May 27, 1924.

1,495,408

E. F. FOSTER

LABELING MACHINE

Filed Feb. 28, 1922

5 Sheets-Sheet 1

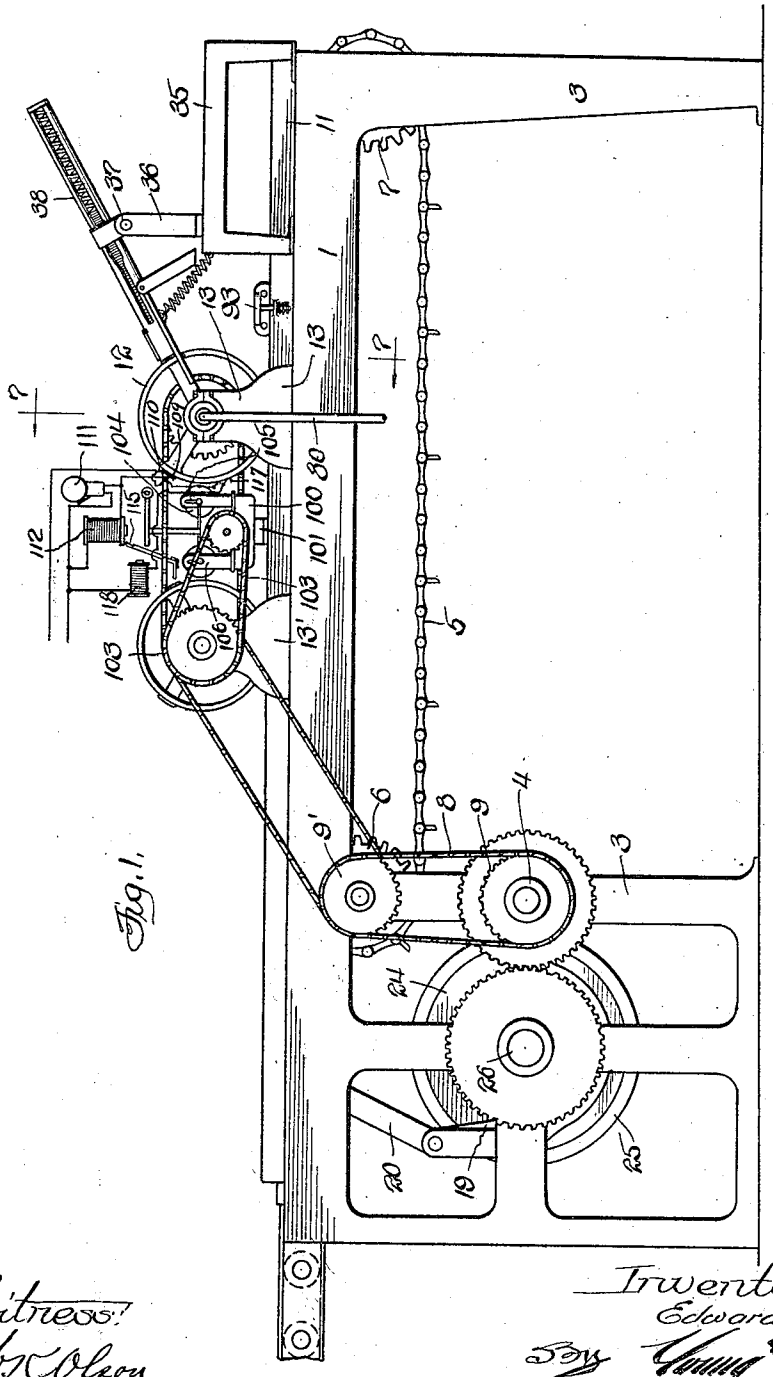


Fig. 1.

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Inventor:
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LABELING MACHINE

Filed Feb. 28, 1922 5 Sheets-Sheet 2

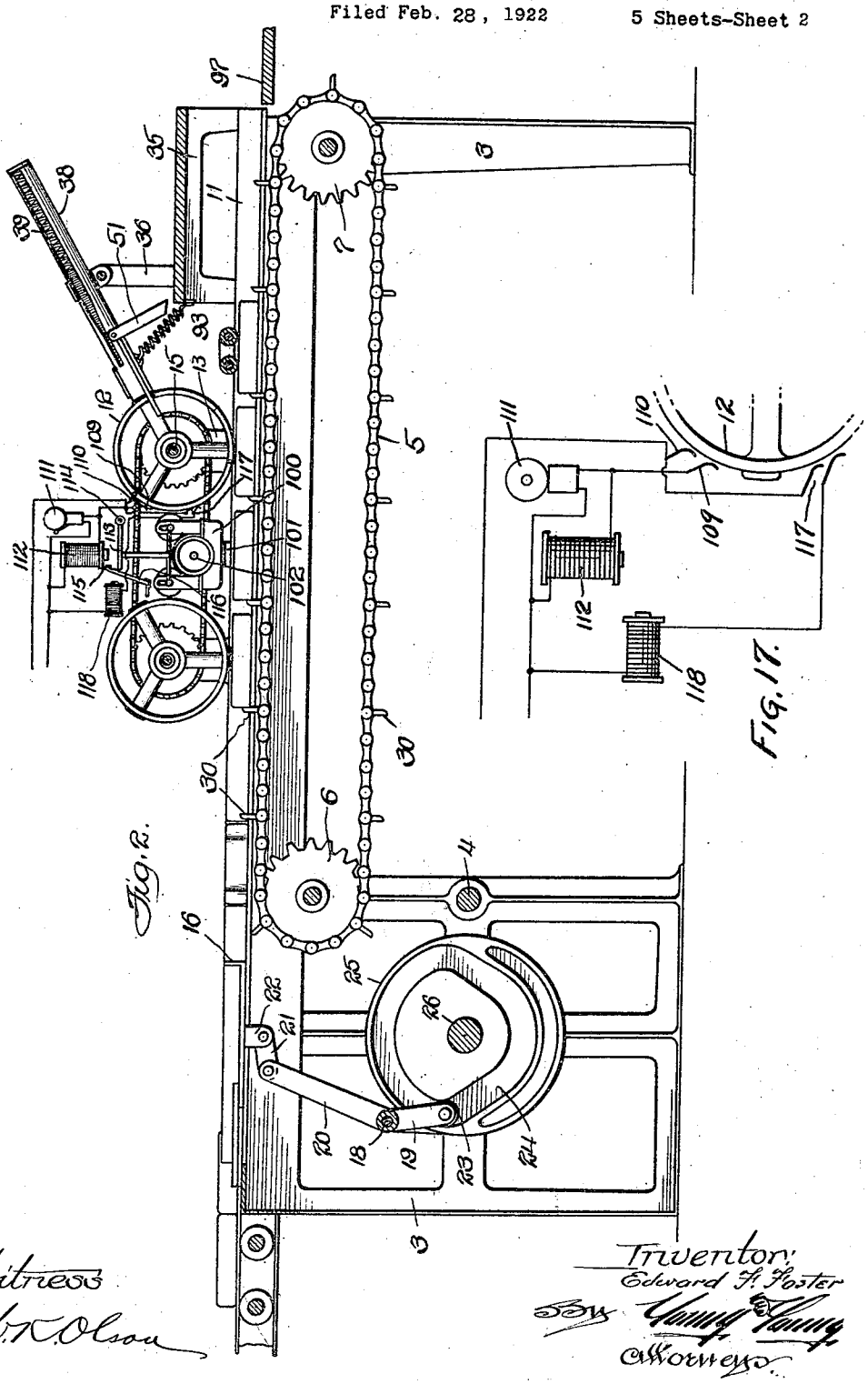


Fig. 2.

Fig. 17.

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LABELING MACHINE

Filed Feb. 28, 1922 5 Sheets-Sheet 3

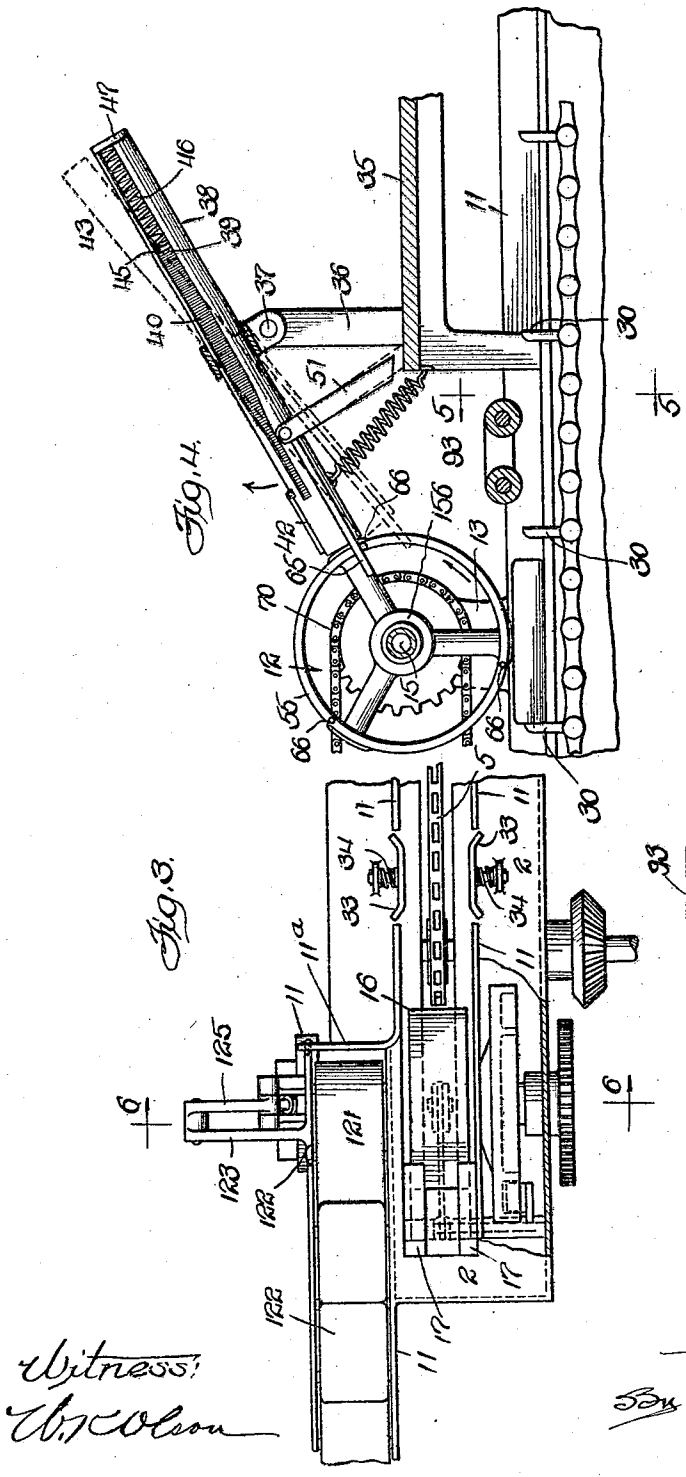


Fig. 4.

Fig. 3.

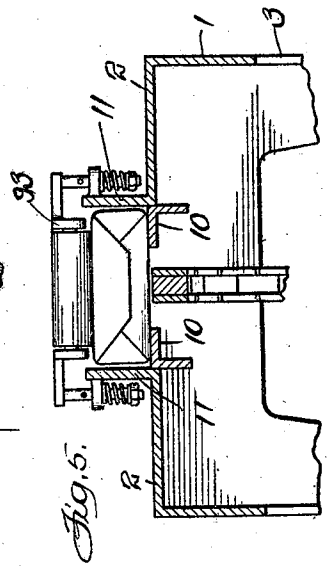


Fig. 5.

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LABELING MACHINE

Filed Feb. 28, 1922 5 Sheets-Sheet 4

Fig. 7.

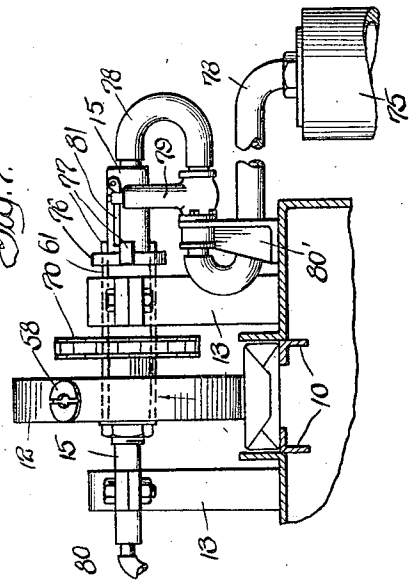


Fig. 8.

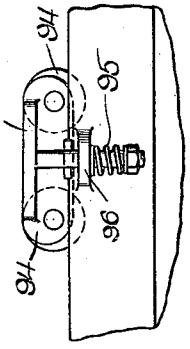
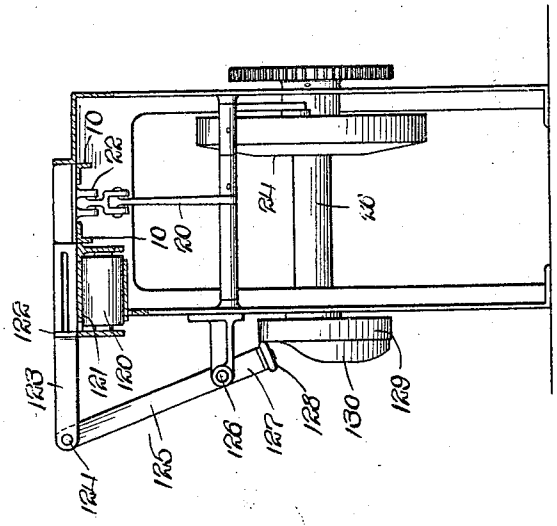


Fig. 6.



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LABELING MACHINE

Filed Feb. 28, 1922 5 Sheets-Sheet 5

Fig. 9.

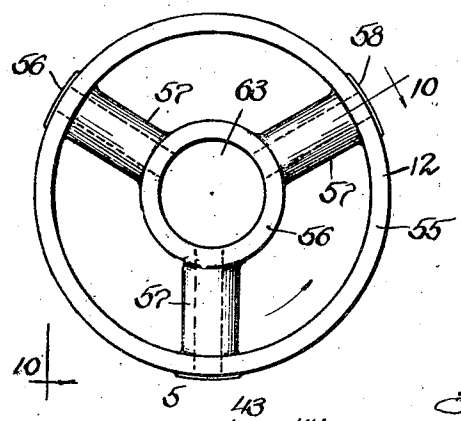


Fig. 10.

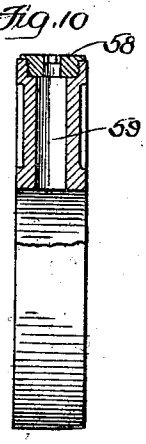


Fig. 12.

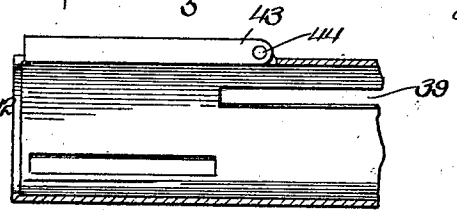


Fig. 11.

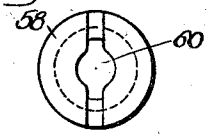


Fig. 14.

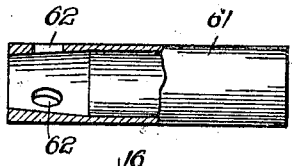


Fig. 13.

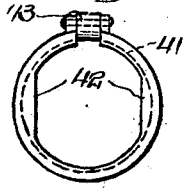


Fig. 15.

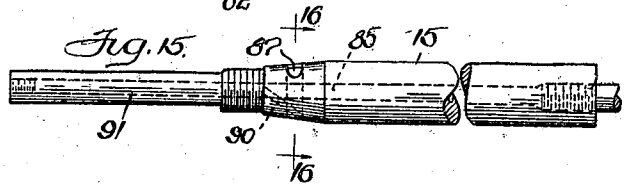
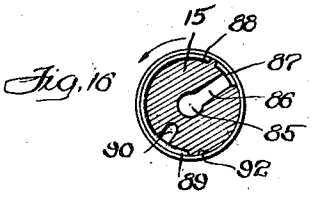


Fig. 16.



Witness:
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Patented May 27, 1924. 1,495,408

UNITED STATES PATENT OFFICE.

EDWARD F. FOSTER, OF MILWAUKEE, WISCONSIN.

LABELING MACHINE.

Application filed February 28, 1922. Serial No. 539,943.

To all whom it may concern:

Be it known that I, EDWARD F. FOSTER, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Labeling Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to the preparation of package goods for market by the application of stamps or seals or specially prepared pieces of paper, either for the purpose of securely fastening the package or the application of a characteristic and identifying design. The object of my invention is to provide an effective, accurate and rapidly operating machine for the purpose described; and, to that end I provide means for taking separate articles to be labeled, feeding them to the machine and carrying them to a predetermined point, and I also include a receptacle or magazine for the labels, and pneumatic means for taking them therefrom and also carrying them to said predetermined point at which they are to be affixed to the article to be labeled; I further provide means by which the labels are moistened or gummed and also by which the moistening or gumming apparatus is thrown out of action in case of failure to properly take and carry the label.

The principles of my invention are illustrated in the drawings in which Fig. 1 shows a side elevation of my machine, Fig. 2 is a longitudinal section on the dotted line 2—2 of Fig. 3. Fig. 3 is a top plan view of the feed end of Fig. 1. Fig. 4 is an enlarged detail of a part of the labeling end of Fig. 2. Fig. 5 is a section on the line 5—5 of Fig. 4 Fig. 6 is an enlarged section on the line 6—6 of Fig. 3. Fig. 7 is a section on the line 7—7 of Fig. 1. Fig. 8 is an enlarged detail of a label pressing device. Fig. 9 is an enlarged view of the labeling wheel. Fig. 10 is an enlarged spoke on the line 10—10 of Fig. 9 partly in section together with the labeling head. Fig. 11 is a top plan view of the labeling head. Figs. 12 and 13 are details of the label holder. Fig. 14 is a bushing for the labeling wheel. Fig. 15 is a stationary shaft upon which said bushing and its wheel revolve. Fig. 16 is a section on the line 16—16 of Fig. 15. Figure 17 is an enlarged diagrammatic view of the wiring.

Further describing my invention with reference to the drawings in which like characters of reference denote like parts throughout: 1 represents the horizontal framing, 2 a table and 3 the legs which carry the operative parts of my machine. 4 is a main shaft which receives the driving power and 5 is an endless chain or platform mounted on the sprocket wheels 6 and 7. Said chain or platform reaches substantially from end to end of the table and is driven by sprocket chain 8 which connects the corresponding sprocket wheels 9 and 9′. Said chain 5 is enclosed between two inwardly projecting members 10 preferably of angle iron, the upper and horizontal flanges of which form the lower portion of a chute through which the articles to be labeled pass. The side rails or walls 11 of said chute extend upwardly from the table 2 and generally define the path which the articles to be labeled follow. A labeling wheel 12 (see also Fig. 9) is mounted upon the uprights 13 which are carried by the table 2. It revolves upon a stationary hollow shaft 15 which passes between and is securely clamped to the uprights 13. The articles to be labeled, such as soap and the like, are supplied to the labeling device and the devices directly accessory thereto by the endless chain or carrier 5. This may be done manually, but I prefer to provide mechanical means as is shown in Fig. 3 consisting of a reciprocating carrier 16 held in alignment by guides 17 and operated by means of a lever pivoted at 18 and having the short arm 19 and long arm 20. The said long arm is connected by link 21 to the depending offset 22 on the underside of the reciprocating carrier 16. The short arm 19 of said lever has an offset roller 23 operating within the groove 24 of the cam 25 mounted on shaft 26 which is geared to the main shaft 4.

The endless carrier 5 is divided into sections of equal length by projections 30 against which, as they move forward, the article to be labeled is received, and which fix the spacing thereof in the direction of their movement. The movement of the endless chain and of the reciprocating head 16 should be so timed that they will coincide and that each movement of the reciprocating head will deposit one of the articles into a corresponding section by which it is carried forward to the labeling device.

On each side of the endless chain are the retaining rails 11 adapted to hold the arti-

cles to be labeled in the chute and within the control of the endless chain or apron. In order that such articles may be centered laterally I provide a plurality of plungers having the heads 33 projecting slightly into the path provided between the retaining rails 11. Said plungers are controlled by springs 34 which tend to bring the heads slightly within the line of the inside faces of the retaining rails. As the articles to be labeled pass between them they will be centered laterally and will be in proper position to receive the label when advanced to the point at which it is presented when impelled by the projections 30.

At the rear end of the apparatus, upon the table 2 is placed a support 35. Extending upwardly therefrom is a post 36 upon which, at 37, is pivoted a tubular label holder 38. Said label holder has a slot 39 extending the greater portion of its length, for the purpose of adjusting labels 40 therein as desired. The discharge end of the label holder is shown in Figs. 12 and 13; it is slightly reduced by the flange 41 and further reduced by the lateral extensions 42, the function of which will be hereinafter explained. The upper portion of said lower end of the tube is provided with a swinging weight 43 pivoted at 44 which is adapted to hold and stabilize the labels in the holder and in their relation to each other when pressed downwardly by the follower 45 actuated by spring 46 and held in place by the cap 47 secured on the end of the label holding tube by a bayonet joint or other suitable means. The downward position of the label holder, as indicated by the dotted lines in Fig. 4, is determined by the spring 50 as limited by the stop 51 when received upon the table 35.

The labeling wheel 12 mounted on support 13 consists of a rim 55 and a hub 56 connected by hollow arms 57 as shown in Figs. 9 and 10. The said arms have labeling heads 58 at their outer extremities, a plan view of which is shown in Fig. 11. It will be seen that the axial bore 59 of the spoke or arm 57 connects with said head which has a transverse opening 60.

A bushing 61, shown in Fig. 14, has peripheral openings 62 and is inserted in the hub opening of the labeling wheel in such a position that the said openings will register with the corresponding axial opening of the arms or spokes 57. The labeling wheel thus constructed is mounted upon the shaft 15 shown in Fig. 15 which spans the space between the supports 13, and which is rigidly secured thereto. The same should be so mounted with reference to the label holder that the labeling heads 58 will make a slight contact with the lower end of the labeling tube when in the relative positions shown in Fig. 4. The label tube is provided with a projecting rod 65, and the rim 55 of the labeling wheel should have pins or projections 66 so disposed with reference to each other that when the labeling head is rotated to the right and upwardly, as shown in the arrow in Fig. 4, the pins 66 will engage the projecting rod 65 when in the normal position shown by the dotted lines. The rotation of the labeling head will raise the label tube to the position shown, at which a label will be drawn from the labeling tube and caused to adhere to the labeling head as hereinafter explained.

Referring to Fig. 7 the apparatus last described is shown assembled, a sprocket wheel 70 being mounted on the extended bushing 61 between the labeling wheel 12 and the support 13.

An exhaust tank 75 is connected with suitable mechanism, not shown, by which the air may be exhausted therefrom and held at a predetermined pressure as desired.

A circular head 76 having the fingers 77 is secured upon the end of the bushing 61 which projects beyond the support 13. The exhaust tank 75 is connected by means of a non-collapsible tubing 78 with the large end of the hollow shaft 15 and also by means of the tubing 80 with the other or small end of the non-rotatable shaft 15. A normally spring closed valve 79 is mounted on the bracket 80′ and is adapted to be opened by pressure on the under side of the lever or handle 81. And this will take place each time that it is engaged by the fingers 77, that is, air suction will be produced in the stationary shaft three times with each revolution of the labeling wheel, and the several parts should be so arranged with reference to each other that this suction will be produced at a predetermined time, namely, when each labeling head comes in proper contact with the lower end of the label tube. As the lower end of the label tube or container is slightly contracted by means of the flange 41 and the lateral contractions 42, and as the labeling head is provided with a correspondingly placed, elongated suction opening 60, as the two are brought into contact as described with reference to Fig. 4, the external label in the label tube will be caused to buckle and to be withdrawn without disturbing any other label contained in the tube.

Describing the air flow by which this effect is produced and the further action of the apparatus by which the label thus taken is held upon the labeling head during its further revolution to the point underneath at which the label is applied: Fig. 16 is an enlarged drawing in section of stationary shaft 15 on the line 16—16, and 85 is a longitudinal bore extending axially through the larger end of the shaft 15 from its connection with the tubing 78 to the radial connection 86 with the short peripheral groove

87 which is adapted to register with the openings 62 in sleeve 61 and be connected to the hollow arm of the labeling wheel. Another peripheral groove in the said stationary shaft extends from the point 88 to the point 89 and is adapted to connect with the offset 90 which connects with the bore 91 in the small end of the stationary shaft 15. It will be observed that as the labeling wheel shown in Fig. 9 turns in the direction of the arrow shown in Fig. 16, upon the shaft 15 the groove 87 will first register fully with the opening 62 in the bushing. The valve 79 will be opened, giving a quick and full suction through the opening 62 and removing the label into engagement with the corresponding labeling head. As the actuating finger releases the valve, continued rotation of the labeling wheel will cause the same opening in the bushing to connect with the longer peripheral groove extending from 88 to 89 from which air is exhausted through offset 90. The label is thus held continuously in place until the labeling head turns to the lowest part of rotation at which point the label is placed in contact with the article to be labeled. At the point 89 at which the groove ends, the air suction is cut off and the air equilibrium restored through an externally opening notch or groove 92. The article to be labeled is then continuously impelled toward the rear end of the machine and is carried under the cross head 93, having rollers 94 and normally held in a position adapted to exert pressure on the said article by means of a spring 95 passing through bracket 96. As the article to be labeled is carried under the said wheels the pressure of the spring is exerted through the T-head carrier, thus primarily fixing the label to the package which is then discharged from the rear end of the machine at 97.

The labels used in this machine may be either gummed, in which case the labels are moistened midway their point of being taken on by the labeling head and being discharged therefrom, or they may be provided with muscilage by a device, in each case practically the same as shown in Figs. 1 and 2. A trough 100 adapted to hold the water or the adhesive, is carried on the support 101 which is provided with a wallower 102 driven by sprocket chain 103; and wheel 104 is axeled in a slotted bearing 105 between supports 106 and is adapted normally to contact with wallower 102 and with the projecting heads 58 as they revolve.

Means are provided which become effective when one of the labeling heads fails to take up a seal. In order to secure these results a pair of electrical contacts 109 and 110 are spaced from each other and are adapted to bear upon each of the labeling heads at a predetermined point in the revolution of the labeling wheel. As long as a label covers the face of the labeling head passing beneath these contacts, no electric circuit will be formed between these contacts. However if the head passes the contacts without the label thereon, the circuit will be closed through these contacts. This circuit includes the solenoid 112 and, if desired, the electric bell 111 arranged in parallel therewith.

Upon energization of the electromagnet, the armature 113 thereof will be raised and by raising the wheels 105 and 106 will prevent contact with and moistening or gumming of the label heads. The armature 113 rocks about its pivot point and its free end engages within a notch 115 formed in a second armature lever 116; thus the armature 113 will be held in elevated relation until released by the armature 116. However, upon further rotation of the labeling wheel a pair of contacts 117 will be engaged by the uncovered labeling head and consequently energization of the electro-magnet will occur at this time. This electro-magnet retracts this aramture 116 and thus allows the armature 113 to drop back into its initial position thus repositioning the wheels 105 and 106.

In Figs. 1 and 2 on supports 13′ I mount a second head which is auxiliary to the labeling head if desired. It is not intended to carry labels as is the other head already described but provides a means by which the articles to be labeled may be moistened at a proper place so that when they are carried to the other head gummed labels may be applied and caused to adhere without moistening when carried by the primary labeling head as described; or, if further desired, the two heads may be arranged to co-act or work simultaneously.

In order to eliminate, as far as possible, any manual manipulation of articles to be labeled and to make the apparatus automatic to the extent of receiving and properly placing the wrapped articles in position to be acted upon by the mechanism heretofore described I provide a device which is shown in Fig. 6 the same being a cross section on the line 6—6 of Fig. 3. At a point in the rear of the reciprocating carrier 16 adapted to receive articles from the wrapping machine is a roller 120 carrying an endless belt 121. Outside that portion of the said belt where articles thereon will normally be stopped by the rail 11ª, I provide a head 122 having a pusher rod 123. Said pusher rod is pivoted at 124 to the long arm 125 of a lever pivoted at 126 and having the short arm 127 provided with a roller 128. And wheel 129 having the cam 130 is keyed on shaft 26. The roller 128 rides on the outer face of the wheel 129 and its cam 130; and the parts are so related and

timed that when the reciprocating carrier 16 is withdrawn by the arm 20 the head 122 will be moved transversely to push the article to be labeled within the reach of the said carrier.

I claim:

1. In a labeling machine; a label holder, a wheel having a hub and hollow labeling spokes adapted to co-act with said label holder, a tubular non-revoluble axle extending through the hub of said wheel having a plurality of peripheral ports adapted successively to be connected with said hollow spokes, means for causing suction from one end of said axle through one port and means independent of the first named means for causing suction from the other end of said axle through another port.

2. In a labeling machine; a label holder, a wheel having a hub and hollow labeling spokes adapted to co-act with said label holder, a tubular non-revoluble axle extending through the hub of said wheel having a plurality of peripheral ports adapted successively to be connected with said hollow spokes, means for causing limited initial suction through one port of said axle, and means for causing continuing suction through another port of said axle.

3. In a labeling machine; a label holder, a wheel having a hub and hollow labeling spokes adapted to co-act with said label holder, a tubular non-revoluble axle extending through the hub of said wheel having a plurality of peripheral ports adapted successively to be connected with said hollow spokes, one of said ports having a peripheral groove, and means for creating a suction in said tubular axle.

4. In a labeling machine; a label holder, a wheel having a hub and hollow labeling spokes adapted to co-act with said label holder, a tubular non-revoluble axle extending through the hub of said wheel having a plurality of peripheral ports adapted successively to be connected with said hollow spokes, said ports being separately provided with peripheral grooves, and means for creating a suction in said tubular axle.

5. In a labeling machine; a frame, a non-rotating axle having a plurality of non-connected suction ports mounted on the frame, a wheel having an apertured bushing in the hub thereof rotatably on said axle, a hollow spoke normally connected with the aperture in said bushing and adapted successively to be connected with the ports in said axle, a label tube operatively positioned relatively to the outer end of said spoke when the inner end thereof is in register with the first of said exhaust ports, and means for creating a suction in said suction ports.

6. In a labeling machine; a frame, a non-rotating axle having a plurality of non-connected suction ports mounted on the frame, a wheel rotatable on said axle and having a hollow spoke adapted successively to register with the ports in said axle, a relief opening beyond the second of said ports, a label tube operatively positioned relatively to the outer end of said spoke when the inner end thereof is in register with the first of said exhaust ports, and means for creating a suction in said suction ports.

7. In a labeling machine; a label holder, a tubular axle having a plurality of ports in the same transverse plane, and having independent passages leading from said ports through the body of said axle to the two ends thereof, a labeling wheel having a hub and a plurality of hollow labeling spokes mounted on said axle so that the spokes are adapted successively to register with the ports on the axle, tubular connections from the ends of said axle to a vacuum producing device, a valve in one of said tubular connections, and means operated by the rotation of said wheel to open the valve whenever the inner end of a labeling spoke is in full register with a port of the axle, and the outer end of said spoke is in co-acting relation with the label holder.

8. In a labeling machine; a label holder, a tubular axle having a plurality of ports in the same transverse plane, and having independent passages leading from said ports through the body of said axle to the two ends thereof, a labeling wheel having a hub and a plurality of hollow labeling spokes mounted on said axle so that the spokes are adapted successively to register with the ports on the axle, tubular connections from the ends of said axle to a vacuum producing device, a valve in one of said tubular connections provided with a trip lever, fingers on the hub of the labeling wheel corresponding in number to the labeling heads adapted to open said valve whenever the inner end of a labeling spoke is in full register with a port of the axle, and the outer end of said spoke is in co-acting relation with the label holder.

9. In a labeling machine; a labeling wheel including a hub, hollow spokes radially attached thereto, labeling heads at the outer ends of said spokes, and bushings in said hub having perforations adapted to register with said hollow spokes, a stationary axle upon which said hub is received, said axle having an axial bore extended to and connected into the plane of rotation of said spokes, means for exhausting the air from said spokes, a label holder adapted to co-act with said labeling heads at each rotation thereof, and a moistening device adapted to be engaged by said labeling heads at each rotation thereof.

10. In a labeling machine, the combination of a revoluble head, label moistening means adapted to contact with said head

under normal conditions, and electro magnetic means for retracting said label moistening means when a label is not carried by said head.

11. In a labeling machine; a tubular label holder having a longitudinally cut-away portion at its lower end, and a block pivoted at the cut-away part and adapted to operate therethrough on the labels at said lower end of the holder and to contact with said labels throughout its extent.

12. In a labeling machine; a tubular label holder having a longitudinal slot extending substantially throughout its length and having a cut-away portion at its lower end, a plurality of lateral flanges to form a contracted discharge opening, a block pivoted at the cut-away part and adapted to operate in said cut-away portion, a follower block in the holder, a cap therefor, means for securing said cap to the holder, and elastic means interposed between said cap and said follower block.

13. In a labeling machine; the combination of a label tube having lateral flanges to form a narrowed, elongated discharge aperture, and a labeling head adapted to coact with said labeling tube having a narrow, elongated suction opening corresponding to the discharge opening in said label tube.

14. In a labeling machine; a labeling wheel having a plurality of labeling heads, a label tube pivotally mounted in operative relation to said labeling wheel and normally below the point of label discharge, means on the labeling wheel adapted to engage corresponding means on the label tube and carry said tube to the point of label extraction, and means for releasing said label tube when said point is passed.

15. In a labeling machine; a labeling wheel having a plurality of labeling heads, a label tube pivotally mounted in operative relation to said labeling wheel and normally below the point of label discharge, means on the labeling wheel adapted to engage corresponding means on the label tube and carry said tube to the point of label extraction, and means for restoring said tube to its normal position when said point is passed.

16. In a labeling machine having a runway for articles to be labeled; the combination therewith of a plurality of heads having rounded faces projecting into the runway on each side thereof. elastic means for normally maintaining them in said projecting position, and means located centrally with respect to said runway for placing labels upon said articles.

17. In a labeling machine; a table, a labeling wheel thereon, a runway on said table, a carrier in said runway adapted to carry articles to be labeled to said labeling wheel, and means on opposite sides of said runway adapted to laterally position such articles on the said carrier.

18. In a labeling machine; a table, a labeling wheel thereon, a runway on said table, a carrier in said runway adapted to carry articles to be labeled to said labeling head, a reciprocating head on the table to place said articles on said carrier, a mechanism having a head operating at right angles to the path of said reciprocating head and means for giving alternately advanced action to said heads.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

EDWARD F. FOSTER.