

A. W. LIVINGSTON.
WRAPPER FORMING AND LABELING MACHINE.
APPLICATION FILED DEC. 16, 1905.

1,059,621.

Patented Apr. 22, 1913.

3 SHEETS—SHEET 1.

Fig. 2.

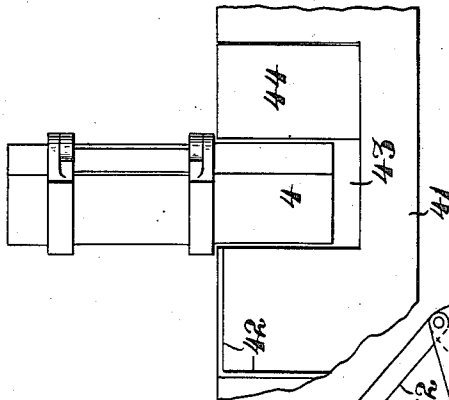


Fig. 1.

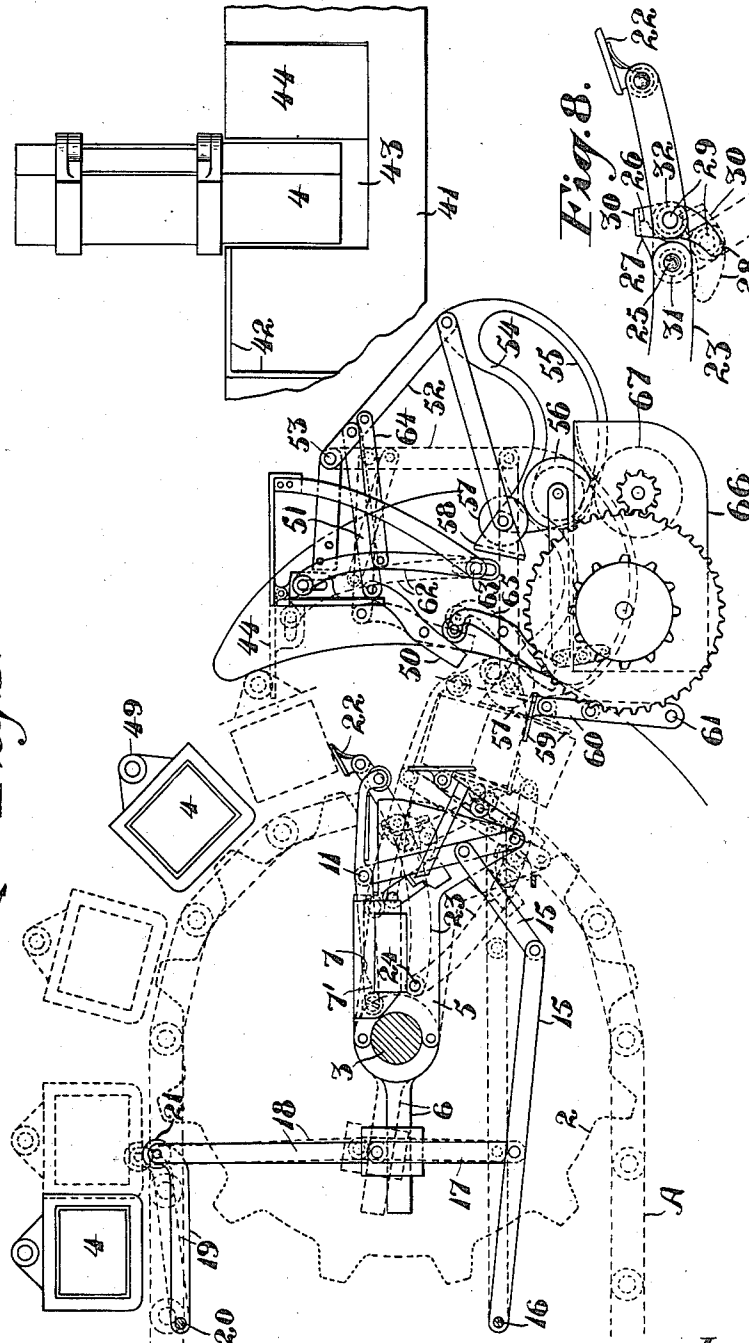
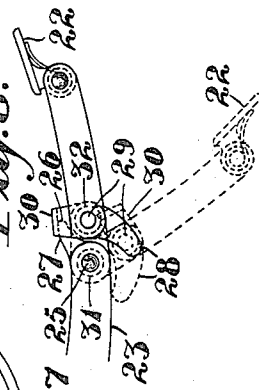


Fig. 8.



Witnesses:
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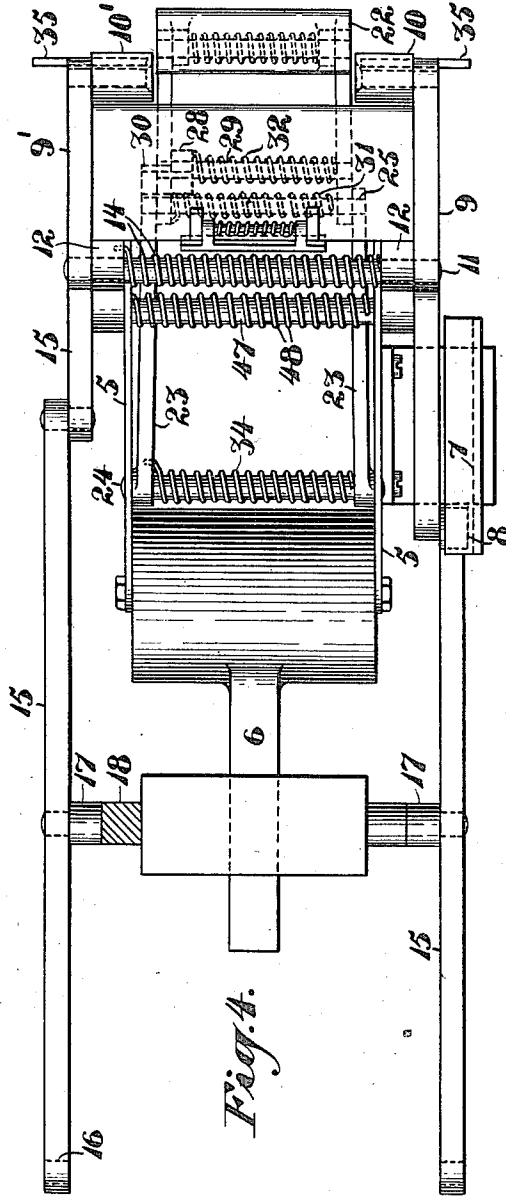
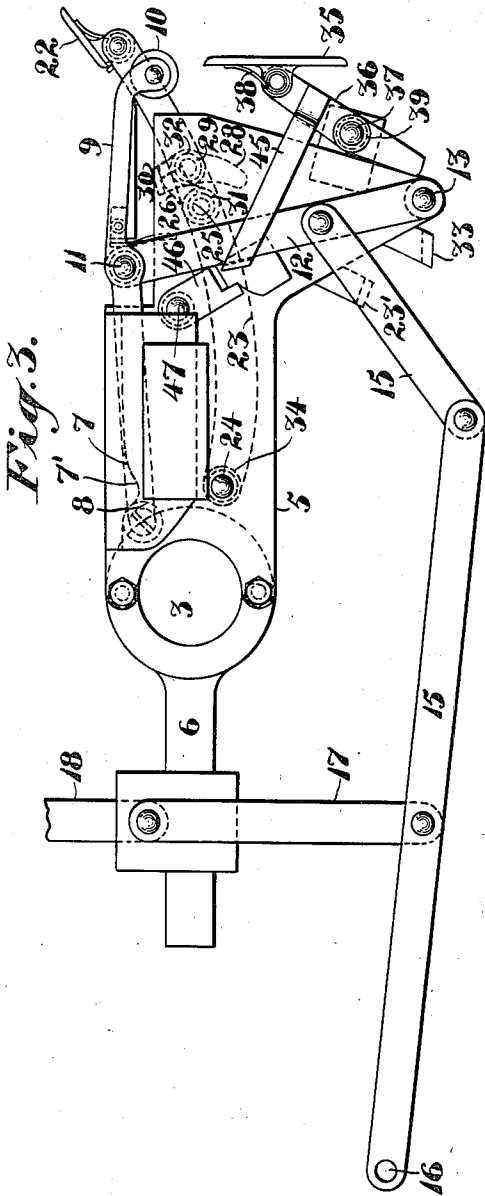
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3 SHEETS—SHEET 2.



Witnesses:-

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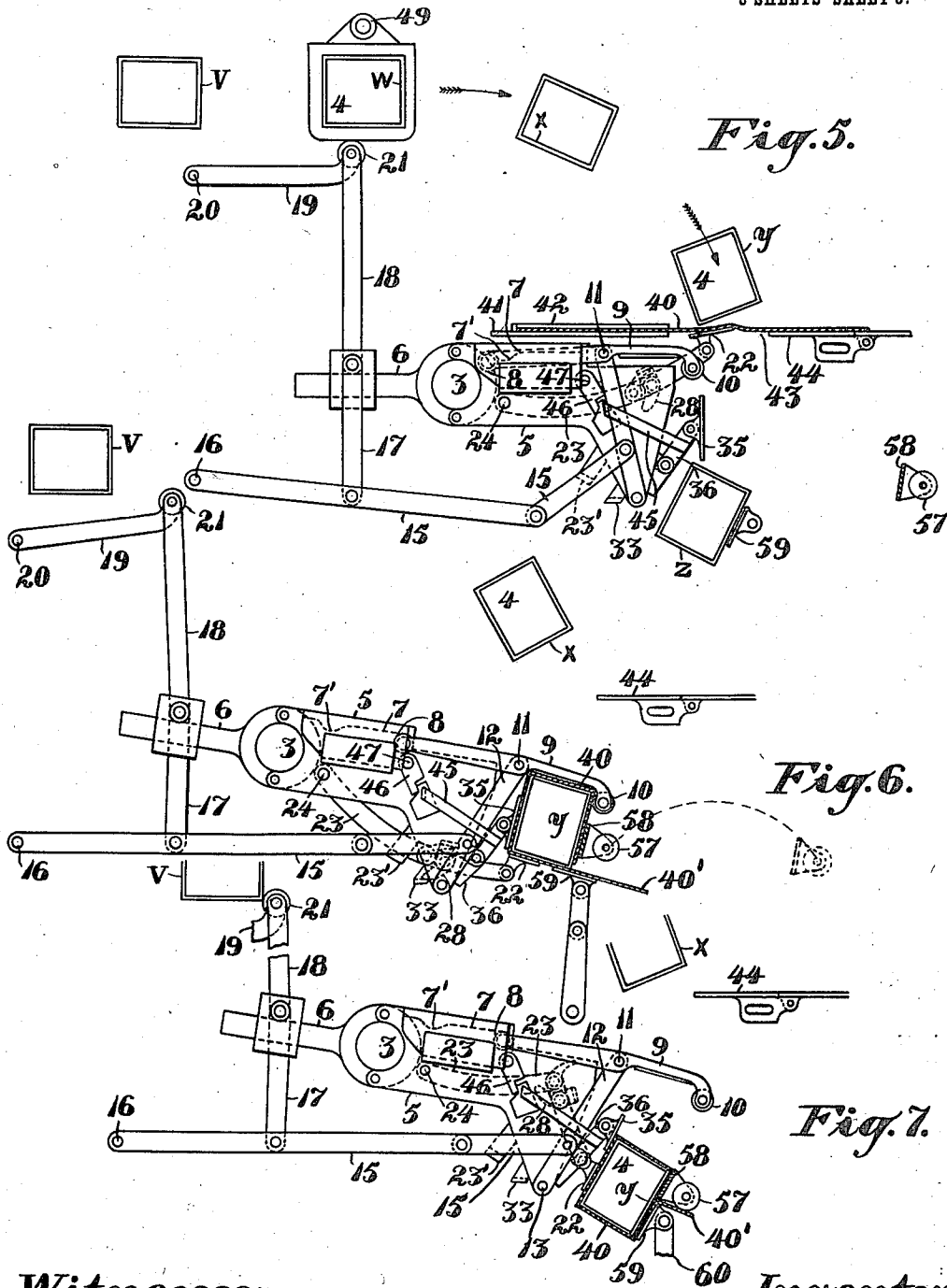
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

ANDREW W. LIVINGSTON, OF ALAMEDA, CALIFORNIA.

WRAPPER FORMING AND LABELING MACHINE.

1,059,621.

Specification of Letters Patent.

Patented Apr. 22, 1913.

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To all whom it may concern:

Be it known that I, ANDREW W. LIVINGSTON, citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Wrapper Forming and Labeling Machines, of which the following is a specification.

My invention relates to a paper wrapping means, or machine for forming paper tubes, bags, wrappers, applying labels and the like, and pertains especially to an apparatus for folding a bag, wrapper or carton-blank into tubular form preparatory to the completion of the bag, wrapper or carton. Its object is to provide a simple, practical continuously-operating machine of the above character having large capacity and capable of a wide range of utility, and particularly designed for forming rectangular packages or applying labels to square or polygonal cans.

The invention consists of the parts and the construction and the combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the principal parts of my invention, the table being elevated more than in the actual machine for the purpose of showing certain features which would otherwise be obscured or confused. Fig. 2 is a plan view of a former and the wrapper-blank-supporting table. Fig. 3 is a side elevation of the wrapping mechanism. Fig. 4 is a plan view of same. Figs. 5—6—7 represent different positions of the wrapping means and holder during the wrapping and sealing operations. Fig. 8 is a detail of the latch mechanism for the underneath gripper arms.

A represents a carrier of any suitable description: here shown as of the endless chain variety passing over the sprocket 2 mounted on and driven from shaft 3 by any appropriate means.

Carrier A is supplied with one or more wrapper holders 4 arranged or held to one side of the carrier so that a wrapper or label can be readily passed clear around a holder. By "holder" I mean any article or body whatsoever capable of being supported to permit a wrapper or label to be wrapped or folded about it by my wrapping mechanism.

5 is a frame or carriage conveniently mounted to have a limited intermittent

movement in unison with each holder 4. As shown, the frame 5 is pivoted on shaft 3 and has a rearward counter-weighted extension 6. The frame is provided with the cam groove or guide 7 extending approximately radial of the arc described by the frame, and a roller 8 on a reciprocating gripper arm 9 operates back and forth in this groove. The arm 9 is downwardly curved at its outer end and carries a roller 10. A similar but shorter arm 9' with a roller 10' is arranged on the opposite side of the frame and is rigidly connected with arm 9 by the rod 11. Two levers 12 are pivoted at one end to the rod or piece 11 and are fulcrumed to frame 5 at 13. A spring 14 acts on rod 11 and levers 12 to tend to draw the latter and arms 9—9' normally together scissors-fashion. Each lever 12 is connected with a toggle 15: one member of toggle 15 being pivoted to a lever 12 and the other member pivoted to a fixed point of support at 16.

The toggles 15 are connected with the extension 6 of frame 5 by the links 17 while the extension 6 connects by a link 18 with a rocker arm 19 fulcrumed at 20.

Arm 19 carries a roller 21 arranged in the path of the moving holders 4 so that each holder as it comes along will engage roller 21, depress arm 19 and the extension 6, thus raising the front end of frame 5, breaking toggles 15 and pulling back on levers 12 to retract the gripper arms 9—9' into the position shown in Figs. 1—3—4 and 5. It will be understood that if the toggles 15 are lifted to straighten them as shown in dotted lines Fig. 1 and in full lines, Figs. 6—7, the gripper arms 9—9', with their rollers 10—10', will be shot forward for the purpose of engaging over the top of a holder 4 to assist in holding the wrapper blank in position as will be more fully explained later.

The means for gripping a sheet to the underside of a holder in opposition to the gripper arms 9—9', comprises the spring-actuated foot-piece or gripper 22 pivoted to the jointed arms 23 which are fulcrumed at 24 to frame 5. Each arm 23 is made in two sections pivoted together at 25. The arms of one section are pivoted to and between the ends of the other section so that the latter section leaves a short projecting end 26 beveled on its upperside as at 27. A spring-actuated latch member or trigger 28 is pivoted intermediate of its ends to one of said

sections as at 29, and has a lateral projection 30 adapted to engage the projection 26 on the other section to hold the two sections rigid in line as shown in full lines Figs. 1-5 and 6 or to be tripped to release projection 26 and leave the sections to assume an angular position as shown in dotted lines Fig. 1, or as shown in Fig. 7, for the purpose of releasing a holder after the wrapper is formed.

The lateral projection 30 is arranged to ride up the bevel 27 and to catch over the top of the projection 26. The pivot 25 of the arm sections consists of a rod which is surrounded by a coil spring 31 which acts on the sections to hold them normally in straightened position as in Fig. 5. If the sections are turned on their pivot 25 the spring 31 will straighten them automatically as soon as it is allowed to act. The latch member or trigger 28 is shown pivoted on the rod 29, which latter carries a spring 32 acting to throw the latch member normally into the path of the projection 26 so that when the arms after being released from their position indicated in Fig. 7, straighten, the projections 30 on the latch member will ride out around the projection 26 and engage over the top of the latter to maintain the arms in rigid straightened position.

The arms are only bent by tripping the latch or trigger 28 to carry the projection 30 over and in front of the projection 26 to release the latter. The tripping of the latch is done by the engagement of the rear end of the latch or trigger with a fixed stop 33 mounted independent of frame 5. This stop 33 is encountered during the oscillation of frame 5 from the position of Fig. 5 to that of Fig. 7.

A spring 34 acts on arms 23 to press them normally upward into position shown in Figs. 3 and 5. Suitable stops not shown are provided to limit the movement in the proper degree of the arms 23, their sections, the latch 28 and the foot-piece or gripper 22. A third folding and pressing instrumentality carried by frame 5, is arranged to operate between and about at right angles to arms 9-9' and the gripper 22 and conjunctively with these parts to hold the wrapper blank to and on the holder. This comprises two pivoted spring-actuated pressers 35 carried by the spring actuated arms 36 which are pivoted at 37 to frame 5.

The springs 38 and 39 tend to hold the pressers in suitable operative position relative to the path of movement of the holders and the resiliency and scope of the pivotal connections of the parts 35-36 are sufficient to allow the parts 35 to assume the various positions indicated in Figs. 1-5-6-7.

The mechanism for folding the fourth side of the wrapper and for sealing the side

edges of the wrapper, assuming a four-sided or polygonal wrapper to be turned out by this machine, is carried by a fixed part of the machine frame. This folding and sealing mechanism will be described and better understood after setting forth the operation of the machine up to this point.

The wrapper blank or label 40 is laid on a table 41 against the guides 42 and over an opening 43 in the direct path of a holder 4. The table is disposed just above the frame 5 and the parts which I have described.

The opening 43 is partly closed in front by the hinged flap or trap door 44. The latter reduces the size of opening 43 so that the flexible blank will not sag, or fall through accidentally, when laid on the table and in the path of an approaching holder. But flap 44 is adapted to be opened, by mechanism operated by a holder in advance, just as soon as the blank is caught by gripper 22 and the holder above. In fact flap 44 drops for just an instant to let a holder pass and then lifts to support the next blank which meanwhile is being placed by suitable means in position on the table. Explanation of the flap-actuating means is deferred until I come to the description of the means for actuating the paste roller, since one means includes more or less the other.

With the arms 23 and gripper 22 in the position shown in Fig. 5, the holder and gripper 22 co-act to seize upon the wrapper-blank lying on the table, and carry it on down through opening 43 to be acted upon by the several instrumentalities by which the blank is gradually folded around the holder and its edges sealed.

The movement of the holders is in the direction indicated by the arrows Figs. 1 and 5. Prior to the engagement of a holder with gripper 22, a succeeding holder encounters roller 21 of arm 19 to break the toggle 15 and retract the arms 9-9' out of the way of the descending holder which is bringing the wrapper blank with it. When the levers 12 are thrown back to retract arms 9-9', they engage hook members 45 carried by the arm 36 and draw them and the pressers 35 also out of interference with the approaching holder and wrapper.

When the levers 12 are thrown back they encounter the stops 46 carried by the rock-shaft 47, the function of which stops, actuated by spring 48, is to resiliently support the levers 12 and arms 9-9' and rollers 10-10' so that the latter will press with the proper degree of force against the adjacent vertical side of the descending holder and roll the adjacent projecting end of the wrapper up against the back of the holder.

The holder and wrapper continue to descend causing arms 23 to turn on their pivots 24; and as the top edge of the holder comes in line with the rollers 10-10', a suc-

ceeding holder which has been meanwhile pressing down on roller 21 to maintain the toggles in bent position with the arms 9—9' retracted, leaves roller 21; thus leaving the toggles free to straighten. During the traverse of a holder across roller 21, the arms 23 have been pushed down nearly to their limit of movement by the holder which is pushing down on the gripper 22, and the frame 5 has remained stationary. After the roller 21 is released, the arms 23 encounter a stop 23' on the frame 5 and rock the latter; which results, through the medium of link 17, in the straightening of the toggles 15 and the forward projection of arms 9—9' and the hooking of the rollers 10—10' over the top and front edge of the holder; which is the position of Fig. 6 and the first dotted line position of Fig. 1.

The cam groove 7 has an angular or irregular part 7' around which the roller 8 travels in the forward projection of the arms 9—9' for the purpose of carrying the rollers 10—10' up over the top corner of the holder nearest frame 5 and down again on top of the holder in such fashion that the rollers 10—10' follow the periphery and the motion of the holder and remain in constant contact therewith at all times during the folding operation so that there is no chance of the paper slipping.

The roller 8 is in fact a movable fulcrum for the arms 9—9' and the latter have both a reciprocating and an oscillating movement for the purpose of allowing the rollers 10—10' to follow the motion of the holder, and to perform their functions properly.

The pressers and rubbers follow the rollers 10—10' in their initial operation of folding up the rear end flap of the sheet 40 against the rear vertical side of the holder, and serve to press the sheet against that side of the holder while the rollers 10—10' are shooting forward across the top of the holder to grip over the upper front edge of the holder. With the several grip members 10—10', 35 and 22 in the position last described, which is that of Fig. 6, the holder is gripped on all four sides and only the lower front end flap of the sheet remains to be folded up and pasted.

The holders each carry a roller projection 49 which is adapted to trip one end of a lever 50. The other end of this lever is connected by a link 51 with a lever 52 which is fulcrumed at one end at 53 and is pivoted at the other end to a member 54 having a segmental slot 55. Member 54 is supported and guided by a roller 56 passing through slot 55. The parts 52—54 constitute a toggle frame or carrier for the pasting roller 57. A plate 58 carried by the toggle frame is arranged parallel with and immediately in front of the paste roller and is designed for

one thing to engage the front side of the holder and keep flat that depending flap of sheet 40, which has just been bent over the front of the holder by the rollers 10—10'. Another purpose of the plate 58 is to maintain the paste roller 57 out of contact with the holder.

The paste is applied by bending up the lower horizontal flap 40' against the under side of roller 57. This is done by the spring-actuated, pivoted presser 59 pivoted to the spring-jointed, spring-actuated lever 60 fulcrumed at 61 to a fixed part of the machine. The engagement of the underside of a holder with the presser 59 takes place at about the same time that the plate 58 is brought forward against the turned down flap 7 of the blank on the front side of the holder.

The trap door 44 connects with a lever 62 fulcrumed at 63; the pivotal connections of the two ends of the lever being slotted to allow of the proper movement of the parts. Lever 62 is connected with toggle-member 52 by a link 64 so the door is dropped or raised according as the paste roller movement is from or toward the path of the holder and by the same lever 50.

The paste roller is thrown in toward the holder and the door 44 raised by the actuation of the lever 50 by the roller 49. Subsequently the paste roller is moved out again and the door dropped, by the roller 49 engaging a second lever 65 which rocks lever 50 in the opposite direction, leaving lever 50 ready to be encountered by a succeeding holder. Thus each holder operates on both levers 50—65 to actuate the door 44 and paste roller in the proper fashion. Each holder actuates the paste roller to apply paste to its own wrapper; but in order to let a holder pass through the table the flap is operated by an advance holder. For instance in Fig. 5 I have shown the relative positions of five holders designated *v*—*w*—*x*—*y*—*z*, and in Fig. 6 the advanced positions of *v*—*x*—*y* are shown. In Fig. 5 holder *z* has not yet opened the door 44 for holder *y* (see Fig. 1). holder *y* has passed through opening 43, tripped lever 50, closed the door 44, and moved the paste roller 57 into the position indicated.

The paste is contained in any suitable receptacle and is applied to rollers 57 by any appropriate mechanism. As shown 66 represents a paste reservoir having a series of geared distributing rollers 67 operated by any suitable means to deliver paste to the combined guide and distributing roller 56 with which the paste roller 57 periodically contacts.

In operation with the trap door 44 in raised or closed position as shown in Fig. 5, a wrapper blank is laid on the table across opening 43 and against the guides 42 and in the path of a descending holder. A suc-

ceeding holder, as indicated at *w* has ridden upon the roller 21 to break the toggles and retract the arms 9—9'. As the holder *y* comes down on top of the sheet the jointed arms 23 are raised and straightened and the gripper 22 comes up on the underside of the sheet to grip the latter against the bottom of the holder. It is understood that in this machine the holders are assumed to move continuously. As soon as the holder *y* and the gripper 22 have seized the sheet, the advance holder *z* has tripped lever 65 to throw back the paste roller and cause the trap-door 44 to drop and allow the holder *y* to pass through. As soon as the holder *y* is well through the aperture in the table, holder *y* engages the lever 50 closes the door 44 again and throws the paste-roller with its guide and presser-plate 58 into the position, shown in Fig. 6. Meanwhile, the rollers 10—10' on the arms 9—9' have traveled up the back of the holder and carried the adjacent projecting end-flap of the wrapper up against the holder; the pressers 35 cooperating to hold the wrapper flat and tight against the holder. As the holder *w* (Fig. 5) passes off of the roller 21 it leaves the frame 5 free to oscillate in unison with the arms 23 and gripper 22, which results in the forward projection of the arms 9—9' to carry the rollers 10—10' and the upwardly projecting flap end of the wrapper across the top of holder *y* and over the front corner of the holder, all as indicated in Fig. 6. The engagement of the underside of the holder with the presser 59 takes place at about the same time that the plate 58 is brought forward into contact with the front side of the holder, as indicated in Fig. 6. The purpose of having the cam slot 55 is to cause the roller 57 to travel in an arc which is substantially reverse of the curve of the slot 55 so that the paste-roller will come down on top of the projecting flap 40'. If the paste-roller moved directly inward on a horizontal line it would be more likely to catch the projecting edge of flap 40' and crumple it up; while as it is, it is carried above and then downward toward the descending flap 40', as indicated. The further downward movement of the holder bends the presser 59 into a vertical position so that the edge of flap 40' is brought against the underside of the paste-roller 57 thereby receiving the proper amount of paste and is then pressed inward beneath roller 57 and plate 58 against the previously folded upper end flap as indicated in Fig. 7. With the wrapper blank thus folded about the four sides of the holder and with the edges pasted, and with the presser 59 still in contact with the overlapped pasted edges of the wrapper, the arm 5 has been moved down until the latch 28 has engaged the stop 33 which results in the arms 23 breaking at their pivots

25 to allow the gripper 22 to slip around the lower inner corner of the holder and slide up the back of the holder between the pressers 35.

With the parts shown in the position of Fig. 7, the wrapper on holder *y* is complete, with the exception of such time for drying as may be necessary. The retraction of the arms 9—9' takes place immediately afterward by the engagement of the holder *v* with the roller 21; the gripper 22 leaving the holder *y* in ample time to assume its normal position of Fig. 5 to engage a fresh wrapper blank with the immediately succeeding holder *x*, the operation being repeated with each succeeding holder.

It is possible that various modifications of my invention may be made without departing from the principle thereof, and I do not wish to be considered as limiting myself to my specific construction beyond what is required by a reasonable interpretation of my claims.

It is to be noted that flat pressers or grippers 22—35 and 59 are used instead of rollers. It has been found by experience that rollers would not do the work satisfactorily as a smooth, drawing, ironing effect is needed to keep the paper taut. Rollers have a tendency to let the paper draw back and slip or bunch up.

While I have described particularly the operation of folding a wrapper, the machine is obviously applicable without change to the application of labels to cans; the can being indicated at 4, and the label at 40, Fig. 5. There is no difference in operation between the use of a can and of a former, as the wrapper or label is wrapped about both.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is—

1. In apparatus of the character described, the combination of a continuously movable holder, an oscillating carriage, a gripper on the carriage movable to and from the holder to grip a wrapper against a holder, reciprocating means on the carriage cooperating with said gripper to fold the wrapper about the holder, said gripper and reciprocating means having a hinged movement toward and from each other, means for uniting the ends of the wrapper blank, and means for operating the several parts mentioned.

2. In a wrapping machine, the combination of a movable wrapper holder or former, an oscillating support, upper and lower hinged arms on the support, said arms having grippers to engage respectively the top and bottom of the wrapper former, means for pressing said arms normally toward each other, said arms opened by the action of the wrapper former, means for moving said former to open said arms.

3. In a wrapping machine, the combination of a movable wrapper holder or former, an oscillating support, upper and lower hinged arms on the support, said arms having grippers, means for pressing said arms normally toward each other, said arms opened by the action of the wrapper former, means by which the grippers on said arms act successively: one to engage the bottom and then one side of the wrapper-former, and the other to engage one side and the top of the former.

4. The combination with a movable holder, of means for folding a wrapper about the sides thereof, said means including an articulated-spring-actuated lever and a spring-actuated pressure-member carried by said lever and normally disposed in the path of the holder.

5. The combination with a polygonal holder, of means for folding a wrapper about the same, said means including a grip member with a spring actuated pivoted foot piece normally disposed in the path of the holder, a reciprocating folding device operating transverse to the movement of the holder, said grip member and said reciprocating device mounted on a movable support, and means for operating said folding device on the movement of said support.

6. The combination with a movable holder, of means for folding a wrapper about the sides thereof, said means including a device with a spring actuated pivoted foot piece having a limited movement in unison with the holder for gripping a sheet thereto, a member having a reciprocating movement transverse to the path of the movement of the holder, and connections with said gripping device for reciprocating said transversely movable member.

7. The combination with a movable holder, of means for folding a wrapper about the sides thereof, said means including a device with a spring actuated pivoted foot piece having a limited movement in unison with the holder for gripping a sheet thereto, a member having a reciprocating movement transverse to the path of the movement of the holder connections with said gripping device for reciprocating said transversely movable member, and for causing said last-mentioned member to travel a limited distance in unison with the holder.

8. In a wrapping machine, the combination of a movable wrapper holder or former, an oscillating support, upper and lower hinged arms on the support, said arms having grippers to engage respectively the top and bottom of the wrapper-former, means for pressing said arms normally toward each other, said arms opened by the action of the wrapper-former, and means for giving one of said arms a reciprocating motion across the wrapper-former.

9. The combination with a movable holder, of means for folding a sheet about the sides thereof, said means including a device with a spring actuated pivoted foot piece having a limited movement to and from the holder and in unison with the holder to grip the sheet thereto, a device having a limited reciprocating movement transverse to the path of movement of the holder, an oscillating support for said devices, and connections between said devices for operating them coordinately with the movement of the holder.

10. The combination with a series of movable holders, of means for wrapping blanks about the sides of successive holders, said means including an oscillating support, a gripper member with a pivoted spring actuated foot piece carried by said support, and a folding member carried by said support and having a reciprocating movement transverse to the path of movement of the holder, and means interposed in the path of the holders for operating said folding member.

11. The combination with a series of movable holders of means for folding wrappers about the holders, said means including an oscillating support, an articulated spring actuated gripper pivoted on the support and having a part normally disposed in the path of the holders, folding devices on the support, and means operated by a plurality of holders to fold a wrapper about one of said holders.

12. The combination with a series of movable holders, of means for folding wrappers about the holders, said means including a movable carriage, a spring-actuated gripper with a pivoted foot piece on the carriage and normally disposed in the path of the holders, a reciprocating folding device on the carriage, operative connections between the carriage and said folding device, and means operated by the movement of the holders for actuating the carriage to operate said folding device.

13. The combination of two or more successively movable holders and means for folding a wrapper about said holders successively, said means including a jointed, spring actuated arm normally disposed in the path of the holders and capable of a limited movement in unison therewith, a reciprocating folding device movable transverse to the arc of movement of the arm, and means operated in part by one holder to cause the folding devices to fold the wrapper about another holder.

14. The combination with a movable holder, of means for folding a sheet about the sides thereof, said means including two articulated spring-actuated levers having grip members normally disposed in the path of said holder, means for supporting said levers to permit the holder to move between them, a reciprocating folding device coöper-

ating with said gripper members, and means for reciprocating said folding device.

15. The combination with a movable holder, of means for folding a sheet about the sides thereof, said means including two pivotally supported grip members arranged in the path of the holder and between which the holder is adapted to pass, means for causing said grip members to successively engage the bottom and the two sides of the holder, a folding device cooperating with said gripper members to fold the sheet over the top and sides of the holder, and means for operating said folding device, one of said grippers mounted on a yielding support and arranged to travel a distance in unison with the holder.

16. The combination with a movable holder, of means for folding a sheet about the sides thereof, said means including a pivotally supported gripper normally disposed in the path of the holder, means for supporting the gripper to permit it to have a limited movement in unison with the holder, a second gripper arranged in the path of the holder and between which and the first-named gripper the holder is adapted to pass, and means for causing each of said grippers to travel in contact with a corresponding side of the holder.

17. The combination with a movable holder, of means for wrapping a sheet about the sides thereof, said means including a pair of pivotally supported spring-actuated grippers normally disposed in the path of the holder, means for supporting said grippers to permit the holder to pass between them, folding devices and pasting means associated with said grippers, and means for operating said folding devices and pasting means coordinately with the operation of the holder, one of said grippers mounted on a yielding support and arranged to travel a distance in unison with the holder.

18. The combination with a movable holder, of means for folding a sheet about the sides thereof, said means including two pivotally supported spring-actuated grippers arranged in the path of the holder, and between which grippers the holder is adapted to pass, and means permitting the grippers each to engage the bottom and a side of the holder, one of said grippers mounted on a yielding support and arranged to travel a distance in unison with the holder.

19. The combination with a movable holder, of means for folding a sheet about the sides thereof, said means including two pivotally supported spring-actuated grippers arranged in the path of the holder and between which grippers the holder is adapted to pass, means permitting the grippers each to engage the bottom and a corresponding side of the holder, and a reciprocating folding member cooperating with said grippers

with means for reciprocating said folding member, one of said grippers mounted on a yielding support and arranged to travel a distance in unison with the holder.

20. The combination with a movable holder, of means for folding a sheet about the sides thereof, said means including a member coacting with the holder to grip the sheet to be folded, said member mounted on a yielding carriage which has a limited movement in unison with the holder, a device having a combined oscillating and reciprocating movement to fold a flap of the sheet up against the holder and to carry it across the top of the holder and over the opposite side thereof, a device for folding up the opposite flap of a sheet, means for pasting the ends of the folded sheet, and means for operating said reciprocating device and pasting means coordinately with the movement of the holder.

21. In a wrapping machine, the combination of a movable wrapper holder or former, an oscillating support, upper and lower hinged arms on the support, said arms having folding devices to engage respectively the top and bottom of the wrapper former, means for pressing said arms normally toward each other, said arms opened by the action of the wrapper former, and means for giving one of said arms a reciprocating motion across and behind the wrapper former.

22. The combination with a movable holder, of means for folding a wrapper about the sides thereof, and means for uniting the ends of the folded wrapper, said last-named means including a pasting roller having a limited movement toward and from the holder, a plate interposable between the holder and pasting roller, and means for operating the plate and paste roller coordinately with the holder and folding means.

23. The combination with a movable holder, of means for folding a wrapper about the sides thereof, and means for uniting the ends of the folded wrapper, said last-named means including a paste roller having a limited movement toward and from the holder, a presser and protective plate interposable between the roller and holder, means for applying the paste from the roller to the sheet, and means for operating the roller and said protective plate coordinately with the operation of the holder and the folding means.

24. The combination with a movable holder, of a movable support, an articulated spring-actuated lever arm carried by said support and having presser means interposable in the path of the holder, a folding device mounted on the support to have a limited reciprocating movement, and means for operating said presser and folding de-

vice coördinately to fold a wrapper about the sides of the holder.

25. The combination with a movable holder, of a movable support, an articulated spring-actuated lever arm carried by said support and having presser means interposable in the path of the holder, a folding device mounted on the support to have a limited reciprocating movement, means for operating said presser and folding device coördinately to fold a wrapper about the sides of the holder, means for uniting the ends of the folded wrapper, said means including a paste-roller having a limited movement to and from the holder, a presser-plate interposable between the roller and holder, and means for operating said roller and presser-plate coördinately with the movement of the holder.

26. The combination with a movable holder, of a movable support, an articulated spring-actuated lever arm carried by said support and having presser means interposable in the path of the holder, a folding device mounted on the support to have a limited reciprocating movement, means for operating said presser and folding device coördinately to fold a wrapper about the sides of the holder, and means for uniting the ends of the folded wrapper, said means including a paste-roller having a limited movement to and from the holder, a folder mounted independent of said movable support interposable in the path of the holder, and means for operating said folder and roller coördinately to bring an end of the wrapper into contact with the roller.

27. The combination with a movable holder, of a movable support, an articulated spring-actuated lever arm carried by said support and having presser means interposable in the path of the holder, a folding device mounted on the support to have a limited reciprocating movement, means for operating said presser and folding device coördinately to fold a wrapper about the sides of the holder, means for uniting the ends of the folded wrapper, said means including a paste-roller movable toward and from the holder, a protective-plate interposable between the roller and holder, a toggle-jointed carriage for the roller and plate, and means for operating the carriage coördinately with the movement of the holder.

28. The combination with a movable holder, of a movable support, an articulated spring-actuated lever arm carried by said support and having presser means interposable in the path of the holder, a folding device mounted on the support to have a limited reciprocating movement, means for operating said presser and folding device coördinately to fold a wrapper about the sides of the holder, means for uniting the ends of the folded wrapper, said means including a

paste-roller movable toward and from the holder, means for causing said roller to describe an arc in its movement toward the holder to permit it to have a limited movement in the same direction with the holder, and means for operating the roller coördinately with the movement of the holder.

29. The combination with a movable holder, of a movable support, an articulated spring-actuated lever arm carried by said support and having presser means interposable in the path of the holder, a folding device mounted on the support to have a limited reciprocating movement, means for operating said presser and folding device coördinately to fold a wrapper about the sides of the holder, means for uniting the ends of the folded wrapper, said means including a paste-roller movable toward and from the holder, a toggle-jointed carriage for the roller, means for causing the roller to take a curvilinear path, and means for operating the carriage coördinately with the movement of the holder.

30. The combination with a movable holder, of a movable support, an articulated spring-actuated lever arm carried by said support and having presser means interposable in the path of the holder, a folding device mounted on the support to have a limited reciprocating movement, means for operating said presser and folding device coördinately to fold a wrapper about the sides of the holder, means for uniting the ends of the folded wrapper, said means including a paste-roller having a limited movement toward and from the holder, a carriage for the roller, a combined presser and protective plate carried by the carriage and interposable between the roller and holder, and means for operating the carriage coördinately with the movement of the holder.

31. The combination with a movable holder, of means for folding a wrapper about the holder to leave a projecting end of the wrapper, and means for uniting the ends of the folded wrapper, said means including a paste-roller movable toward and from the holder, a carriage for the paste roller, a presser-plate on the carriage and interposable between the roller and holder, and means operated by the holder for uniting the pasted ends of the wrapper.

32. In a wrapping machine, the combination of a movable wrapper holder or former, an oscillating support, upper and lower hinged arms on the support, said arms having folding devices, means for pressing said arms normally toward each other, said arms opened by the action of the wrapper former, means by which the folding devices on said arms act successively: one to engage the bottom and then one side of the wrapper-former, and the other to engage one side and the top of the former, and a presser-member

on said oscillating support acting on the same side of the wrapper-former with but in advance of, the folding device on the lower arm.

33. The combination with a movable holder, of means for folding a wrapper about the sides thereof to leave a projecting end of the wrapper, means for applying paste to this projecting end, means operated by the holder for folding said pasted end, said paste-applying means including a paste-roller movable to and from the holder having a limited movement in the direction of movement of the holder and operating prior to the operation of said pasted-end-folding means, and means for operating the roller coordinately with the movement of the holder.

34. The combination with a movable holder, of means for folding a wrapper about the sides thereof to leave a projecting end of the wrapper, means for applying paste to this projecting end, means operated by the holder for folding said pasted end, said paste-applying means including a paste-roller movable toward and from the holder and operating in advance of the movement of the pasted-end-folding means, a protective-presser plate interposable between the roller and holder, and means for operating the said roller and plate coordinately with the movement of the holder.

35. The combination with a movable polygonal holder, of means having a limited travel in unison with the holder to grip the sheet intermediate of its ends against one side of the holder, means operated by the said gripping means for carrying one end of the sheet around the other sides of the holder, means for applying paste to the other end of the sheet, means for folding the pasted end of the sheet against the already folded end of the sheet, and means for operating said grip folding and pasting means coordinately with the movement of the holder.

36. The combination with a movable polygonal holder, of means for presenting a sheet to be folded to the holder, means having a limited travel in unison with the holder to grip the sheet intermediate of its ends against one side of the holder, means connected with and operated by said gripping means and having a limiting oscillating and reciprocating movement for carrying one end of the sheet around the other sides of the holder, paste-applying means, means for folding the remaining end of the sheet against the already folded end of the sheet, and means for operating said gripping, folding and pasting means.

37. The combination with a movable holder, of an oscillating support, an articulated spring-actuated lever-arm on said support, means for locking said arm in extended position, a grip member carried by the arm

and interposable in the path of the holder, folding devices on said support, means for operating the support, said gripper and said folding devices, and means for releasing said locking means to allow the sections of said lever to operate to free the gripper from the holder.

38. The combination with a movable holder, of a movable support, a spring-actuated articulated lever carried by the support, a gripper on the arm and interposable in the path of the holder, locking means for the articulated sections of the arm, a folding device on the support cooperating with the gripper means for operating the folding device, and means for releasing the locking means for the sections of said arm to allow the arm to bend.

39. The combination with a movable holder of a movable support, an oscillating spring-actuated arm on the support having a jointed foot piece normally interposed in the path of the holder, a reciprocating folding device on said support, means for actuating the folding device, and means to operate the foot piece to free it from the holder.

40. The combination with a plurality of movable holders, of a movable support, paper gripping means on the support interposable in the path of each holder, a reciprocating folding device on the support, pasting mechanism, and means engageable by successive holders to operate the folding and pasting means.

41. The combination with a plurality of movable holders, of a movable support, paper gripping means on the support interposable in the path of the holders, a folding device on the support, toggle connections between the support and folding device, and means operated by successive holders for actuating said folding device.

42. The combination with a plurality of movable holders, of a movable support, paper gripping means on the support interposable in the path of the holders, a folding device on the support, toggle connections between the support and folding device, means operated by successive holders for actuating said folding device, paste-applying means, toggle members supporting the latter, and means operated by successive holders for actuating said last-named toggle-members.

43. The combination with a plurality of movable holders, of a movable support, paper gripping means on the support interposable in the path of the holders, a folding device on the support, toggle connections between the support and folding device, means operated by successive holders for actuating said folding device, paste-applying means, toggle-members supporting the latter, means operated by successive holders for actuating said last-named toggle-mem-

bers, and a protective plate carried by the toggle-members and interposable between said roller and a holder.

44. The combination with a plurality of 5 movable holders, of a suitable support, paper gripping means carried by the support and interposable in the path of the holders, means permitting said paper gripping means to travel a limited distance in 10 unison with the holders, a reciprocating folding device on the support, a part interposable in the path of the holders, toggle-connections between said folding device and said part, and means permitting said fold- 15 ing device to have a limited movement in unison with the holders.

45. The combination with a plurality of movable holders, of a suitable support, paper gripping means carried by the support and 20 interposable in the path of the holders, means permitting said paper gripping means to travel a limited distance in unison with the holders, a reciprocating folding device and a part interposable in the path of the 25 holders, connections between said folding device and said part for operating said device, means permitting said folding device to have a limited movement in unison with the holders, a paste-roller movable to and 30 from the path of movement of the holders, a toggle-lever support for the paste roller, and means interposable in the path of the holders to actuate said toggle-lever support.

46. In a continuously operating wrapping 35 machine, the combination with a plurality of movable holders, of a movable support, paper gripping means on the support interposable in the path of the holders, a folding device on the support, toggle connections be- 40 tween the support and folding device, means operated by successive holders for actuating said folding device, and means for moving the holders continuously.

47. In a continuously operating wrapping 45 machine, the combination with a movable holder, of an oscillating support, an articulated spring-actuated lever-arm on said support, means for locking said arm in extended position, a grip member carried by the 50 arm and interposable in the path of the holder, folding devices on said support, means for operating the support, said gripper and said folding devices, means for releasing said locking means to allow the 55 sections of said lever to operate to free the gripper from the holder, and means for operating the holder continuously.

48. In a continuously operating wrapping 60 machine, the combination with a movable polygonal holder, of means having a limited travel in unison with the holder to grip the sheet intermediate of its ends against one side of the holder, means operable by and 65 having a limited motion in unison with said gripping means for carrying one end of the

sheet around the other sides of the holder, means for applying paste to the other end of the sheet, means for folding the pasted end of the sheet against the already folded end of the sheet, means for operating said 70 grip folding and pasting means coördinately with the movement of the holder, and means for operating the holder continuously.

49. In a wrapping machine, the combination of a movable wrapper holder and 75 former, an oscillating support, upper and lower hinged arms on the support, said arms having folding devices to engage respectively the top and bottom of the wrapper former, means for pressing said arms nor- 80 mally toward each other, said arms opened by the action of the wrapper former, the lower of said arms being jointed but normally rigid, and means to bend the arm at its joint to allow the wrapper former to 85 pass.

50. In a continuously operating wrapping machine, the combination with a movable holder, of means for folding a sheet about the sides thereof, said means including two 90 pivotally supported spring-actuated grippers arranged in the path of the holder, and between which grippers the holder is adapted to pass, means permitting the grippers each to engage the bottom and a side of the holder, means for giving one of said grip- 95 pers a reciprocating motion independent of the other gripper and means for moving the holder continuously.

51. In a continuously operating wrapping 100 machine, the combination with a movable holder, of means for folding a sheet about the same, said means including a member having a limited movement toward and with the holder to grip the sheet thereto, and a 105 folding device operable by said gripping means and supported to oscillate and having a limited reciprocating movement, coöperating with the gripper, means to operate the latter and the folding device, and means for 110 moving the holder continuously.

52. In a continuously operating wrapping machine, the combination with a movable holder, of means for folding a sheet about the sides thereof, said means including a 115 pivotally supported gripper normally disposed in the path of the holder, means for supporting the gripper to permit it to have a limited movement in unison with the holder, a second gripper arranged in the 120 path of the holder and between which and the first-named gripper the holder is adapted to pass, means for causing each of said grippers to travel in contact with a corresponding side of the holder, and means for 125 moving the holder continuously.

53. In a wrapping machine, the combination of a movable wrapper holder or former, an oscillating support, upper and lower 130 hinged arms on the support, said arms hav-

ing folding devices to engage respectively the top and bottom of the wrapper former, means for pressing said arms normally toward each other, said arms opened by the action of the wrapper former, the lower of said arms being jointed but normally rigid, means to bend the arm at its joint to allow the wrapper former to pass, the other of said arms having a limited reciprocating motion, and means to reciprocate said arms on the oscillation of said support.

54. In a wrapping machine, the combination of a movable wrapper holder or former, an oscillating support, upper and lower hinged arms on the support, said arms having folding devices to engage respectively the top and bottom of the wrapper former, means for pressing said arms normally

toward each other, said arms opened by the action of the wrapper former, and means for reciprocating the upper arm on the oscillation of the support.

55. In a wrapping machine, the combination of a plurality of movable formers, wrapping mechanism operable by one former to fold a wrapper about it, and means operable by a succeeding former to return said wrapping mechanism to normal initial position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ANDREW W. LIVINGSTON.

Witnesses:

E. H. MORGAN,
J. A. SCHUPP.