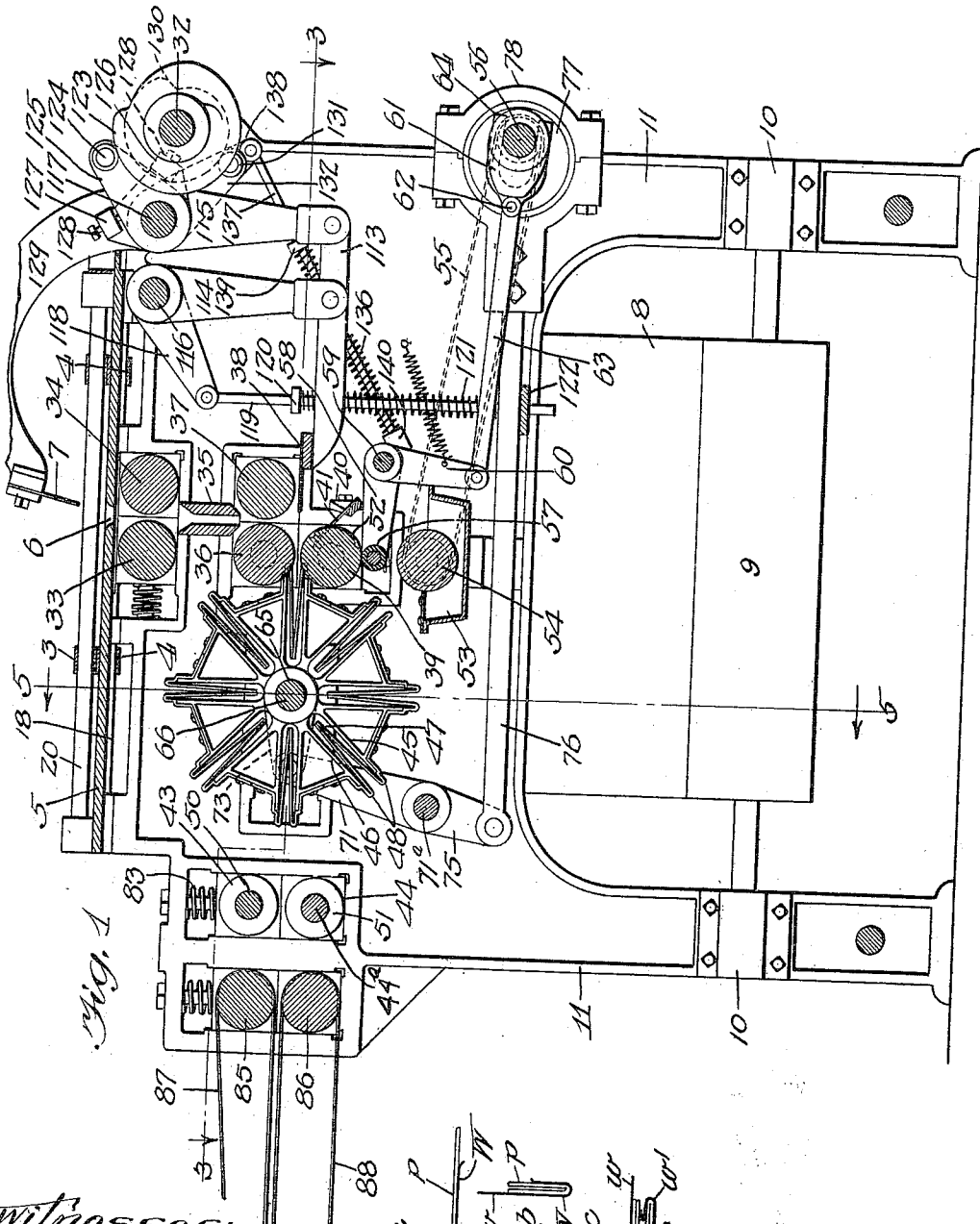


S. C. COX.
FOLDING AND WRAPPING MACHINE.
APPLICATION FILED MAY 5, 1908.

979,439.

Patented Dec. 27, 1910.

5 SHEETS—SHEET 1.



Witnesses:
Robert H. Blair
L. V. Domarus.

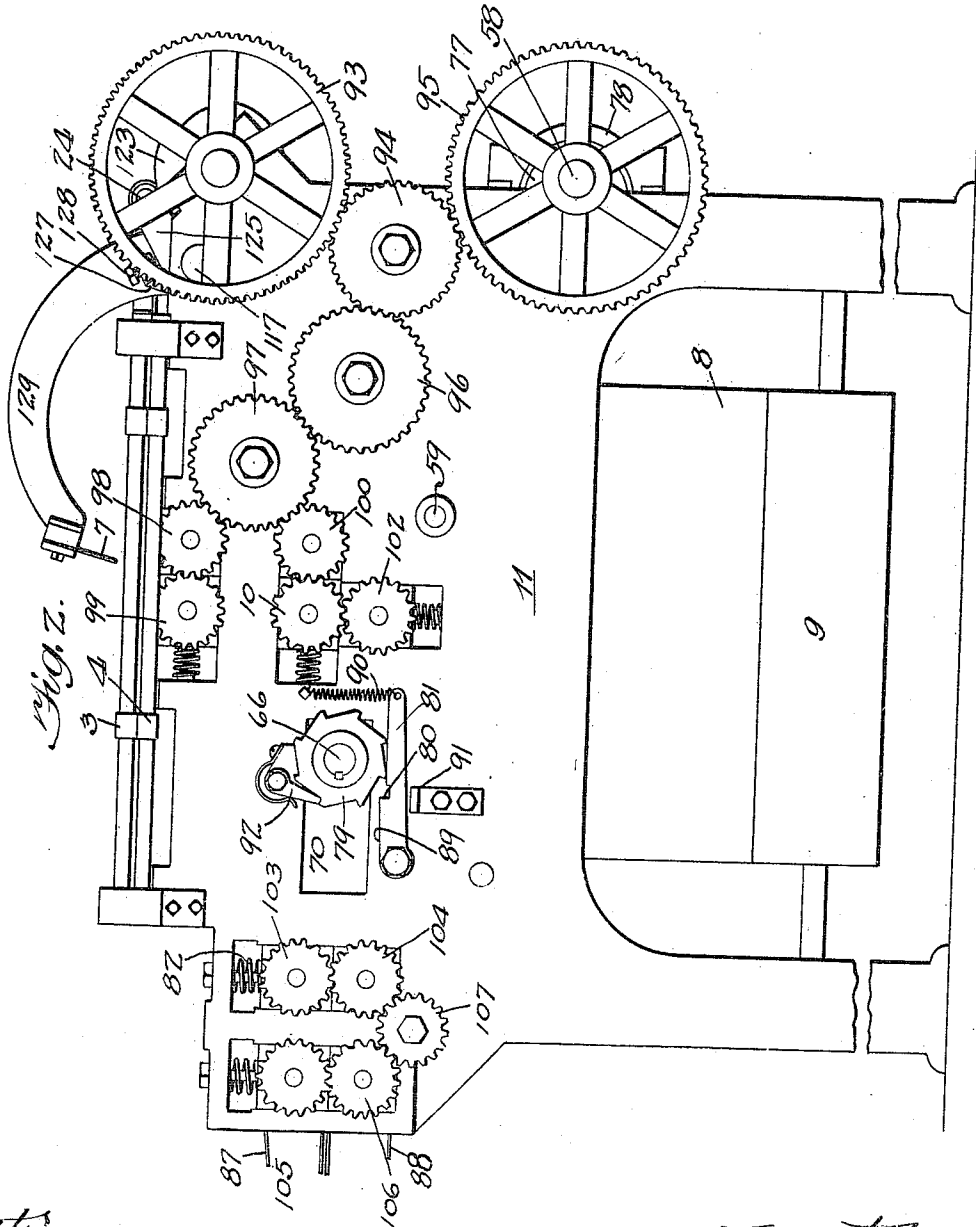
Fig. 1a
Fig. 1b
Fig. 1c
Fig. 1d
Fig. 1e
Fig. 1f
Fig. 1g
Fig. 1h
Fig. 1i
Fig. 1j
Fig. 1k
Fig. 1l
Fig. 1m
Fig. 1n
Fig. 1o
Fig. 1p
Fig. 1q
Fig. 1r
Fig. 1s
Fig. 1t
Fig. 1u
Fig. 1v
Fig. 1w
Fig. 1x
Fig. 1y
Fig. 1z

Inventor:
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by Brown & Stearns
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5 SHEETS—SHEET 2.



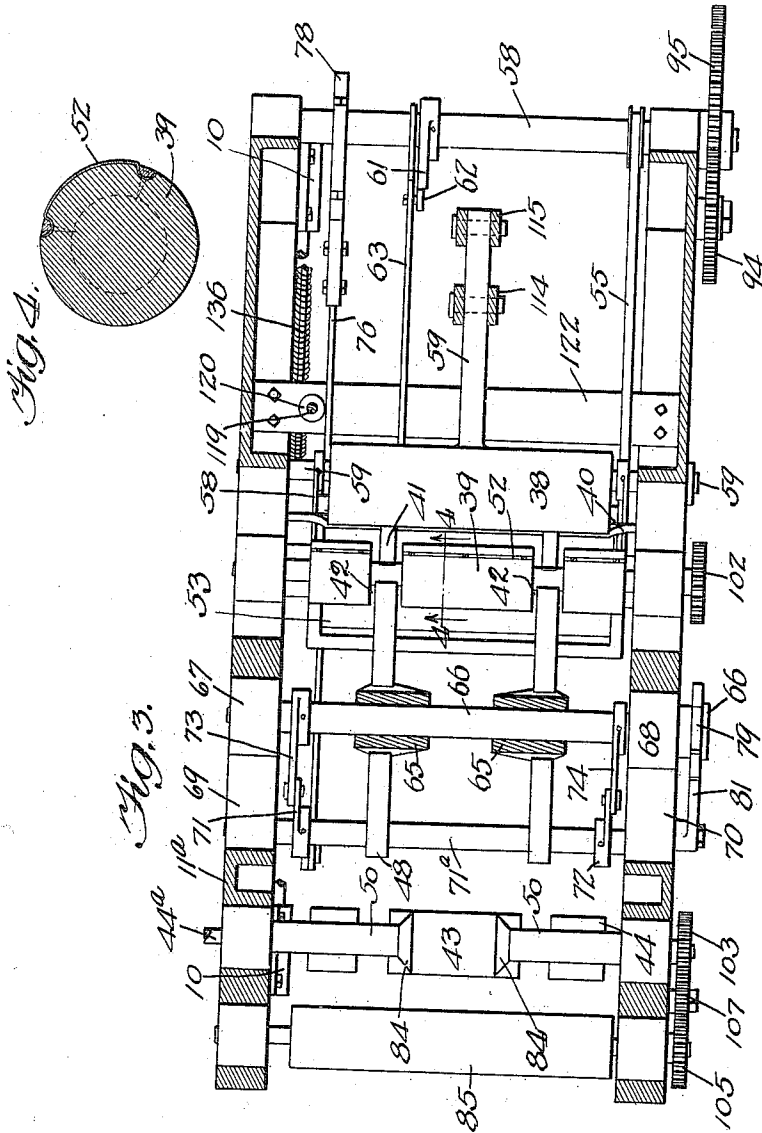
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Robert H. Blair
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5 SHEETS—SHEET 3.



Witnesses:
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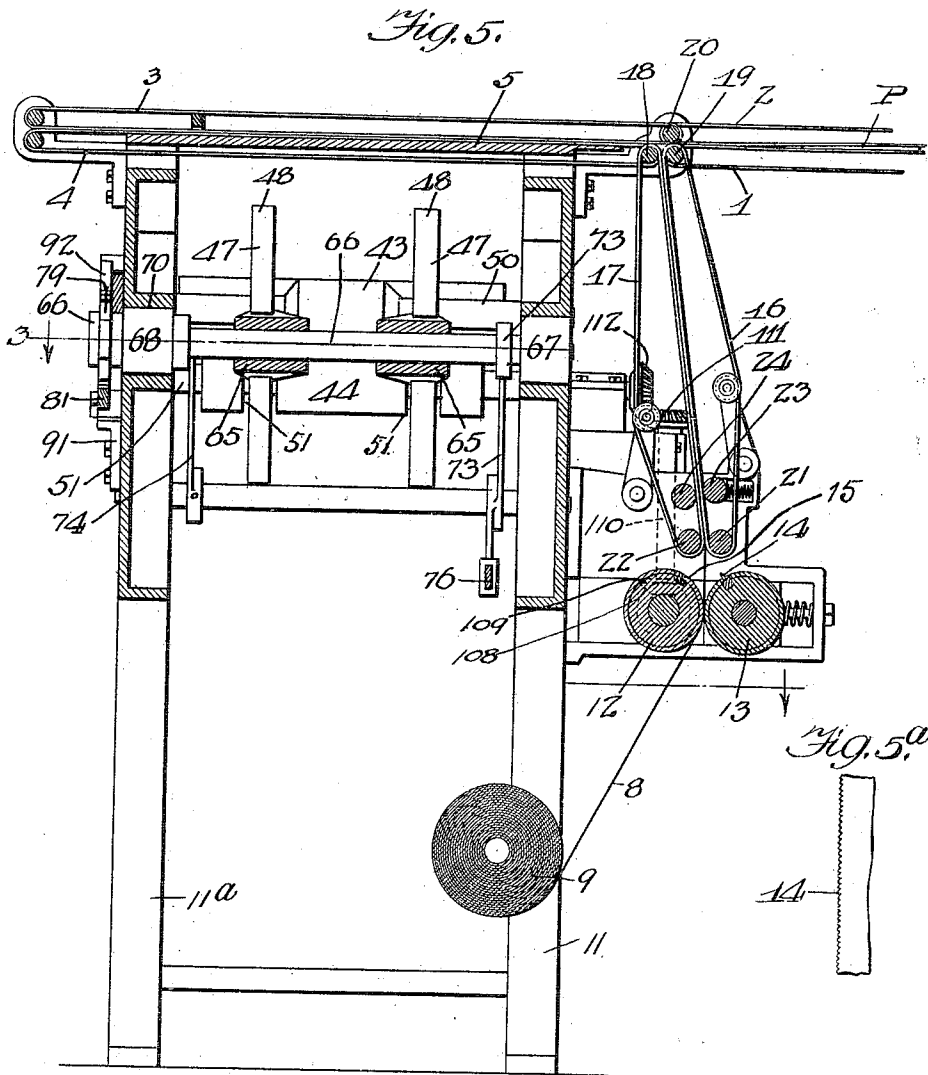
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APPLICATION FILED MAY 6, 1906.

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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

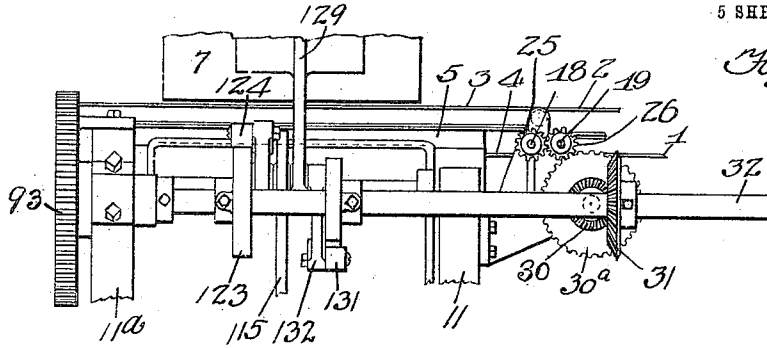


Fig. 6.

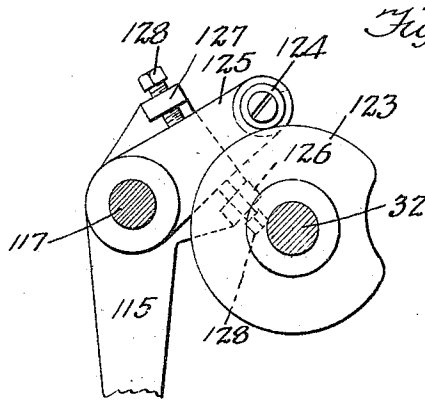


Fig. 8.

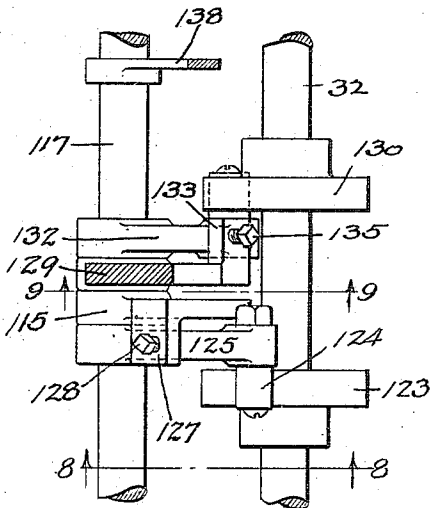


Fig. 7.

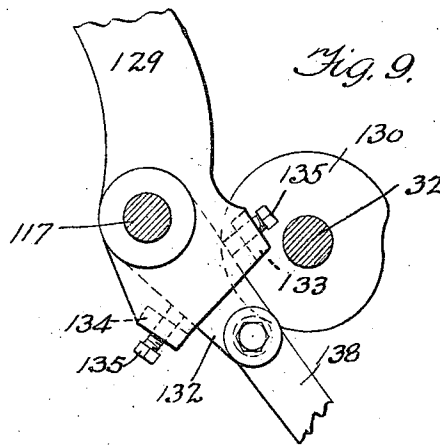


Fig. 9.

Witnesses:
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Inventor:
Samuel C. Cox
by Brown & Darby & Co. Attys

UNITED STATES PATENT OFFICE.

SANDFORD C. COX, OF EDISON PARK, ILLINOIS, ASSIGNOR TO COX MULTI-MAILER COMPANY, OF AUGUSTA, MAINE, A CORPORATION OF MAINE.

FOLDING AND WRAPPING MACHINE.

979,439.

Specification of Letters Patent. Patented Dec. 27, 1910.

Application filed May 5, 1906. Serial No. 315,389.

To all whom it may concern:

Be it known that I, SANDFORD C. COX, a citizen of the United States, residing at Edison Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Folding and Wrapping Machines, of which the following is a full, clear, and exact specification.

This invention relates to that class of machines for folding and wrapping newspapers and the like in which the paper, pamphlet or other article to be folded and wrapped is fed into the machine in conjunction with the wrapper or is associated with the wrapper before or at about the time the wrapping operation commences, and in which wrapper the paper or article is simultaneously folded and enveloped and the flap of the wrapper is pasted in place; and the present invention is designed as an improvement upon the machine of this character shown and described in my application Serial No. 305,050, filed March 19, 1906, having for its object to provide an improved machine of the described character, which will be simple in construction and rapid and efficient in operation.

The present invention has for its further object to bring about a closer relation between the paper clamp or holder and the folding and sealing rolls than has heretofore been accomplished.

A still further object of the present invention is to provide improved and simple means for applying the paste to the wrapper by one and the same roller which cooperates with the folding mechanism, without permitting the paste to overspread the portion of the roll utilized in the folding operation.

With a view to the attainment of these ends and the accomplishment of certain other objects which will hereinafter appear, the invention consists in the features of novelty in the construction, combination and arrangement of parts, which will now be described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings—Figure 1 is a vertical longitudinal sectional view of a folding and wrapping machine embodying this invention. Fig. 1^a is a diagrammatic illustration of the paper and wrapper after they arrive upon the folding table. Fig. 1^b is a similar illustration of the paper and wrapper

after they receive the first fold. Fig. 1^c is a similar illustration of the paper and wrapper after they receive the second fold. Fig. 2 is a side elevation of the machine. Fig. 3 is a plan section on the line 3—3, Figs. 1 and 5. Fig. 4 is an enlarged detail transverse section of the paste roll. Fig. 5 is a vertical transverse section of the machine on the line 5—5, Fig. 1. Fig. 5^a is a detail view of the wrapper cutting or perforating knife. Fig. 6 is a rear elevation of the upper part of the machine looking from the rear. Fig. 7 is an enlarged plan view of the cams and arms for the folding blades. Fig. 8 is a vertical section thereof taken on the line 8—8, Fig. 7; and Fig. 9 is a similar section on the line 9—9, Fig. 7.

The papers, pamphlets or other articles to be folded and wrapped, one of which is shown at P, may be fed into the machine from an addressing machine, printing press or from any other source, where the papers or articles are supplied with the address if the articles are to be applied thereto before they are folded and wrapped, by any suitable means such as traveling tapes 1, 2, which conduct them into the light of another set of tapes 3, 4, running over and under any suitable folding table 5, provided with a slot 6, through which the paper is forced by a folding blade 7. The wrapper shown at W, in which the paper or article is wrapped, is cut from a strip of paper or other suitable material 8, which is preferably stored on a reel or roll 9, mounted on suitable bearings 10 on frame 11 of the machine, and which strip 8 is carried upwardly between a pair of feeding and cutting rolls 12, 13, which are provided with cutting means such as a blade 14 and a cutting block 15, serving to perforate the strip 8 transversely at suitable intervals, the knife 14 being serrated as shown in Fig. 5^a. When the strip 8 leaves the cutting rolls 12, 13, it enters between the lower ends of two sets of tapes 16, 17, whose upper ends pass over two rollers 18, 19, arranged adjacent to a tape roller 20, around which the upper tapes 2 also pass, the lower tapes 1 passing around roller 19. The lower ends of the tapes 16, 17 pass around and are driven by two rollers 21, 22, at a greater rate of speed than the surface travel of the rollers 12, 13, so that after the strip has entered fairly between the tapes 16, 17 its

perforated end will be pulled asunder, forming a separate wrapper, which is conducted upwardly by these tapes 16, 17, where it meets the incoming paper feed which serves to deflect its upper end in the direction of the feed tapes 3, 4, it being observed that the upper set of tapes 3 extend across the upward line of travel of the wrapper as it rises between the tapes 16, 17, so that its upper end is also acted upon by the tapes 3, and thereby given a tendency to move into the bight of the tapes 3 and the roller 18. For the better grasp of the wrapper or upper end of the strip 8 as it rises between the rolls 12, 13, a pair of pressure rolls 23, 24 may be arranged between the folds of the tapes 16, 17 so as to press the inner folds together as shown in Fig. 5. These tapes 16, 17 may be driven at the required speed by any suitable gearing or other connection with any suitable moving part of the machine. For example, the tape rolls 18, 19 may be provided with pinions 25, 26, intermeshing with each other, and one of these, the pinion 26, intermeshing with a gear wheel 30^a, which is driven by a pair of bevel gears 30, 31, from a driving shaft 32.

The papers and wrappers are fed across the table 5 in such a manner that when they arrive at the position to receive the folding action of the blade 7 they will be in the relative arrangement shown in Fig. 1^a, and will then be engaged by the folding blade 7, which strikes the paper fed at about its mid length or width and forces it downwardly between feed and folding rolls 33, 34, arranged under the table, and if desired, below these rolls may be situated a guide chute 35, which guides the paper and wrapper downwardly in the form shown in Fig. 1^b, into the grasp of a pair of rolls 36, 37, which still further direct the paper in a downward direction and across the plane of operation of a horizontally operating folding blade 38. Below the roller 36 is another roller 39, which also takes a part in the folding operation, and when the paper arrives at a position lapping over the two rolls 36, 39, substantially equally and in the partially folded form shown in Fig. 1^b, it is engaged at about its mid width by the folding blade 38 and forced between the rolls 36, 39, the paper being arrested in its downward course by a stop 40 and fingers or tongues 41, which are extended across its downward path and project into peripheral grooves 42 in the roll 39, and by virtue of their inclined position serve to deflect the lower end of the paper outwardly from the roll 39 and give it the initial bend which it acquires in passing between the rolls 36, 39. As the paper and wrapper emerge from the rolls 36, 39, they have the form shown in Fig. 1^c, with the flap *w* of the wrapper projecting sufficiently beyond the edge of the

folded paper to permit it to be subsequently folded down against the opposite side of the wrapper and pasted or sealed, and as the two thus leave these rolls they are forced firmly into the grasp of a holder *x* which oscillates between the rolls 36, 39, and a pair of receiving and sealing rolls 43, 44. This holder just mentioned embodies a series of rotating pockets or clamps, which successively receive the papers from the rolls 36, 39, and conduct them to the rolls 43, 44, and each of these pockets or clamps preferably consists of two jaws 45, 46, between which are arranged two centrally disposed converging springs 47, which receive the folded paper between them, the purpose of the elastic character of the springs being to allow for expansion and contraction as the papers vary in thickness. The outer ends of the springs or jaws or some other portion of each holder, however, are formed with projections 48, which may be conveniently constituted by simply extending the ends of the springs, and these project into the peripheral grooves 42 of the roller 39, and similar grooves 49 of the roller 36, whereby the clamps of the paper holder are brought into intimate and close relation to the two rolls 36, 39, and intermesh therewith to insure the entry of the paper into the jaws or clamps. After the paper is thus introduced into the clamp opposite the rollers 36, 39, the holder comprising the series of clamps makes a partial rotation, bringing another one of the clamps directly opposite the rolls 43, 44, the extent of each intermittent rotation being of course regulated according to the number of holders or clamps employed, eight being employed in this example. At the same time the holder makes a bodily transverse movement in a direction away from the rollers 36, 39, toward the rollers 43, 44, so as to intermesh therewith, that is, so that the projections 48 will be introduced into peripheral grooves 50, 51, in the rollers 43, 44, respectively, which are driven in a direction away from these projections and consequently receive the paper in the form shown in Fig. 1^c, which is introduced fairly and fully into their bight by the projections 48, and which is then conducted away or extracted from the holder or clamp, the flap *w* of the wrapper being smoothed down and sealed into place at the same time.

A portion of the periphery of the roller 39 is provided with a felt strip 52, which extends throughout the length thereof, it, of course, being cut away like the roller 39 where the latter is grooved, and below this roller 39 is situated a paste fountain or trough 53, containing a fountain roller 54, which is driven by any suitable means such as a belt 55, operatively connected with a shaft 56, and between this fountain roller 54 and the roller 39 is mounted a ductor roll

57 on a pair of arms 58 secured to a rocker-shaft 59, having crank arms 60, which is oscillated by a cam 61 on shaft 56, engaging anti-friction roller 62 on a rod 63, which
 5 has a fork 64 supporting its end on shaft 56, whereby the ductor roll 57 is caused to alternately engage the fountain roll 54. The felt surface 52 of the roll 39 and shaft 56 are so timed that the felt surface 52 is at the
 10 lower side of roll 39 when the ductor roll 57 is in its upper position, and at other times the ductor roll 57 is out of contact with the roll 39. The rolls 36, 39 are also so timed with relation to the movement of
 15 the series of clamps or holders and the blade 38 that while the forward edge of the folded paper is passing between the rolls 36, 39 the paste or felt surface 52 will be turned away from the paper, but as the rear
 20 edge or area marked *w'* in Fig. 1^c is passing between the rolls the felt surface 52 will engage the body of the wrapper and supply the necessary paste for securing the lap *w* in place. It will be seen, however, that inas-
 25 much as the clamps and projections 48 are narrow as compared with the length of the folded paper, see Figs. 3 and 5, the same being less in width than the grooves in the rollers 36, 39, at which places of course the
 30 wrapper receives no paste, it will be seen that even though the paper be forced fully between the projections 48 the latter will not become besmeared with paste. As better shown in Figs. 3 and 5, there are two
 35 series of these paper clamps or pockets, the jaws 45, 46 thereof radiating from hubs 65 secured to a shaft 66, which in turn is journaled in boxes 67, 68, arranged to slide longitudinally in ways or guides 69, 70, in the
 40 side frames 11, 11^a of the machine, so that the entire series of clamps may be given a bodily reciprocating movement as well as a rotary movement. This bodily movement may be brought about by arms 71, 72, which
 45 are supported by a suitable rock shaft 71^a journaled in the frame work and these arms are secured to the holder or the shaft 66 thereof at their upper ends by means of links 73, 74, or any other suitable devices,
 50 while the lower end of one of the arms, the arm 71 for example, is provided with an extension 75 giving it the form of a lever which is connected by rods 76 to the shaft 56 in any suitable way, as, for example, by
 55 an eccentric 77 and eccentric strap 78, so that when the shaft 56 is rotated the boxes 67, 68 carrying the shaft 66 of the rotary holder will be caused to slide back and forth in their ways, carrying the paper which is
 60 adjustably introduced into one of the clamps on one side, away from the rolls 36, 39, while presenting the paper in the diametrically opposite clamp to the bight of the sealing rolls 43, 44.

65 In order that the paper and projecting

edge of the wrapper which is in the clamp contiguous to the rolls 36, 39, may clear these two rolls when the holder begins to rotate, it is of course desirable that the holder shall
 first move bodily away from these two rolls
 70 so as to withdraw its projections 48 beyond or substantially beyond the peripheries of the rolls before it begins its intermittent rotation. The same power which produces the withdrawing or bodily movement just described may, if desired, also be utilized for
 75 imparting the step by step rotary movement, and can be accomplished by the simple mechanism shown in Fig. 2. This, it will be seen, consists in providing the end of the
 80 shaft 66 with a ratchet 79, having preferably as many teeth as there are pockets or clamps in the paper holder, and which are so arranged as to successively engage a shoulder
 85 80 on a bar 81, after the holder has moved bodily a sufficient distance to withdraw the projections 48 from the rolls 36, 39. This engagement of the teeth with this shoulder
 80, of course rotates the series of pockets or clamps upwardly away from the roll 36 and
 90 downwardly toward the roll 43, and inasmuch as the edge of the wrapper will be projecting toward the roll 43 when the pocket gets around to this side, the ungrooved portion of roll 43 will serve to fold the flap or
 95 lap back against the body of the wrapper where it has been supplied with paste, the ungrooved portion of roll 43 being of course between the two series of clamps as shown in Fig. 3, so that it can serve to lay the flap
 100 back in place and partially over the projections 48 without danger of tearing it or sealing it to the projections. By the time the holder carrying the paper which is being thus operated upon arrives diametrically op-
 105 posite the two rolls 43, 44, the holder will have pressed its forward or outer edge firmly into the bight of these two rolls, the upper one of which may be yieldingly held in position by one or more springs 82, 83, and as
 110 these rolls 43, 44 are driven together they simultaneously extract the paper and press the lap down into place on the pasted surface of the body of the wrapper. In order that the flap of the wrapper may not be ruptured
 115 by the combined action of the end of the ungrooved portion of roll 43 and the projections 48, these ends, as better shown in Fig. 3, are beveled, as indicated at 84. From the rolls 43, 44, the folded and enveloped paper
 120 is received by a second pair of rolls 85, 86, which complete the sealing or pressing operation and deliver the paper out of the machine, these two rolls, if desired, being provided with conveyer tapes 87, 88, which take
 125 possession of the paper before it is allowed to go free a sufficient length of time to insure the setting of the paste. As the shaft 66 moves forwardly, bringing one of the teeth of ratchet 79 against shoulder 80 the next
 130

tooth moves downwardly against an upper straight edge 89 on the bar 81, causing the bar to become slightly depressed against the action of a lifting spring 90, the downward motion of the bar being finally limited by a stop 91. This enables the tooth that engaged shoulder 80 to also ride upwardly on the straight edge 89, and it will be seen that with two of the teeth thus resting on the edge 89 the series of clamps or pockets will be held against further rotation. When the shaft 66 moves back again both teeth drop off of the straight edge 89, and the ratchet is held against backward movement by a spring-pressed pawl 92, secured in any suitable way to the box 68.

The various rolls and other movable parts of the machine may be driven in any suitable way, the details of which driving mechanism are immaterial and constitute no essential part of the invention. For example, driving shaft 32 imparts motion to shaft 56 by means of gears 93, 94, and 95, and the motion of gear 94 is imparted to the rollers 33, 34, 36, 37, 39, through the intermediary of a train of gears 96, 97, 98, 99, 100, 101, 102; the rolls 43, 44 are geared together by pinions 103, 104; the rolls 85, 86 are geared together by pinions 105, 106, and the pinions 104 and 106 are connected by idler 107. One of the rollers 44, 86, preferably the roller 44, may be driven from the roll 12 by bevel gear 108; roll 12 is driven on its shaft by bevel gear 109 on upright shaft 110, and bevel gear 111 on the upper end of this shaft engaging bevel gear 112 on the shaft 44 of roll 44, or any other suitable means. The blade 38 is supported by an arm 113, which in turn is supported by two parallel arms 114, 115, pivoted thereto at their lower ends, and supported at their upper ends from shafts 116, 117, respectively, arm 114 being secured to its shaft 116. The shaft 116 is provided with an arm 118, connected to the upper end of a rod 119, which carries a shoulder 120, under which bears a spring 121 coiled on the rod 119 and resting upon a boss 122 fixed on the frame, through which the rod passes, and which spring serves to move the blade 38 in one direction. It is moved in the other direction by a cam 123 acting upon anti-friction roller 124, on an arm 125, which may be loose on the shaft 117, but which is situated between two bosses 126, 127 on arm 115, carrying adjusting screws 128, against which the arm 125 impinges for rocking the arm 115 and thereby reciprocating blade 38. The blade 7 is carried by an overhanging arm 129, loosely mounted upon shaft 117 and receiving oscillation at the proper time from a cam 130 on shaft 32, which acts upon an anti-friction roller 131 on an arm 132, which is secured to shaft 117, but provided with connection with arm 129 through the aid of bosses 133,

134 on said arm 129 and adjusting screws 135 in said bosses, against which the arm 132 impinges for oscillating arm 129, thus causing the blade 7 to move in one direction. The blade is moved in the opposite direction by a spring 136 on a rod 137, pivoted to an arm 138, secured to the shaft 117, one end of the spring being shouldered against a nut or shoulder 139 on rod 137, and the other end against a boss 140 on the frame, whereby the anti-friction roll 131 will be held in contact with its cam. Any other suitable operating mechanism for the blades 7, 38, however, may be employed.

What I claim is:

1. In a machine for the purpose described, the combination of a rotatable bodily shiftable holder, having a paper pocket, means for partially folding the paper and guiding it into said pocket, said pocket and guiding means being intermeshed when they are in the position of their closest relation, means for first producing a relative withdrawing movement between the pocket and said guiding means for taking them out of mesh, and means for thereafter rotating the holder to carry the pocket away from said guiding means.

2. In a machine for the purpose described, the combination of a rotatable bodily shiftable paper holder having a plurality of pockets for receiving the papers and wrappers, the outer ends of said pockets being provided with projections, rolls for partially folding the paper and wrapper and guiding the same into said pockets, said rolls having grooves for receiving said projections, rolls for receiving the paper and wrapper from said pockets and sealing the wrapper, also having grooves for the reception of said projections, and means for shifting and intermittently rotating said holder.

3. In a machine for the purpose described, the combination of a bodily shiftable rotatable holder for the papers, having a paper pocket, means for partially folding a paper and introducing the same with the wrapper into said pocket, said pocket having a projecting end, sealing rolls for receiving the paper and wrapper from said pocket and sealing the wrapper, having grooves for receiving said projecting end of the pocket, the edges of said grooves being beveled to avoid rupturing or wrinkling the lap of the wrapper, and means for bodily shifting and intermittently rotating said holder.

4. In a machine for the purpose described, the combination of a rotatable bodily shiftable holder having a paper pocket for the paper and wrapper, of less width than the wrapper, the paste roll having a groove for receiving the end of the pocket, and adapted to apply paste to the wrapper while in the pocket, means for withdrawing the holder from the paste roll and imparting a rotary

motion thereto, and means for withdrawing the paper and wrapper from the pocket and sealing the wrapper.

5 5. In a machine for the purpose described, the combination of a bodily shiftable rotatable holder embodying two coincident series of paper pockets, means for introducing the partially folded paper and wrapper into said pockets, embodying a paste device hav-
10 ing its surface interrupted opposite the ends of the pockets, whereby the paste will not be applied at these points, means for bodily shifting the holder to withdraw the pockets from the paste device, and means for ex-
15 tracting the paper and wrapper from the pockets and sealing the lap of the wrapper.

6. In a machine for the purpose described, the combination of a bodily shiftable rotatable holder comprising two coincident series of paper pockets having projecting ends, a pair of rolls for partially folding and guid-
20 ing the wrapper and paper into said pockets, said rolls having grooves for the passage of said projecting ends, one of said rolls having a paste-applying surface, means for apply-
25 ing paste to said surface, means for shifting the holder and imparting an intermittent rotation thereto, and means for extracting the paper from the pockets and sealing the lap
30 of the wrapper.

7. In a machine for the purpose described, the combination of a bodily shiftable rotatable holder provided with a paper pocket embodying two spring clamps or jaws, di-
35 verging outwardly, for receiving the paper and wrapper, means for introducing the paper and wrapper between said jaws, means for moving the holder toward and from said introducing means and imparting a partial
40 rotation thereto during a portion only of the bodily movement of the holder, and means for extracting the paper and wrapper from said pocket and sealing the lap of the wrapper.

8. In a machine for the purpose described, the combination of a rotatable bodily shiftable holder having pockets for the papers and wrappers, means for introducing the paper and wrapper into said pockets, means
50 for thereafter imparting shifting and rotary movement to the holder to withdraw the wrapper and paper from said introducing means, sealing rolls having grooves for re-
55 ceiving the ends of the pockets and extracting the paper and wrapper and sealing the lap of the wrapper, and rolls for receiving the paper and wrapper from said sealing rolls and conducting the same away.

9. In a machine for the purpose described, the combination of a rotatable bodily shiftable holder having pockets for the papers and wrappers, rolls for introducing the pa-
60 per and wrapper into said pockets and having grooves for receiving the ends of the pockets, means for extracting the papers and

wrappers from the pockets, a third roll arranged contiguous to one of the first said rolls for guiding the paper and wrapper to a position across the first two said rolls, a paper stop having inclined fingers engaging
70 in the grooves of one of said rolls and arranged across the line of movement of the paper, and a folding blade arranged to en-
75 gage the paper and wrapper after the same engage said stop, for forcing the paper and wrapper between the first two said rolls.

10. In a machine for the purpose described, the combination of a rotatable bodily shiftable holder having a paper pocket, means for partially folding the paper and
80 guiding it into said pocket, means for bodily shifting the holder to withdraw the paper from the guiding means, means for rotating the holder away from the paper introducing means, and means for locking the holder
85 against rotative movement during a portion of its bodily movement.

11. In a machine for the purpose described, the combination of a slotted support for the wrapper, means for forcing the wrap-
90 per and article to be wrapped through the slot of said support, a rotating bodily reciprocating series of pockets for receiving the article and wrapper, said pockets being brought into article-receiving positions by
95 their bodily reciprocation, feed rolls situated between said series of pockets and the slot of said support for receiving the article and wrapper, and delivering the same into one
100 of the said pockets, and means for extracting the article from said pocket when the latter is rotated away from the feed rolls.

12. In a machine for the purpose described, the combination of a slotted support for the wrapper, means for forcing the
105 article to be wrapped and the wrapper through the slot of said support, a rotating bodily reciprocating series of pockets for receiving the wrapper and article, feed rolls situated between said support and series of
110 pockets for introducing the article and wrapper into said pockets, one of said feed rolls being provided with a paste pad for applying paste to an object passing between the rolls, and means for extracting the arti-
115 cles and the wrappers from the said pockets.

13. In a machine for the purpose described, the combination of two pairs of rolls, a rotating bodily reciprocating series of pockets arranged between said pairs of
120 rolls and adapted to move toward them alternately, means for introducing an article to be wrapped and a wrapper between the rolls of one pair whereby the latter said pair will introduce said article and wrapper into
125 one of said pockets contiguous thereto, and means for causing a partial rotation and a bodily receding movement of the said series of pockets after the article has been introduced therein.

14. In a machine for the purpose described, the combination of two pairs of rolls, a rotary series of pockets arranged between said pairs of rolls, means for imparting rotary feeding action to one pair of said rolls in a direction toward said pockets, means for imparting a rotary extracting action to the other pair of said rolls in a direction away from said pockets, means for moving said series of pockets bodily alternately toward said pairs of rolls, and means

for imparting an intermittent rotation to the said series of pockets.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 20th day of April, A. D. 1906.

SANDFORD C. COX.

Witnesses:

J. TOMLINSON,
E. H. SANFORD.