

11 SHEETS--SHEET 1.

By Franklin H. Douglass
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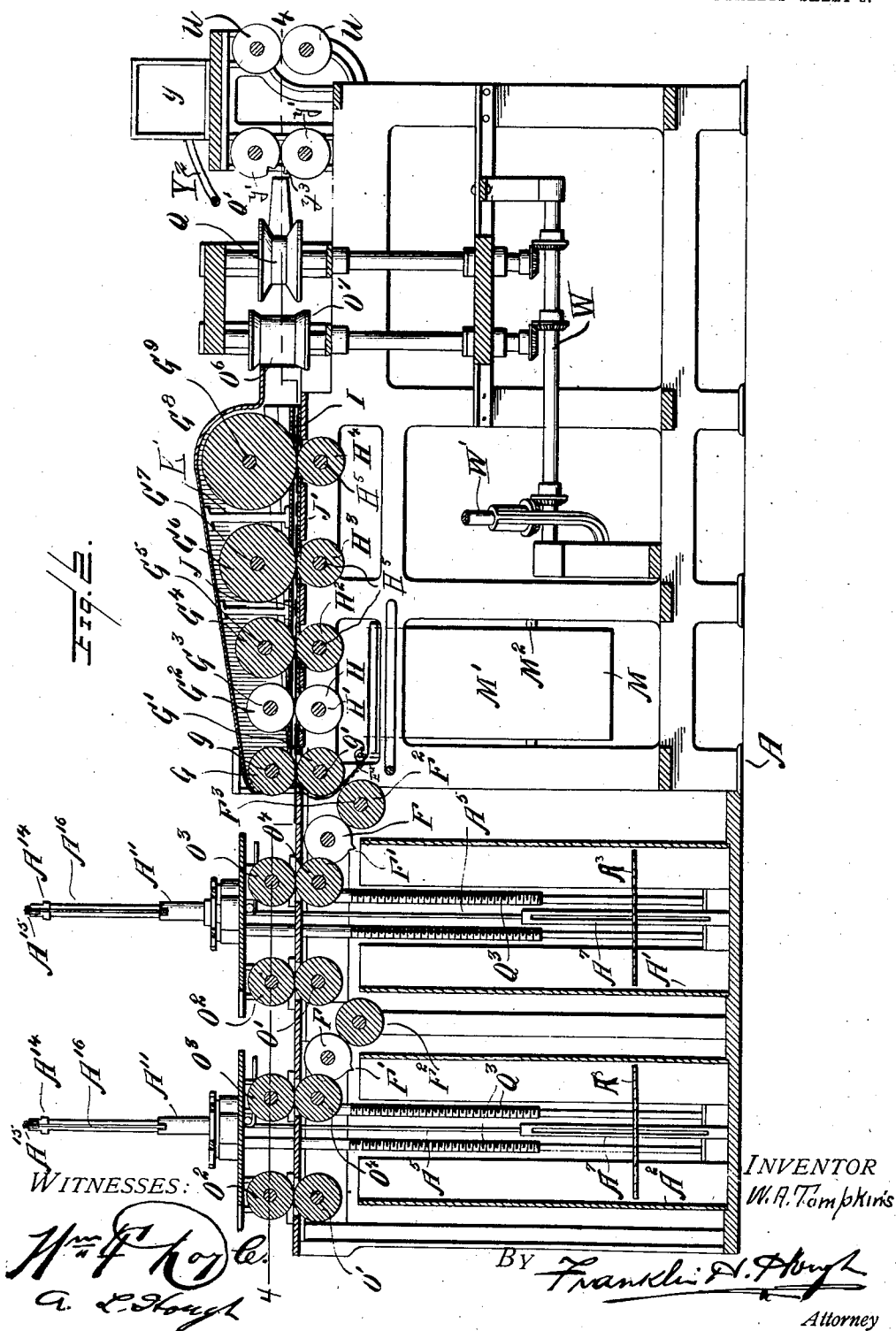
APPARATUS FOR COLLECTING, FOLDING, AND WRAPPING PAPERS.

APPLICATION FILED MAR. 9, 1907.

Patented Jan. 12, 1909.

11 SHEETS—SHEET 2.

909,712.



W. A. TOMPKINS.

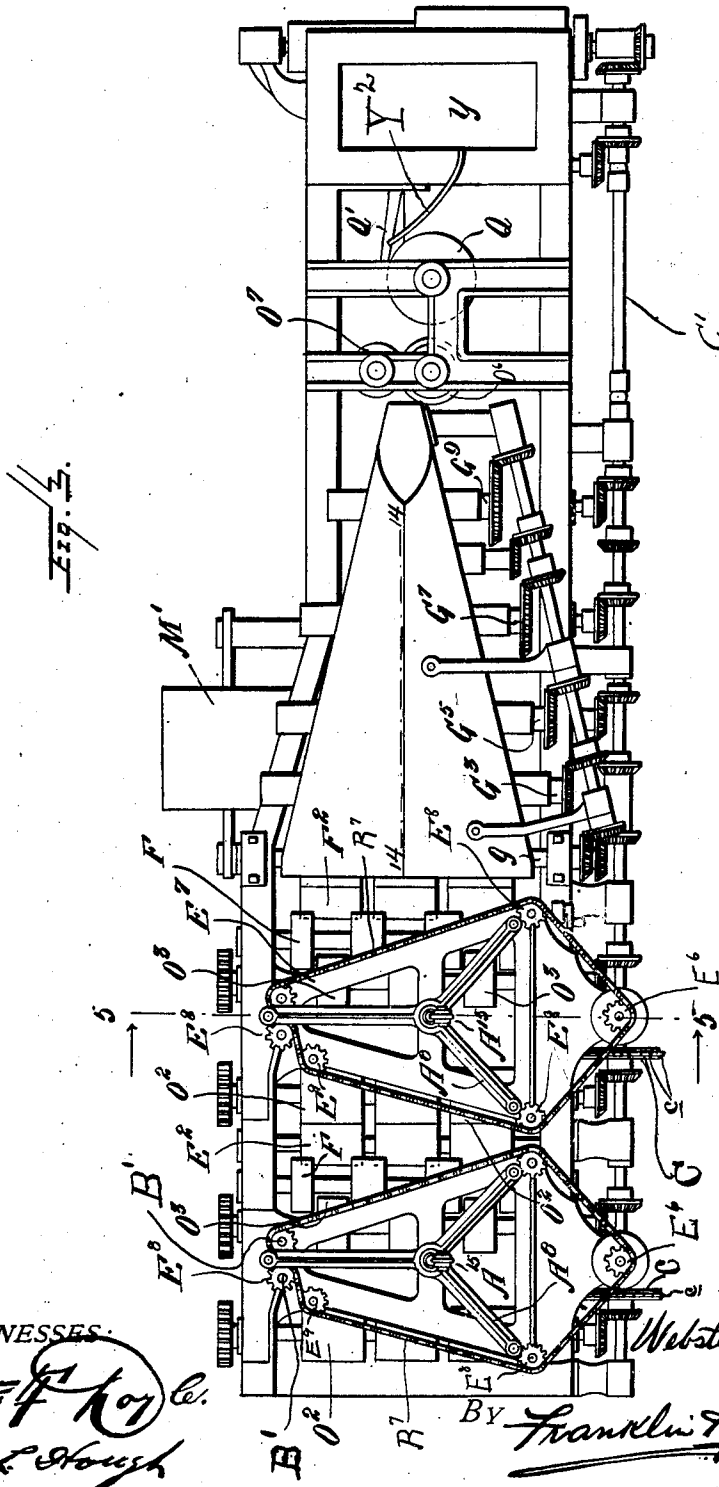
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11 SHEETS—SHEET 3.



WITNESSES:

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 APPARATUS FOR COLLECTING, FOLDING, AND WRAPPING PAPERS.

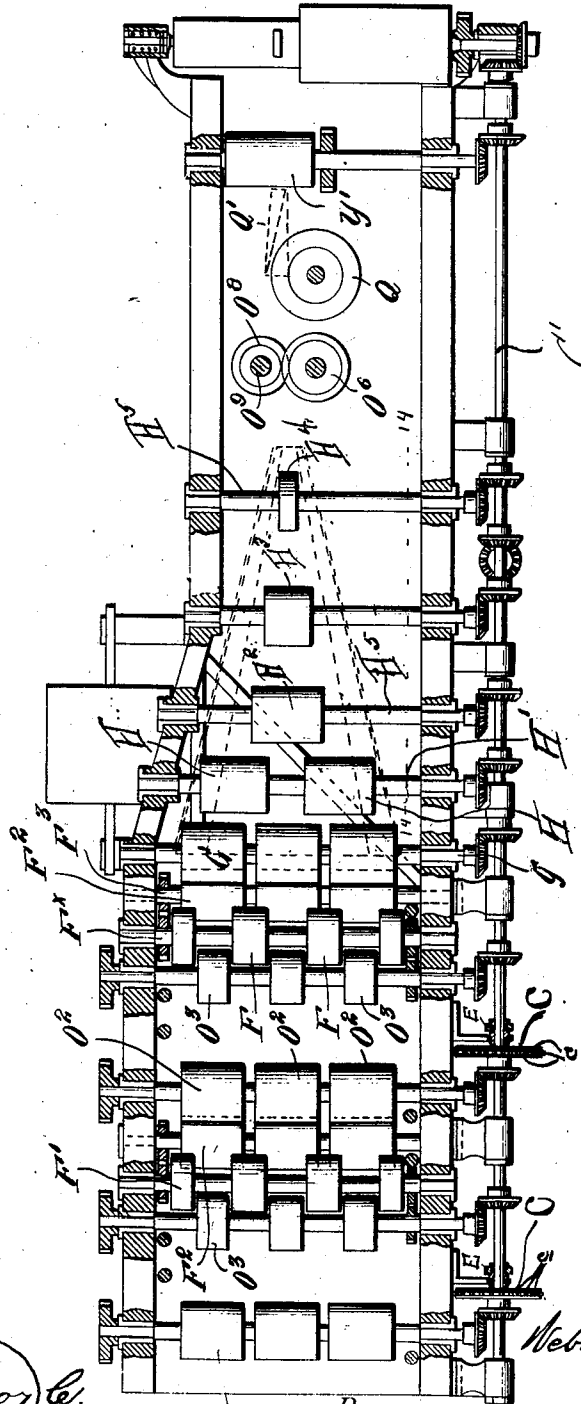
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11 SHEETS—SHEET 4.

Fig. 2.



WITNESSES:

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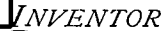
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11 SHEETS—SHEET 6.

Fig. 5.

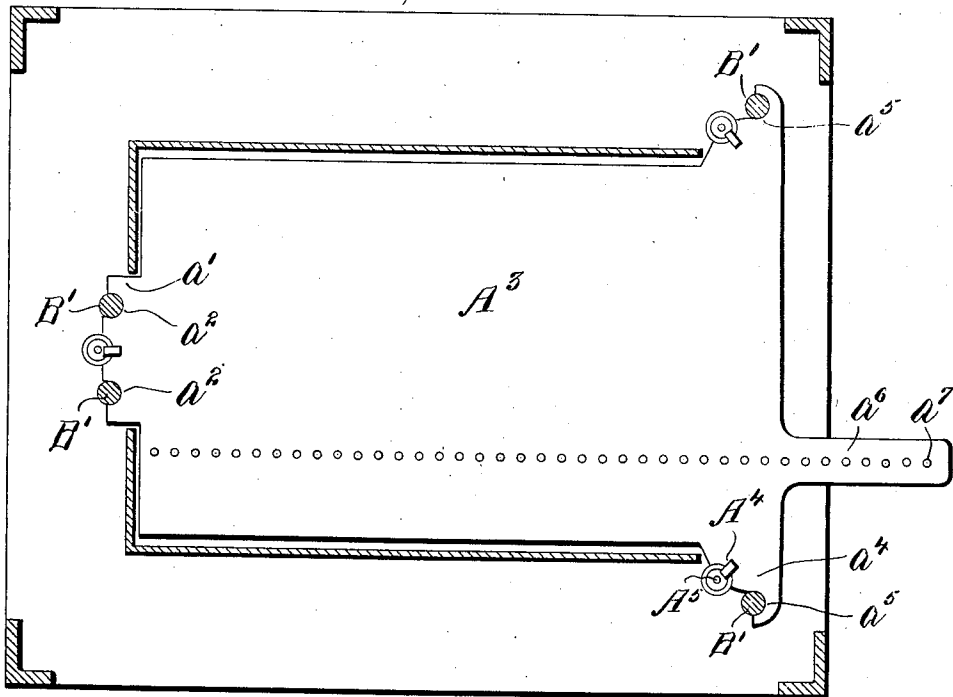


Fig. 6.

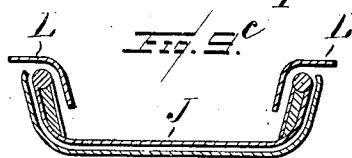
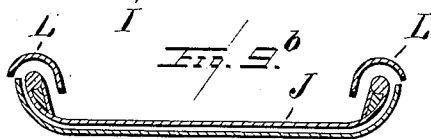
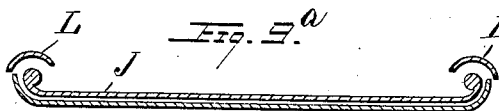
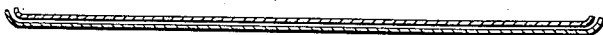


Fig. 6d

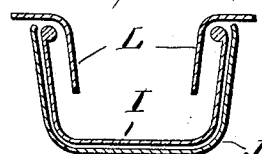
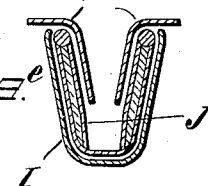


Fig. 6e



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11 SHEETS—SHEET 7.

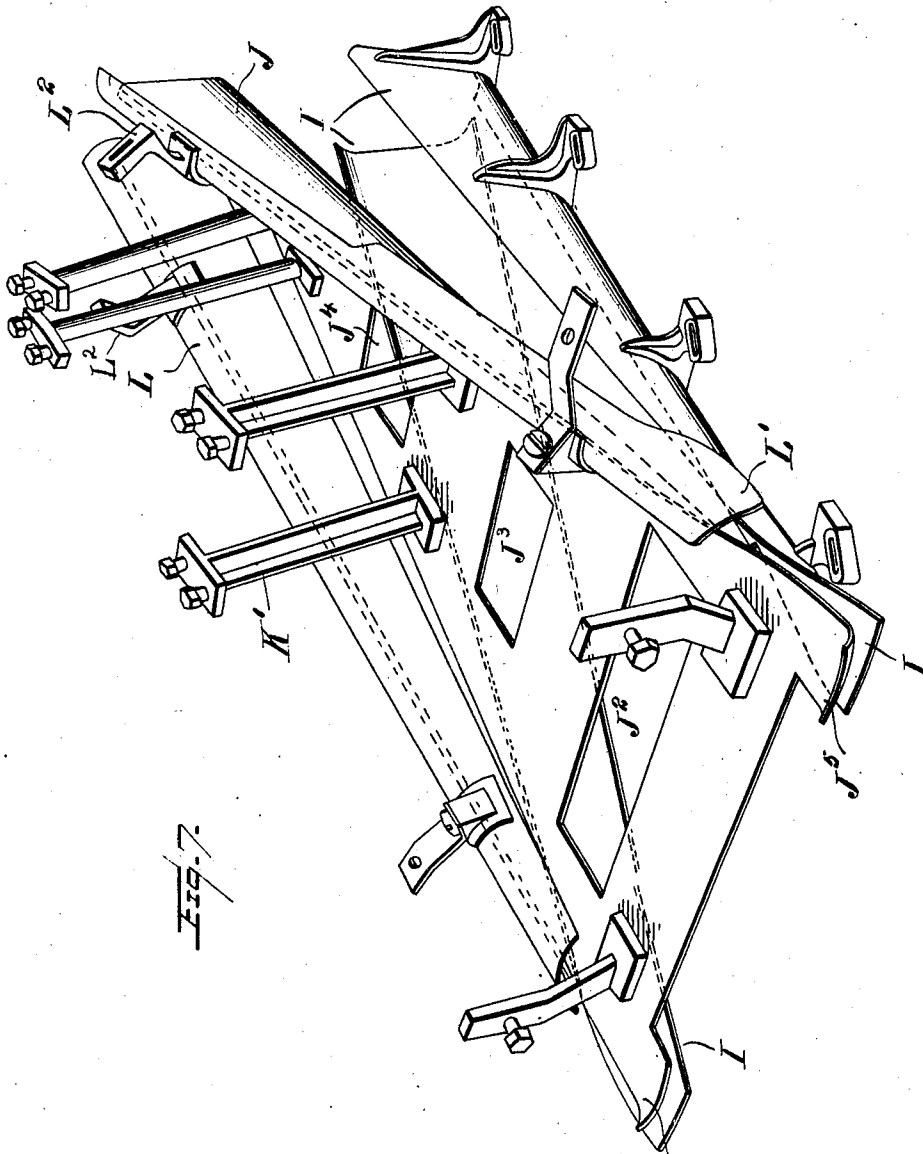


FIG. 7

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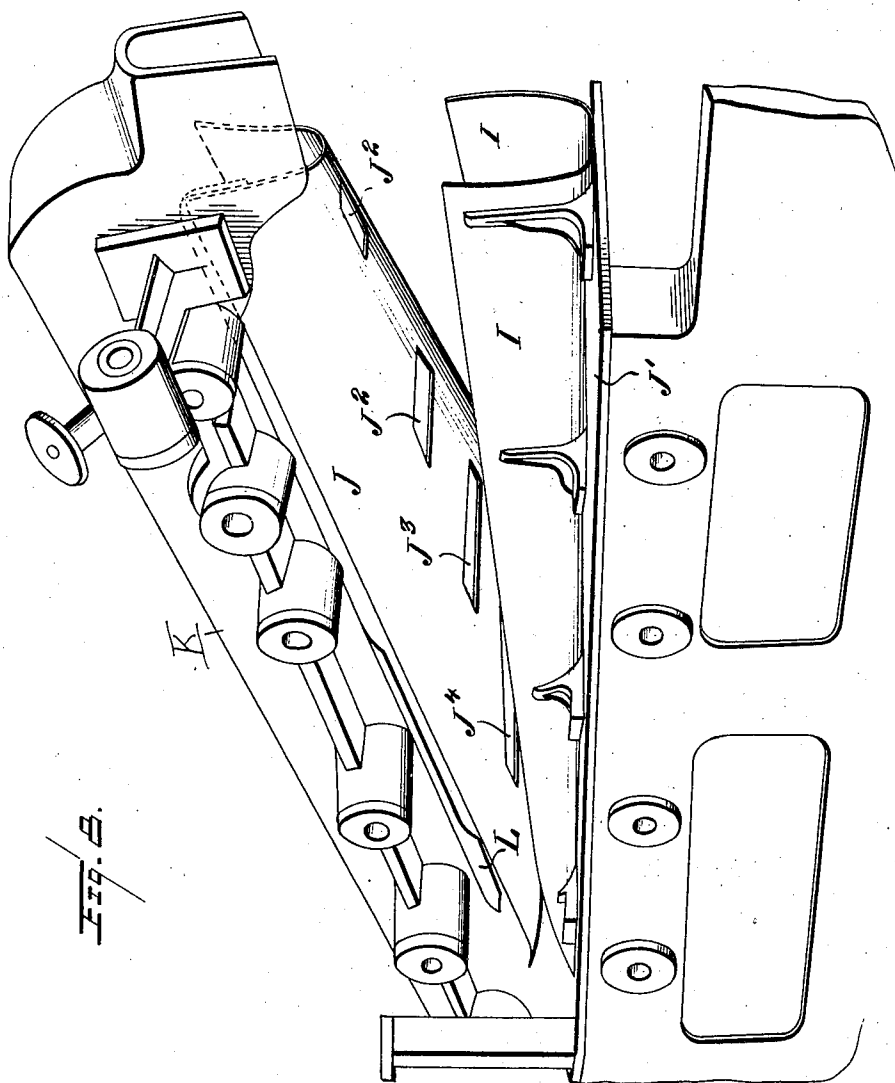
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11 SHEETS—SHEET 9.

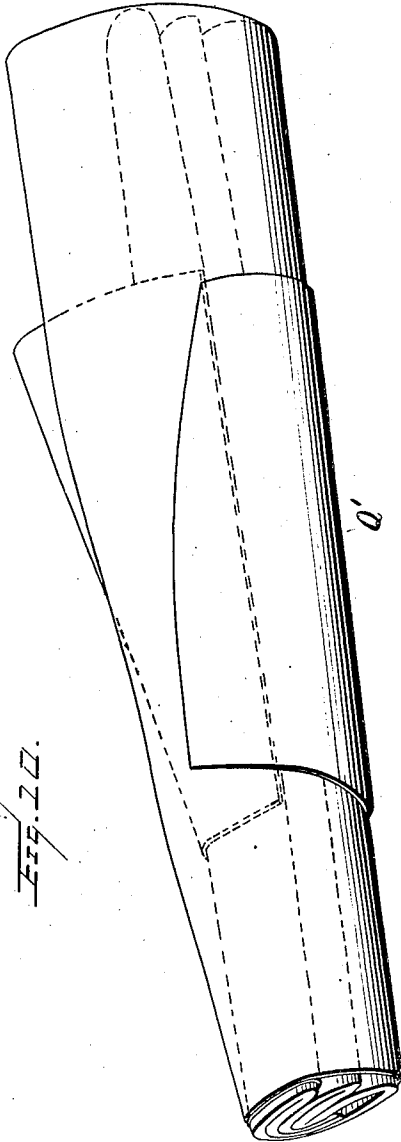


Fig. 23.

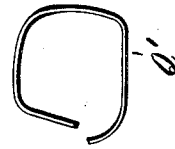


Fig. 24.

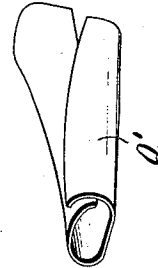


Fig. 25.



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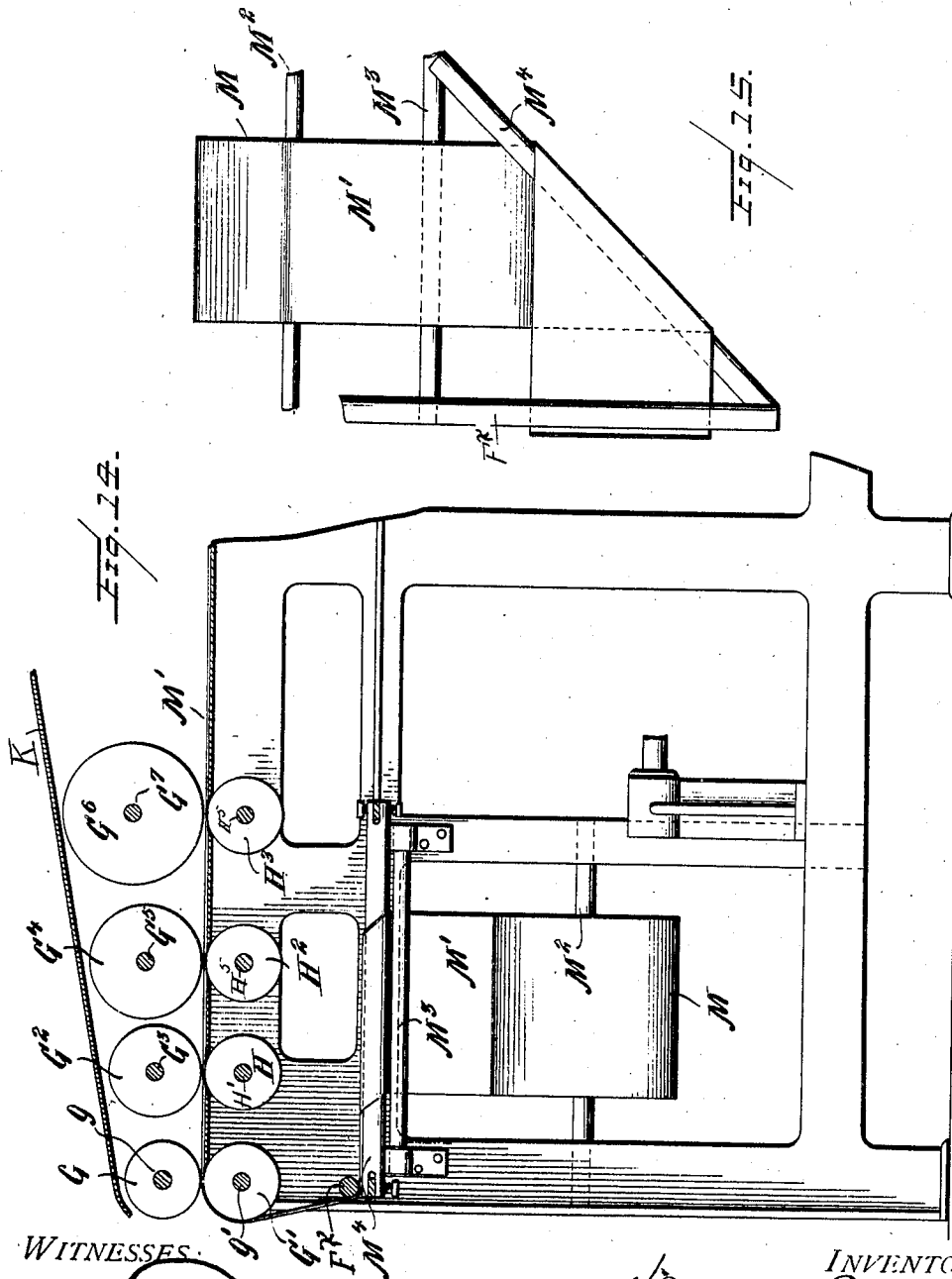
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W. A. TOMPKINS.
 APPARATUS FOR COLLECTING, FOLDING, AND WRAPPING PAPERS.
 APPLICATION FILED MAR. 9, 1907.

909,712.

Patented Jan. 12, 1909.
 11 SHEETS—SHEET 10.



WITNESSES:
Wm. F. Hoyle
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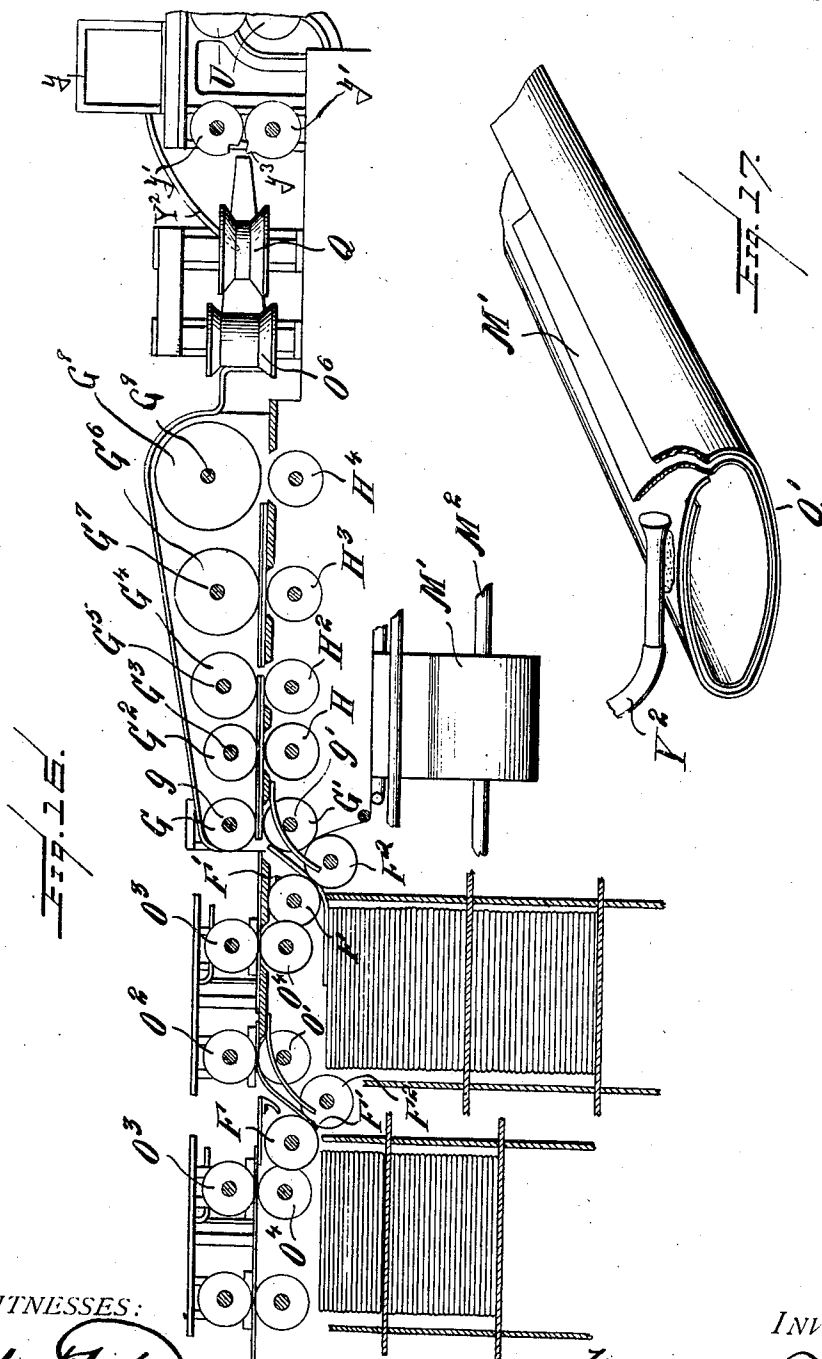
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APPARATUS FOR COLLECTING, FOLDING, AND WRAPPING PAPERS.

Patented Jan. 12, 1909.

11 SHEETS--SHEET 11.

909,712.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR COLLECTING, FOLDING, AND WRAPPING PAPERS.

No. 909,712.

Specification of Letters Patent.

Patented Jan. 12, 1909.

Application filed March 9, 1907. Serial No. 361,508.

To all whom it may concern:

Be it known that I, WEBSTER A. TOMPKINS, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Apparatus for Collecting, Folding, and Wrapping Papers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in apparatus for the mechanical collection of newspapers and the folding and wrapping of the same, and comprises means whereby the papers may be collected and after being wrapped, deposited in rapid succession and fed to apparatus whereby the addresses may be printed upon the wrappers.

My invention comprises various details of construction and combinations and arrangements of parts which will be hereinafter fully described and then specifically defined in the appended claims.

I illustrate my invention in the accompanying drawings, in which:—

Figure 1 is a side elevation of my collecting, folding and wrapping machine. Fig. 2 is a central longitudinal sectional view vertically through the machine. Fig. 3 is a top plan view of the apparatus. Fig. 4 is a horizontal sectional view, parts being shown in top plan. Fig. 5 is a vertical sectional view taken on line 5—5 of Fig. 3 through the portion of the apparatus by which the papers are raised to positions where they are fed between rollers where the papers are folded, parts of the apparatus, such as rollers, not being illustrated. Fig. 6 is a sectional view on line 6—6 of Fig. 5. Fig. 7 is a perspective view of the folding shields between which the papers are fed to be folded, corresponding ends of said shields being separated a short distance to better illustrate the shape of the shields. Fig. 8 is a perspective view showing the parts of the folding shields reversely arranged and separated. Figs. 9, 9^a, 9^b, 9^c, 9^d and 9^e are cross sectional views through the folding shields at different positions, showing the peculiar curvatures of the shields at certain locations for the purpose of par-

tially folding the papers with the wrapper strips applied thereto. Fig. 10 is a perspective view of a shield through which the papers with wrappers applied thereto are fed to receive the final folds of the papers and wrapper strip. Fig. 11 is a view of the delivery end of the shield shown in Fig. 10. Fig. 12 is a perspective view showing the peculiar shape of the shield illustrated in Fig. 10. Fig. 13 is a view of the receiving end of the shield or folding apparatus shown in Fig. 10. Fig. 14 is a side elevation of a portion of the apparatus, portions being shown in section, a portion of the rolls only being illustrated in end elevation. Fig. 15 is a detail sectional view showing the manner of turning the wrapper at an angle. Fig. 16 is a side elevation of the apparatus, showing parts in section and illustrating the manner of gathering the papers from two piles, said view also showing the wrapping paper which is fed into the folding apparatus with the papers and the cutting and pasting means. Fig. 17 is a detail view showing the manner of pasting the flap of the wrapper.

Reference now being had to the details of the drawings by letter, A designates the frame of my collecting, folding and wrapping apparatus having, in the present instance, two rectangular outlined boxes or receptacles A¹ and A² with their front faces open for the reception of piles of papers which are placed upon the removable shelves A³ which are held upon the spring-pressed bracket arms A⁴ which are carried by the rods A⁵, said brackets being guided in longitudinal slots A⁶ formed in the hollow casings A⁷. One of said bracket arms A⁴ is held at its farthest outer throw by means of a spring A¹⁰. The upper ends of said rods A⁵ are fastened to the ends of a yoke A⁸ by means of nuts *a* engaging threaded portions of said rod and bearing against the opposite ends of bosses A⁹ formed at the ends of said yoke. The central portion of said yoke has a tubular shell A¹⁰ for the reception of a bushing A¹¹ which is fixed therein, and A¹² designates an open-ended pipe or tubing which is fastened at its lower end within an opening in the cross-piece A¹³ of the top of the frame. Mounted on a bracket arm A¹⁴ carried by said tubular casing A¹² is a grooved sheave A¹⁵ over which a rope or cable A¹⁶ passes, afterward passing through the pipe A¹² underneath a second

grooved sheave A¹⁷, thence winding about a drum or reel B which is loosely journaled upon one of the vertically disposed feeding shafts B', there being four of said feeding shafts illustrated in the drawings, two adjacent to the opening into said box and along its side walls and the other two feeding shafts positioned at the rear end of the box, as shown clearly in section in Fig. 6 of the drawings. Each of said shelves A³, one of which is seen in top plan view in Fig. 6 of the drawings, has a projection a' upon its rear end, which projection has the grooves a² formed therein for the reception of the feeding shafts B', which shafts have screw-threads a³ portions of their length. The forward or front edge of said shelf A³ has lateral projections a⁴ which are recessed at a⁵ for the reception of the forward feeding shafts B' and also for the reception of the vertically-disposed shells A' in which the rods A⁶ of the bracket arms A⁴ are positioned. The forward edge of each shelf has a projection a⁶ and a series of perforations a⁷ extends the entire length of said projection and of the shelf, as shown clearly in Fig. 6 of the drawings. Said perforations a⁷ are provided for the reception of the teeth c upon the circumference of a spur wheel C which is fixed to a driving shaft C' journaled in suitable bearings C² along the side of the frame of the apparatus, these spurs or teeth c of said wheel C being designed to engage said perforations as the shelves are raised to the top of the box in a manner which will be presently described. The upper end of one of said feed shafts B' is fixed to a bushing B^x which rotates in suitable bearings in the upper portion of the frame and against the lower flanged end of which bushing said drum or reel B is adapted to be thrown in contact by means of a coiled spring D bearing between the reel B and a second reel D' having a cam groove about its circumference, which groove is engaged by a roller D² mounted upon an arm D³ of a lever D⁴ which is journaled in suitable bearings upon the frame of the apparatus, said lever having a handle D⁵ whereby the lever may be actuated for the purpose of raising said reel D' in order to increase the tension of the spring to cause the reel B to be forced against the flange at the lower end of the bushing B^x with sufficient pressure to cause the drum or reel B to rotate with the bushing for the purpose of raising or lowering the yoke A⁸ and the lifting rods A⁵ fastened thereto which support, by means of the brackets A⁴, shelves upon which the papers are placed.

A variable motion is imparted to the mechanism for raising the papers comprising a friction pulley E which is splined to the operating shaft C', shown in section in Fig. 5 of the drawings, and supported in bracket

arms E² fastened to the frame of the machine.

E³ designates a shell which is mounted vertically in an aperture in the frame and forms a bearing for a shaft E⁴ which has fixed at its lower end a disk E⁵ which is adapted to contact with the friction wheel E at different locations radially upon the under surface thereof, whereby a variable motion may be imparted to the shaft E⁴. A sprocket wheel E⁶ is fixed to the upper end of the shaft E⁴ and has sprocket chain connections R' with a sprocket wheel E⁸ fixed to the upper end of the shaft B'.

Referring to Fig. 3 of the drawings illustrating a top plan view of the mechanism, it will be seen that there are a plurality of said sprocket wheels E⁸, two of which are positioned near the front side of the machine and two near the rear and fixed to the tops of the feeding shafts, an idler E⁹ being provided the two rear sprocket wheels, and said sprocket chain R' passes about the several sprocket wheels E⁸ as shown, whereby the feed screw shafts may rotate in unison. It will also be noted in Figs. 1 to 3, inclusive, of the drawings that there are two of said boxes shown as side by side which are of identical construction and operative mechanism, whereby papers of one section may be fed into the conveyer rolls O', O², O³, O⁴, etc., so timed that they will arrive at the entrance of the folder exactly coincident with the other sections of the same paper being fed out of the other boxes, thereby effecting the mechanical collecting of newspapers.

When it is desired to raise the papers in order that they may be fed automatically, the reel D' is actuated by means of the cam lever so that the winding reel B will frictionally engage the bushing B^x, causing the yoke and rods, upon which latter the shelf rests, to be raised until the opposite edges and the rear end of the shelf comes in contact with and engages the space intermediate the grooves in the screws B', in which position the shelf will be in readiness to be raised as the shaft rotates further. When the plate with its load of papers engages the feed screws, the cam lever D⁴ is released by the operator, when the elevator mechanism as hereinbefore mentioned, drops down by gravity, so that the spring pressed bracket arms A⁴ engage a second plate with its load of papers, raising the papers into intimate contact with the plate above. As the uppermost paper of the pile comes in contact with rollers F, shown clearly in the top plan view, Fig. 4 of the drawings, which are fixed to a shaft F^x journaled in suitable bearings in the opposite walls of the frame, the spur F' upon each roller F will engage the uppermost folded paper and feed the same between the series of rollers F and F², which

latter are fixed to a shaft F^3 journaled in suitable bearings in the frame of the apparatus. The papers are fed by the spurs F' between the bite of the rollers F and F^2 and are fed upward and between the rollers G and the rollers G' , said rollers G being fixed to a shaft g which is journaled in suitable bearings upon an adjustable frame above the frame of the main part of the apparatus and the rollers G' are fixed to a shaft g' journaled in suitable bearings in the main frame of the machine. Another roller G^2 is fixed to a shaft G^3 which is also journaled in the same frame with the shaft g and is positioned with its central portion intermediate the two rollers G . A roller G^4 is fixed to a shaft G^5 which is mounted upon the frame carrying the shafts g and G^3 . Another feed roller G^6 which is somewhat shorter than the rollers G^4 and G^2 is mounted upon a shaft G^7 , and G^8 is still another roller which is shorter than any of the other rollers and is fixed to a shaft G^9 which, with the shaft G^7 , is journaled in the same framework which carries the shafts g , G^3 , etc.

Positioned underneath the rollers G^2 is a series of rollers H fixed to a shaft H' journaled in bearings in the frame of the apparatus, and H^2 , H^3 and H^4 designate other rollers, each of which is mounted upon a shaft H^5 journaled in the frame of the machine, the roller H being positioned underneath the roller G^2 , the roller H^2 underneath the roller G^4 and the roller H^3 , underneath the roller G^6 and roller H^4 underneath roller G^8 . It will be noted that the diameters of the rollers G and G^2 are the same, while those of the rollers G^4 , G^6 and G^8 are of increasing diameters, for the reason that the side walls of the folding shields J are rising in height toward the tapering end of the shields, the shafts carrying the upper feed rolls G^4 , G^6 and G^8 must pass over the top of the shields at sufficient height to allow them to be operated, therefore the diameters of the rolls must be increased.

It will be observed that the different conveyer rollers, which convey the sections from the two piles to the point where the papers are folded, are of the same diameter, but that the rollers G^4 , G^6 and G^8 are of increasing diameter to allow the papers which are rolling up on the edge of the shield to pass under the shafts, G^5 , G^7 and G^9 upon which the rollers of increasing diameter are mounted, the latter being geared back so that the surface speed is the same as the other rollers. As the standard size of the conveyer rollers, which are of uniform diameter, is preferably four inches, so that the feed will be $12\frac{5}{8}$ inches per revolution of the conveyer roller, which is slightly in excess of the ordinary common size of a newspaper in half fold as it comes from the press and the sections are fed into the folder so that, at each revolution.

of the rollers, the papers progress substantially the width of the latter plus the distance they are spaced apart. If a section is fed from the pile at the left of the drawing in Fig. 16 at the first revolution of the feed roller above the same and if the distance from the rollers F and F^2 to the rollers G and G' were just the width of the one-half folded paper, then the first section from the pile to the left would be carried to rollers G and G' at the beginning of revolution No. 2 in precisely the same manner the second sections would arrive at the rollers above the same.

It will be noted that the ends of the shafts to which the various feeding rollers are mounted have geared connections, whereby the rollers may rotate in unison.

Referring to Figs. 7 and 8 of the drawings will be seen two lower shields I and an upper shield J . Said lower shields I are adapted to be fastened to the top of the frame in any suitable manner, as by means of bolts, and positioned upon a table J' having openings through which the upper portions of the rollers H , H^2 , H^3 and H^4 turn. The top shield J is provided with similar apertures J^2 , J^3 and J^4 which register with said openings in the table J' , the openings in the shield J being provided for allowing the lower portions of the feed rollers G^2 , G^4 , G^6 and G^8 to turn as shown in Fig. 2 of the drawings, whereby papers being folded may be fed forward between the shields. Said top shield which is made preferably of sheet or other suitable metal is comparatively narrow at its bottom at one end and flaring toward the top at its narrow end while the vertical height at the tapering end of the shield should be about one-quarter the width of the papers to be folded. The flaring or wide end of the upper shield is as wide as the papers to be folded and the back corners of said shield are curved upward slightly as seen at J^5 in order to allow the papers to enter between the shields without interference. The side walls at the widest end of the shield J are turned up from the bottom, as shown in Fig. 7 of the drawings, the curve of the angle being a section of a cone, lying with its truncated end at the tapering end of the shield. The flaring portion of the upper shield adjacent to the receiving ends of the shield is curved as shown in the sectional view 9^a of the drawings, and the angle of curvature intermediate the rolling edges of said shield is nowhere a full quarter of a circle, as the opposite edges of the shield from a location on which section 9^b is taken forward, rise at an angle of about eighty degrees at a straight line from the horizontal axis of the cone-shape, as shown in the sections from 9 to 9^c , inclusive, in the drawings. From the location upon which the section 9^b is taken toward the flaring end

of the shield, the side walls thereof flatten out, as illustrated clearly by said sectional views, 9^a and 9. The highest portions of the opposite edges of the upper shield are straight and incline toward the tapering end thereof and each marginal edge is slightly rounded, as shown by the sectional views of the drawings. Said shield J is supported from the top roll case K by means of the brackets K', shown in Fig. 7 of the drawings, so that it is fixed and rigid in its position. When the rolls are adjusted in their proper positions, the upper series is in contact with the lower feed rolls as described, the top shield is positioned preferably about a quarter of an inch above said table to which the side shields are fixed so that the lower edges of the opposite sides of the two shields curve from under the top shield and are curved correspondingly and positioned at equal distances from the top or inside shield, leaving a slight space, preferably one-eighth of an inch, between the two sets of shields. It will be understood therefore that if a paper were fed between the two sets of shields, it would necessarily assume all of the successive curvatures shown by the various sections from 9 to 9^a, inclusive. Referring to the side shields I, it will be seen that they rise gradually as compared with the angles of convergence so that the forward corners of the advancing papers very soon project over the edge of the side shield. This projecting corner is received by the overlapping curved ends of the guide shields L, as seen at L'. Said top guide shields are so constructed and supported by the adjustable brackets L² fixed to the casing so that it forms a continuation of the opening between the side and top shields overlapping the outside walls of the top shield, forcing the papers down inside.

Importance is attached to the novel shape and arrangement of the feature of the sets of shields as in the first place the lower corners of the top shields are sections of a cone which are very much larger at the back and are slightly flattened down at the point where the papers first enter between the shields so that the front edge and corner of the advancing papers are received by portions of the shields of small curvature, which curvature is constantly increasing as it goes forward, and the whole diameter or width of the folder shields which grow narrower by convergence as well as by the diminishing circumference of the curved corners J^a, is compensated for in part by the rising longitudinal sides of the top shield, the balance of the loss in width being made up by the papers running up and over the top edges of the shield J, lapping down inside so that at the point upon which the section 9^a is taken, the distance around through the opening between the shields is the same as at the

location upon which section 9 is taken. From the foregoing it will be noted that with these novel features, a converging roll shield is provided, the lower angle of which is a conic section, the base of which lies in the line of the first contact with the papers to be folded, affording an easy and natural rolling motion for the first fold, secondly, closely fitting outside shields, forcing the papers to assume the shape of the inside roll shield, then by the provision of the overlapping guide shields, the papers are turned gradually down over the rising walls of the side shields, giving the papers their second fold by a continuation of the progressive rolling motion imparted to the paper, and by the provision of the two sets of oppositely disposed rollers, as shown and described, the circumferences of which rollers are preferably milled, the papers are fed forward at predetermined speeds to accomplish the folding of the paper into four folds in the shape of two inverted letters U with their outside legs turned down and connected parallel to each other. After the papers thus partially folded issue from the tapering ends of the shields, they are passed through the discharging shield Q', details of which are shown in Figs. 10 to 13, inclusive, in which figures, Fig. 13 illustrates the receiving end of said discharging shield which is made of a roll of metal with the edges overlapping and spaced apart while the discharging end is illustrated in Fig. 11. The papers, which are infolded in wrappers by mechanism which will be presently described, pass through the discharging shield in readiness to have the wrapping paper pasted preparatory to the addressing of the wrapper, which addressing mechanism forms the subject matter of a co-pending application and which is not shown in detail in the present case.

Mounted upon a reel M is a wrapping paper M', said reel being journaled upon a shaft M² having bearings in bracket arms carried by the frame of the apparatus. The wrapping strip M' passes over a roller M³, running lengthwise of the frame, thence over a diagonally disposed roller M⁴, and running forward, passes underneath the roller F² where it advances in a general line of travel with and in contact with the papers to be wrapped on the under side of said papers and slightly to the right of the center, so that as the papers and wrappers are together carried forward through the folder, the right edge of the wrapper is folded over into the second fold on the right hand side of the papers. The left hand edge of the wrapper comes slightly more than half way up the side of the second left hand fold as they pass into the first creaser and friction feed roll roller O⁶ which is journaled on a vertical spindle and

is provided with flanges O⁷. Said roller O⁶ is driven by geared connection with a shaft W which also has geared connection with the shaft W' which in turn is geared to a pinion wheel V fixed to the shaft which actuates, through the gear wheels V', the under rollers of the folding mechanism. A second creaser and friction feed roller O⁸ shown in Fig. 4 of the drawings has a vertical spindle O⁹ journaled in suitable bearings, and the circumference of said rollers O⁶ and O⁸ receive the partially folded paper as it passes from the rollers G⁸ and H⁴ and said rollers O⁸ and O⁶ feed the partially folded paper with the wrapper about the folds, against the creaser shoe Q.

Q' designates a shield, a detail view of which is illustrated in Fig. 10 of the drawings, and through which the paper with the wrapper partially wound about the same, receives its final fold. The now top fold of the paper including the right hand edge of the wrapper is pressed down by said shield Q' while the left edge of the wrapper is carried up over and deposited upon the top of the right edge, completing the wrapping, at the same time completing the third fold.

After the folded papers with the wrappers thereon make exit from the shield Q', they pass between the rollers y¹, one of which carries a knife y³ and the other is recessed to receive the knife, whereby the wrappers may be severed. Paste for fastening the wrapper is fed from the receptacle y through the pipe Y² which has, in the position adjacent to the end of the discharge shield through which the paper and wrapper are fed and at the end of the pipe through which the paste is conveyed, a sponge or any other porous material preferably placed in order to wipe against the edge to be sealed as the folded paper with wrapper advances through the shield.

From the foregoing it will be noted that the papers, wrapped and pasted, are coming in a continuous stream through the folder, the papers being spaced apart a slight distance while the wrapper is in a continuous strip.

In operation it will be observed that piles of papers are placed upon the shelves A³ and said shelves raised through the medium of the hoisting apparatus until the edges of said shelves are engaged by the feeding screw shafts B', after which the pile of papers is fed gradually upward and when the uppermost paper of the pile comes in contact with the rollers F, the paper is fed by the spurs F' into the bite between the rollers F and F² and fed upwardly and forwardly between the rollers of the folding mechanism, at which point the paper is acted upon by the peculiarly curved walls of the sets of shields, the oppositely disposed rollers underneath the casing K feeding the

paper rapidly forward and with the wrapper which is fed with the papers as they enter the space between the shields.

As the papers, partially folded, leave the folding shield, they pass between the rollers O⁶ and O⁸ thence, together with the wrapping paper, through the shield Q' where they receive their final fold with the wrapping paper, after which the wrapping paper is severed and the folded paper with its wrapper pasted delivered from the apparatus.

As the papers of a pile, being fed through the folding mechanism approach the feeding off roll F, the shelf comes in contact with the wheel C, and the spurs c thereon engaging the perforations a' in the shelf, will cause the shelf to be rapidly thrown from the boxing, making way for a succeeding pile of papers which is fed upward through the folding mechanism.

By the provision of the two boxes and the arrangement of rollers as shown and described, it will be noted that while one box is being replenished with papers, when a paper consisting of one section was being handled, or two sections that have been collected on the press, the other box may be feeding the papers through to the folding part of the mechanism through the medium of the identical set of feeding rollers illustrated at the left hand end of Fig. 2 of the drawings.

From the foregoing it will be noted that by the provision of my improved apparatus, means is afforded for rapidly, effectually and automatically collecting the papers, folding wrapping and pasting the same, without the intervention of any manual labor.

What I claim is:—

1. An apparatus for mechanically collecting, folding and wrapping newspapers; comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, means for raising said shelves in contact with the threads of said shafts, folding shields, and means for feeding papers singly from said piles between said folding shields, together with a wrapping strip, as set forth.

2. An apparatus for mechanically collecting, folding and wrapping newspapers; comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, means for raising said shelves in contact with the threads of said shafts, folding shields, means for feeding papers singly from said piles between said folding shields together with a wrapping strip, and means for automatically removing said shelves as papers are fed therefrom, as set forth.

3. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, a vertically-movable yoke, connections between the same and said shelves, means for raising said yoke, folding shields, and mechanism for feeding the papers singly from the top of said piles between said folding shields, together with a wrapping strip, as set forth.

4. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, a vertically-movable yoke, rods secured to said yoke, bracket arms fastened to said rods and upon which said shelves are adapted to rest, means for raising said yoke, folding shields, and means for feeding the papers singly from said piles between said shields, together with a wrapper, as set forth.

5. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, a vertically-movable yoke, rods secured to said yoke, bracket arms fastened to said rods and upon which said shelves are adapted to rest, vertically-disposed guide members adapted to guide said bracket arms, means for raising said yoke, folding shields, and means for feeding papers singly, together with a wrapper, from the shelves between said shields, as set forth.

6. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, a vertically-movable yoke, rods secured to said yoke, bracket arms fastened to said rods and upon which said shelves are adapted to rest, guide members in which said rods have longitudinal movements and adapted to guide said bracket arms, means for raising said yoke, folding shields, and mechanism for feeding papers, together with wrappers, from said shelves between said folding shields, as set forth.

7. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, a vertically-movable yoke, rods secured to said yoke, spring-pressed bracket arms fastened

to said rods and upon which said shelves are adapted to rest, guide members in which said rods have longitudinal movement, said guide members having longitudinal slots through which said bracket arms project, means for raising and lowering the yoke, folding shields and means for feeding the paper from said shelves between said folding shields, together with a wrapper, as set forth.

8. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, a yoke, rods connected to said yoke, bracket arms carried by said rods, a shelf mounted upon said bracket arms, a winding reel, means for rotating the same, cable connections between the same and said yoke for raising the latter whereby said shelf may be brought into engagement with the threads of the feeding shafts, folding shields, and means for feeding the paper from said shelves between and through said shields, together with a wrapping strip, as set forth.

9. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, series of vertically-disposed rotatable shafts having threads about their circumferences, means for rotating said shafts in unison, a yoke, rods secured to said yoke, bracket arms secured to said rods, a shelf mounted upon said bracket arms, a winding reel loosely journaled upon one of said feed shafts, a cable winding about said reel, pulleys about which said cable passes, the latter being fastened to said yoke, means for rotating said winding reel whereby said shelf may be raised so that its edges will contact with the threads of said feeding shafts, folding shields, and means for feeding a paper from said shelves between the feeding rolls, together with a wrapping strip, as set forth.

10. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, sprocket wheel and chain connections between said shafts whereby the same may be rotated in unison, a vertically-movable yoke, rods fastened to said yoke, bracket arms carried by said rods, a shelf mounted upon said bracket arms, a loosely mounted winding reel journaled upon one of said feed shafts, a bushing rotating with the shaft carrying said reel, a cable secured to said yoke, sheaves over which said cable passes, said cable

adapted to wind about said reel, a longitudinally-movable spring-actuated grooved sleeve, and means for actuating the same whereby said winding reel may be thrown into frictional contact with said bushing, a folding shield, and means for feeding papers together with a wrapping paper from said shelves to and between the shields, as set forth.

11. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, vertically-disposed threaded feed shafts, sprocket wheel and chain connections between said shafts whereby the same may be rotated in unison, a vertically-movable yoke, rods fastened to said yoke, bracket arms carried by said rods, a shelf mounted upon said bracket arms, a loosely mounted winding reel journaled upon one of said feed shafts, a bushing rotating with the shaft carrying said reel, a cable secured to said yoke, sheaves over which said cable passes, said cable adapted to wind about said reel, a longitudinally-movable spring-actuated grooved sleeve, a cam lever, a roller carried thereby and engaging the groove of said sleeve whereby the latter may be raised upon its shaft to throw the winding reel against said bushing, folding shields, and means for feeding a paper from said shelves together with a wrapper, between said shields, as set forth.

12. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, series of vertically-rotatable threaded feed shafts, a yoke, rods fastened thereto, bracket arms carried by said rods, shelves supported upon said bracket arms and upon which papers are placed, sprocket wheel and chain connections intermediate said feed shafts, a rotatable disk, a drive shaft, a friction wheel splined thereto and adapted to contact with said friction disk, gear connections between said disk and feed shafts, and means for raising said yoke, as set forth.

13. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, series of vertically-disposed rotatable threaded shafts, means for rotating the same in unison, a yoke, means for raising the same, rods secured to said yoke, bracket arms carried by said rods, shelves supported by said bracket arms and provided with a series of perforations, a spur wheel, means for rotating the same, the spurs of said wheel designed to engage the perforations of said shelf for moving the same horizontally as papers carried by the shelf are fed

therefrom, folding shields, and means for feeding the papers from said shelf to and between said shields, together with a wrapper, as set forth.

14. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, two sets of shields which are spaced apart, means for feeding papers to said shields together with a wrapper, an upper, and a lower series of feeding rollers, said upper series of rollers turning in openings in one of said shields and cooperating with the lower set of rollers to feed papers between said sets of shields, thereby giving the papers a progressive fold, as set forth.

15. An apparatus for mechanically collecting, folding and wrapping newspapers, comprising a frame, a plurality of identical feed boxes, shelves upon which piles of papers to be collected, folded and wrapped are placed, shields which are spaced apart, means for feeding papers to said shields together with a wrapper, an upper and a lower series of feeding rollers, said upper series of rollers having different diameters, and gear connections between said rollers, the lower portions of the latter extending through openings in one of said shields, as set forth.

16. A progressive rotary paper folding apparatus comprising a framework, converging folding shields spaced apart, one of said shields having openings, a series of feed rollers turning in said openings, a second set of feed rollers underneath the shields and cooperating with said feed rollers which turn in the openings of the shields, a casing over said shields, a support secured to said casing and connected to one of said shields, said rollers adapted to cooperate to feed papers, together with wrappers, intermediate the shields, as set forth.

17. In a newspaper collecting, folding and wrapping apparatus, comprising a converging folding shield having openings therein, the longitudinal edges of said shield turned into rolls, a second folding shield spaced apart from the rolls of said converging shield and curved upwardly conforming in shape to said converging shield, top guide shields which are downwardly curved and extend over the adjacent edges of the side and converging shields, two sets of feed rolls, the upper set of which turn in the openings of said converging shield and cooperate with an under set of rollers to feed papers through the spaces between said shields whereby the papers are folded, as set forth.

18. In combination in an apparatus for collecting, folding and wrapping newspapers, a converging folding shield having

openings therein, the opposite longitudinal edges of said shield being turned into rolls, with the upper portions of said rolls tapering toward the converging end of the shield, side folding shields which are curved corresponding to the rolls of said converging shields and spaced apart therefrom, the upper edges of said side rolls tapering longitudinally, curved top guide shields positioned over the adjacent edges of said converging shield and side shields and spaced apart therefrom, two sets of feed rollers, the upper of said sets adapted to turn in the openings of said converging shield and an under set cooperating therewith whereby the papers and wrappers may be fed between said shields and folded to conform to the curvature of the spaces intermediate the shields, as set forth.

19. In a paper collecting, folding and wrapping apparatus, a converging shield having openings therein, the flaring end of said shield having slightly curved projections, the opposite longitudinal sides of said shield turned into rolls, the curvature of which is constantly increasing toward the tapering end thereof, side shields spaced apart from the converging shield and curved to conform to the curvature of the side walls of said converging shield and spaced apart therefrom, top curved guide shields supported over and spaced apart from the adjacent edges of said converging and side shields, two sets of feed rollers, the upper of said sets turning in spaces in said converging shield and cooperating with an under set, whereby papers with wrappers may be fed between said shields and folded to conform to the shape of the space intermediate the shields, as set forth.

20. In combination in an apparatus for collecting, folding and wrapping newspapers, a framework, a converging folding shield having apertures formed therein and supported upon said framework, a series of rollers carried by said framework and adapted to turn in the openings of said shield, the opposite sides of said shield turned into rolls, the marginal edges of which taper longitudinally, side shields which are curved to conform to the curvature of the side walls of said converging shield and spaced apart therefrom, top guide shields which are curved and supported over the adjacent edges of said converging shield and side shields, a second set of rollers intermediate said side shields and adapted to cooperate with the rollers carried by said framework for feeding papers and wrappers intermediate the folding shields, as set forth.

21. In combination in an apparatus for collecting, folding and wrapping papers, a converging folding shield having openings therein, supports rising from said shield, a

casing adjustably mounted upon said supports, a framework carried by said casing, rollers journaled in said framework and adapted to turn in said openings in the shield, a set of side folding shields conforming to the curvatures of the sides of said converging shield and spaced apart therefrom, top guide shields curving over the upper edges of said converging and side shields, a second set of rollers cooperating with the first set and adapted to feed papers and wrappers between said shields, as set forth.

22. In combination in a collecting, wrapping and folding machine, folding shields having truncated conical shaped folding edges with their apexes forward, and their bottom lines in a plane coincident with the plane of a traveling sheet and means for feeding papers and wrappers between the same whereby the papers are partially folded with the wrappers, a discharge shield, rollers in advance of said shield for feeding the papers partially wrapped through said discharge shield for completing the folding of the papers, as set forth.

23. In a collecting, folding and wrapping machine, a series of folding shields having truncated conical-shaped folding edges with their apexes forward and their bottom lines in a plane coincident with the plane of the traveling sheet, two series of feeding rolls, a coiled discharge shield centrally in alignment with said shields, and means for feeding partially wrapped papers through said discharge shield whereby the final folds are given the papers and wrapper, as set forth.

24. In a collecting, folding and wrapping machine, a series of folding shields having truncated conical-shaped folding edges with their apexes forward and their bottom lines in a plane coincident with the plane of the traveling sheet, two series of rolls, a coiled discharge shield centrally in alignment with said shields, fractional feed rollers for receiving partially wrapped papers and carrying the same from the folding shields to and through the discharge shield, as set forth.

25. In an apparatus for collecting, folding and wrapping papers, folding shields, means for feeding papers between said shields, a discharge shield made of a sheet of metal folded conical-shaped with spaces intermediate the overlapping edges, and means for feeding the partially wrapped papers through said discharge shield, whereby the final flap of the wrapper may be turned about the paper, as set forth.

26. In an apparatus for collecting, wrapping and folding papers, a folding shield and means for feeding papers to be folded together with a wrapping strip, a discharge shield formed of a sheet of metal turned into conical shape with one edge overlapping the other and adapted to turn the flap of a

wrapper over the paper, friction rollers adapted to feed the paper through said discharge shield, and mechanism for pasting the wrapper, as set forth.

- 5 27. In an apparatus for collecting, wrapping and folding papers, a folding shield and means for feeding papers to be folded together with a wrapping strip, a discharge shield formed of a sheet of metal turned into
10 conical shape with one edge overlapping the other and adapted to turn the flap of a wrapper over the paper, friction rollers adapted to feed the paper through said discharge shield, mechanism for pasting the
15 wrapper, and rollers between which the folded and wrapped paper is fed, as set forth.

28. In an apparatus for collecting, wrap-

ping and folding papers, a folding shield and means for feeding papers to be folded
20 together with a wrapping strip, a discharge shield formed of a sheet of metal turned into conical shape with one edge overlapping the other and adapted to turn the flap of a wrapper over the paper, friction rollers
25 adapted to feed the paper through said discharge shield, mechanism for pasting the wrapper, rollers between which the folded and wrapped paper is fed, and means for severing the wrapper, as set forth.

30 In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WEBSTER A. TOMPKINS.

Witnesses:

H. DENLINGER,
J. W. MATTHES.