence downwardly and backwardly in contact with the adhesive applying roller, thence downwardly into contact with the article to be labeled, and then back to label-lifting position, and means for connecting the suction-head with the exhaust pipe during the lifting and carrying operation and for dis-

connecting the head from the exhaust pipe when the label is in contact with the article to be labeled.

10. In a labeling machine, the combination of a magazine for holding a supply of articles, a suction-head for removing the top labels of said supply, one at a time, an air exhaust pipe adapted to be connected with said suction-head, a compression air pipe adapted to be connected with said suction-head, a valve for selectively connecting said pipes with said head, an adhesive applying roller, a support for articles to be labeled, mechanism for moving articles to be labeled along said support and positioning them at proper intervals in position to receive labels, mechanism for moving said suction-head with the label carried thereby from the label-holding magazine upwardly and forwardly past the article support and adhesive applying roller, downwardly and backwardly in contact with the mucilage roller, thence downwardly into contact with the article to be labeled, means for connecting the suction-head with the exhaust pipe during the lifting and carrying operation, means for disconnecting the head from the exhaust and connecting it with the compression pipe when the head is in label-applying position, and means for preventing the suction-head from contacting with the adhesive applying roller whenever there is no label carried by the suction-head.

11. In a labeling machine, the combination of means for holding a supply of labels, a suction head for removing the top labels from said supply one at a time, means for exhausting the air from said suction head, an adhesive applying device, a support for articles to be labeled, mechanism for moving said suction head with the label carried thereby from the label holding means to the adhesive applying device and thence into contact with the article to be labeled, and means for disconnecting said suction head from the air exhausting means when the label is in contact with the article to be labeled.

12. In a labeling machine, means for holding a supply of labels, a label lifting device for removing labels from said supply, an adhesive applying device, and means for moving said label lifting device from said supply past said adhesive applying device and thence backwardly in contact with said adhesive applying device and thereafter into contact with an article to be labeled.

13. In a labeling machine, means for holding an article to be labeled, an adhesive applying device and means for carrying a label from said supply past said adhesive applying device and thence backwardly in contact with said adhesive applying device and to the article held in said holding means.

14. In a labeling machine, means for holding a supply of labels, means for holding an