

(No Model.)

5 Sheets—Sheet 1.

M. E. BRIGHAM.
WRAPPING MACHINE.

No. 478,396.

Patented July 5, 1892.

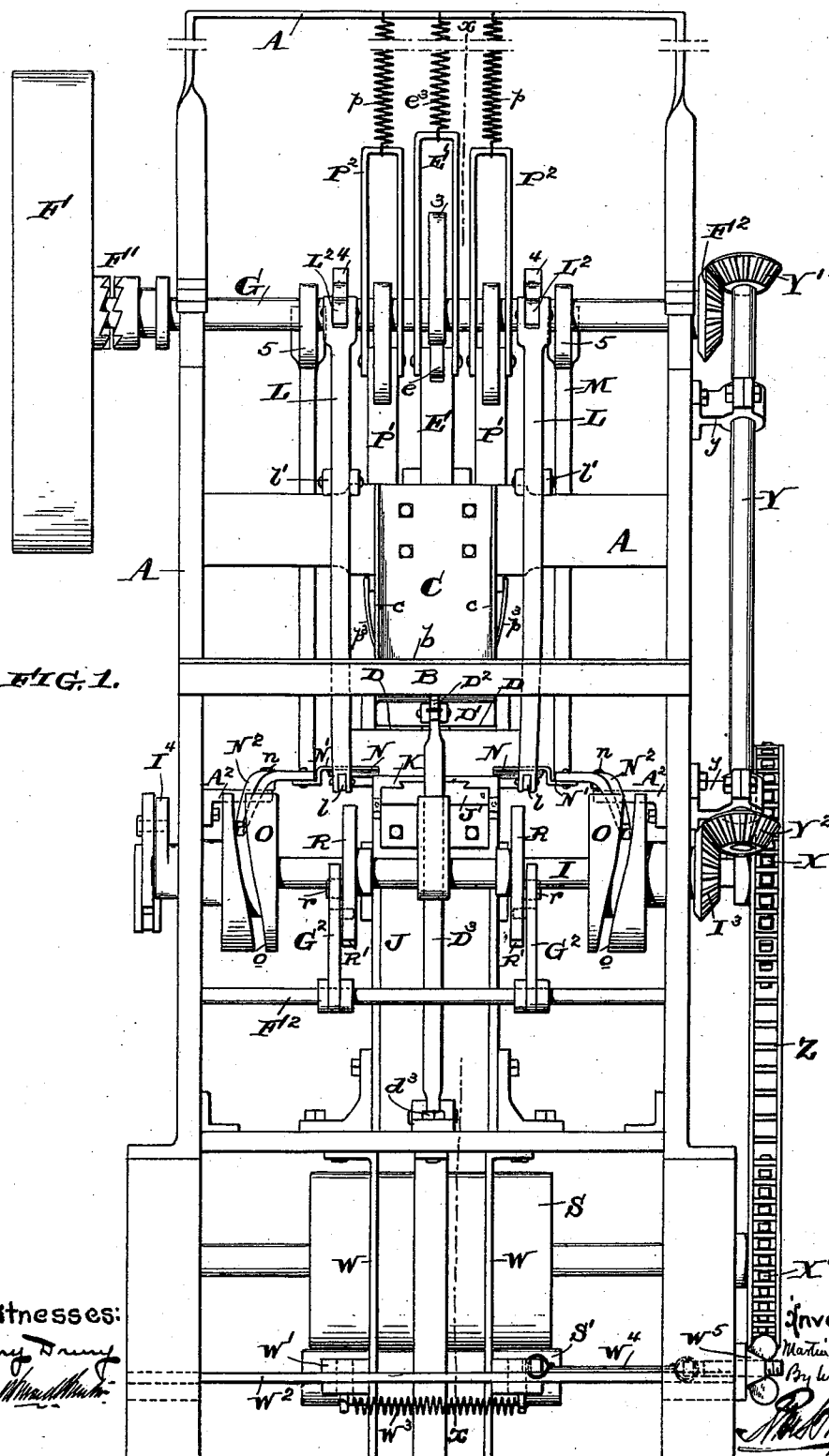


FIG. 1.

Witnesses:
Henry D. [Signature]
Wm. [Signature]

Inventor:

Martin E. Brigham

By *[Signature]*

(No Model.)

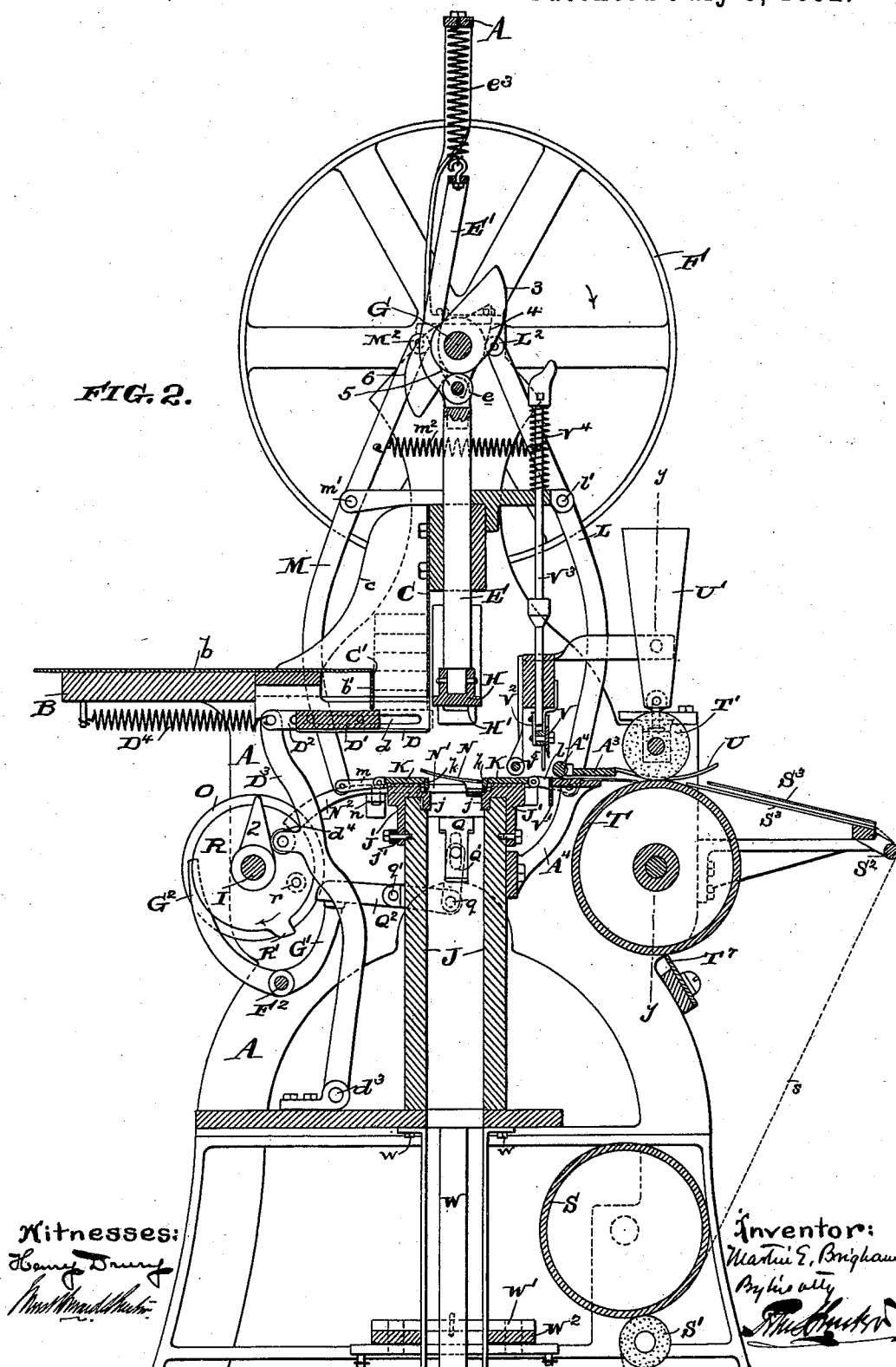
5 Sheets—Sheet 2.

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FIG. 2.



Witnesses:
Henry D. Dwyer
Andrew W. Dwyer

Inventor:
Martin E. Brigham
By his atty
[Signature]

(No Model.)

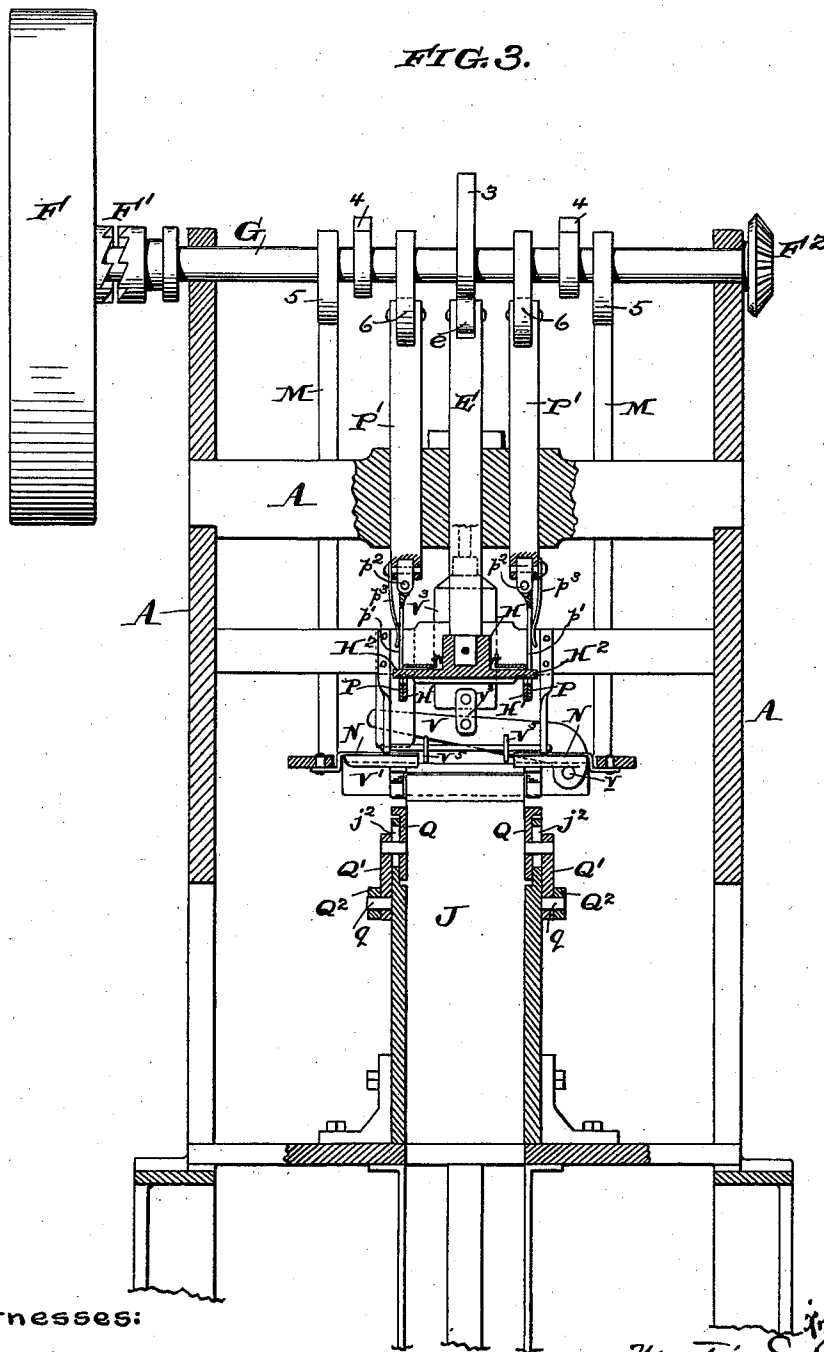
5 Sheets—Sheet 3.

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FIG. 3.



Witnesses:

Henry D. Dwyer
[Signature]

Inventor:

Martin E. Brigham
By his atty
[Signature]

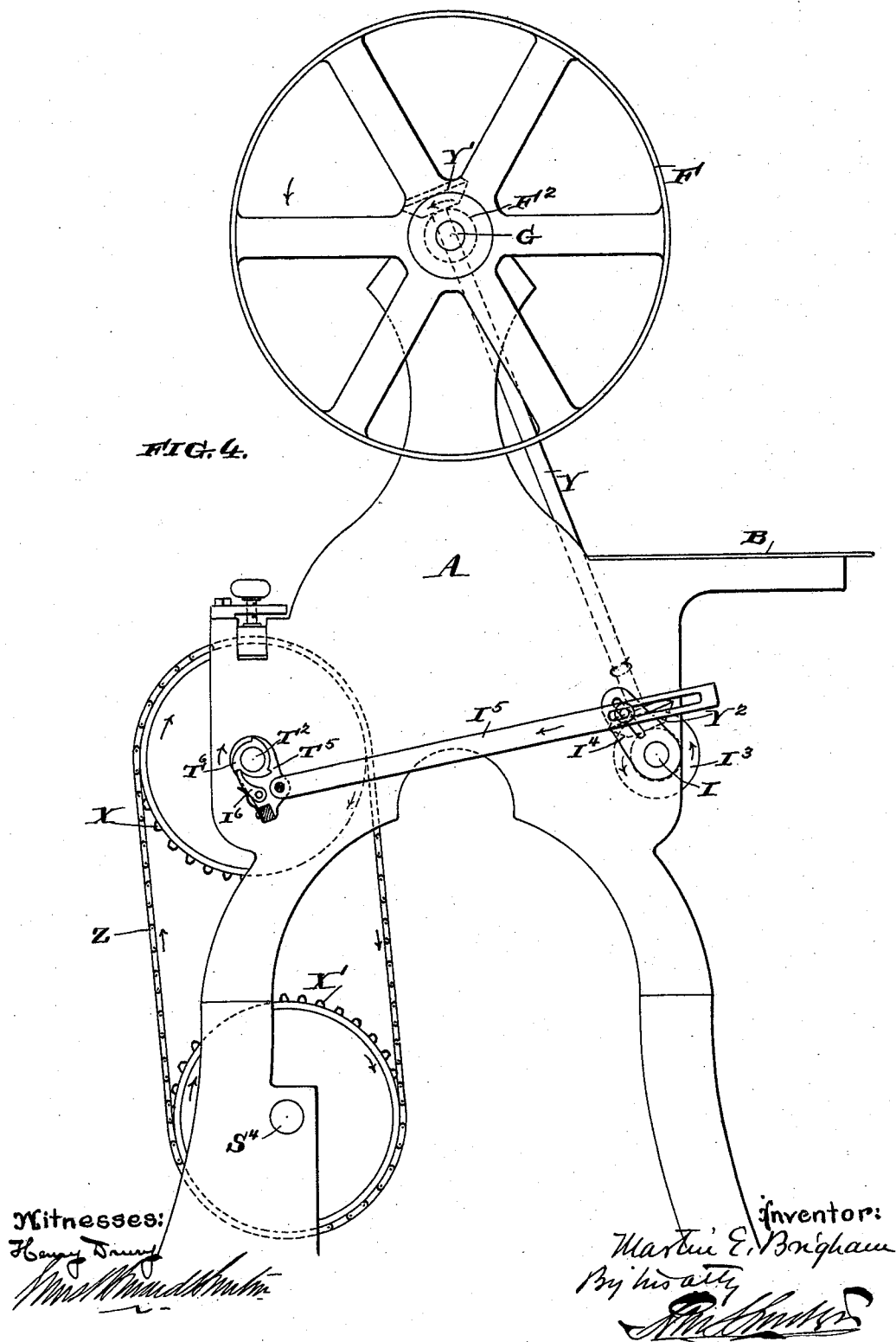
(No Model.)

5 Sheets—Sheet 4.

M. E. BRIGHAM.
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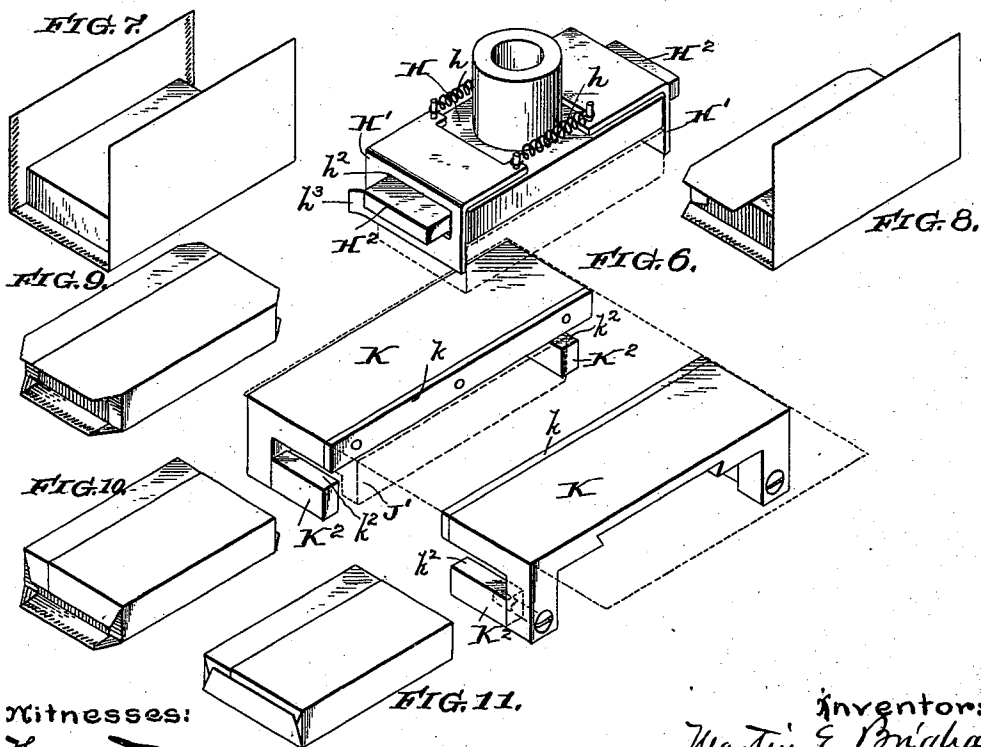
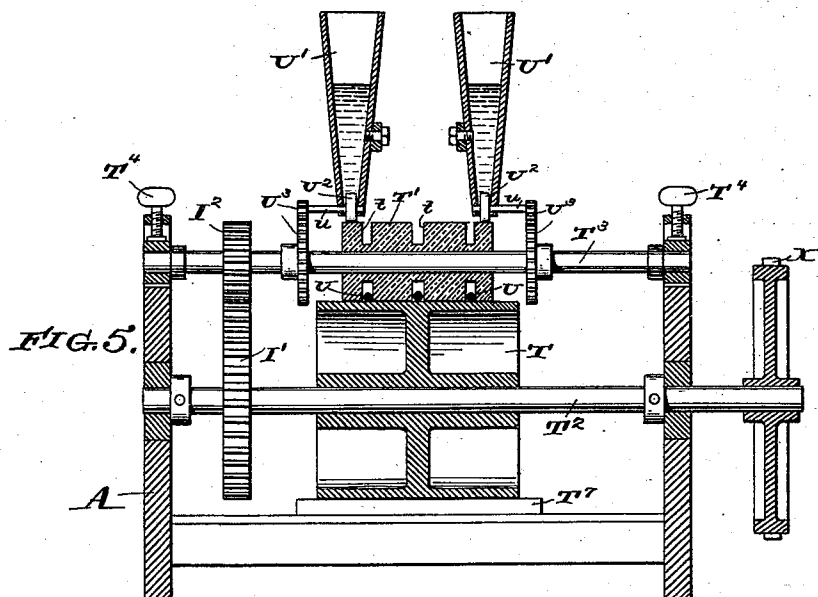
Patented July 5, 1892.



M. E. BRIGHAM.
WRAPPING MACHINE.

No. 478,396.

Patented July 5, 1892.



Witnesses:

Henry Denny
Russell M. Smith

Inventor:

Martin E. Brigham
By his atty
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UNITED STATES PATENT OFFICE.

MARTIN EUGENE BRIGHAM, OF PHILADELPHIA, PENNSYLVANIA.

WRAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,396, dated July 5, 1892.

Application filed June 3, 1890. Serial No. 354,114. (No model.)

To all whom it may concern:

Be it known that I, MARTIN EUGENE BRIGHAM, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Wrapping-Machines, of which the following is a specification.

My invention relates to wrapping-machines; and it consists of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

Many articles of commerce—such as soap, yeast, essence for coffee, &c.—are inclosed in separate wrappers for each piece or small package before they are placed upon the market.

The object of my invention is to automatically accomplish the wrapping of these individual packages or articles by means of mechanism operating with the requisite rapidity, precision, and neatness.

The feeding, pasting, and folding operations are all carried on successively and are so timed with reference one to another that the operation of the machine is continuous and rapid.

In carrying out my invention I employ suitable feeding devices for feeding the wrapping material or paper to the folding devices, and as the paper is being fed it is cut into appropriate lengths and provided with paste. The articles to be wrapped are fed one at a time into position upon the wrapper, and the sides and ends of the wrapper are then successively folded over, the paste upon the ends or edges causing them to adhere.

My invention includes certain improvements in the feeding and pasting devices and the means of operating them, whereby the paper or wrapper is fed positively to the folding devices and the pasted portions are prevented from coming in contact with any of the parts of the machine, so as to be liable to adhere to them or communicate any of the paste to the mechanism.

My invention also includes improvements in the feeding devices for feeding the articles into position to be enveloped in the wrapper and in the manner in which the articles are held in position while that operation is being performed, as well as in the folding devices themselves and the mechanisms for operating and timing the various parts, and in certain

new constructions and combinations thereof, which are hereinafter more fully described and claimed.

In the drawings, Figure 1 is a front elevation of my improved wrapping-machine. Fig. 2 is a vertical sectional view of the same on the line *xx* of Fig. 1, looking toward the left. Fig. 3 is a front elevation of the upper portion of the machine with some of the parts removed. Fig. 4 is a side elevation of the machine, illustrating the power-transmitting connections. Fig. 5 is a sectional elevation of the paper-feeding and paste-supplying devices on the line *yy* of Fig. 2. Fig. 6 is a perspective view, on an enlarged scale, of a portion of the folding devices removed from the other parts of the machine; and Figs. 7, 8, 9, 10, and 11 are perspective views of a cake of material and wrapper, illustrating the successive steps of the wrapping operation.

A is the main frame of the machine.

B is a table to support the articles to be wrapped.

C is a vertical plate carried by the frame A, provided with vertical guiding-wing *c*, and arranged a distance from the end of the table B and extending down so as to form a feeding-chute C'. The plate C and the wings *cc* form, respectively, end and side guides for guiding the article to the chute C'. I prefer to form the upper surface of the table B of a smooth piece of metal *b*, extending a distance between the guiding-wings *c* and having its inner end extending downwardly to form with the plate C the chute C'.

D is a support under the end of the chute C' to receive the articles as they are fed down it.

D' is a sliding block or pusher guided in slots *d* in the frame above the support D, whereby the articles are pushed from the support to the jaws of the feeding-plunger E. This sliding block is provided with an arm or extension D², which is pivoted to a lever D³. This lever D³ is pivoted to the main frame at *d*³ and carries a roller *d*⁴. It is actuated by a cam 2, carried by the shaft I, which strikes the roller *d*⁴ as it rotates, and thereby rocks the lever D³ and imparts a reciprocation to the sliding block D'.

D⁴ is a spring to draw back the lever D³ and block D' after they have been actuated by the cam 2.

E is a plunger guided in the main frame A and carrying upon its end a block H, which supports two nipping-jaws H' H'. These nipping-jaws H' H' project below the face of the block H and are drawn toward each other by means of springs *h h*. These jaws H' H' are preferably constructed in the manner shown in Fig. 6, consisting of angle-plates supported by the block H, provided with slots *h²*, through which extend guiding-plates H², projecting from the ends of the block so as to guide the jaws in their movements, and having the springs *h h*, connecting them upon the top of the block H. The lower portions of the jaws upon the side adjacent to the sliding block D are provided with small guiding projections *h³*, curved or inclining outwardly to guide the article fed by the sliding block D between the nipping-jaws H' H'. The plunger E carries upon its upper end a roller *e*, which is operated upon by a cam 3, carried upon the main power-shaft G to depress the plunger E for the purpose of feeding the article carried by the nipping-jaws H' H' to the folding devices. The plunger is raised again after the operation of the cam 3 by means of a spring *e³*, connecting an extension E' of the plunger E with the main frame A.

J is a chute under the plunger E, provided at its upper open end with jaws J' J' to receive and support the article during the wrapping operation. These jaws are preferably constructed in the manner shown in Fig. 2, consisting of two angle-pieces bolted upon the outside of the chute J and provided with lips *j j*, projecting over the top of it. The bolt securing one of these jaws J' is provided with an elastic packing *j'* to permit a slight yielding of the jaw, the upper part of the chute J being formed to permit the resulting movement of the lip *j*.

K K are sliding folders arranged over the jaws J' J' and guided by them, the upper edge of the jaws being recessed or cut away, as shown in Fig. 2, to receive the folding edges *k k* of the folders K. The details of these folders are shown in Fig. 6. In addition to the flat surfaces K and the folding edges *k* they are provided with projecting folding-blocks K² on their sides for folding in the sides of the projecting ends of the wrapper in the manner hereinafter more fully disclosed in the description of the operation of the machine. Between these folding-blocks K² and the upper portion of the folder K are recesses or slots *k²*. One of the sliding folders K is operated by two levers L L, connected to it by links *l l* and pivoted to the main frame at *l'*, and the other is operated by corresponding levers M M, connected to the folder by links *m m* and pivoted to the main frame at *m'*. (See Figs. 1 and 2.) The levers L L and M M are provided upon their free ends with rollers L² and M², respectively, and are operated by sets of cams 4 and 5, respectively. These cams are carried by the shaft G. The cams 4, operating the levers L L, are arranged oppo-

sitely to the cams 5, which operate the levers M M, so that the levers L L and M M will be rocked alternately, first operating one sliding folder K and then the other, as is hereinafter more fully set forth. The levers L L and M M are drawn back into their normal positions after they have been operated by means of springs *m²*.

N N are wings or supports for guiding and supporting the wrapper above the chute J, carried by arms N' N', pivoted at *n* to brackets A² A² of the main frame A. These arms N' N' are provided with extensions N² N², which fit into cam-grooves *o* upon wheels O, carried by the shaft I. By these cams *o* the wings N N are moved from under the paper or wrapper to release it when it receives the article to be wrapped from the plunger E and to permit the folding devices to operate.

P P are reciprocating folders for folding the upper projecting ends of the wrapper, carried by rods P' P', guided in the main frame A, and operated by cams 6 6, carried by the shaft G. The rods P' P' are raised to their normal positions after they have been operated by the cams 6 6 by means of springs *p*, connecting extensions P² P² of the rods P P with the main frame A. (See Fig. 1.) The reciprocating folders P P are preferably arranged adjacent to the nippers H' H' and provided with slots *p'* to admit the projecting guiding-plate H² of the block H (see Fig. 3) and are pivoted to the rods P P, as at *p²*, and spring-pressed against the faces of the nippers H' H' by the springs *p³*.

Q Q are two reciprocating folders for folding the lower projecting ends of the wrapper after the upper projecting ends have been folded by the folders P P. These reciprocating folders Q Q are preferably arranged on the inside of the chute J and are connected with links Q' Q', upon the outside of the chute, by means of bolts passing through guiding-slots *q²*, as shown in Fig. 3.

Q² Q² are arms pivoted to the links Q' Q' at *q q* and pivoted to a bracket or support *q' q'*. The end of each arm Q² rests upon a supporting-lever G', journaled on the shaft F².

R R are disks carried by the shaft I, provided each with a pin or projection *r*, adapted to strike the free end G² of the lever G' when it is moved toward it. The disks R R are also provided with cam projections R', which as the disk R rotates strike the ends of the levers Q², depressing them and operating the folders Q Q. This action also operates the levers G' G' so as to throw the ends G² G² in the path of the pins or rollers *r*, by which the levers are moved back again into their normal positions, operating the levers Q² Q² and lowering the folders Q Q. The friction between the folders Q Q and the wrappers will maintain the folders in their raised position until they are lowered again in the manner just described.

S is a supply or roll of the wrapping material, from which it may be fed in a continuous

web over a guiding-roller S^2 between the guides $S^3 S^3$ to the feeding-rollers $T T'$.

S' is an idler-roller, preferably coated with rubber or other similar material to insure a true feeding of the material to the guides and feeding-rollers.

The feeding-rollers T and T' are carried upon shafts T^2 and T^3 , respectively. These shafts T^2 and T^3 are journaled in the main frame A and are geared together by means of gears $I' I^2$. The journals of the shaft T^3 are preferably made adjustable in the frame A by means of adjusting-screws T^4 , so that the roller T' may be adjusted to or from the roller T . Of these rollers T and T' , I prefer to construct one T of metal and the other T' of rubber and of smaller diameter, as by this means I obtain a better feeding action. The roller T' is provided with annular grooves or recesses t , into which project strippers or fingers U between the surfaces of the two rollers T and T' . By this means the wrapping material or paper is prevented from adhering to the roller T' . These fingers are carried by a cross-piece A^3 of the main frame A .

A^4 is a roller for the paper or wrapper to guide it to the cutters.

T^5 is a cleaning-bar arranged in contact with the surface of the feeding-roller T to remove from it any paste that may collect thereon from the roller T' .

$U' U'$ are paste-receptacles supported by brackets of the main frame above the ends of the rollers T' .

$U^2 U^2$ are paste-distributing rollers by which the paste from the receptacles $U' U'$ is fed upon the ends of the roller T' and thence distributed upon the edges of the wrapping material. These paste-distributing rollers U^2 are carried upon shafts $u u$, which are operated by gearing $U^3 U^3$ between them and the shaft T^3 of the roller T' .

V is a shearing-cutter pivoted at v to the stationary cutter V' . These cutters are arranged between the rollers $T T'$ and the folding devices, so that the wrapping material is cut into appropriate lengths in passing from one to the other. The pivoted cutter V is connected by a link V^2 to a reciprocating rod V^3 , guided in a cross-bar of the main frame A . The upper end of this rod V^3 is arranged in the path of the plunger-actuating cam 3, so that the cutter is operated immediately before the operation of the plunger E . A spring V^4 between the rod V^3 and a portion of the frame A normally raises the rod V^3 and the cutter V after they have been operated by the cam 3.

V^5 are feeding and stripping rollers for the cutters $V V'$ to guide the paper or wrapper to the folding devices.

$W W$ are vertical guides below the chute J , forming a continuation of the chute down which the wrapped packages descend. (See Figs. 1 and 2.) These vertical guides exert a slight pressure upon the folded ends of the packages as they descend, being connected

to the bottom of the chute J by bolts w with sufficient looseness to permit slight play.

$W' W'$ are pressure-blocks guided upon a rod W^2 and drawn toward each other by means of springs W^3 , so as to exert a pressure upon the guides $W W$ and press them against the articles descending between them. This pressure may be regulated by means of a link W^4 , connecting one of the pressure-blocks W' with an adjusting-screw W^5 .

G is the main driving-shaft, and F the driving-wheel, which may be connected or disconnected with the shaft G by means of a clutch F' .

The power-transmitting connections are shown more clearly in Fig. 4.

The shaft G is provided on its end with a bevel-gear F^2 , and the shaft I is similarly provided with a bevel-gear I^3 . Power is transmitted from the shaft G to the shaft I by means of a shaft Y , journaled in bearings j^2 upon the main frame A , and provided on its ends with bevel-gears Y' and Y^2 , gearing, respectively, with the bevel-gears F^2 and I^3 of the shafts G and I . The shaft I is provided upon its opposite end with a crank-arm I^4 .

I^5 is a connecting-rod connecting the crank-arm I^4 with a link T^5 , loosely journaled on the shaft T^2 . This link carries a spring-pressed pawl I^6 , which engages the teeth of a ratchet T^6 upon the shaft T^2 . By this means an intermittent rotation is imparted to the shaft T^2 and to the feeding devices operated by it. The shaft T^2 and the shaft S^4 of the supply-roller S are provided, respectively, with sprocket-wheels X and X' , which are connected together by means of a chain Z .

The operation of my apparatus is as follows: The articles to be wrapped are fed from the table B and are arranged one upon the other in the guide C and descend one at a time down the chute C' to the support D . The pusher D' is then projected by the action of the cam 2, pushing the article between the nippers $H' H'$ of the plunger E . Simultaneously with this operation the paper or wrapping material has been fed from the roll S through the guides $S^3 S^3$ between the rollers $T T'$ and is supplied upon its edges with paste from the paste-receptacles $U' U'$. The paper thus pasted is guided by the stripping-wires $U U U$ and the roller A^4 between the cutters which are operated by the cam 3 and cut the paper into the appropriate lengths. The cut paper or wrapper is fed in position over the folding devices K before it is cut by the cutters $V V'$, and is supported above the folders by the wings or supports $N N$. The cam 3 now depresses the plunger E and lowers the article to be wrapped upon the wrapper and forces it down into the opening of the chute J , where it is supported between the lips $j j$ of the jaws $J J$. Simultaneously with this operation of the plunger the wings $N N$ have been operated by the cam-grooves o , moving them out of the way, so as to release the paper or wrapper which is now held between the jaws $J' J'$ with its sides extending upwardly in the manner

shown in Fig. 7. The levers M are then operated by the cams 5 5, projecting forward one of the folders K and folding down one of the projecting sides on the top and also folding in the corresponding sides of the ends, as illustrated in Fig. 8. Immediately after this operation the levers L are operated by the cams 4 4, folding down the other projecting side on the top and the opposite sides of the ends, as indicated in Fig. 9. The folders P are then operated by the cams 6, which depress the rods P' P' and project the folders P' P down upon the upper projecting ends of the wrapper, as indicated in Fig. 10, and the folders Q are then projected upward by the action of the cam projections R' upon the levers Q', folding over the lower projecting ends in the manner indicated in Fig. 11, and the wrapping operation is completed. It will be observed that the paste upon the edges of the wrapper causes them to adhere when folded to the article itself and to the wrapper, as indicated. Meanwhile the machine has been operating to bring another wrapper into position and to deposit a second article upon it in the manner heretofore described. As this next article is pushed into position between the jaws J' J' the article already wrapped is pushed down the chute J. The folders Q Q are caused to return to their former positions by means of the lever G and the pin r in the manner heretofore described. The tension of the guides W upon the pasted ends of the wrapped article causes those ends to adhere and prevents them springing loose before the paste has sufficiently dried.

The various operative cams are so arranged with reference to each other and are so timed in their action that the steps are performed successively and the machine operates continuously, going from one step to the next, and while one article is being wrapped another is being brought into position and a new wrapper is being prepared, so that the machine operates with great rapidity and the wrapping is performed with perfect precision.

While I prefer the details of construction which are here shown, I do not limit my invention to them, as it is apparent that they may be modified without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for wrapping packages, the combination, with the folders, of a reciprocating feeding-plunger provided upon two sides only with holding-nippers and a reciprocating pusher located in a line with the nippers of the plunger when the same is in a raised position and adapted to push the article to be wrapped directly between said nippers.

2. In a wrapping-machine, the combination of a support for the article to be wrapped and its wrapper, feeding devices for feeding the wrappers successively over said support, a feeding-plunger for feeding the articles to be

wrapped one at a time to said support, provided with nippers for holding the article, a reciprocating pusher to push the articles laterally between the nippers of the plunger, and folders for folding the edges of the wrapper about the article.

3. In a wrapping-machine, the combination of a feeding-chute for the articles to be wrapped, terminating in a support, supporting-jaws for supporting the articles and their wrappers, folding devices for folding the wrappers about the article while held in said supporting-jaws, a feeding-plunger for feeding the articles one at a time to said supporting-jaws, provided with nippers for holding the article, and a pusher to push the articles successively from the support of the feeding-chute to the feeding-plunger.

4. In a wrapping-machine, the combination, with supporting-jaws for the articles to be wrapped and their wrappers, of folding devices for folding the wrapper about the article, the feeding-plunger E, provided with nippers H' H' for feeding the articles to the supporting-jaws, the cam 3 for operating the plunger, the pusher D' for pushing the articles successively to the nippers of the plunger, the lever D³ for operating the pusher, the cam 2 for operating the lever, and the spring D⁴ for withdrawing the pusher after it has been projected by the lever D³.

5. In a wrapping-machine, the combination, with jaws for supporting the articles to be wrapped, together with their wrappers, of folding devices for successively folding the edges of the wrapper upon the article, feeding devices for feeding the wrappers successively over the supporting-jaws, supports for supporting the wrappers above said jaws, cam mechanism for operating said supports for the wrapper to release the wrapper, and a feeding-plunger for feeding the articles one at a time upon the wrapper and between the supporting-jaws.

6. The combination, in a wrapping-machine, of supporting-jaws to support the article and its wrapper, folding devices to fold the wrapper about the article when so supported, a feeding-plunger to feed the articles one at a time to the supporting-jaws, feeding devices for feeding the wrapper between the plunger and supporting-jaws, supports for holding the wrapper above the jaws, cam mechanism to move said supports from under the wrapper and release it, cam mechanism to reciprocate the plunger, and connections between the cam mechanisms to operate them synchronously.

7. The combination, in a wrapping-machine, of supporting-jaws to support the article and its wrapper, folders to fold the wrapper about the article when so supported, a feeding-plunger to feed the articles one at a time to the supporting-jaws, feeding devices to feed the wrappers over the supporting-jaws and under the plunger, supporting-wings N for the paper carried by the pivoted levers N', and

wheels O, having cam-grooves o for the free ends N² of the levers, whereby the wings N are operated to release the wrapper.

8. The combination, in a wrapping-machine, of supporting-jaws to support the article and its wrapper, folders to fold the wrapper about the article when so supported, a feeding-plunger to feed the articles one at a time to the supporting-jaws, feeding devices to feed the wrappers over the supporting-jaws and under the plunger, paste-supplying rollers to supply paste to the edges of said wrappers, and a stripper to prevent the pasted wrapper adhering to the feeding devices.

9. The combination, in a wrapping-machine, of supporting-jaws to support the article and its wrapper, folders to fold the wrapper about the article when so supported, a feeding-plunger to feed the articles one at a time to the supporting-jaws, feeding-rollers for feeding the wrapper over the supporting-jaws and under the plunger, means to supply paste to one of said rollers, and stripping fingers or wires extending between said rollers to prevent the wrapper adhering to the paste-applying roller.

10. In a wrapping-machine, the combination of supporting-jaws having a yielding supporting-surface to hold the article to be wrapped, together with its wrapper, a delivery-chute extending below said supporting-jaws, folding devices to fold the wrapper about the article while held by the supporting-jaws, and a feeding-plunger provided with nippers for holding and feeding the articles one at a time to the supporting-jaws and adapted to push the article when wrapped from the supporting-jaws to the delivery-chute.

11. The combination, in a wrapping-machine, of two laterally-reciprocating folders for folding over the upper portions of the wrapper, each provided with lateral projections, arranged immediately adjacent to and below the upper portions of said folders, for folding in the sides of the ends of the wrapper, whereby the folding of each upper flap and the corresponding sides of the ends of the wrapper are accomplished simultaneously.

12. The combination, in a wrapping-machine, of the supporting-jaws J' J' for supporting the article to be wrapped and its wrapper, the laterally-reciprocating folders K K, movable over said jaws J' J' and provided

with the folding-blocks K² K², arranged immediately adjacent to and below the upper portions of the folders K K for folding in the sides of the ends of the wrapper, the vertically-movable folders P P for folding down the upper projecting ends of the wrapper, and the vertically-movable folders Q Q for folding up the lower projecting ends of the wrappers, said folders operating successively and entirely folding the package while supported by the jaws J' J', substantially in the manner described.

13. In a machine for wrapping articles, the combination, with folders for folding the wrapper about the article, of a feeding-table to support the articles, terminating in a feeding-chute, side and end guides upon said table to guide the articles to the feeding-chute, and a pusher to push the articles from the chute into a position above the folders.

14. In a wrapping-machine, the combination of supporting-jaws for the articles to be wrapped, a feeding-plunger for feeding the articles thereto one at a time, laterally-movable folders located above the supporting-jaws, means to feed the wrapper between the feeding-plunger and supporting-jaws, the vertically-movable folder P P for folding down the upper projecting end of the wrapper, vertically-movable folders Q Q for folding up the lower projecting ends of the wrapper, and cam mechanism for operating said folders P P and Q Q successively.

15. In a wrapping-machine, the combination of supporting-jaws for the article to be wrapped, a feeding-plunger for feeding the articles thereto one at a time, laterally-movable folders located above the supporting-jaws, means to feed the wrapper between the feeding-plunger and supporting-jaws, the vertically-movable folders P P for folding down the upper projecting end of the wrapper, vertically-movable folders Q Q for folding up the lower projecting ends of the wrapper, lever Q², connected to the folders Q, supporting-levers G', cams R' for operating the levers Q², and pins r for operating the supporting-levers G'.

In testimony of which invention I have hereunto set my hand.

MARTIN EUGENE BRIGHAM.

Witnesses:

ERNEST HOWARD HUNTER,
A. J. DUNN.