

(No Model.)

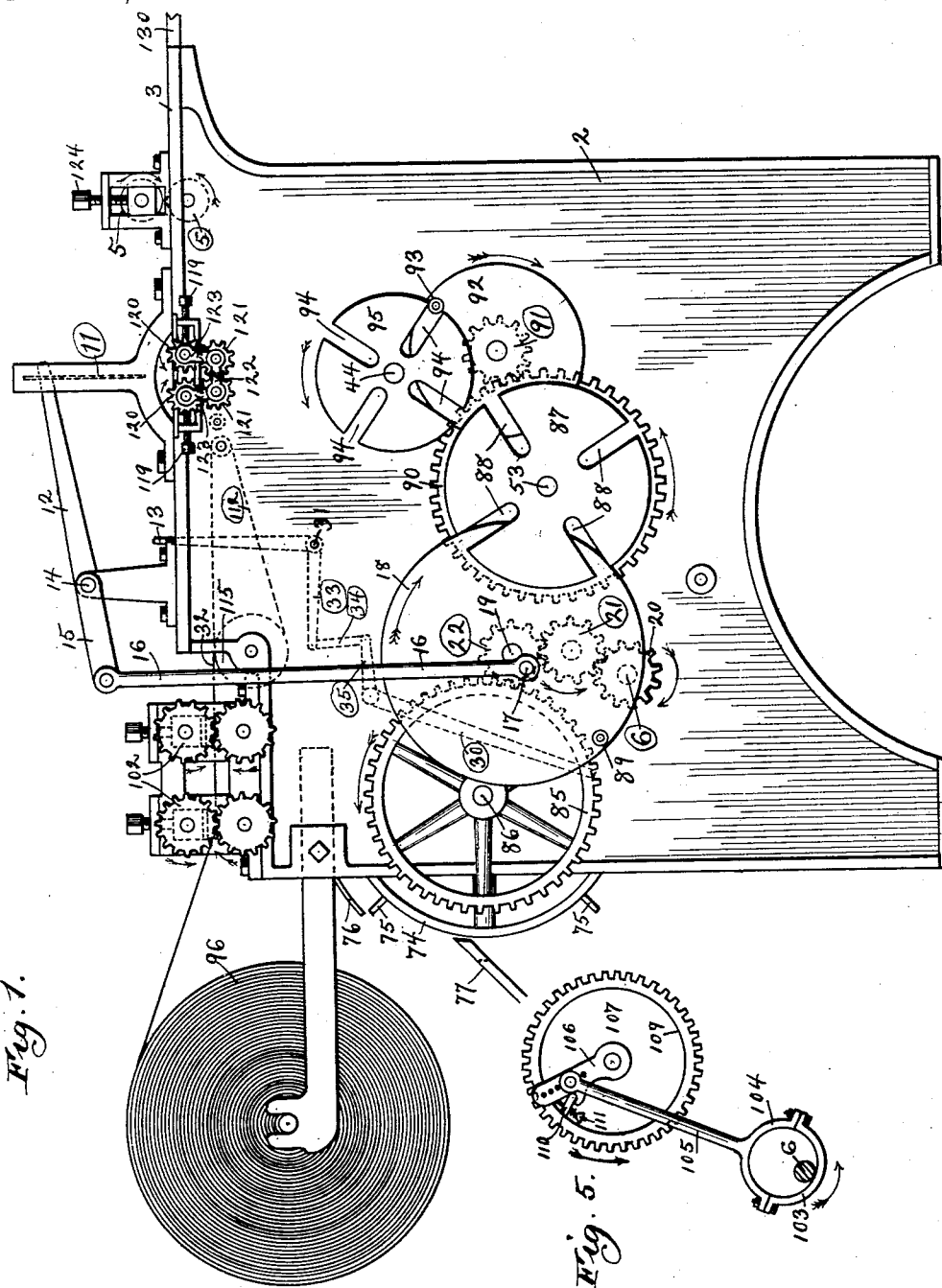
4 Sheets—Sheet 1.

L. A. AGNEW.

MACHINE FOR FOLDING AND WRAPPING NEWSPAPERS.

No. 591,801.

Patented Oct. 19, 1897.



Witnesses:

W. J. Jacker,
Chas. B. Johnson.

Inventor:

Lee A. Agnew

By Ellist Hopkins

Atty:

(No Model.)

4 Sheets—Sheet 2.

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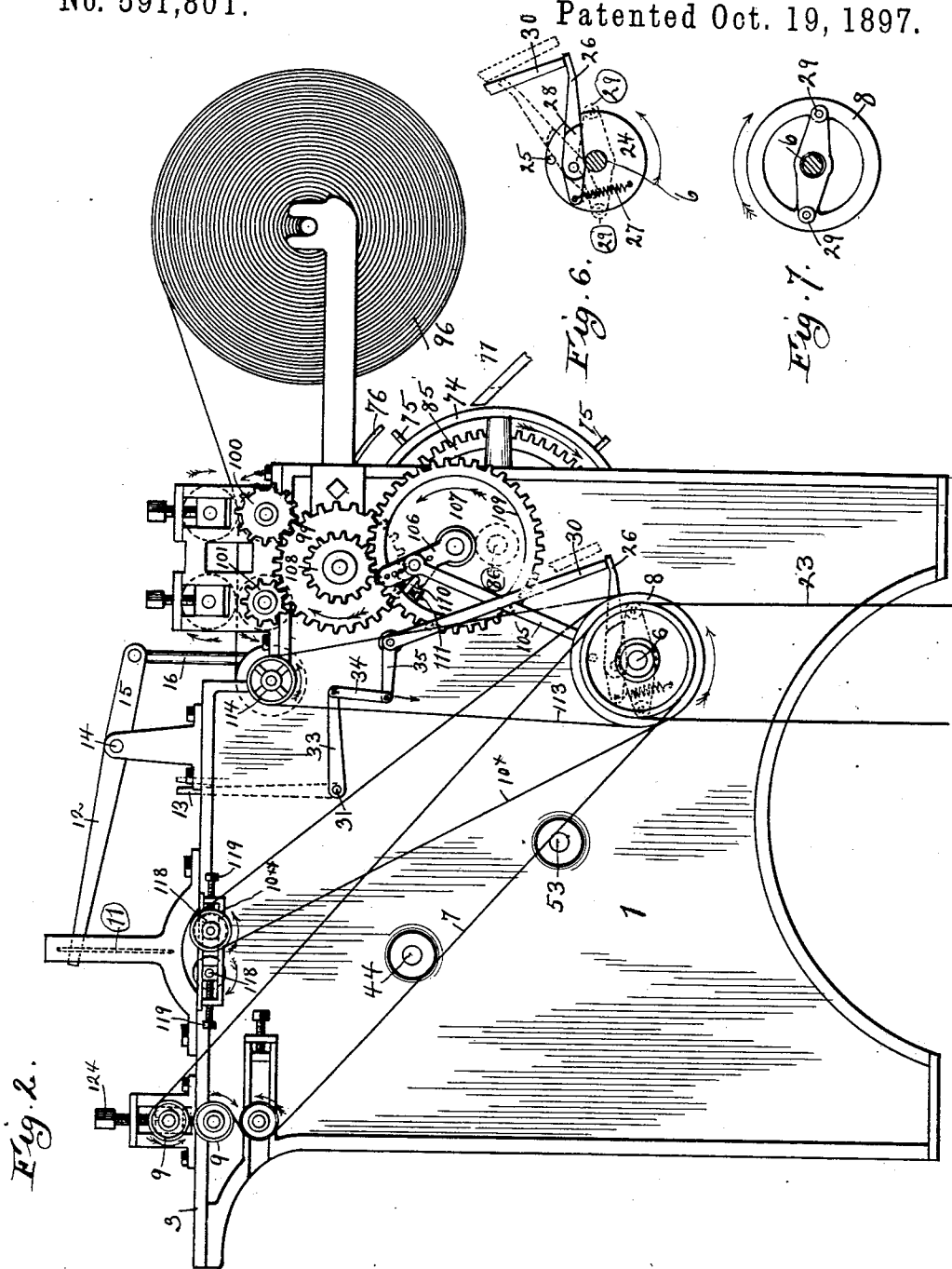
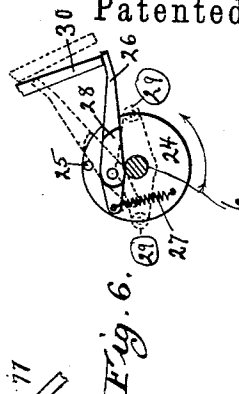
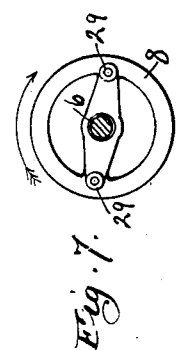


Fig. 2.

Witnesses:

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Att'y's.

(No Model.)

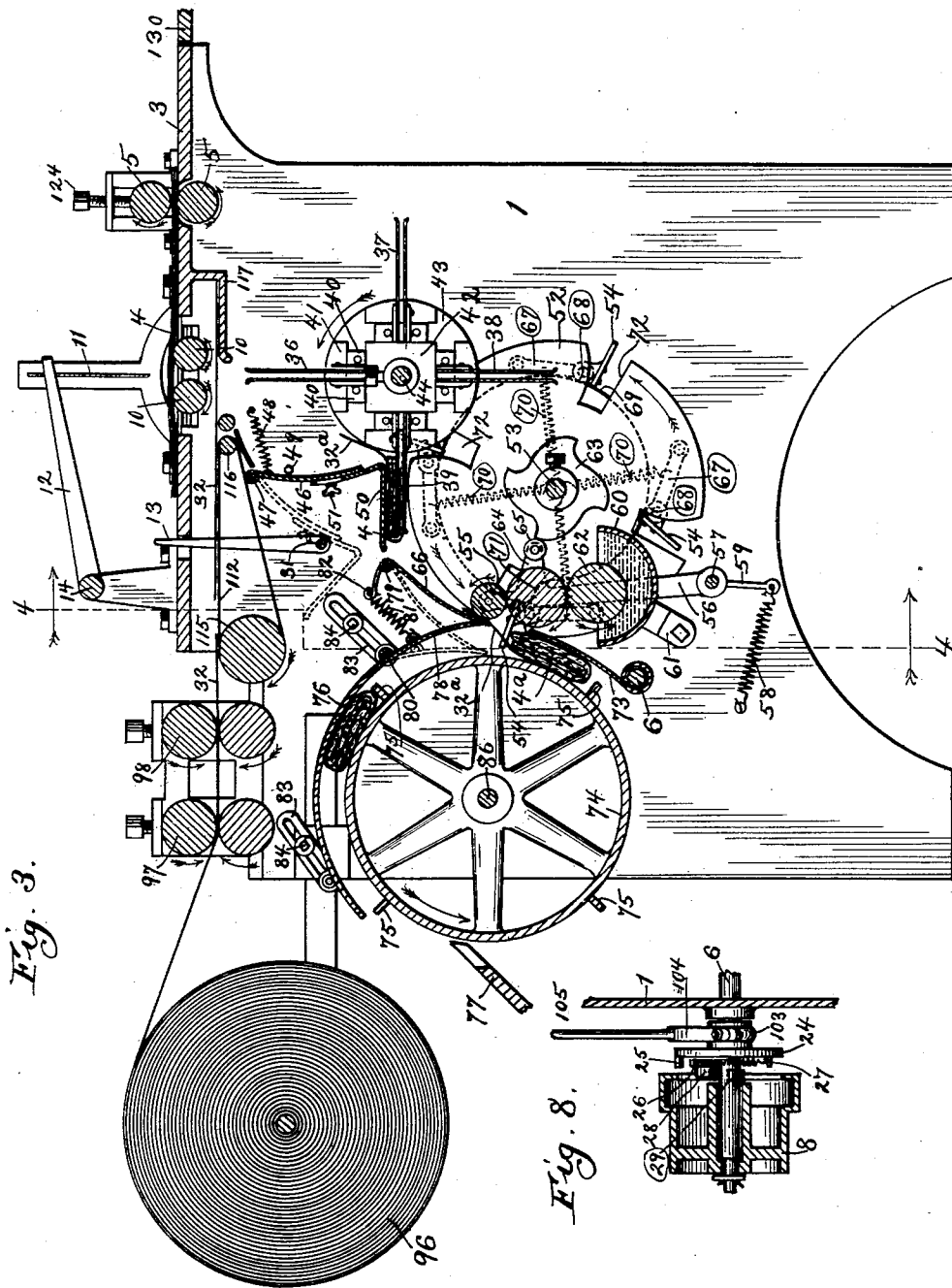
4 Sheets—Sheet 3.

L. A. AGNEW.

MACHINE FOR FOLDING AND WRAPPING NEWSPAPERS.

No. 591,801.

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Witnesses:

R. J. Jacker.
Edna B. Johnson.

Inventor:

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By Elliott Hopkins
Attys.

(No Model.)

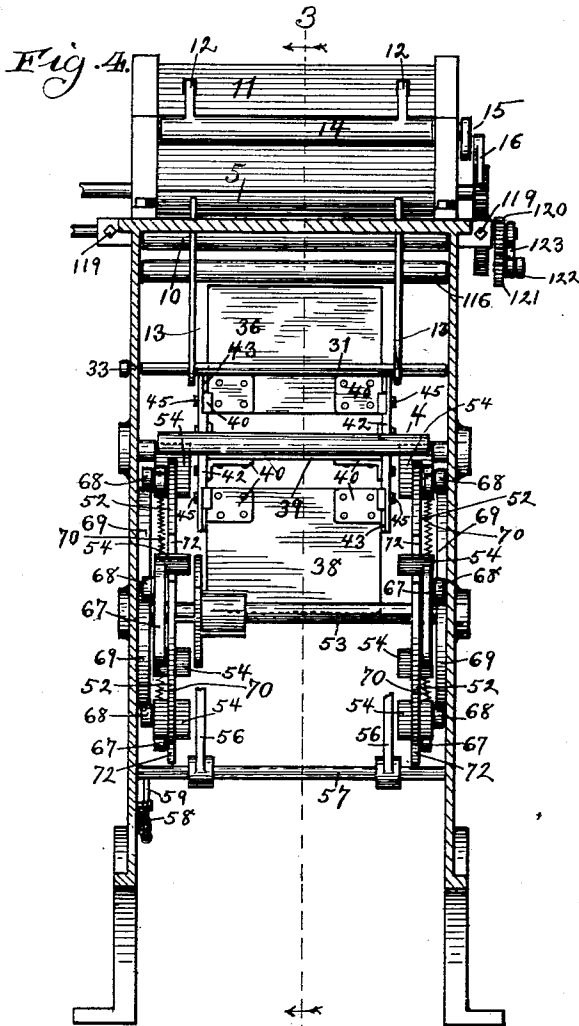
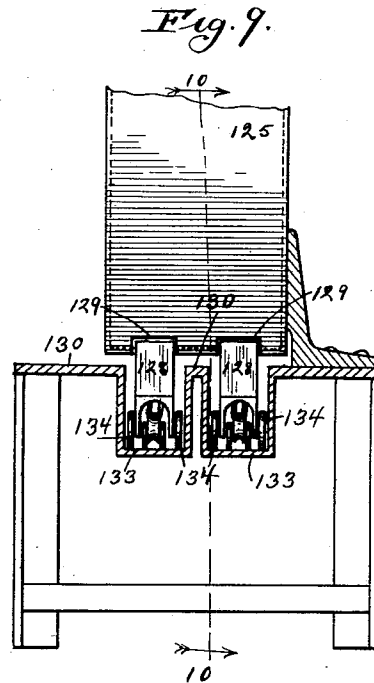
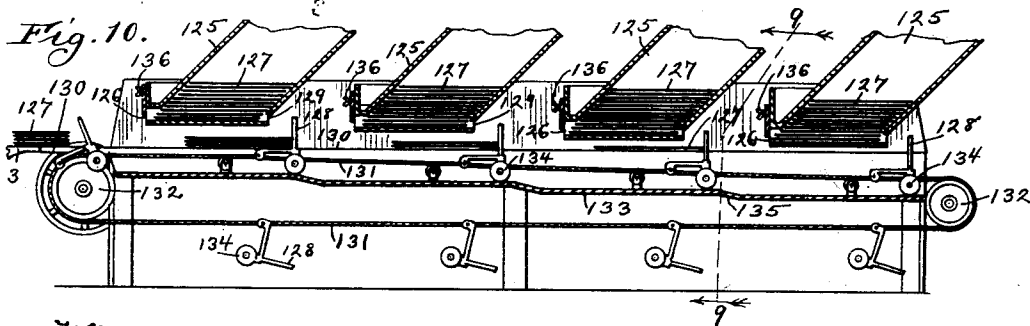
4 Sheets—Sheet 4.

L. A. AGNEW.

MACHINE FOR FOLDING AND WRAPPING NEWSPAPERS.

No. 591,801.

Patented Oct. 19, 1897.



Witnesses:

R. J. Jacker,
Chas. B. Johnson

Inventor:

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UNITED STATES PATENT OFFICE.

LEE A. AGNEW, OF CHICAGO, ILLINOIS.

MACHINE FOR FOLDING AND WRAPPING NEWSPAPERS.

SPECIFICATION forming part of Letters Patent No. 591,801, dated October 19, 1897.

Application filed December 18, 1894. Serial No. 532,209. (No model.)

To all whom it may concern:

Be it known that I, LEE A. AGNEW, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Folding and Wrapping Newspapers or other Sheets, of which the following is a full, clear, and exact specification.

My invention relates more particularly to machines for automatically folding newspapers and the like and wrapping the same in suitable wrappers which are fed into the machine one at a time or from a continuous strip and have their lap ends or edges gummed and pasted down in place while passing through the machine.

My invention has for its object to provide improved and simple means for rapidly doubling or folding the paper over upon itself a sufficient number of times to convert it into a convenient form for mailing and at the same time wrap the wrapper around it and paste or secure the lap end of the wrapper in place.

Another object of my invention is to provide means for folding and wrapping sheets varying in thickness or bulk.

Another object of my invention is to provide means for automatically conveying the sheets or newspapers to the folding and wrapping machine from a store or supply of such sheets or papers.

Another object of my invention is to provide means for automatically conveying the sheets or papers from a store of the same to the folding and wrapping machine and to start such machine into operation by the movement of the sheet or paper itself; and yet another object of my invention is to automatically collect the various parts or sheets of the same newspaper or publication into one bundle or pile and convey the same to the folding-machine.

With these ends in view my invention consists in certain features of novelty by which the said objects and certain other objects hereinafter appearing are attained, all as fully explained with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side ele-

vation of the folding and wrapping mechanism embodying my improvements. Fig. 2 is a similar view of the opposite side. Fig. 3 is a vertical longitudinal section taken on the line 3 3, Fig. 4. Fig. 4 is a vertical transverse section taken on the line 4 4, Fig. 3. Fig. 5 is a detail view of a clutch hereinafter described. Fig. 6 is a detail view of the driven member of another clutch, viewing it from the outer side or face. Fig. 7 is a detail view of the driving member of the last said clutch, viewing it from its inner side. Fig. 8 is a sectional view taken lengthwise of the driving-shaft of such last-named clutch. Fig. 9 is a transverse vertical section of the sheet collecting and feeding mechanism, taken on the line 9 9, Fig. 10; and Fig. 10 is a vertical transverse section thereof, taken on the line 10 10, Fig. 9.

Like signs of reference indicate like parts throughout the several views.

1 2 are the side frames, which may be of any suitable construction and upon which is supported a table or platform 3, over which the papers or sheets 4 are fed by hand or any suitable means, but preferably by means of my sheet collecting and feeding mechanism hereinafter described. The sheets 4 as they come from the said feeding mechanism onto the table 3 are projected between a pair of rollers 5, mounted in the table 3, and which derive their motion from the driving-shaft 6 by any suitable means—such as a belt 7, driven by a continuously-revolving pulley 8 and passing over pulleys 9 on the ends of the rollers 5, as shown in Fig. 2. These rollers 5 feed the sheet 4 forward over a pair of oppositely and downwardly revolving rollers 10, which are set a slight distance apart, as shown in Fig. 3, and arranged immediately above the space between these rollers 10 is a rising-and-falling folding-knife 11, supported and operated by a pair of arms 12. The folding-rollers 10 are driven by a belt 10^x, running over the pulley 8 and a pulley 10^{xx} on one of the rollers 10, the rollers 10 being geared together at their opposite ends, as described farther on.

When the sheet 4 has advanced along the table 3 to the proper position with relation to the knife 11, it strikes a trip or trigger 13 and causes the folding-knife 11 to descend

and also sets the folding and wrapping mechanism, hereinafter described, into operation. This result may be best effected by providing the driving-shaft 6 with a detachable
 5 connection or clutch which, when the paper strikes the trigger 13, is tripped or shifted into positive engagement with the driving-shaft and thereby imparts the motion of such shaft to the other mechanism. I will first
 10 describe the connection between such clutch and the folding-knife 11.

By referring to Figs. 1 and 4 it will be seen that the arms 12 of the folding-knife are mounted upon or secured to a rock-shaft 14,
 15 which is also provided with a crank-arm 15, and this crank-arm is connected by pitman 16 with a wrist-pin 17 on a disk 18, which latter is mounted upon a short shaft or pin 19, secured in the side frame 2. This disk 18
 20 derives its motion from the driving-shaft 6 through the intermediary of a pinion 20, mounted upon such shaft, and a transitory pinion 21, meshing with the pinion 20 and with a similar pinion 22, secured to the
 25 inner face of the disk 18. Hence at every revolution of the driving-shaft 6 the knife 11 will descend and again rise to its normal position, as shown in Fig. 3, but in order that the knife may not descend a second time
 30 before the next paper has reached the proper position on the table with reference to such knife I cause the clutch members on the shaft 6 to disengage and render the knife inactive as soon as the latter has risen to its normal
 35 position. A convenient form of clutch for accomplishing this is best shown in Figs. 6, 7, and 8. The driving member 8 of this clutch is in the form of a pulley loosely mounted upon the driving-shaft 6, and over which
 40 runs a continuously-driven belt 23. The driven member of such clutch is in the form of a disk 24, rigidly secured to the shaft 6 and being provided on its inner face with a pin or lug 25, arranged to be struck by an arm 26,
 45 pivoted to the disk 24 and having secured to its rear end and to such disk a coil-spring 27, adapted to throw such arm 26 against the lug 25 as soon as such arm is released.

The arm 26 is pivoted eccentrically on the
 50 disk 24 and provided with a shoulder 28, which extends from the inner end of the arm 26 outward; or, in other words, the arm 26 is thicker at its inner end than at its outer end, thus producing the shoulder 28. When the
 55 arm 26 is in the position shown in dotted lines in Fig. 6, resting against the lug 25, shoulder 28 will be struck by one of two pins or lugs 29, mounted upon the inner face or edge of the pulley 8; but when the arm 26
 60 is in the position shown in full lines in Fig. 6 the shoulder 28 will be within the circle described by the lugs 29, and consequently out of their path, and so long as the arm 26 is in this position the clutch members will be
 65 out of engagement and the folding-knife and other folding and wrapping mechanism will

remain inactive. The arm 26 is held in this inactive position by a stop 30, which is connected with and operated by the trigger 13 and is thrown out of engagement with the
 70 arm 26 when such trigger is deflected by the insertion of the sheet or paper. The stop 30 is arranged in the line of movement of the arm 26, and hence the arm 26 strikes against the stop as soon as the arm makes a complete revolution with the disk 24, on which it
 75 is carried. This action stretches the spring 27 and forces the end of the shoulder 28 to a position within the circle described by the lugs 29, and consequently the said lugs revolve past the shoulder 28 and do not impart
 80 motion to the disk 24, fixed on the driving-shaft 6.

The trigger 13 is mounted upon a rocker-shaft 31 and is preferably duplicated on the
 85 opposite side of the machine, as shown in Fig. 4, the two upwardly-projecting arms constituting such trigger being preferably mounted on the sides of the machine, so as to be out of the way of the wrapper 32 as it
 90 enters. The rocker-shaft 31 is provided at its outer end with a crank-arm 33, which in turn is connected by link 34 with a crank-arm 35, secured to or forming a part of the stop 30, these parts being nicely balanced,
 95 so that the slightest pressure of the sheet 4 will throw the stop 30 out of engagement with the arm 26, and as soon as the pressure of the sheet on the trigger 13 is relieved the stop 30 and trigger will again spring back to
 100 their normal positions and the arm 26 will catch against the end of the stop 30 when the driving-pulley 8 has completed one revolution, and the clutch members will be thereby
 105 disengaged.

When the folding-knife 11 strikes the paper and forces it between the rollers 10, their downwardly-revolving peripheries, which are slightly roughened, will catch the paper thus
 110 doubled and impel it downward into one of a series of sheet-holders 36 37 38 39, which revolve under the rollers 10 and come to rest directly under the space between such rollers. These paper or sheet holders 36 37,
 115 &c., are expansible or adjustable, whereby they may be adapted for papers or sheets varying in bulk or thickness, and this adjustability of the side portions of these sheet-holders may be conveniently effected by providing each side piece with a block 40,
 120 mounted to slide between two blocks or shoulders 41 42, formed on the inner faces of two disks or hubs 43, which are mounted upon the shaft 44, which carries and operates the series of rollers. These blocks 40 are secured
 125 in place by means of set-screws 45, passing through slots (not shown) in the disks or hubs 43. By this means it will be seen that the space between the plates constituting each of the holders 36 37, &c., may be increased or diminished according to the bulk
 130 of the paper to be folded, it being under-

stood that the sheet-holders are open at their ends, whereby the ends of the paper or sheet may protrude therefrom.

When the doubled sheet is forced into the holder 36, &c., a portion thereof about equal to the amount which projects into the holder will protrude from the upperside of the holder. When the holder now makes a quarter-revolution, carrying the sheet or paper down to the position of the holder 39, this upper protruding edge of the sheet or paper will be struck by a plate arranged adjacent to the line of movement of the holder and will be folded back upon the upper side of the holder, thus folding or doubling the paper into proper form for mailing. It is then caught by mechanism hereinafter described and pulled out of the holder and delivered from the machine.

The described mechanism folds the paper or sheet into such a form that, if desired, it may be caught as it comes from the machine and wrapped by hand; but it is preferable to secure the wrapper thereon automatically, and hence the wrapper 32 is fed across the holder 36 immediately under the rollers 10 before the knife 11 descends, so that when the knife descends the wrapper and paper will be forced together into the holder 36, the wrapper being so arranged that it will receive its first fold or will be struck by the paper at a point to one side of its center, so that one end of the wrapper will protrude from the holder 36 in the form of a lap 32^a.

As a means for turning the projecting edge of the paper and this lap 32^a back against the upper side of the holder when it is in the position of the holder 39 I prefer to employ what I shall herein term a "doubler" 46, which is yielding or spring-actuated, it being pivoted at 47 and having a spring 48 tending to throw its lower edge normally toward and between the holders, so that when first struck by the holder or the paper protruding therefrom it will be deflected outward in the position shown in dotted lines, and after the holder has descended to the position of the holder 39 the inertia of the spring 48 will be sufficient to double the protruding edge of the paper and the wrapper back upon the upper side of the holder, the inward movement of the doubler 46 being limited by any suitable means, such as a stop 49, and such doubler also being preferably provided with an extension or foot 50 for resting upon the wrapper. This foot is adjustably secured to the doubler by set-screw 51, so that its position with reference to the holder may be varied to allow for variation in the bulk of the sheets or papers being folded.

The holders 36 37, &c., in revolving, pass between two supports 52, mounted upon a shaft 53 and being preferably in the form of disks revolving with or upon such shaft and upon which disks or supports 52 the extremities of the folded sheet 4, as shown in Fig. 4, rest when the sheet is pulled out of the holder. As a means for pulling the sheet and wrap-

per from the holder I provide a series of traveling claws 54, which are preferably mounted upon and move in unison with the disks or supports 52 and engage with the extremities of the folded sheet which overlap the disks 52. Mounted between the disks or supports 52 is a lap-pasting device or roller 55, which applies gum or paste to the lap end 32^a of the wrapper. This roller 55 is journaled in the upper extremities of a pair of vibrating arms 56, mounted upon a shaft or rod 57 and being held normally away from the wrapper by a spring 58, secured to a downward extension 59 on such rod or shaft.

60 is a paste-trough secured by brackets 61 to the side frames 12 and from which the paste is fed upward to the roller 55 by a pair of feed-rollers 62, as will be understood, the pair of rollers 62 receiving their rotation by frictional contact with the roller 55, which is rotated by the lap of the wrapper when the latter is pulled away.

The vibrating lap-paster thus constructed is adapted to move out of the way of the folded sheet and wrapper until the same have been carried by the claws 54 past it to the position shown at 4^a in Fig. 3, and to then move outward and press against the lap end of the label, as shown in such figure. The movement away from the lap is accomplished, as before said, by the spring 58, and a movement toward the lap may be conveniently accomplished by means of a cam 63, mounted upon the shaft 53 to one side of the line of movement of the holders 36, &c., and having a number of projections or active portions equal to the number of the holders 36, &c., employed, (four being shown in the drawings,) so that the lap-paster will be forced outward or toward the lap shortly after each folded sheet is carried past the roller 55 by the claws 54. Contact between the cam 63 and the arms 56 may be effected by means of a projection 64 on one of such arms 56, carrying an antifriction-roller 65, which bears upon the edge of the cam 63.

In order that the wrapper may be held in place on the folded sheet 4 and such held from unfolding after it leaves the sheet-holder, I locate in close proximity to the line of movement of the holders 36, &c., a plate 66, against which the claws 54 force the sheet and wrapper as the latter leaves the holder. This plate 66 is yielding or spring-actuated and tends normally toward the peripheries of the disks 52, so that the action of the traveling claws 54 will be to crowd the folded sheet between the peripheries of such revolving disks or supports and the under surface of the plate 66, the lower end of which plate rests against or in close proximity to the peripheries of the disks 52 when the roller 55 is in its retracted position. Hence it will be seen that as soon as the folded sheet has passed the lower end of the plate 66 the latter will again spring inward and grip the projecting lap 32^a, and at this instant one of the

projections of the cam 63 forces the roller 55 outward against the under side of the lap, holding the latter detachably but firmly against the plate 66 and at the same time applying sufficient paste to cause it to adhere when folded down against the wrapper.

When the described action of the lap-pasting device takes place, the claws 54 are withdrawn from engagement with the folded sheet in order that the movement of such sheet may be reversed. To this end each of the claws 54 is mounted upon a pivoted arm 67, carrying an antifriction-roller 68, which rests upon the periphery of a fixed cam 69, which is arranged with its full side adjacent to the holders 36 37, &c, in order that the claws 54 will be forced outward into engagement with the folded sheet as they approach the latter when held in the position of the holder 39. The antifriction-rollers 68 are held normally in contact with and compelled to follow the outline of the cam 69 by means of springs 70, and hence by forming an abrupt depression or offset in the cam 69 at 71 the claws 54 will be withdrawn from engagement with the folded sheet shortly after the latter has passed the paste-roller, but before the lap 32^a has been entirely withdrawn from the lap-holder constituted by such paste-roller and the plate 66.

In order that the claws 54 may work in the same vertical plane with the disks 52, I provide such disks with notches 72, in which the claws may rise and fall to conform to the contour of the cam 69. Inasmuch as each of the disks is provided with a series of claws 54, one of the cams 69 is of course arranged on each side of the machine.

As the folded sheet comes down between the plate 66 and roller 55 it is caught between a support 73 and the periphery of a drum 74, where it remains until one of a series of lugs 75 on the periphery of such drum catches it on its under side and carries it upward in a direction contrary to the direction of movement of the claws 54, and in so doing it will be seen that the lap 32^a is folded downwardly over the upper edge of the folded sheet by reason of such lap being held by the plate 66. As the folded sheet 4^a continues upward, however, the lap is gradually pulled away from the roller 55 and plate 66 and is smoothed down upon and caused to adhere to the body portion of the wrapper by means of a smoothing-plate 76, arranged over and concentric with the upper side of the drum 74, such plate 76 being of sufficient extent to thoroughly smooth out the wrapper and give the paste an opportunity to adhere before the wrapper-sheet is ejected onto chute 77. The lap-smoothing plate 76 being coterminus with the paste-roller, it will bear directly against those portions of the wrapper which have been supplied with paste.

In order that the plate 66 may move outward to permit the folded sheet to pass, and that at the same time the lower-inner end of

the smoothing-plate 76 may act as a sweep for directing the folded sheet between such plate 76 and the drum and thereby preventing the sheet from again rising and engaging under the plate 66, I provide such plate 76 with a yielding or flexible section 78, whose lower end is coterminus with the lower end of the plate 66 and presses normally thereagainst, holding the plate 66 against the roller 55 or disks 52. When the folded sheet comes down from the holder 39, these parts 66 78 assume the position shown in dotted lines in Fig. 3, and as soon as the sheet has passed the lower edge of the plate 66 they again return to their normal position, as shown in full lines. The portions 66 78 are pivoted at 79 80, respectively, and may be held in their normal position by one and the same spring 81, secured at its ends, respectively, to the back of the plate 78 and to a crank-arm 82 on the plate 66.

In order that the smoothing-plate 76 with its flexible member may be adjusted to adapt the machine for folding sheets or papers of various bulk, it is mounted upon parallel slotted arms 83, secured to the side frames by set-screws 84.

The rotation of the shaft 53, carrying the disks 52 and cam 63, as well as the rotation of the sheet-holders 36 37 38 39 and the drum 74, are intermittent and the direction of that of the drum 74 is contrary to or the reverse of that of the shaft 53 and sheet-holder; and each of these parts 74 53 and the shaft 44, carrying the holders, make a partial rotation each time the folding-knife 11 descends, and such partial rotation is equal to the whole divided by the number of sheet-holders 36, &c., carried by the shaft 44, four being preferably employed.

I will now describe the mechanism which I prefer to employ for producing this intermittent quarter-rotation of these parts.

Intermittent rotation is imparted to the drum 74 by the pinion 22, which meshes with a gear-wheel 85, secured to the shaft 86 of the drum, and its rotation is so timed that the lugs 75 thereon will arrive successively to a position in readiness to catch the folded sheet, as at 4^a, as such sheets are fed down by the mechanism already described. The shaft 53, upon which the disks 52 and claws 54 are mounted, is provided with a disk 87, having radial slots 88 equal in number to the number of sheet-holders 36, &c., employed, four being shown, and the disk 18, whose edge is arranged between the disk 87 and the frame 2, is provided with a lug or pin 89, which every revolution of the driving-shaft engages in one of the slots 88 and causes a quarter-revolution of the shaft 53. The shaft 53 is also provided between the disk 18 and the frame 2 with a gear-wheel 90, which meshes with a pinion 91, secured to the inner face of a disk 92 and being so proportioned with reference to the circumference of the pinion 90 as to cause a complete revolution of the disk

92 at every quarter-revolution of the pinion 90. The disk 92 like the disk 18 is provided with a lug or pin 93, which at each revolution of the disk 92 engages in one of four radial slots 94, formed in a disk 95, secured to the shaft 44, which carries the sheet-holders 36, &c. By this means it will be seen that the shafts which carry the sheet-holders and the claws 54, &c., are caused to make a quarter-revolution in the same direction at every revolution of the driving-shaft and stroke of the folding-knife 11, while the drum 74 revolves in the same direction, but carries the folded paper in a direction opposite to that in which it is carried by the claws 54.

The paper forming the wrappers 32 is preferably employed in the form of a continuous strip stored on any suitable reel 96, it having by preference been first perforated transversely at intervals apart equal to the length of the wrappers. This strip is fed into the machine by two pairs of rollers 97 98, the first of which, 97, grip the paper with easy friction, while the second pair 98 grip it with sufficient force to pull it between the rollers 97, irrespective of the speed of rotation of the latter; and these two pairs of rollers are driven by differential gears, the second pair 98 being driven at a greater rate of speed than the first pair 97, so that as soon as the sheet or strip is integral it will be fed entirely by the second pair 98 and will slide between the rollers 97; but these rollers 97 produce sufficient retardation to the forward movement of the strip to cause the strip to break in two along the line of perforations as soon as such perforations reach a point between the two pairs of rollers. The wrapper broken off is then fed into the machine by the rollers 98, while the movement of the main strip is continued by the rollers 97.

One roller of each of the two pairs of rollers 97 98 is geared to a gear-wheel 99 by means of the differential gears 100 101, respectively, the latter being the smaller, while the opposite ends of the rollers of each pair are geared together by pinions 102. It is also desirable to drive the rollers 97 98 intermittently, so that at each stroke of the knife 11 a wrapper will be thrown off and fed into the machine and the strip will remain at rest until the knife has risen preparatory to making another stroke. In order to accomplish this, I provide the driving-shaft 6 with an eccentric 103, whose strap 104 is connected by pitman 105 with a crank 106. This crank-arm 106 forms one member of a clutch whose other member 107 has cogs meshing with a pinion 108, secured to the gear 99. The member 107 is also provided with a laterally-projecting flange 109, with which engages a clog or friction device 110, pivoted to the arm 106 and adapted to wedge against the flange 109 and cause the rotation of the clutch member 107 when the arm 106 is oscillated in one direction, but to release such flange when the arm is oscillated in the opposite direction. This

clog 110 may be held in place by a retaining-screw 111. Thus it will be seen that at each rotation of the driving-shaft 6 a partial rotation will be imparted to the member 107, whose periphery is so proportioned with reference to the pinion 108 as to turn the rollers 98 a sufficient number of times to feed the wrapper 32 onto an endless traveling belt 112, which derives its motion from a band 113, running over the pulley 8 and also over a pulley 114, mounted on the shaft of the drum 115, around which the belt 112 travels, the other end of the belt 112 being carried by an idler 116.

As the forward edge of the wrapper 32 is projected under the rollers 10 it is supported and its movement limited by means of a depending bracket or shelf 117.

In order that the feed-rollers 10 may be adjusted with relation to each other to suit the varying sizes of papers, I journal their ends, respectively, in sliding blocks 118, regulated by set-screws 119. These rollers at one end are each provided with a pinion 120, which mesh, respectively, with the pinions of a pair of engaging pinions 121, the latter being coupled together by a link 122 and suspended from the rollers or their journals by links 123. One of the rollers 5 may also be adjusted by means of set-screws 124.

I will now describe my improved means for feeding the sheets to be folded onto the table 3 into the grasp of the feed-rollers 5. This is illustrated in Fig. 10, and it primarily consists of one or more boxes or chutes 125, each having an opening 126 in its forward side for the exit of the sheets 127, contained in the boxes. Traveling under these boxes is a carrier having one or more fingers 128, which project up into the boxes 125 and push the papers or sheets 127 therein out through the openings 126 one at a time and convey the same onto the table 3.

The bottom of each box is provided with two parallel slots 129, into and along which the fingers 128 project, such fingers being preferably arranged in pairs, as shown in Fig. 9, and arranged immediately below the bottoms of these boxes is a table or support 130, slotted longitudinally for the passage of the fingers 128 and having a support for the sheets 127 as the same are pushed from the boxes and fall. These boxes 125 are designed to hold the respective parts or sheets of a newspaper, which are usually folded separately. Thus it will be seen that each pair of the fingers 128 will collect one part of the paper from each of the boxes, and the parts thus collected will fall one upon the other in a stack in the manner shown on the left in Fig. 10, thus making up a complete edition of the publication, which is carried as a whole onto the table 3 and fed in the same condition under the knife 11, which forces it through to the folding and wrapping mechanism in the manner already described.

The fingers 128 are carried by an endless

belt or carrier 131, running over suitable pulleys 132, deriving their power from a suitable source, and each pair of fingers is supported on a track or way 133 by means of rollers 134, the belt 131 being made in two parts arranged one on each side of the central division of the table 130.

Instead of arranging the boxes 125 with their bottoms in the same plane and having the track or way 133 horizontal or parallel therewith, I prefer to arrange the boxes at graduated elevations and to form complementary rises 135 in the way 133, so that the fingers 128 will bear the same relative altitude to all of the boxes. The purpose of this construction is to avoid dropping the first parts of the paper a great distance onto the table 130, which might result in the disarrangement of its folds.

The openings 126 in the boxes 125 are provided with adjustable valves or gates 136 for varying the opening to suit the size of the paper.

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

1. A machine for the purpose described having in combination mechanism for folding the sheet and wrapping the wrapper partially around said folded sheet; a support for the folded sheet and wrapper after the same leave the folding mechanism; a lap-paster arranged to impinge the lap of the wrapper after it leaves said folding mechanism; a yielding lap-smoothing device having its engaging surface fixed against movement with the wrapper whereby it will drag thereagainst; means for pulling the folded sheet and wrapper bodily from said folding mechanism and forcing the same between said support and lap-smoothing device; and means for folding the pasted lap back against the wrapper, paste side inward, located in the line of travel of the sheet at a point between the lap-paster and the lap-smoothing device, substantially as set forth.

2. A machine for the purpose described having in combination mechanism for folding the sheet and wrapping the wrapper partially around said folded sheet; a support for the folded sheet and wrapper after the same leave the folding mechanism; means for applying paste to the projecting end or lap of the wrapper; a yielding lap-smoothing device pressing continually toward said support and having its engaging side coterminous with said lap-paster and fixed against movement along the line of travel of the wrapper whereby the wrapper will be caused to drag thereagainst and the paste-coated surface smoothed out and pressed into place; and means for pulling the folded sheet and wrapper bodily from said folding mechanism and forcing the same between said support and lap-smoothing device, substantially as set forth.

3. A machine for the purpose described,

having in combination mechanism for folding the sheet and wrapping the wrapper partly around said folded sheet, a support for the folded sheet after it leaves the folding mechanism, a deflectable plate impelled toward said support, means for pulling the folded sheet and wrapper bodily from said folding mechanism and forcing the same between said support and plate, said support and plate being arranged to hold the folded sheet, and means for applying paste to the lap of the wrapper and pressing such lap into place, substantially as set forth.

4. A machine for the purpose described, having in combination mechanism for folding the sheet and wrapping the wrapper partly around it, a support for the folded sheet after it leaves said folding mechanism, a deflectable plate impelled toward said support, means for pulling the folded sheet and wrapper bodily from said folding mechanism and forcing the same between said support and plate, said support and plate being arranged to hold the folded sheet, means for applying paste to the lap of the wrapper, and means for imparting a reverse movement to the folded sheet while the lap of the wrapper is yet engaged by said plate, substantially as set forth.

5. A machine for the purpose described, having in combination means for folding the sheet and partly wrapping the wrapper around it, a vibrating lap-pasting device, a plate to and from which said lap-pasting device vibrates, and means for carrying the folded sheet and wrapper bodily between said lap-pasting device and plate, and means for forcing the lap against the wrapper, substantially as set forth.

6. A machine for the purpose described, having in combination a movable holder consisting of independent side pieces arranged to receive the sheet between them, end pieces and sliding blocks secured to said side pieces respectively and adjustably mounted on said end pieces, means for forcing the sheet into said holder, means for doubling the sheet back against the holder and finally withdrawing the folded sheet from the holder, substantially as set forth.

7. A machine for the purpose described, having in combination a movable holder, means for forcing the sheet into said holder, a doubler arranged in the line of movement of said holder and adapted to engage with the sheet therein, circular supports or disks for the folded sheet, and claws carried by said supports for pulling the folded sheet from said holder, substantially as set forth.

8. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the wrapper and sheet into said holder, a doubler arranged in the line of movement of said holder, and adapted to engage with the sheet therein, means for pulling the folded sheet from the

holder, and means for securing the lap of the wrapper, substantially as set forth.

9. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into the said holder, a doubler arranged in the line of movement of said holder and adapted to engage with the sheet therein, means for pulling the folded sheet from the holder, means for holding the lap of the wrapper and applying paste thereto and means for reversing the movement of the folded sheet while the lap is being so held, substantially as set forth.

10. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a doubler arranged in the line of movement of said holder and adapted to engage with the wrapper therein, traveling claws for pulling the folded sheet and wrapper from said holder, a lap pasting and holding device past which said claws carry the folded sheet, means for withdrawing said claws from engagement with the folded sheet, and means for carrying the folded sheet in a reverse direction while the lap is being so held, substantially as set forth.

11. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a doubler arranged to engage with the edge of the sheet and wrapper in the holder, means for pulling the sheet and wrapper from said holder, a lap-holder whose one member is a lap-pasting device, and means for moving the folded sheet in a reverse direction while the lap is so held, substantially as set forth.

12. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a doubler arranged to engage with the edge of the sheet and wrapper in the holder, claws for pulling the sheet and wrapper from the holder, a cam for forcing said claws into engagement with the sheet, a lap pasting and holding device, means for withdrawing said claws from the folded sheet after it passes said lap-paster, and means for carrying the folded sheet in a reverse direction while the lap of the wrapper is being held by said lap-holder, substantially as set forth.

13. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a doubler arranged to engage with the edge of the sheet and wrapper in the holder, pivoted claws for pulling the sheet and wrapper from the holder, a fixed cam for forcing the claws into engagement

with the sheet, a lap-pasting device, said cam having a depression or offset located beyond the lap-pasting device, springs for forcing the claws toward said cam, and means for moving the folded sheet in a direction contrary to the movement of the claws, substantially as set forth.

14. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a doubler arranged to engage with the edge of the sheet and wrapper in the holder, a pair of revolving disks or supports between which said holder passes and upon which the ends of the folded sheet rest, pivoted claws revolving in unison with said disks and adapted to engage the ends of the folded sheet for pulling it from the holder, means for applying paste to the lap of the wrapper, and means for pressing said lap against the folded wrapped sheet, substantially as set forth.

15. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a doubler arranged to engage with the edge of the sheet and wrapper in said holder, means for pulling the sheet and wrapper from said holder, a vibrating lap-pasting device adapted to come against the lap end of the wrapper, a plate arranged opposite said vibrating lap-pasting device and means for turning the folded sheet with reference to the lap until the lap is stuck in place, substantially as set forth.

16. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, means for pulling said sheet and wrapper from said holder, a yielding plate against which said sheet and wrapper are forced, a vibrating lap-pasting device between which and said plate the sheet and wrapper pass, and means for carrying the folded sheet in a contrary direction to force the lap against the wrapper, substantially as set forth.

17. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a yielding plate arranged adjacent to the upper or outer edge of the holder, a vibrating lap-pasting device moving to and from said plate, means for pulling the sheet and wrapper from said holder and against said plate and carrying it between said lap-pasting device and plate, a smoothing-plate and means for carrying the folded sheet in a reverse direction against said smoothing-plate, substantially as set forth.

18. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said

holder, means for forcing the sheet and wrapper into said holder, a plate arranged adjacent to the upper or outer end of said holder, a lap-pasting device arranged to make contact with the lap end of the wrapper, traveling claws for pulling the sheet and wrapper from said holder and forcing them against said plate and carrying them between said plate and pasting device, means for withdrawing said claws from engagement with the folded sheet before the lap end of the wrapper passes the lap-paster, a smoothing-plate and means for carrying the folded sheet and wrapper in a reverse direction against said smoothing-plate and thereby pressing the lap in place, substantially as set forth.

19. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a plate arranged adjacent to the upper or outer edge of said holder, a lap-pasting device, means for pulling the sheet and wrapper from said holder and forcing them against said plate and between said plate and lap-pasting device, a cam for periodically forcing said lap-pasting device into the line of movement of the lap of the wrapper, and means for forcing the pasted lap against the wrapper, substantially as set forth.

20. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a pivoted or yielding plate arranged contiguous to the line of movement of said holder, a lap-pasting device arranged opposite said plate, traveling claws for pulling the sheet and wrapper from said holder and forcing them against said plate and between the latter and said pasting device, a yielding smoothing-plate bearing against and forcing said first plate toward said pasting device, and means for carrying the folded sheet in a direction contrary to the movement of said claws and against said smoothing-plate, substantially as set forth.

21. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a yielding plate arranged adjacent to the line of movement of said holder, a lap-pasting device arranged opposite said plate and toward which said plate is normally forced, traveling claws for pulling the sheet and wrapper from said holder and forcing them against said plate and between said plate and pasting device, a drum having lugs, means for revolving said drum in a direction contrary to the movement of said claws, and a yielding smoothing-plate having means for forcing it normally toward said first plate, substantially as set forth.

22. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said

holder, means for forcing the sheet and wrapper into said holder, supports for the ends of the sheet after it leaves the holder, a yielding plate arranged adjacent to the line of movement of said holder and tending normally toward said support, a lap-pasting device opposed to the said yielding plate, means for pulling the sheet and wrapper from said holder and crowding them between said support and plate and carrying them beyond said lap-pasting device, and means for forcing the lap against the wrapper, substantially as set forth.

23. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a yielding plate arranged adjacent to the line of movement of said holder, a lap-pasting device opposed to the said plate, means for pulling said sheet and wrapper from said holder and crowding the same against said plate and pulling the lap of the wrapper between said plate and pasting device, a smoothing-plate having a pivoted or yielding portion bearing normally against the end of said first plate and forcing it toward the lap-paster and a drum mounted adjacent to said smoothing-plate and having lugs for engaging with the folded sheet, and means for revolving said drum in a contrary direction to the forward movement of the folded sheet, substantially as set forth.

24. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, a plate arranged adjacent to the line of movement of said holder, a lap-pasting device arranged opposite said plate, a drum having peripheral lugs, a rest for the folded sheet arranged opposite said drum, means for pulling the sheet and wrapper from said holder and crowding them against said plate and carrying them beyond said plate between the latter and said pasting device, a smoothing-plate and means for revolving said drum in a direction to carry the folded sheet toward the lap end of the wrapper, substantially as set forth.

25. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, means for doubling the sheet and wrapper back upon the holder, a lap-holding device consisting of a yielding plate and a pasting device, a yielding smoothing-plate, a spring connecting said first plate with said smoothing-plate and forcing the ends of both plates together and toward said pasting device, means for pulling the sheet and wrapper from said holder and carrying them between said pasting device and the first said plate, and means for carrying the folded sheet in a reverse direction against said smoothing-plate, substantially as set forth.

26. A machine for the purpose described, having in combination a movable holder, means for projecting the wrapper across said holder, means for forcing the sheet and wrapper into said holder, means for doubling the sheet and wrapper back upon the holder, means for pulling the sheet and wrapper from said holder and applying paste to the lap end of the wrapper, an adjustable smoothing-plate and means for carrying the folded sheet in a reverse direction against said smoothing-plate for forcing the lap against the wrapper, substantially as set forth.

27. A machine for the purpose described, having in combination means for feeding the sheet to be folded, folding and wrapping mechanism, a driving-pulley, a disengageable connection between said driving-pulley and folding and wrapping mechanism, and a trip or trigger arranged to be struck by the sheet and controlling said disengageable connection for throwing the folding and wrapping mechanism into operation, substantially as set forth.

28. A machine for the purpose described, having in combination a number of boxes or chutes arranged at different altitudes and having openings in their forward sides, a table arranged under said boxes, a traveling carrier arranged under said table and having a finger projecting up therethrough for engaging with the sheets in said boxes, and means for elevating said finger at intervals throughout its line of movement under the boxes, substantially as set forth.

29. A machine for the purpose described, having in combination a shaft carrying a number of revolving sheet-holders, lap-pasting mechanism, revolving claws for pulling the folded sheet from said sheet-holders, a revolving cam for oscillating said lap-paster, a disk having a number of radial slots equal to the number of said sheet-holders, for revolving said claws and cam, a revolving pin or lug

adapted to engage in the said slots, a second disk on said shaft having radial slots equal in number to the number of said sheet-holders, a second revolving pin or lug for engaging in the slots of said second disk and said second revolving lug being driven by said first slotted disk, substantially as set forth.

30. A machine for the purpose described, having in combination a series of intermittently-revolving sheet-holders, an intermittently rising and falling folding-knife, intermittently-revolving feed-rollers for feeding the wrapper under said knife and over said holders, an intermittently-revolving series of claws for pulling the sheet from said sheet-holders, a plate arranged adjacent to the line of movement of said claws and adapted to press upon the folded sheet, a vibrating lap-pasting device, means for carrying the folded sheet in a contrary direction to that in which it was carried by said claws, a disengageable connection geared with and adapted to operate said revolving holders and claws and to vibrate said paste device, a lock for holding said disengageable connection inactive and a trip arranged to be struck by the sheet for releasing said lock, substantially as set forth.

31. A machine for the purpose described, having in combination a driving-shaft, a rising-and-falling knife operated by said shaft, a pair of rollers between which said knife descends, a clutch on said shaft having its driven member provided with operative connection so as to operate said knife, a lock for holding said clutch inactive and a trip or trigger arranged to be struck by the sheet as it enters the machine and being connected to and adapted to release said lock, substantially as set forth.

LEE A. AGNEW.

Witnesses:

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EDNA B. JOHNSON.