

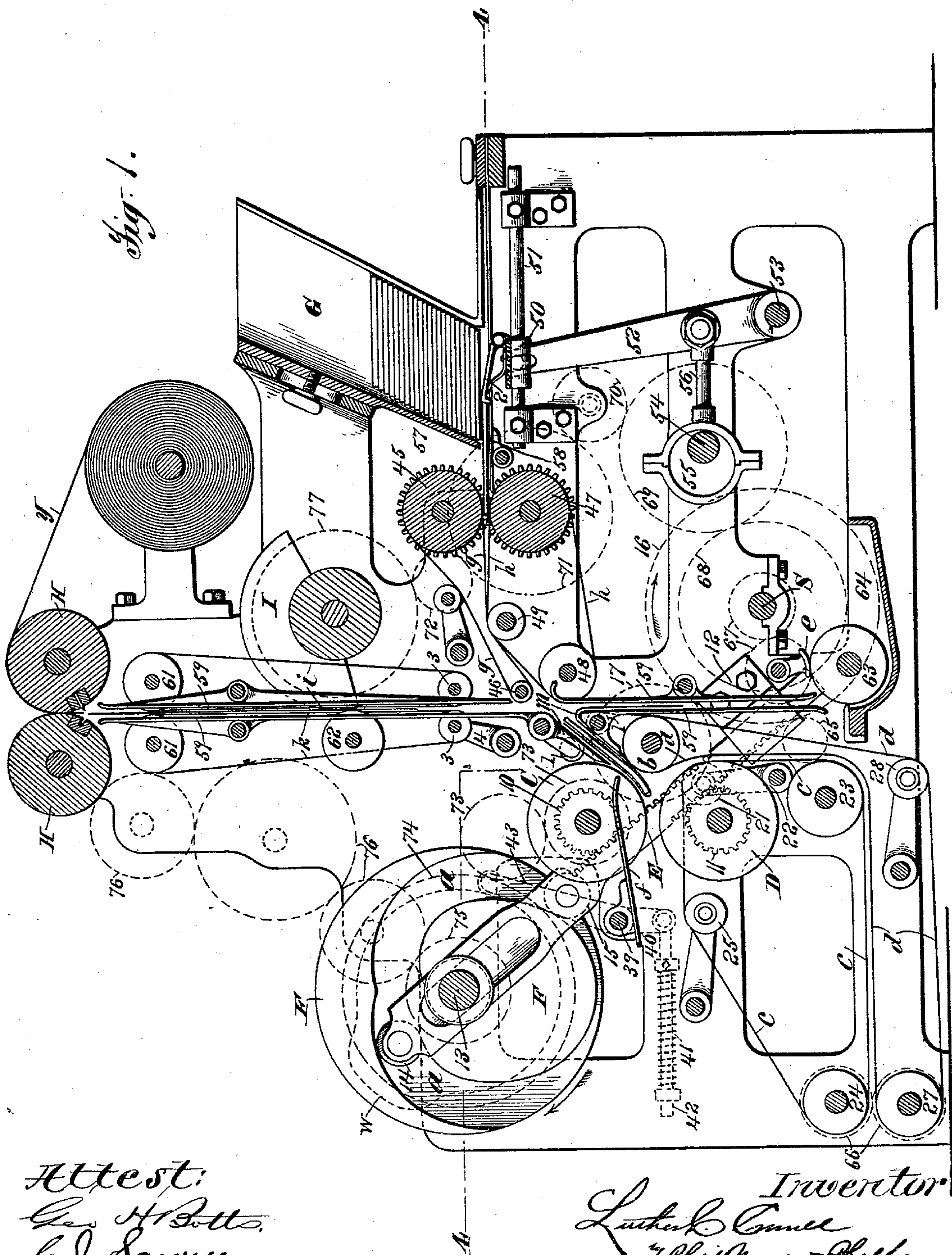
(No Model.)

3 Sheets—Sheet 1.

L. C. CROWELL.  
NEWSPAPER WRAPPING MACHINE.

No. 517,441.

Patented Apr. 3, 1894.





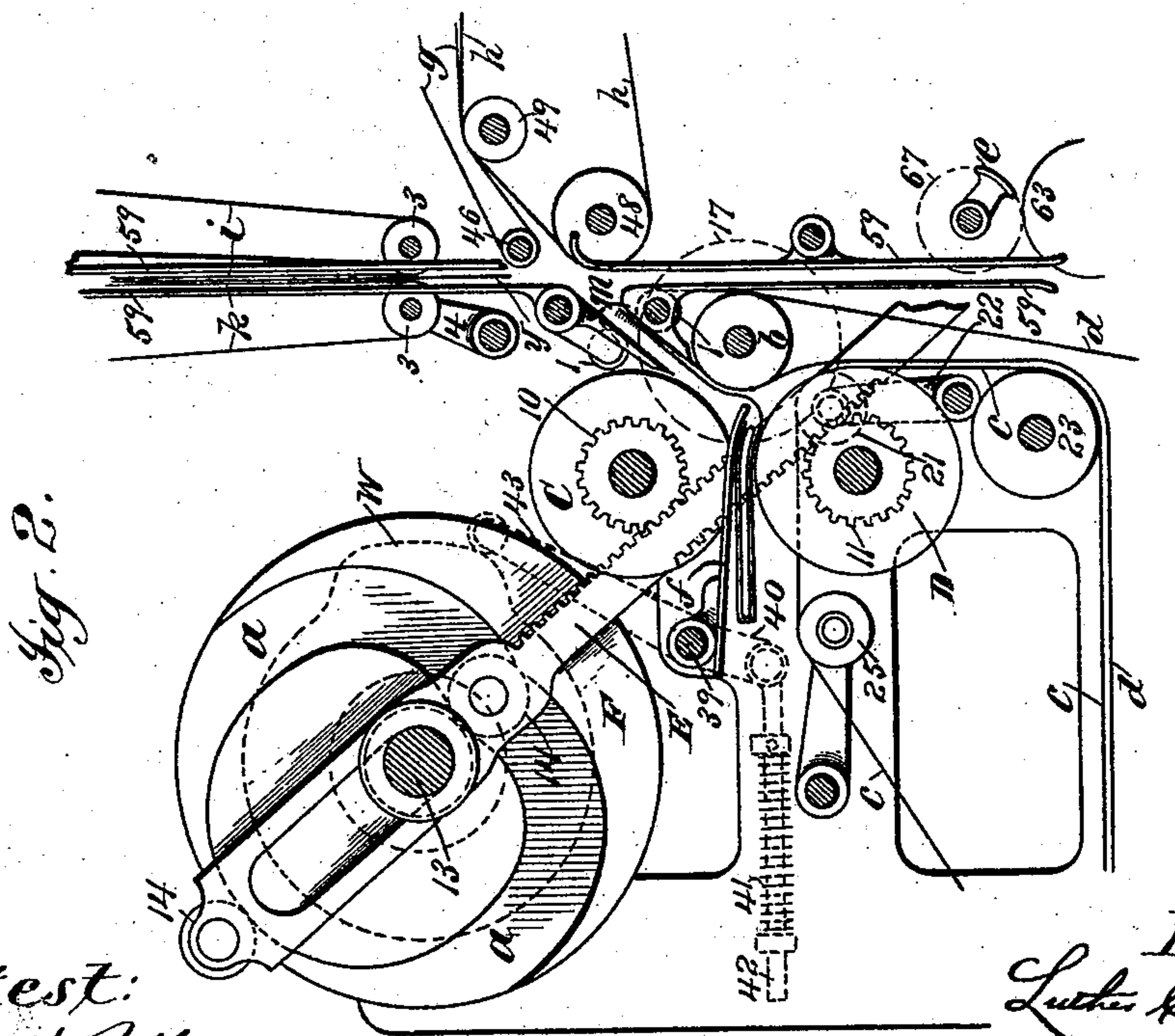
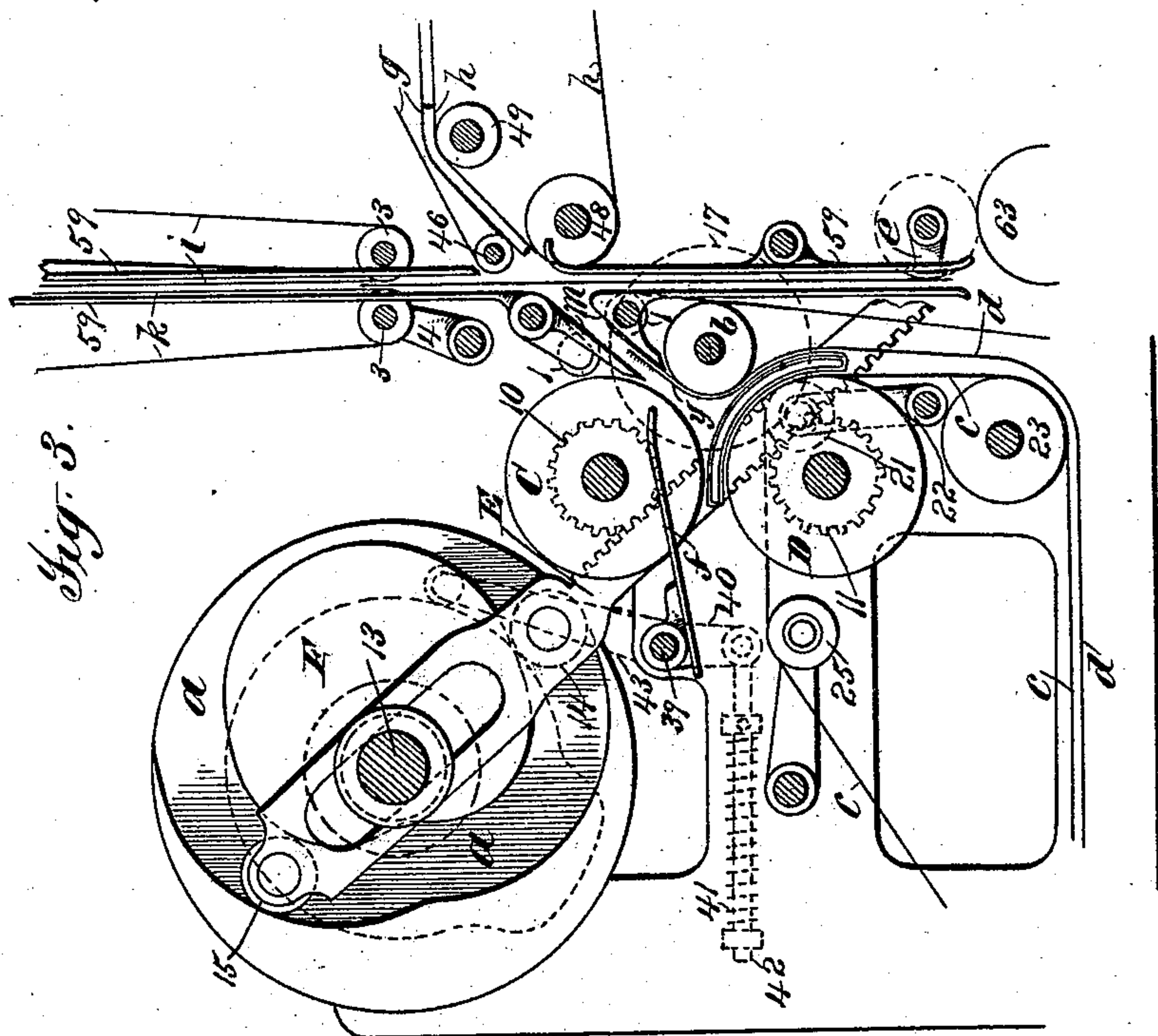
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3 Sheets—Sheet 2.

L. C. CROWELL.  
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No. 517,441.

Patented Apr. 3, 1894.



Attest:  
Geo. H. Botts.  
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Inventor:  
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(No Model.)

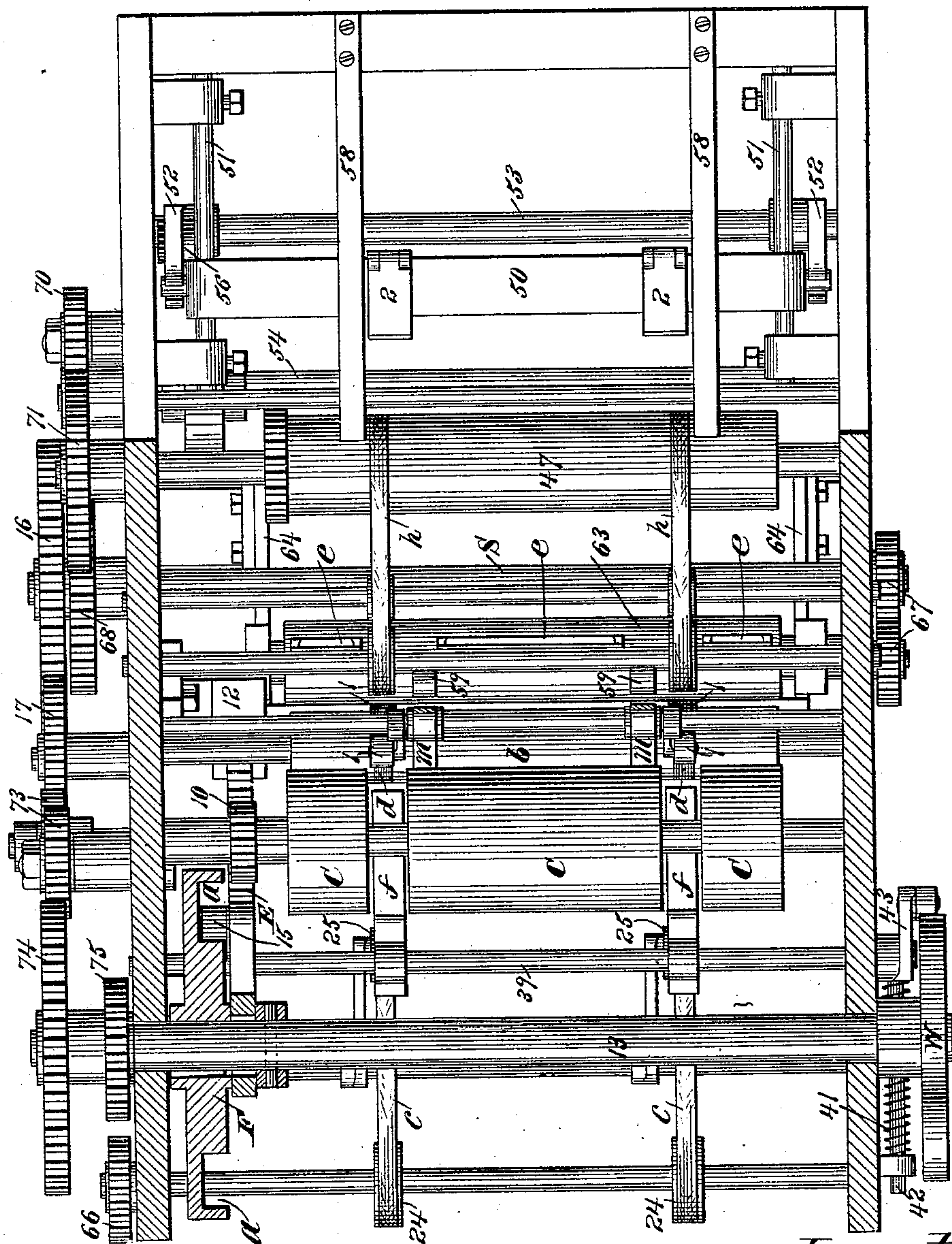
3 Sheets—Sheet 3.

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Fig. 4.



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# UNITED STATES PATENT OFFICE.

LUTHER C. CROWELL, OF BROOKLYN, ASSIGNOR TO ROBERT HOE, THEODORE H. MEAD AND CHARLES W. CARPENTER, OF NEW YORK, N. Y.

## NEWSPAPER-WRAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,441, dated April 3, 1894.

Application filed October 7, 1893. Serial No. 487,502. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER C. CROWELL, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Newspaper-Wrapping Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to provide an improved wrapping machine, and especially to provide a simple and rapid machine of that class used in wrapping newspapers and other publications for mailing and generally known as newspaper wrapping machines.

The principle upon which a machine embodying the present invention operates is that of first advancing the paper or other article to be wrapped to the required point with the wrapper overlapping its leading end and with the flap of the wrapper projecting behind the paper sufficiently to overlap upon the layer of wrapper for pasting, and then reversing the direction of movement of the paper and turning over and pressing down the flap of the wrapper so as to secure the overlapping and pasting of the flap upon the layer of wrapper on the paper as the reversed paper is advanced. In another application, Serial No. 470,167, filed April 13, 1893, I have described and claimed broadly a machine constructed to operate upon this principle employing means of any suitable form, such as two pairs of oppositely driven rotating segments or a pair of rolls driven alternately in opposite directions, for advancing and reversing a paper and wrapper, in combination with a flap turner for turning over the flap of the wrapper, this flap turner preferably consisting of a roll past which the reversed paper is fed and upon opposite sides of which the paper passes during its movement in opposite directions. The present invention relates to a machine of this general construction in which the roll forming the flap turner coacts with one of the rolls or segments in the advance movement of the paper and with the other roll or one of the oppositely driven segments in the reverse movement.

It is obvious that different constructions of

feeding rolls or segments and devices for driving the same may be used, and that the roll forming the flap turner may be driven only by friction from the rolls or segments with which it coacts or positively, and in the latter case that different means may be used for driving this roll. I prefer to use, however, a pair of feeding rolls driven in opposite directions so as to advance and reverse the paper by the same feeding surfaces and actuated by a sliding rack operated by a cam or other suitable means and geared with one or both of the feeding rolls so that as this rack is reciprocated the rolls are positively driven in opposite directions.

It is preferable, although not essential in all constructions, that guides should be used for guiding the end of the reversed paper to the opposite side of the flap turner. These guides may be of any suitable form and any suitable means for withdrawing them from the path of the paper as it is advanced to the feeding rolls may be used, but I prefer to use a series of fingers so constructed as to form spring fingers exerting a yielding pressure upon the paper only sufficient to secure the movement of the reversed paper in the proper path and withdrawn positively from the path of the next advancing paper.

The wrapped paper may be delivered directly from the feeding rolls and flap turner forming the wrapping mechanism, the flap turner and feeding roll with which it coacts in reversing the paper operating to positively advance the paper and press down and secure the wrapper after the paper has passed out of the control of the feeding rolls, but I prefer to combine with the wrapping mechanism pressing and delivery devices of any suitable construction, such as feeding rolls or tapes by which the paper is received from the wrapping mechanism and the wrapper held pressed down for some time before final delivery so as to allow time for the paste to set, the securing of the wrapper thus being assured with machines operating at very high rates of speed. The papers and wrappers, or either of them, may be fed to this wrapping mechanism by hand, or any suitable feeding device for automatically advancing the papers and wrappers to the feeding mech-



anism in proper time, together or separately may be combined therewith, and the papers may be previously folded to the size desired or folded, either partially or wholly, by mechanism embodied in and forming a part of the machine. The wrapping mechanism may be combined with any of the ordinary forms of folding and delivery mechanisms now in use in folding machines, or combined printing and folding machines, so that the paper may be printed, folded, wrapped and delivered by a single machine, the wrapping mechanism herein shown being of sufficient capacity to be applicable to modern web printing machines.

The delivery of the papers and wrappers to the wrapping mechanism in proper position may be secured in any suitable manner, but I prefer to feed the wrapper downward in the line of movement of and in front of the papers as they are advanced to the wrapping mechanism, so that each advancing paper will engage the wrapper upon the desired line and carry it with it to the wrapping mechanism. The wrappers may previously be cut to the desired size and fed to the wrapping mechanism as sheets, but it is preferable to feed the wrappers from the web and sever them in the machine.

Pasting devices for the wrapper are preferably added, and the paste may be applied to the first layer of wrapper upon the paper, or to the loose end of the wrapper prior to or at any desired time during the operation of wrapping, but it is preferable to apply the paste to the first layer of wrapper upon the paper, the movement of the wrapper with the paste thus being reduced.

In the accompanying drawings forming a part of this specification, there is shown for the purpose of illustration, a complete, independent, newspaper or pamphlet wrapping machine of the general construction above described, which will be found a convenient and efficient embodiment of the present invention, the previously folded papers or pamphlets being fed from a pile and the wrappers from a web, and a detailed description of the same will now be given, and the features forming the invention specifically pointed out in the claims.

In the drawings:—Figure 1 is a central vertical, longitudinal section of the machine. Figs. 2 and 3 are partial views similar to Fig. 1 showing the wrapping mechanism in different positions during the operation of wrapping, and Fig. 4 is a horizontal section on the line 4 of Fig. 1.

The frame of the machine may be of any suitable construction for supporting the operating parts. At the rear or delivery end of the machine are mounted the reversible feeding rolls C, D, which so far as their action upon the paper is concerned, may have continuous surfaces, but are preferably formed of a series of disks or cut away to accommodate other parts of the wrapping mechanism.

These rolls are preferably rubber faced, milled or otherwise roughened so as to give a good grip upon the paper. The shafts of these rolls C, D carry inside the frame gears 10, 11 and are rotated in opposite directions by rack bar E provided with racks at opposite sides engaging said gears, said rack bar sliding at one end in a suitable guide 12 in the frame of the machine and at its opposite end being provided with a slot threaded on shaft 13, and engaged by two bowls 14, 15, running in a cam groove  $\alpha$  on the face of a cam disk F on shaft 13, so that by rotation of the cam disk F the rack E is reciprocated in the guides 12. In front of the rolls C, D, and on the side at which the paper is fed to the rolls, the flap turner  $b$  is placed, this flap turner  $b$  consisting of a roll mounted to rotate in the frame and driven from the main driving shaft S by gears 16, 17. This flap turning roll  $b$  is located in position so as to coact with the roll C in feeding in the paper to be wrapped, as shown in Fig. 1, and to coact with the roll D in advancing the reversed paper, thus operating to aid in feeding the papers to the rolls C, D, and advance and deliver the paper after it has left the grip of the rolls C, D, while it presses down the flap of the wrapper with sufficient pressure to secure the wrapper by pasting. The reversible feeding rolls C, D, and the flap turning roll  $b$  therefore form a complete wrapping mechanism and the wrapped paper may be finally delivered directly therefrom. In a machine of high capacity, however, it is evident that the pasted portion of the wrapper is pressed between the rolls  $b$ , D but a short time and it is preferable that means should be provided by which the wrapper shall be held pressed down a longer time, so as to insure the setting of the paste to properly secure the wrapper. It is preferable, therefore, to combine with this wrapping mechanism pressing and delivery devices to which the paper passes from the rolls  $b$ , D and by which the wrapper is held pressed down until the paste has set and the paper then finally delivered. These pressing and delivery devices may be of any suitable construction, and the roll D may be used as part of said pressing and delivery devices, or the delivery devices may be separate from and independent of the roll D.

I have shown a simple and efficient construction in which feeding rolls or tapes are used, arranged as follows:—A series of belts  $c$  are led about belt rolls or pulleys 21 mounted below the flap turner  $b$  and carried by adjustable arms 22 so as to be adjustable to vary the position of the belts and secure the proper grip upon papers of different thicknesses. The belts  $c$  are led from belt rolls 21 to rolls 23 by which they are driven, thence to rolls 24 and returned to the belt rolls 21 over adjustable tension rolls 25. The series of belts  $d$  are led about small rolls 1 above the flap turning roll  $b$ , then downward about the latter, thence along with the belts  $c$  under the



rolls 23, then around rolls 27 opposite to and driven from rolls 24, returning around adjustable tension rolls 28. The feeding belts *c*, *d*, therefore, continue the pressure upon the wrapper from the time when it is turned back by the flap turning roll *b* and pressed between it and the roll *D* and continue this pressure for a suitable time so as to hold the wrapped paper in form and under pressure until the paste has fully set, and deliver the wrapped paper at the end of the machine, although it will be understood that these belts may be arranged so as to deliver directly downward from the wrapping mechanism, or at any other desired point, although the construction shown is preferable, as it gives a long run for the belts.

It will be found that the construction thus far described is efficient and that the papers will generally be carried backward properly under the flap turner *b*, especially if the papers be of such thickness as to bend readily, but in order to assure absolute certainty of action, however, there is preferably used with thick rigid papers a series of guides which operate to positively guide the rear end of the reversed paper downward and below the flap turner *b*. These guides may be constructed in any suitable manner, but as shown consist of a series of spring fingers *f* which are carried by a rock shaft 39 actuated to raise the guides out of the path of the paper as it passes to the rolls *C*, *D*, by a crank arm 40 carried by the shaft and spring pressed by a spring 41 on rod 42 mounted on the outside of one of the side frames, the shaft being rocked in the opposite direction to press the guides downward at the proper time to act on the leading end of the reversed paper by a crank arm 43 on the shaft 39 carrying a bowl which runs on a cam *w* carried by the shaft 13 outside the frame. The guides *f* act also to prevent the end of the wrapper coming into engagement with the roll *C*, on reversal of the paper, as shown in Fig. 2. As above stated, the paper and wrapper may be fed to this wrapping mechanism by hand or may be advanced thereto by any suitable means and the proper relative position of the paper and wrapper secured in any manner desired, and any suitable pasting mechanism may be used for applying paste to the wrapper. In the machine, shown, however, which is especially adapted for wrapping papers previously folded to wrapping size or magazines, the wrapper is fed downward in the path of the advancing paper and so as to be engaged upon the proper line and carried to the wrapping mechanism by the latter, the paste being applied to the end of the wrapper below the path of the paper, and the papers or magazines are piled within a holder *G* mounted on the front end of the machine and the bottom paper advanced from the holder to feeding belts *g*, *h*, by which they are carried to the wrapping mechanism. The upper series of belts *g* are led from driven feed roll 45 for-

ward over tension rolls 49 and around small belt rolls 46 returning directly to roll 45, and the lower series of belts *h* are led from driven feed roll 47 forward around belt rolls 48 opposite rolls 46 returning to feed roll 47 around tension rolls 49 beneath the belts *g*.

Any suitable feeding device may be used for advancing the bottom paper from the holder to the rolls 45, 47 and belts *g*, *h*. As shown a series of pivoted fingers 2 are used, these feeding fingers being carried by a slide 50 moving on rods 51 mounted in the frame of the machine and being pressed upward so as to engage the bottom paper when withdrawn by means of springs mounted on the slide under the fingers. This slide 50 is reciprocated upon the rods 51 to advance the papers in proper time by means of slotted levers 52 carried by the rock shaft 53 mounted in the side frames, and operated from shaft 54 by an eccentric 55 on said shaft and a pitman 56 connecting said eccentric with one of the arms 52. The holder *G* is shown as adjustable so as to hold and feed papers of different thicknesses, the rear plate 57 of the box being made adjustable so as to act as a stop to all the papers except the lowest and permit the passage of papers of different thicknesses, the holder being open at the bottom and the papers fed out by the fingers 2 over guides 58 extending from the box to the rolls 45, 47. From the rolls 46, 48 and tapes *g*, *h* the papers are fed to the rolls *b*, *C* between short guides *m*, between which guides are preferably provided anti-friction rolls 1 over the lower of which the belts *d* pass, as previously described, the friction upon the paper between the guides thus being removed and the belts *d* aiding in feeding the paper downward to the rolls *b*, *C*.

The wrappers are cut, pasted and advanced to the wrapping mechanism by the following means. At the top of the machine are mounted two cutting and feeding rolls *H* to which the wrapper web *y* is advanced from the web roll and by which it is partially severed on the proper line to form a single wrapper. From the cutting and feeding rolls *H* the partially severed web is fed downward between guides 59 by feeding belts *i*, *k* extending downward nearly to the wrapping mechanism, these belts being carried and driven by rolls 61 at their upper ends and carried by rolls 3 at their lower ends, one of the rolls 3 being mounted upon arms 4 so as to be adjustable to secure the desired pressure between the two series of belts. For the purpose of entirely severing the wrapper at the proper time, a breaking segment *I* is used, coacting with the roll 62 on the opposite side of the guides 59, the segment operating to permit the wrapper to be fed downward by the tapes *i*, *k*, and then to positively grip the wrapper and wholly sever it, the segment *I* rotating at a higher rate of speed than that at which the wrapper is moving, as usual in such constructions. The guides 59 are broken opposite



the rolls 46, 48, and guides *m* and then extend downward below the wrapping mechanism and the paste is applied to the end of the wrapper at its lowest point by a rotating paster *e* engaging a paste roll 63 running in its fountain 64.

The operating parts of the machine, with the exception of the rolls C, D and flap turning roll *b* already described, are driven from the main driving shaft S by the following means:—The rolls 23 driving belts *c* are driven from the gear 16 by an intermediate 65, and the other series of belts *d* are driven by gearing together the shaft of belt rolls 24, 27 by gears 66 and by flap turning roll *b*. The paster *e* is driven from the shaft S through gears 67 and in turn drives the fountain roll 63. The shaft 54 is driven by gear 68 on shaft S and gear 69 on shaft 54 and from this gear 69 the feeding rolls 45, 47 are driven by intermediate 70 and gear 71 on the shaft of the lower roll, the feeding rolls 45, 47 being geared together and the breaking segment I driven from a gear 71 on the lower feeding roll 47 through intermediate 72. The shaft 13 is driven from gear 17 through intermediates 73, and gear 74 on its shaft, and in turn drives the cutting rolls H from gear 75 and intermediate 76.

The parts are so timed, as will be seen from an inspection of the drawings, that the rolls *b*, C, D and the belts *c*, *d*, are run at a higher rate of speed than the paper and wrapper feeding mechanisms, so as to secure the rapid wrapping of the paper and its removal from the path of the next paper and wrapper as the latter advance.

The operation of the machine is as follows:—With the parts in the position shown in Fig. 1, the rack E is being moved upward by the operation of the cam groove *a* upon the bowls 14, 15 and the feeding rolls C are being rotated to feed the paper and wrapper rearward or to the left of Fig. 1, the paper having just been advanced to the rolls C, D by the roll *b* coacting with the roll C, the guides *f* being raised out of the path of the paper. In the position shown in Fig. 2, the rack E has reached its highest position, rotating the feeding rolls C, D to carry the paper and wrapper into their extreme rearward position, and the guides *f* have been turned down to press against the rear end of the paper by the cam *w*, so that the parts are in position for the commencement of the reversed movement of the paper, the flap of the wrapper to be overlapped and pressed down for pasting lying over the roll B, so that, as the parts are reversed and the rear end of the paper, becomes the leading end, returns below the roll *b*, the flap of the wrapper will be turned down upon the paper and pressed down upon the layer of wrapper thereon, by the pressure between the rolls *b*, D. As the shaft 13 continues its rotation, the cam groove *a* acts upon the bowls 14, 15, so as to carry the rack bar E downward, thus reversing the rotation

of the rolls C, D, so as to feed the paper toward the front of the machine or to the right in Fig. 1, and the paper is guided below the roll *b* by the guides *f*, and is fed by the rolls *b*, D into the grasp of the belts *c*, *d*, the guides *f* being pressed down by the raised portion of the cam *w* long enough to insure the passage of the end of the paper below the roll *b*, and then released by the cam and returned by spring 41. In the position shown in Fig. 3, the paper has just been received by the belts *c*, *d* and is being advanced for delivery, the rear end of the paper being still in contact with rolls *b*, D and the flap of the wrapper just being turned over so as to be pressed down for pasting. Another paper has meanwhile been delivered from the holder G and is being advanced by the belts *g*, *h* to the wrapping mechanism, while a wrapper *y* has been fed downward into the path of the paper and the paster *e* is just applying the paste to the end of the wrapper. As the operation of the machine continues, the wrapped paper is carried away by the belts *c*, *d*, and the rack bar E having been carried into its upper position is returned by cam *a* so as to again reverse the movement of the rolls C, D, for wrapping another paper.

It will be understood that various modifications may be made in the construction shown without departing from the invention and the latter, considered broadly, is not to be limited to the particular form or arrangement of the devices shown.

The term "rolls" used throughout the specification and claims is intended to include other equivalent feeding devices such as segments, and such feeding rolls or segments may be arranged and move in any suitable manner to secure the advance and reverse movement of the paper, although a pair of rolls or segments driven alternately in opposite directions are preferably used.

While the invention has been described as applied in wrapping newspapers and other publications, for which the machine shown is especially adapted, the invention is not thus limited, but the machine shown may be applied in wrapping other articles, and the invention may be embodied in machines especially adapted for such other uses. It will be understood, therefore, that the term "paper" has been used to designate the article to be wrapped only for convenience, and that the claims are intended to cover the constructions as applied in wrapping other publications, or articles of any character in connection with which the invention may be applied.

What I claim is—

1. The combination with feeding rolls for advancing and reversing a paper and wrapper, of a roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, substantially as described.

2. The combination with feeding rolls for advancing and reversing a paper and wrapper, of a positively driven roll coacting there-



with to feed the advanced and reversed paper and forming a flap turner, substantially as described.

3. The combination with feeding rolls for advancing and reversing a paper and wrapper, of a roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, and guides coacting with the flap turner to control the paper, substantially as described.

4. The combination with feeding rolls for advancing and reversing a paper and wrapper, of a roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, and pressing and delivery devices, substantially as described.

5. The combination with feeding rolls for advancing and reversing a paper and wrapper, of a roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, guides coacting with the flap turner to control the paper, and pressing and delivery devices, substantially as described.

6. The combination with feeding rolls for advancing and reversing a paper and wrapper, of a roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, guides coacting with the flap turner to control the paper, and means for moving said guides into and out of position to engage the paper, substantially as described.

7. The combination of feeding rolls, means for rotating said rolls in opposite directions, and a roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, substantially as described.

8. The combination of feeding rolls, means for rotating said rolls in opposite directions, and a positively driven roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, substantially as described.

9. The combination of feeding rolls, means for rotating said rolls in opposite directions, a roll coacting therewith to feed the advanced and reversed paper and forming a flap turner, and guides coacting with the flap turner to control the paper, substantially as described.

10. The combination with paper and wrapper feeding mechanism, and wrapper pasting devices, of feeding rolls for advancing and reversing the paper, and a roll coacting with said feeding rolls to feed the advanced and reversed paper and forming a flap turner, substantially as described.

11. The combination with paper feeding mechanism, of wrapper feeding mechanism advancing a wrapper transversely to and into the path of the movement of the paper, wrapper pasting devices, feeding rolls for advancing and reversing the paper, and a roll coacting with said feeding rolls to feed the advanced and reversed paper and forming a flap turner, substantially as described.

12. The combination with paper feeding mechanism, of wrapper feeding mechanism advancing a wrapper transversely to and into the path of the movement of the paper, wrapper pasting devices, feeding rolls for advancing and reversing the paper, a roll coacting with said feeding rolls to feed the advanced and reversed paper and forming a flap turner, and guides coacting with the flap turner to control the paper, substantially as described.

13. The combination with paper feeding mechanism, of wrapper feeding mechanism advancing a wrapper transversely to and into the path of the movement of the paper, wrapper pasting devices, feeding rolls for advancing and reversing the paper, a roll coacting with said feeding rolls to feed the advanced and reversed paper and forming a flap turner, guides coacting with the flap turner to control the paper, and pressing and delivery devices, substantially as described.

14. The combination with feeding rolls for advancing and reversing a paper and wrapper, of a flap turning roll *b* coacting with said feeding rolls, and pressing and delivery tapes *c*, *d*, one of said series of tapes passing over the roll *b*, substantially as described.

15. The combination with feeding rolls for advancing and reversing a paper and wrapper, of flap turning roll *b* coacting with said rolls, guides *m* and rolls *l* over which the paper is fed to the roll *b*, and pressing and delivery tapes *c*, *d*, one of said series of tapes passing over rolls *l* and flap turning roll *b*, substantially as described.

16. The combination with feeding rolls for advancing and reversing a paper and wrapper, of flap turning roll *b* coacting with said feeding rolls to feed the advanced and reversed paper, guides *f*, and means for moving said guides into and out of position to engage the paper, substantially as described.

17. The combination with feeding rolls for advancing and reversing a paper and wrapper, of flap turning roll *b* coacting with said feeding rolls to feed the advanced and reversed paper, guides *f*, means for moving said guides into and out of position to engage the paper, and pressing and delivery devices, substantially as described.

18. The combination with feeding rolls and means for rotating said rolls in opposite directions, of flap turning roll *b* coacting with said feeding rolls, guides *f*, means for moving said guides into and out of position to engage the paper, and pressing and delivery devices, substantially as described.

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

LUTHER C. CROWELL.

Witnesses:

C. J. SAWYER,  
T. F. KEHOE.