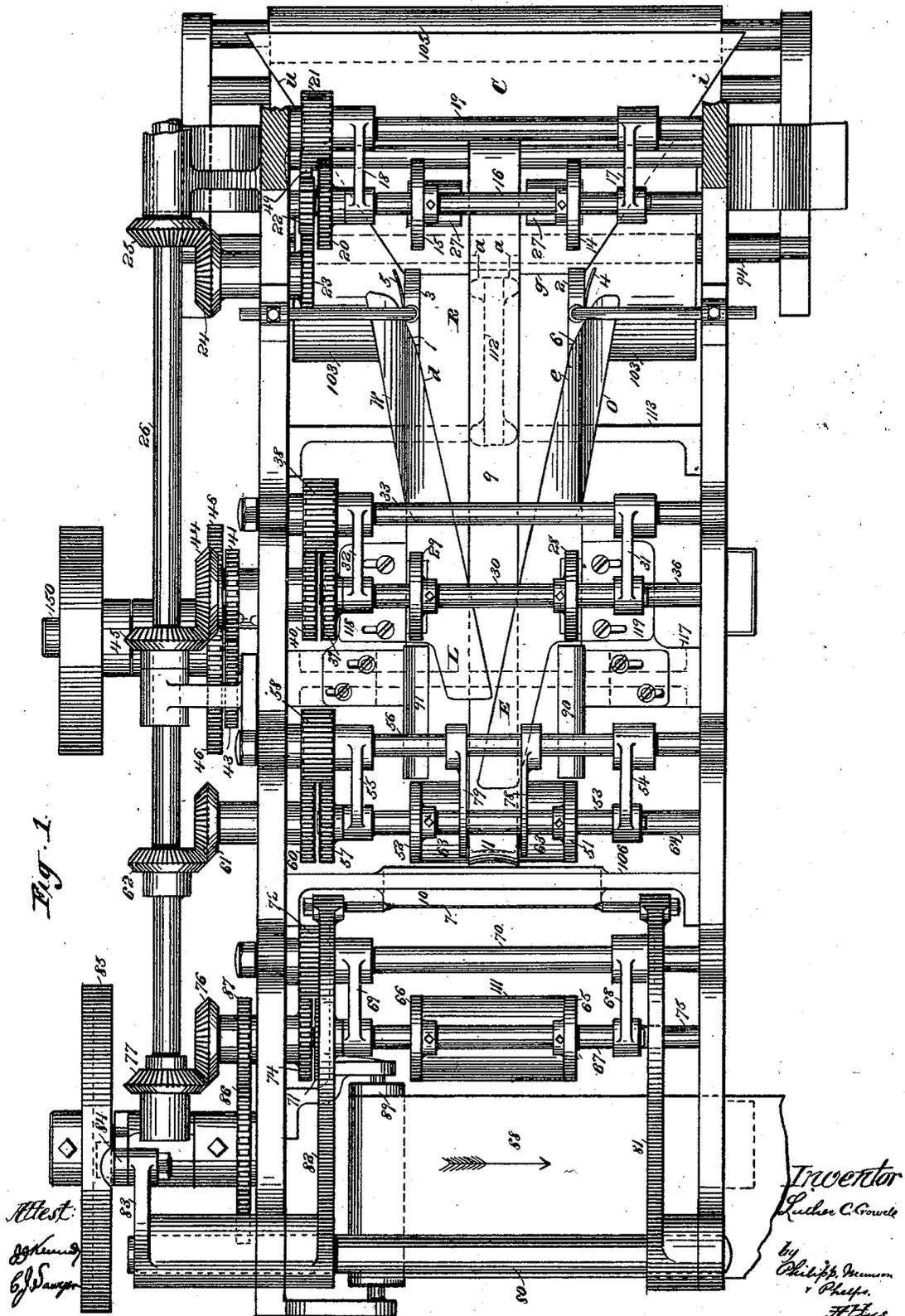


L. C. CROWELL.
PACKAGE WRAPPING MACHINE.

No. 516,186.

Patented Mar. 13, 1894.



(No Model.)

8 Sheets—Sheet 2.

L. C. CROWELL.
PACKAGE WRAPPING MACHINE.

No. 516,186.

Patented Mar. 13, 1894.

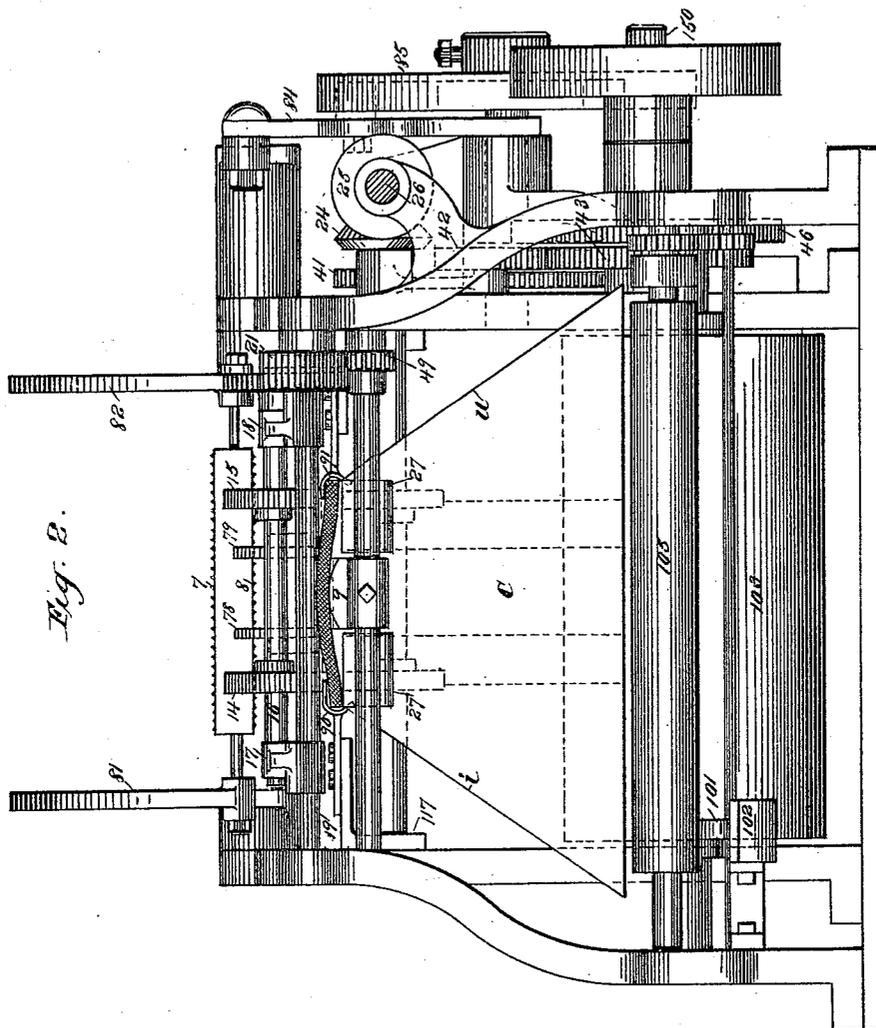


Fig. 2.

Attest:
J. Kennedy
C. Sawyer

Inventor.
Luther C. Crowell
 by
Phillip Munson & Phelps
 Attys

L. C. CROWELL.
PACKAGE WRAPPING MACHINE.

No. 516,186.

Patented Mar. 13, 1894.

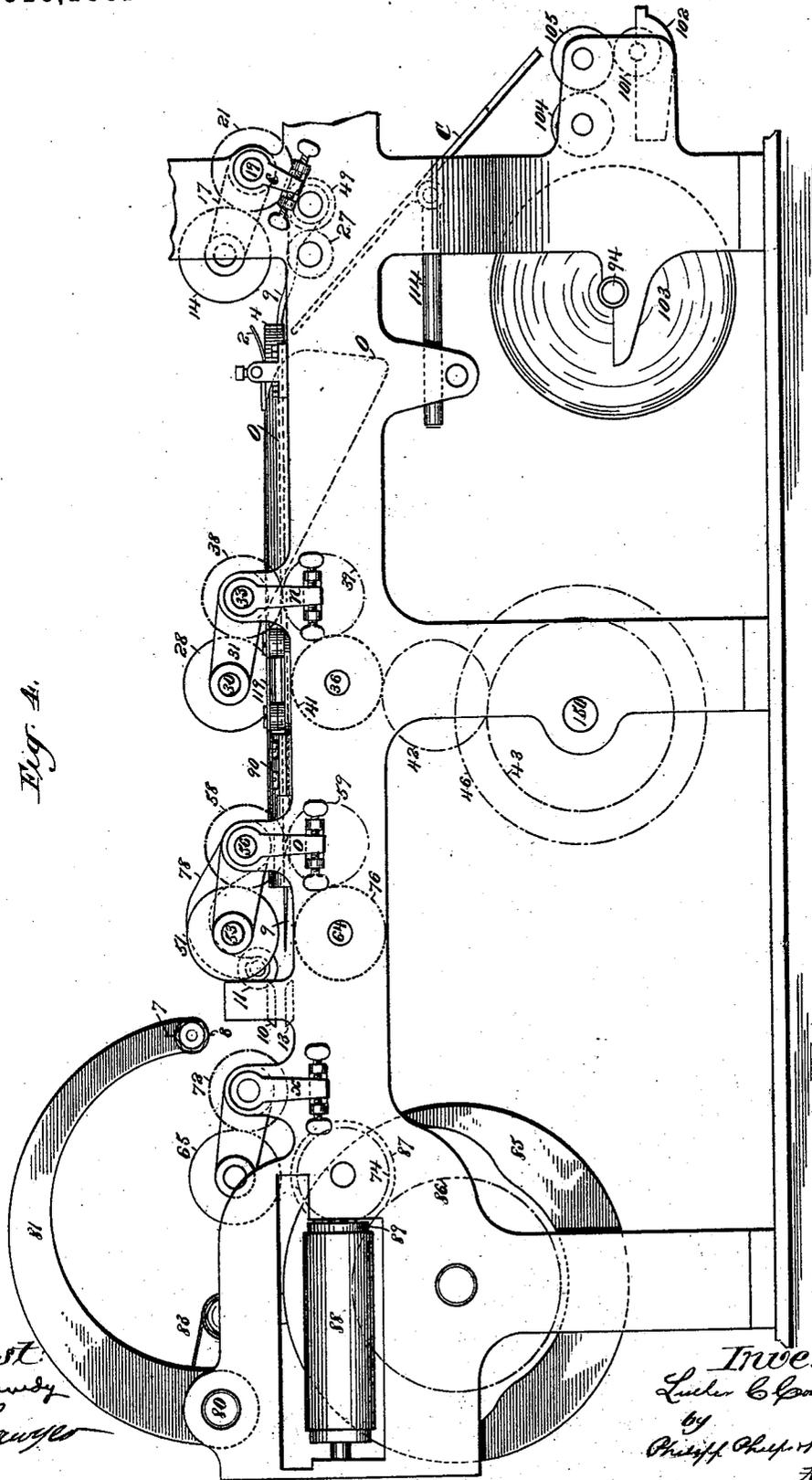


Fig. 4.

Attest
J. J. Sawyer
C. J. Sawyer

Inventor
Luther Crowell
by
Phy. Chas. Henry
Atty.

(No Model.)

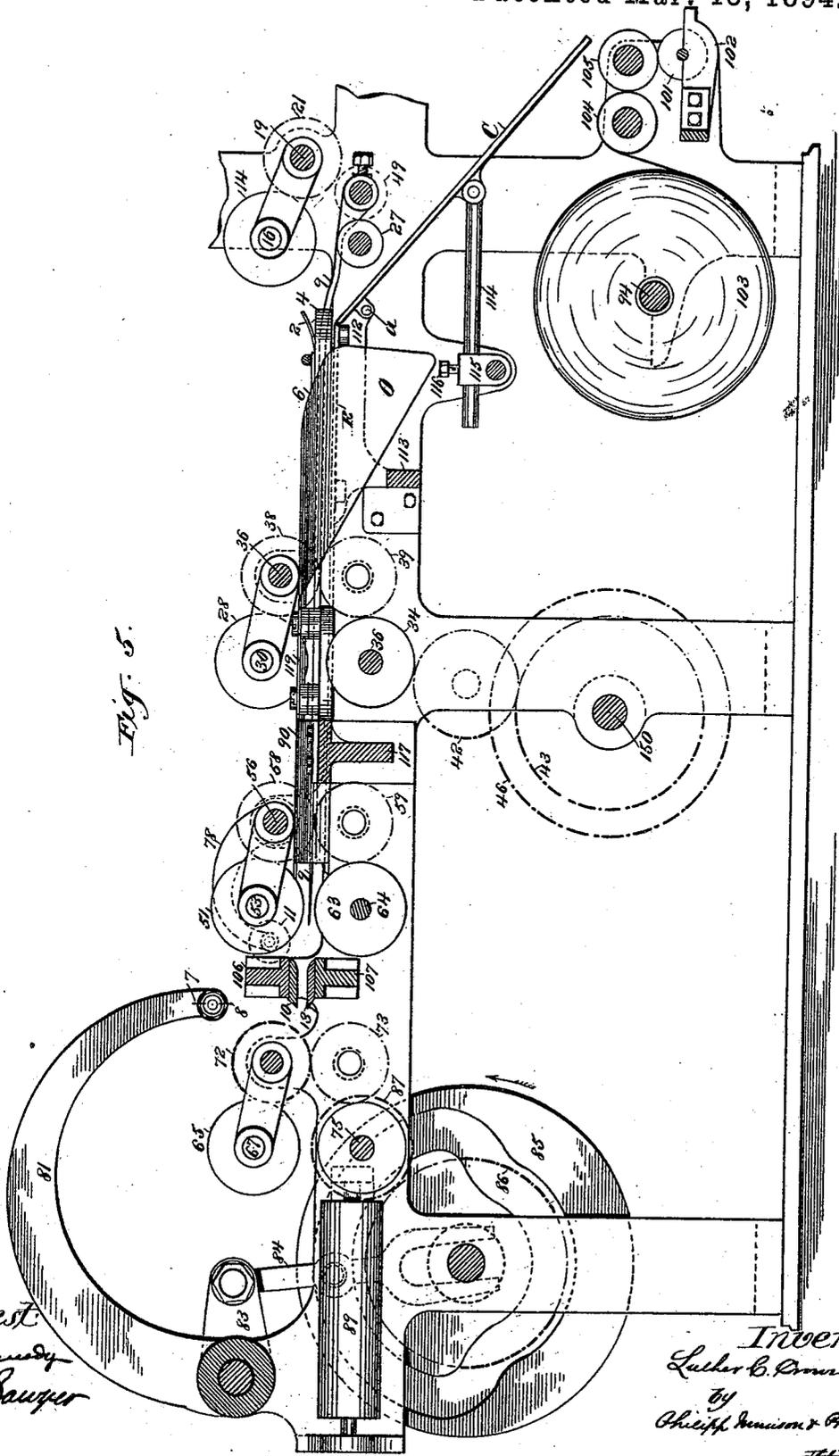
8 Sheets—Sheet 5.

L. C. CROWELL.
PACKAGE WRAPPING MACHINE.

No. 516,186.

Patented Mar. 13, 1894.

Fig. 5.



Attest
J. H. Saunders
C. J. Sawyer

Inventor
Luther C. Crowell
by
Chas. H. Anderson & Assoc.
Attys

L. C. CROWELL.
PACKAGE WRAPPING MACHINE.

No. 516,186.

Patented Mar. 13, 1894.

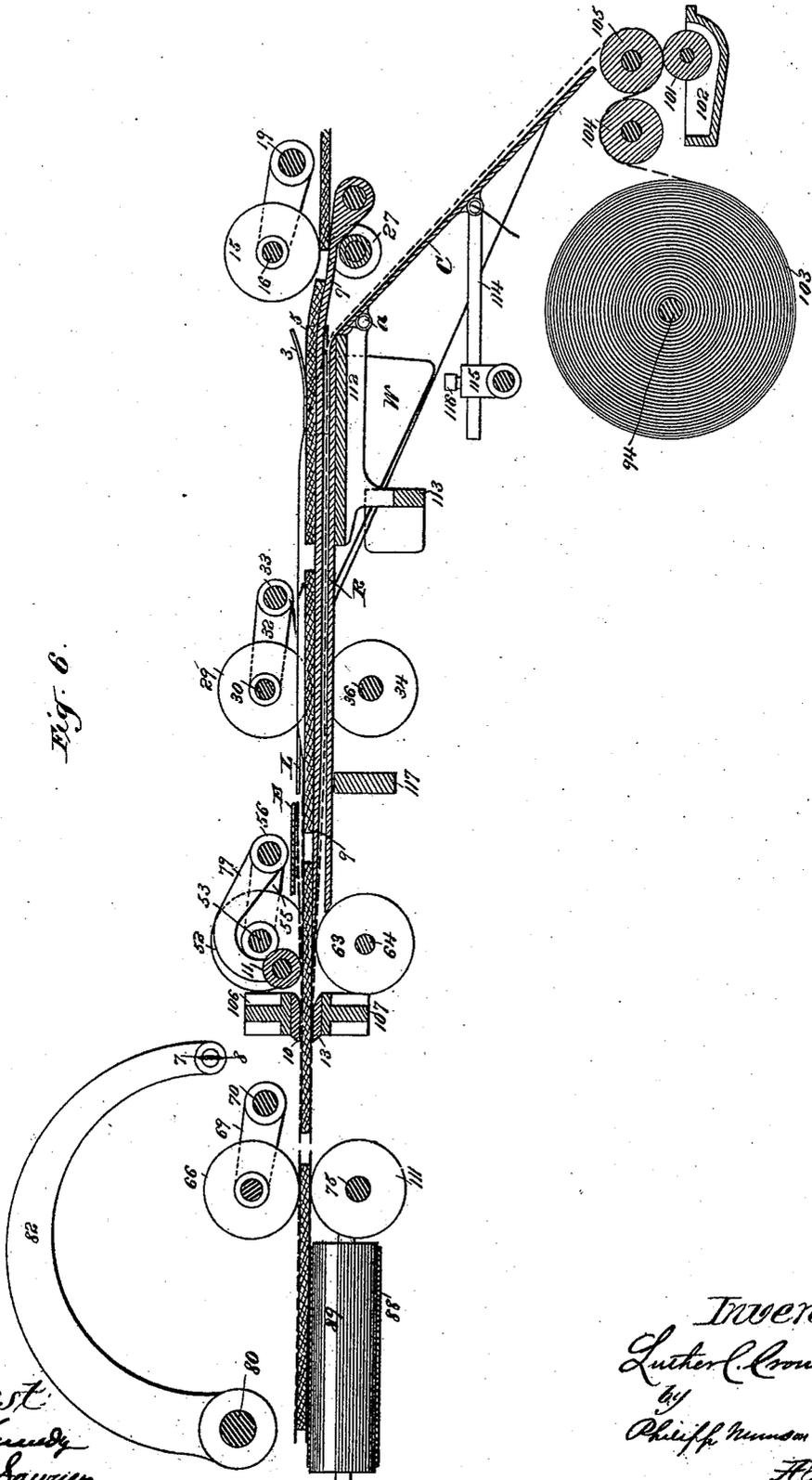


Fig. 6.

Attest
[Signature]
C. J. Sawyer

Inventor
Luther C. Crowell
by
Philip Munson & Co.
Atty.

(No Model.)

8 Sheets—Sheet 7.

L. C. CROWELL.
PACKAGE WRAPPING MACHINE.

No. 516,186.

Patented Mar. 13, 1894.

Fig. 8.

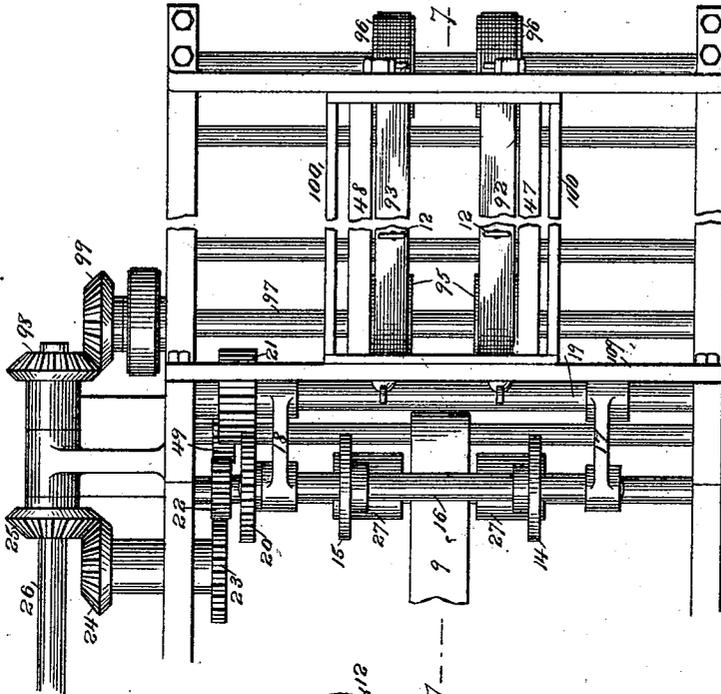
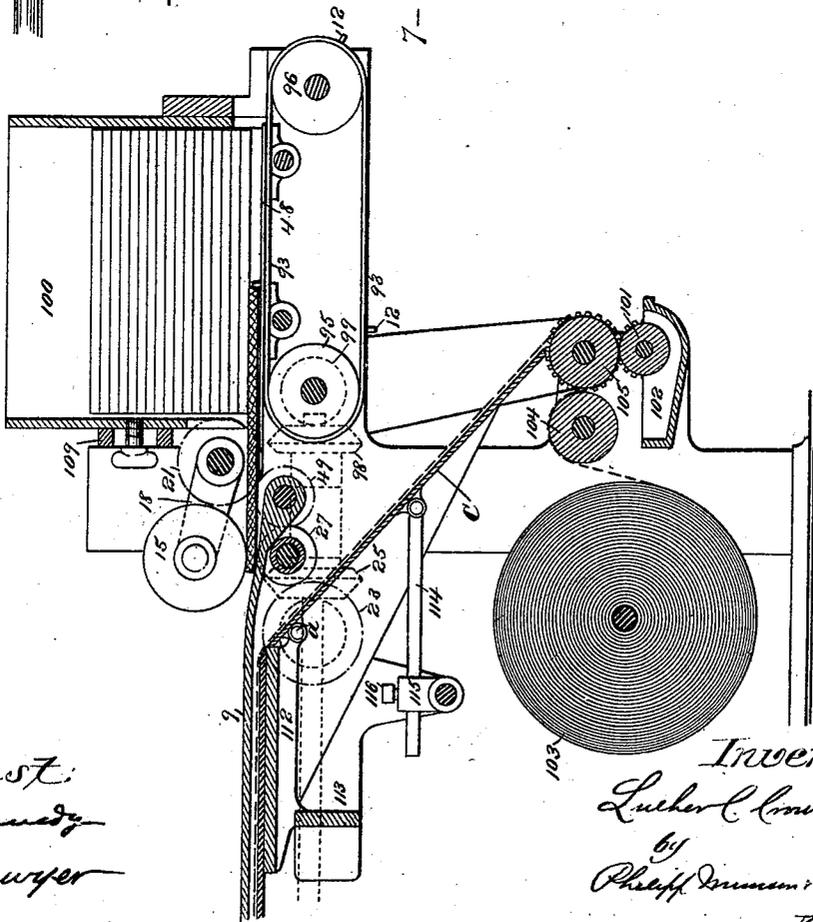


Fig. 7.



Attest:
J. Kennedy
C. J. Sawyer

Inventor
Luther Crowell
by
Phillip Drummond Phelps
Attys

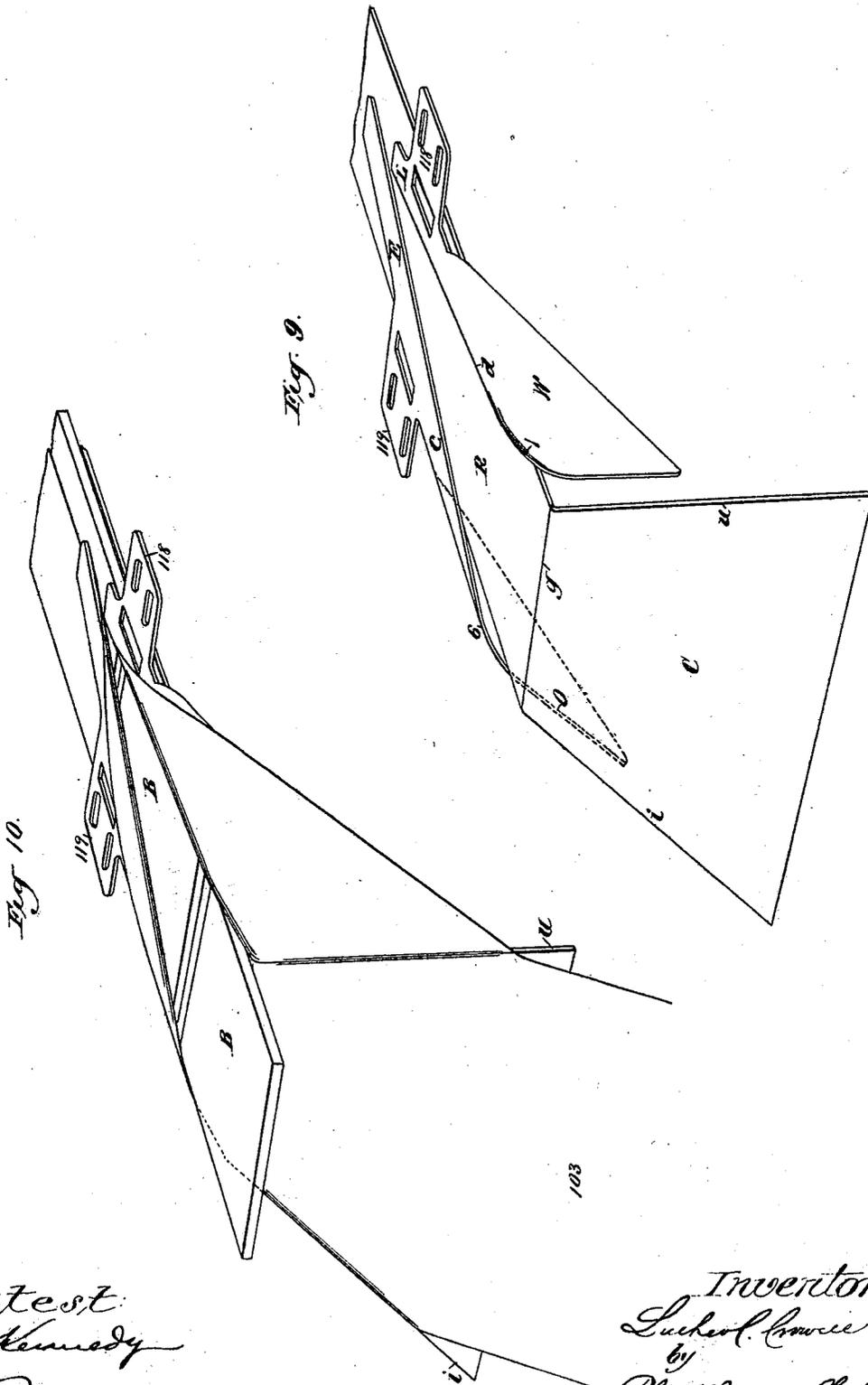
(No Model.)

8 Sheets—Sheet 8.

L. C. CROWELL.
PACKAGE WRAPPING MACHINE.

No. 516,186.

Patented Mar. 13, 1894.



Attest
J. Kennedy
C. J. Sawyer

Inventor.
Luther Crowell
by
Phillip Johnson & Co.
Attys

UNITED STATES PATENT OFFICE.

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

PACKAGE-WRAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 516,186, dated March 13, 1894.

Application filed June 13, 1892. Serial No. 436,591. (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 Package-Wrapping Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present improvements relate to that class of mechanisms known as wrapping machines, the purpose of which is to envelop a book, pamphlet or folded sheet within a postal cover or carriage wrapper, by automatically feeding one to the other and uniting the two as a compound product.

The function of this machine is to supply the covering material from the web, to apply the cover to the article fed to it, and deliver the article covered or wrapped as a finished package.

While it is contemplated in some instances to connect this wrapping machine with a printing press so that the folded product thereof may be covered or wrapped and delivered in convenient form for mailing or other carriage, the article requiring to be covered may be fed to this wrapping machine, either by hand, or by any feeding device that will successfully deliver to it books, pamphlets, folded papers or other similar articles and cause them to enter within the range of action of the folding mechanism which simultaneously forms a covering or wrapping tube and applies the same about the article.

The invention consists in an improved folder whereby a web of paper or similar wrapping material is converted into a tube of dimensions suited to the article to be wrapped, which folder so operates that when the tube is partially formed it provides an entrance pocket for the reception within it of the article and thereafter during the completion of the tube it applies the same about the article so as to envelop or cover it, and it embraces various adjustments of parts of the folder to adapt it for operation in connection with varying dimensions of the article to be wrapped or covered.

It also includes a peculiar construction of two of the members of the folder whereby that portion of the web which is laid against the edges of the said article shall be properly guided and its buckling or rupture prevented during the operation of so folding it.

It further includes a compressing device whereby the loose leaves or plies of the article to be wrapped are compacted so as to reduce the article to its smallest dimensions and thus secure a perfect package.

It also comprises means for bending the article to be wrapped transversely and thus contracting the crosswise extent of the tube so that the covering tube applied thereto shall snugly fit the package when it assumes its ultimate flat form. And it embodies feeding mechanism for introducing the package to be wrapped and for advancing the web and the tube inclosing the package, as well as means for severing package from package, and delivering the severed package out of the machine.

The foregoing constitute the principal features of this invention, but others will, however, be set out in the course of the following description of the manner in which these improvements are or may be carried into effect and be specifically set forth in claims therefor, an understanding of all of which will be aided by reference to the accompanying drawings, in which—

Figure 1 is a plan view of a machine embodying said invention, with the package feeding mechanism removed and certain of the lower shafts omitted for the sake of clearness. Fig. 2 is an end elevation, in which are omitted some of the parts which would obscure others more important to be clearly illustrated. Fig. 3 is an elevation of the gear side of the machine. Fig. 4 is an elevation of the opposite side of the machine. Fig. 5 is a similar view with the nearest side frame removed. Fig. 6 is a longitudinal central sectional elevation. Fig. 7 is a longitudinal sectional elevation of the package feeding mechanism. Fig. 8 is a plan view of the same. Fig. 9 is a perspective view of the folding devices detached from the machine. Fig. 10 is

a similar view of the folding devices, with the web undergoing the folding operation and being wrapped about the package as its cover.

The principal elements of the machine illustrated, are:—a pasting mechanism whereby the wrapping or covering web is provided with a line of paste for forming its uniting seam; a folding apparatus by which a web of paper is converted into a tubular wrapper by lapping the same about the article to be covered or wrapped; a feeding device whereby articles to be wrapped or covered are successively fed to the folding devices to be wrapped or enveloped by the tube as it is formed from the web; a compressing device whereby the loose plies or sheets, composing the package to be wrapped, are pressed together so as to enter readily into the mouth of the folder, a conforming device whereby the package is temporarily so shaped while receiving its wrapper that when it assumes its ultimate shape the said wrapper will snugly fit or bind the same; bending devices whereby the foregoing operation is aided; feeding mechanism, whereby the covering or wrapping web and the article to be covered or wrapped are carried through the machine, and the wrapped or covered article is conveyed to the delivery mechanism; a cutting mechanism whereby the foremost covered or wrapped article is severed from the wrapped article following it while both are traveling onward through the machine; and, a delivering mechanism whereby the completely wrapped article is delivered out of the machine.

The general operation of the machine illustrated as embodying these improvements, which may be readily comprehended by an inspection of Fig. 10, is as follows: A web of paper while being fed through the machine is converted into a tube which when partially formed presents an open pocket into which the article to be covered, as the book B, is introduced, and when fully formed is lapped widthwise about said article as a cover or wrapper. Successively wrapped articles thus enveloped within the tube are separated into separate packages by severing the web between their adjacent ends.

The pasting mechanism by which the lapped edges of the tube are united consists of a paste disk or roller 101 that is mounted to run in a paste vat 102 and bear upon one edge of the web as it passes from the web roll 103 and is led over a roller 104 and around a roller 105. A line of paste is thus deposited upon one edge of the web and when said edge is laid on and pressed upon the opposite edge of the web after its two sides are folded inwardly and overlapped to form a tube, the two edges will be joined by a pasted seam and form a tubular wrapper or cover.

The folding apparatus (see Fig. 9) consists essentially of a horizontal transverse guiding or folding edge *g*, two rearward depending guiding or folding edges *u, i*, laterally disposed at opposite angles to the guiding edge *g* and

two horizontal guiding or folding edges *d, e* set at converging angles, and of such a length as will not only cause the sides of the web to be turned centrally into horizontal planes, but one overlap the other to the extent desired for the seam that unites one to the other to form a tube.

It is convenient and advantageous, instead of forming the guiding or folding edges *g, u, i, d, e* of bars or rods, as might be done, to construct the folder in plate form. Thus the rearwardly inclined portion *g, u, i* might be a plate C of suitable form and have extending forward from its upper edge a horizontal plate R of a width equal or about so to that of the wrapped package to be formed, which plate as it alone operates as a support for the wrapping or covering web when it sustains the article to be wrapped, might have substituted for it an apron or be constructed as a table fixed to the frame and in some cases be omitted altogether. The guiding edges *d, e* instead of being composed simply of turning bars or rods angularly disposed, might be a plate structure of the shape shown with rearward depending wings O, W and front lapping plates or guides E, L. This folder or folding guide is sustained as follows: Its plate C is hung near its upper or guiding edge *g* by means of ears *a* (see Fig. 5) that are pivoted to arms attached to the support 112 which extends from a bridge bar 113, and the angular disposition of this plate C with respect to the leading roller 105 of the pair 104 105 over which the web 103 passes from the carrying spindle 94, is effected by means of adjusting rods as 114, which, pivoted to the under side of said plate, are supported by means of sockets as 115, attached to the side frames, in which they may slide and are held in fixed positions by set screws 116. The plate R is sustained at one end by a central support 112 that extends from the bridge bar 113 and near its forward end by the bridge bar 117. The composite plates forming the side wing O, guiding edge *e* and lapping guide E, and the side wing W, guiding edge *d* and lapping guide L, as single instrumentalities are adjustably supported so as to properly relate the guiding edges *d, e* to each other and to the guiding edges *g, u, i* by means of horizontal supporting arms 118, 119 which have slotted holes through which set screws secure them to extensions of the bridge bar 117. Such a folding guide whether composed of the plates C, R, O, W, E, L or of the edges *g, u, i, d, e* similarly adjustable, with or without the plate R, will cause a web of material drawn through it to be converted into a tube as follows:—The web 103 will be distended to its full width as it passes onto the rearwardly inclined plate C and its central or body portion, corresponding with the width of the tube to be formed, will be passed over the guiding edge *g* and extend onward through the folding guide. At the guiding edge *g* the web is bent at such an angle as to cause its opposite sides to drop

over the guiding edges *u, i*, and extend therefrom to and over the guiding edges *d, e*, said sides being infolded under the guides *d, e*, and doubled onto the central or body portion beyond the guiding edge *g*, on parallel lines coinciding with right line forward extensions of the points where the guiding edges *g, u, i*, intersect. These guiding edges *g, u, i*, all support the web outwardly while the guiding edges *d, e*, support the sides inwardly and lap the said sides from their lines of doubling or folding on to the central or body portion of the web, which sides will be pressed or laid flat in an horizontal plane such one edge lapping slightly over the other, thus forming a flat tube. When this web thus disposed is advanced through the folding guide, the lines of folding will be formed at the intersections of the guides *g, u, i*, the sides will be stretched from the guiding edges *u, i*, over the guiding edges *d, e*, and thus be folded on said parallel folding lines and lapped upon the central body. As this machine is especially adapted to envelop quite a thick article, as a newspaper or a folded newspaper within the tube formed by this folding guide the guiding edges *d, e*, are arranged to be adjusted vertically so as to provide a space for it above the plane of the guiding edge *g*, whence it results that the web is not only doubled on the folding lines as described, but these lines are expanded to form sides for the tube which are substantially equal to the thickness of the said article or have dimensions equal to the distance at which the guides *d, e*, are set above the guiding edge *g*, and hence the tube will be the hollow structure shown in Fig. 10, which illustrates the conformation of the web as it is converted from a distended or flat condition and assumes such tubular form. This method of forming the tube provides it with an open pocket beyond the guiding edge *g* for the reception of the article to be enveloped by it, as the same is fed within the range of action of the folder.

The feeding of the article to be wrapped might be an introduction of it by hand into this pocket, but as it is obvious that the wrapping tube will be rapidly formed by the machine, it is desirable to feed the article to be wrapped through a mechanism having a speed of operation equal to that of the wrapping machine. This may be accomplished by tapes connecting with a printing machine that produces a printed and folded product, or with a folding machine that folds a sheet into proper dimensions, and delivers the same by tapes. The tapes from such a folding machine, whether it be connected or not with a printing machine as its delivery, might be extended to run over the roller 27 or pulleys on a shaft near it, and suitable upper tapes be provided to run over the pulleys 14, 15, or any other arrangement of tapes be provided to carry the folded product into the said pocket. An advantageous construction of feeding device, especially suited to the feed-

ing of such articles as pamphlets is shown in Figs. 7 and 8. This consists of a box like structure or container 100 through the bottom of which feeding belts or lagged aprons 92, 93 protrude to act as carriers. These belts or aprons are endless and run over suitable pulleys or sprocket wheels 95, 96 that are mounted upon shafts, one of which 97 is actuated to give timely feeding movements to the whole from the shaft 26 by means of bevel wheels 98, 99. The front end board of this container is adjustable vertically by means of set screws that pass through slotted holes in a cross plate 109 so as to expose an opening at the lower front corner of the container of suitable dimensions to admit the passage one at a time of the pack or article to be wrapped, which packs or articles are piled one upon another within the container upon suitable rigid supporting guides 47, 48 which practically form a skeleton bottom that sustains the pile against undue pressing upon the feeding belts or aprons 92, 93, while permitting the latter to operate between them. These belts or aprons are so moved that each set of lags or projecting fingers 12 will force the lowermost pack or article outward onto the moving web which is being converted into a wrapper whereupon it will travel concertedly with said web and become wrapped within it as will hereinafter appear. This feeding mechanism may be located so as to deliver the pack or article between the disks 14, 15 and the roller 27 or so as to deliver directly into the pocket over the plate R. Thus delivered, the leading end of the pack or article will enter the pocket leaving only space enough between them to admit of the severing of one from another, unless it be desired that the wrapper shall have an overhanging end or ends, in which case the necessary distance between the articles will be provided by a more slowly feeding of them.

As the object of this improved folder is to lay or fold a web of paper in the form of a tube about an article to be wrapped or covered and said article will vary in its thickness as well as its width, said guides *d, e* require in addition to a proper angular relation to the guide *g* a lateral adjustment which is also accomplished by properly moving the same into suitable positions secured by the set screws passing through the slotted holes in the extensions 118, 119. In order to adapt these guides *d, e* to suit the varying thicknesses of the articles to be wrapped or covered they also have a vertical adjustment upon the same set screws which is secured by placing one or more suitable lifts beneath said extensions 118, 119 as will be readily apparent. When thus adjusted for an article having any considerable thickness such as is shown in Fig. 10, it is obvious that a portion of the wrapping web will require to be laid against said edges as it is guided inwardly to be lapped upon the top of said article. Thus instead of having its inwardly turned sides

folded upon a single line of doubling at points corresponding with horizontal extensions from the junction of the guides *g, u* and *g, i* the said sides will rise from said junctions to an extent equal to that of the thickness of the article and thus necessarily form a double folding line, namely, where it passes over the lower edge of the side of the article and over the upper edge or corner of the article. In order that the thin, limp paper constituting the wrapper or cover may not buckle or be otherwise distorted in passing from said junction of the guides *g, u* and *g, i* the said guides *d* and *e* have their rearward portions adjacent to said points of junction rounded at 1 and 6 as shown in Fig. 9, so as to form practically continuous supports within the partially folded web at the points named, conforming to the natural position it assumes and thus acting to sustain the paper and gradually turn it against the edges of the article as it passes onward to be laid onto the top of said article by the guides *g, e*.

The compressing devices, by which the edge or edges of the article to be wrapped are so compacted as to enable said article to smoothly and readily enter into the pocket which the wrapping tube presents in being folded or converted into a tube as just described, consists of an open sided gradually tapered guide preferably composed of a horizontal plate 2, 3 whose outer end is curved upward, see Fig. 6, and of a vertical plate as 4, 5, whose outer end is bent outwardly, see Fig. 1, thus forming an entrance end which is large enough to receive the spread or distended edge of the article, as the spread corner of a book or the distended edges of a folded sheet, and gradually contracts so that at its exit end its dimensions are equal to that of a compact condition of the material composing such article. Such a compressing device is mounted at one or both sides of the pocket, with its forward end slightly entered within said pocket and its outer or rear end in the pathway of the article to be wrapped, so that the article readily entering into such guide has its free leaves or bulging plies gradually pressed together and the thickness of its body brought to the proper dimensions to receive and be tightly enveloped by the wrapper as the two pass into the mouth of the folder and move onward under the guide *d* or guides *d, e*. Ordinarily but one edge of a package will require the use of this compressor, for instance a magazine or pamphlet having one bound edge will have but one edge with loose leaves, and a folded newspaper, will have one doubled edge and its other edge will have free plies, but in the case of the folded paper as the parts of the folded edge are unattached that edge will bulge considerably and make the use of two compressors desirable; and for rapid manipulation both compressors will be found advantageous with all packages. Where a vertical pressing is alone required it will be obvious

that the compressor may be a roller or rollers of suitable size as the curved surfaces of such rollers will present a curved sloping guide substantially like those marked 2 and 4 and additionally impart a rolling pressure. They are therefore to be considered as the equivalent of the fixed pressing guide 2 or 3.

The package conforming device consists of a conformator which is a long narrow floating bar 9 preferably slightly wider than the seam to be formed by the overlapped edges of the wrapping tube. This floating bar 9 is sustained by having one end secured to the shaft that carries the intermediate 49, and, bearing upon or over the shaft of the roller 27 which roller is cut away for this purpose, it extends forward centrally and terminates at or near the feeding roller 11 somewhat in advance of the ends of the longer lapping guide E or plate *e*, by which the upper ply of the web is completely laid into place. Its upper surface is preferably convex so that in addition to raising the upper plies of the wrapper, it will slightly curve or bend upward the central portion of the article to be wrapped and thus draw its outer edges inwardly, the effect of which is to contract the article widthwise as in Fig. 2. The lateral compressing or bending devices which co-operate with the bar 9 are composed of opposite side or edge guides 90, 91 that are adjustably supported by the bridge bar 117 upon which they are secured by means of lateral plates provided with slotted attaching holes and securing set screws. These guides embrace the point where the tube is fully formed and extend near to the point where the uniting seam is formed, and they preferably have concave surfaces that bear upon the outer edges of the enveloped package as it passes between them. They may be set to press more or less inwardly and thus bend or arch the article to be wrapped so as to secure or aid in securing the effect ascribed to the conforming device. Although the use of both is desirable, either bar 9 or these guides 90, 91 will so bend the package as to enable the lower ply of its wrapper to be drawn from edge to edge of the article like a bowstring, which will cause the wrapping tube to be conformed to exactly the same size as the outside widthwise dimensions of the article when fairly compressed, and the result will be that when the wrapped article and its wrapper are free to assume their ultimate flattened shape, the wrapper will snugly fit the article and form a compact package, capable of resisting any ordinary handling and transport.

One feeding mechanism consists of two disks 14, 15 mounted upon a shaft 16 that is sustained by arms 17, 18 by which it is hung to swing upon a shaft 19 that is journaled in the side frames. These disks are adjustably set apart such a distance that they preferably bear upon or near the outer edges of the article passed beneath them for introduction into the machine, and they are constantly ro-

tated by means of a pinion 20 that meshes with a pinion 21 on the shaft 19, which latter is driven by intermediates 49 and 22 from a pinion 23 on a short shaft which is driven by miter gears 24, 25, from the longitudinal shaft 26. The disks 14, 15 have as a pressing support the roller 27 whose shaft is driven by means of a pinion 22. Another feeding mechanism consists of similar disks 28, 29 mounted upon a shaft 30 that is sustained by arms 31, 32 by which it is hung to swing upon a shaft 33 that is journaled in the side frames. These disks are adjustably set such a distance apart that they preferably bear upon or near the outer edges of the article passed beneath them in its onward passage through the machine, their shaft 30 is rotated by a pinion 37 that gears with a pinion 38 on the shaft 33 which latter is driven by an intermediate 39 which gears through an intermediate 40 that is on a shaft 36 which is revolved by means of miter gears 44, 45, from the longitudinal shaft 26. These disks 28, 29 have pressing support upon disks 34, 35 directly beneath them, which disks are supported and driven by their carrying shaft 36 upon which is fixed the intermediate 40. Another feeding mechanism consists of similar disks 51, 52 mounted upon a short shaft 53 that is sustained by arms 54, 55 which are hung upon a shaft 56, that is journaled in the side frame. These disks are adjustably set such a distance apart that they preferably bear upon or near the outer edges of the article passed beneath them in its inward passage through the machine. Their shaft 53 is rotated by a pinion 57 that gears with a pinion 58 on the shaft 56 which latter is driven by an intermediate 59 from a pinion 60 on a shaft 64 which in turn is driven by miter gears 61, 62 from the shaft 26. These disks 51, 52 have pressing support upon a roller 63 mounted beneath them upon the shaft 64. Another feeding mechanism consists of similar disks 65, 66 mounted upon a shaft 67 that is sustained by arms 68, 69 which are hung upon a shaft 70 that is journaled in the side frames. These disks are also adjustably set such a distance apart that they preferably bear upon or near the outer edges of the article passed beneath them in its onward passage through the machine. Their shaft 67 is rotated by a pinion 71 that gears with a pinion 72 on the shaft 70 which latter is driven by an intermediate 73 from a pinion 74 on a shaft 75 which in turn is driven by miter gears 76, 77 from the shaft 26. These disks have as a pressing support a roller 111 mounted on the shaft 75.

A pressing device consists of a small concave roller 11 that depends from arms 78, 79 that are hung upon the shaft 56. This roller has a contour that fits the convex upper surface of the bar 9 upon which it has a pressing support over the whole or greater part of the upper surface of the seam uniting the edges of the wrapper that envelops the pack-

age, while the thus wrapped package is passing between it and said bar 9.

The shafts 19, 33, 36 and 70, are provided with rock arms *c, n, o, x* by which the adjustment of the feeding disks 14, 15; 28, 29; 51, 52; 65, 66; and roll 11 which they respectively support, with relation to the thickness of the package being formed, is accomplished and maintained. These rock arms are held in suitable position between opposite lugs by means of set screws, as is clearly shown in Fig. 4.

The cutting mechanism consists of a vibrating double edged cutter whose two oppositely cutting blades 7, 8 co-operate with shear plates 10, 13 that are supported by bridge bars 106, 107 secured to the framing and which shear plates are set and may be adjustable sufficiently apart to admit the passage of the wrapped or covered article to be operated upon. These shear plates 7, 8 are carried by two vibrating arms 81, 82 supported by a shaft 80 that is rocked with timely exactitude through a rock arm 83 and a connecting rod 84 that are moved by a cam 85 journaled by a stud on one side frame and rotated by means of a wheel 86 that meshes with a pinion 87 carried by the shaft 75.

The delivery mechanism consists of an endless apron 88 that runs over rollers, one 89 only being shown, to which apron an onward feeding movement may be imparted in any convenient way.

The intermediate or longitudinal shaft 26, through which motion is imparted to many of the devices, is rotated from the main driving shaft 150 by means of an intermediate 42, constantly geared with an intermediate 41 fast on the shaft 36, and hung in swinging arm 50 so that may mesh with a large driving wheel 46 or with a small driving wheel 43 as may be desired, said driving wheels 46, and 43 being splined on and arranged to slide upon the driving shaft 150 for this object.

It being understood that as the conforming device or floating bar 9 and the compressing bending devices or edge guides 90, 91, are not essential, though advantageous, in the operation of wrapping, that operation will first be described without reference to these devices; and thereafter their functions will be explained.

A rolled web 103 of suitable wrapping paper of a width equal to the widthwise area of the article to be wrapped, plus the overlapping portion required for the seam, is mounted upon the spindle 94 and led over a roll 104 and then under a roll 105, where the under side of one of its edges receives a line of paste from the paste disk or roll 101 which dips into a paste vat 102 and runs in pressing contact with the roll 105. It is introduced through the folder with its central portion drawn over the folding guide or edge *g*; its sides are folded inwardly on lines corresponding with parallel extensions from the

points of union between the guides or edges g, u and g, i so that one edge will overlap the other to form a uniting seam and these inwardly folded sides are bent outwardly over the guides or edges d, e , so as to be distended thence from the guides u, i , see Fig. 10. Its sides will thus be overlapped forming a tube which is fed onward by the disks 51, 52 and roller 63. Thus conformed the web will be progressively converted into a tube as it is continuously fed or drawn through the folder, and its overlapped edges will be joined together by a pasted seam. From an inspection of Fig. 10, it will be observed that this process of conversion of the web into a tube, causes the sides of the web to take such directions of travel as to present an open pocket just in advance of the guiding edge g , which is peculiarly suitable for the introduction into the tube of the article to be wrapped or covered, as is shown in Figs. 9 and 10. The incoming package, fed onward by the tapes described or by the disks 14, 15 and roller 27 or otherwise delivered into this pocket, will by passing through the compressing guides have its edge or edges compressed to an equal thickness, and when in contact with the moving web or wrapper it will thereafter be carried onward through the machine by frictional action, though it is preferable to aid its movement by means of the disks 28, 29 and roller 34, before it reaches the disks 51, 52 and roller 63 which propel the web. As the article to be wrapped rests upon the paper web and advances through the folder the sides of the web will be turned centrally over it and laid smoothly and tightly upon it, one side of the web overlapping the other side and being fastened thereto by a pasted seam, thus enveloping the article in a flat paper tube or cover. The seam will ordinarily be complete when the wrapped article passes the lapping guide E or guide e , but it is preferable to use a roller as 11 to press this pasted seam so as to render it sufficiently strong to maintain itself when it is freshly formed and damp. The packs or articles will preferably be so fed onto the wrapper as to lie quite closely together, although if it is desired to have one or both ends overhang so as to form a protecting projection said packs or articles will be fed so as to be suitable distances apart. The wrapped packages thus successively formed within the tubular wrapper, may be divided one from another by any suitable cutting mechanism. The one herein shown is however a desirable construction and it operates as follows:

When the leading wrapped package has entered between the disks 65, 66 and roller 111 which are to feed it out of the machine and its rear end or predetermined line of severance between it and next rearward package emerges from between the shear plates 10, 13 and is passing a point corresponding with the path of travel of the cutting blade 7 or 8, their carrier will be quickly vibrated to cause one

blade as 8 to descend through the wrapper and sever it transversely more or less close to the rear end of one or the forward end of the other package, and the next severing will be accomplished in like manner by the blade 7 as its carrier is quickly moved upward. The plates 10, 13, may thus in connection with the blades 7, 8 act as shears, or they may constitute a holding guide to sustain the wrapped package while the cutting is performed. The foremost wrapped package thus completed by being severed from those following it and undergoing the wrapping operation will be fed onward by the disks 65, 66 and roller 111 and emerging therefrom will drop onto the moving belt 88 which constantly advancing will receive the packages in succession upon it and finally deliver them into any convenient receptacle.

While the operation as thus described is a practical mode of wrapping packages, it is advantageous to produce a package whose wrapper is so tightly bound about the enveloped parts as to closely compact its component parts into the smallest possible dimensions. To accomplish this is the object of the conformator or floating bar 9 and the compressing or bending devices and the edge guides 90, 91. This floating bar 9 lies in such a plane with respect to the guiding edges d, e that it lifts the central portion of the article to be wrapped high enough to transversely curve said article, thus enabling the lower ply of the wrapping web to be drawn in a straight line from the lower outside edges of said article, and thus occupy somewhat less space than it will ultimately cover when the article finally assumes its flat form, while the sides of the web are drawn tightly over the edges of the article and laid smoothly over its upper surface where they are lapped together and united by the seam. And as this bar 9 is curved to conform to this temporarily arched condition of the article, the pressing roller 11 is correspondingly concaved so that it will press evenly upon the pasted seam. This conforming of the package will be aided by the edge guides 90, 91, which pressing laterally upon the edges of the package tend to compress it into the arched form, yet while advantageous they may be omitted, and with some packages they may be alone used and the floating bar 9 be omitted. When the package passes beyond the floating bar 9 and the guides 90, 91, it will from its inherent qualities at once assume a flat condition thus straining its wrapper closely about it and drawing its component parts, as the plies of paper forming it, compactly together and practically form a compressed package.

It will from slight consideration be apparent that since the floating bar is positioned somewhat above the path of travel through the folder, that bearing disks pressing its outer edges downward will cause the arched form described.

The function of the disks 14, 15 and roller

27 is to feed the article delivered to them on-
ward into the pocket of the tube, and hence
if the feeding mechanism for the article to be
wrapped delivers it directly into such pocket,
5 they may be omitted. The disks 28, 29 and
their co-operating disks 34, 35, are not neces-
sary in all cases. All of these feeding disks
may be used with advantageous results since
they are set less distances apart than the
10 length of the shortest package and insure a
positive onward feed at all points of travel
of the article.

What is claimed is—

1. A folding apparatus for producing a
15 wrapping tube, consisting of guides having
edges *g, u, i, d, e*, the latter *d, e* of which are
adjustable vertically for varying thicknesses
of articles to be wrapped or covered, substan-
tially as described.

2. A folding mechanism consisting of the
20 guides having edges *g, u, i, d, e*, of which the
guiding edges *d, e* are curved at points 1, 6
adjacent to the guiding edge *g*, whereby they
operate to support that portion of the paper
web which is to be lapped against the edge
25 of the article to be wrapped, substantially as
described.

3. In a machine for wrapping or covering a
package having loose plies, as a pamphlet or
30 folded newspaper, the combination with the
folding lapping guides having edges *d, e* of
the compressing guide operating upon the up-
per surface of the package near one or both
of its edges, substantially as described.

4. The combination with the folding lapping
35 guides having edges *d, e*, of the compressing
guide 4 or 5 operating upon one or both of
the outer edges of the package, substantially
as described.

5. The combination with the folding lapping
40 guides having edges *d, e*, of a compressing
guide as 2, 4 or 3, 5 operating upon the up-
per surface and outer edge of the package at
one or both sides thereof, substantially as de-
45 scribed.

6. The combination with the folding lapping
guides having edges *d, e* for laying the sides
of the web onto and overlapping the same
upon the article to be covered, of means for
50 bending or arching the said article trans-
versely, whereby the cover or wrapper is ap-
plied snugly about the said article, substan-
tially as described.

7. The combination with the folding lapping
55 guides having edges *d, e*, for laying the sides
of the web onto and overlapping the same
upon the article to be covered, of the con-
formator 9 and side guides 90, 91, operating
to bend or arch said article transversely and
60 thus insure a snug fitting of its cover when
said article assumes a flat form, substantially
as described.

8. The combination with the folding lapping
55 guides having edges *d, e* for laying the sides
of the web onto and overlapping the same
upon the article to be covered, of the con-
formator 9, substantially as described.

9. The combination with the lapping guides
having edges *d, e* for laying the sides of the
web onto and overlapping the same upon the
70 article to be covered, of side guides 90, 91,
operating to bend or arch said article trans-
versely, and a support, as plate R, for the
package, substantially as described.

10. The combination with the guides hav- 75
ing edges *g, u, i, d, e* operating to convert a
web into a tube and form a pocket for the
entrance of the article into said tube, of
means for feeding the article to be wrapped
through said pocket into the tube, and means 80
for advancing said web, whereby the article
becomes enveloped or wrapped within the
tube, substantially as described.

11. The combination with the guides hav- 85
ing edges *g, u, i, d, e*, operating to convert a
web into a tube, form a pocket for the en-
trance of the article therein and to envelop
or wrap said article within the tube, of means
for feeding the articles to be wrapped through 90
said pocket into the tube, means for advanc-
ing the tube and the article enveloped by it,
and devices for applying a line of paste to
the overlapping parts of said tube to form
its closing seam, substantially as described.

12. The combination with the guides hav- 95
ing edges *g, u, i, d, e*, operating to convert a
web into a tube, form a pocket for the en-
trance of the article therein and to envelop
or wrap said article within the tube, of means
for feeding the articles to be wrapped through 100
said pocket into the tube, means for advanc-
ing the tube and the article enveloped by it,
a device for applying a line of paste to one
of the overlapping parts of said tube to form
its closing seam, and a roller operating to 105
press said seam, substantially as described.

13. The combination with the guides hav-
ing edges *g, u, i, d, e*, operating to convert a
web into a tube, form a pocket for the en-
trance of the article therein and to envelop 110
or wrap said article within the tube, of means
for feeding the articles to be wrapped through
said pocket into the tube, means for advanc-
ing the tube and the articles enveloped by it,
a device for applying a line of paste to one 115
of the overlapping parts of said tube to form
its closing seam, and a means for severing the
tubular wrapper at points between the envel-
oped packages, substantially as described.

14. The combination with the guides hav- 120
ing edges *g, u, i, d, e*, operating to convert a
web into a tube, form a pocket for the en-
trance of the article therein and to envelop
or wrap said article within the tube, of means
for feeding the articles to be wrapped through 125
said pocket into the tube, means for advanc-
ing the tube and the articles enveloped by it,
a device for applying a line of paste to one
of the overlapping parts of said tube to form
its closing seam, a pressing roller operating 130
to press said seam, and a means for sever-
ing the tubular wrapper at points between
the enveloped packages, substantially as de-
scribed.

15. The combination with the guides having edges *g, u, i, d, e* operating to convert a web into a tube, form a pocket for the entrance of the article therein and to envelop or
 5 wrap said article within the tube, of means for feeding the articles to be wrapped through said pocket into the tube, means for advancing the tube and the articles enveloped by
 10 it, a device for applying a line of paste to one of the overlapping parts of said tube to form its closing seam, a pressing roller operating to press said seam, a means for severing the tubular wrapper at points between the enveloped packages, and means for delivering the
 15 detached enveloped package, substantially as described.

16. The combination with a mechanism for feeding packages in succession thereto, of the guides having edges *d, e*, whereby the sides of
 20 a web are laid or folded onto said packages as a wrapper or cover therefor, and feeding disks adjustable laterally so as to effectively bear upon and feed forward the enveloped article, substantially as described.

25 17. The combination with a mechanism for feeding packages in succession thereto, of the guides having edges *d, e* whereby the sides of a web are laid or folded onto said packages as a wrapper or cover therefor and feeding disks
 30 adjustable vertically to suit the thickness of and thus effectively feed forward the enveloped article, substantially as described.

18. In a wrapping machine wherein the wrapper or cover is folded about the package
 35 as a tube and the tube and enveloped articles are simultaneously advanced through the ma-

chine by one or more pairs of feeding disks, the combination with said disks of means for adjusting them to fixed vertical bearing positions to suit different thicknesses of articles to
 40 be operated upon, substantially as described.

19. The combination with a folder operating to form a tube and envelop an article therein, and means for advancing the same rapidly through the machine, of a cutter having
 45 blades 7, and 8, and means for vibrating the same so as to sever package from package at each of its movements of vibration, substantially as described.

20. The combination with a folder operating to form a tube and envelop an article therein, and means for advancing the same rapidly through the machine, of shear plates 10, 13
 50 and a cutter having blades 7 and 8, and means for vibrating the same so as to sever package from package at each of its movements of vibration, substantially as described.

21. The combination with a folder operating to form a tube and envelop an article therein and means for advancing the enveloped
 60 article through the machine, of a floating bar as 9 having a convex upper surface and a pressing roller as 11 having a concave bearing surface, substantially as described.

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

LUTHER C. CROWELL.

Witnesses:

H. T. MUNSON,
 THOS. F. KEHOE.