No. 724,485. PATENTED APR. 7, 1903.

E. E. MILES.

PACKAGE WRAPPING MACHINE.

APPLICATION FILED JUNE 14, 1902.

NO MODEL. 7 SHEETS—SHEET 1.

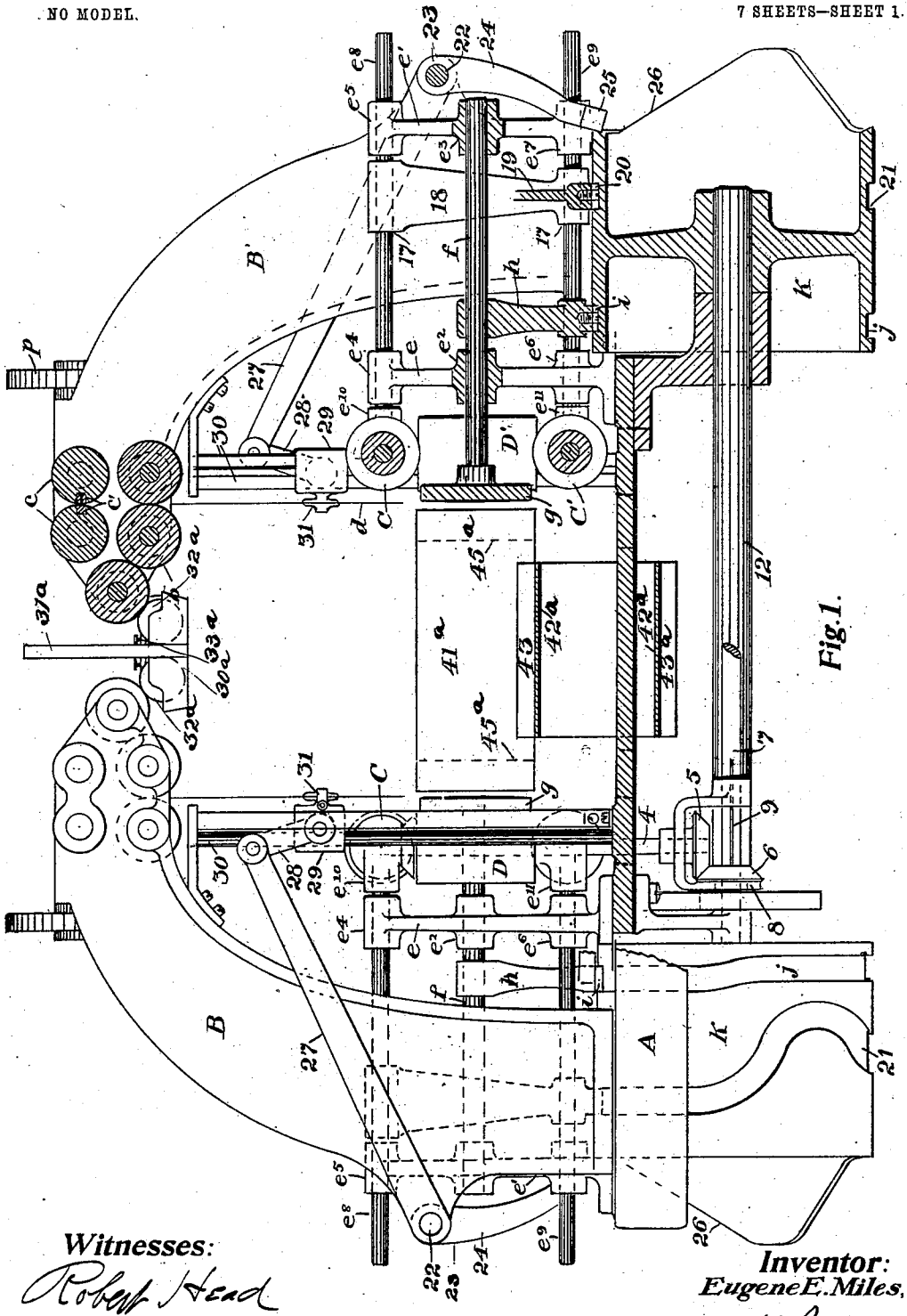


Fig. 1.

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Inventor:
Eugene E. Miles,
By his Attorney,
F. H. Richards.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 7 SHEETS—SHEET 2.

Fig. 13.

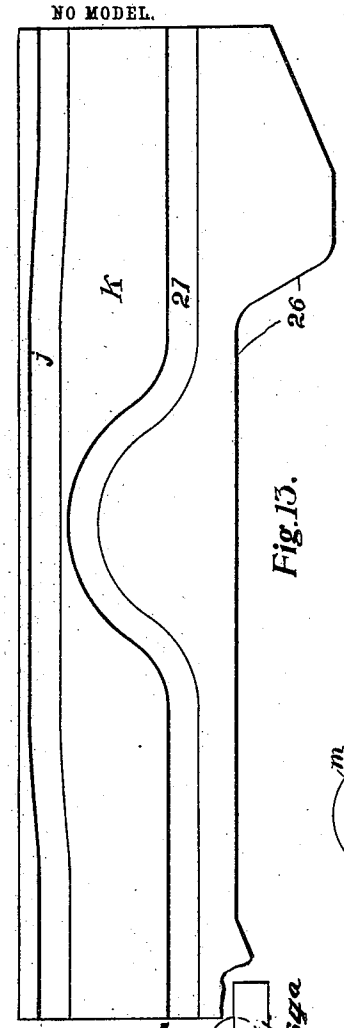


Fig. 2.

Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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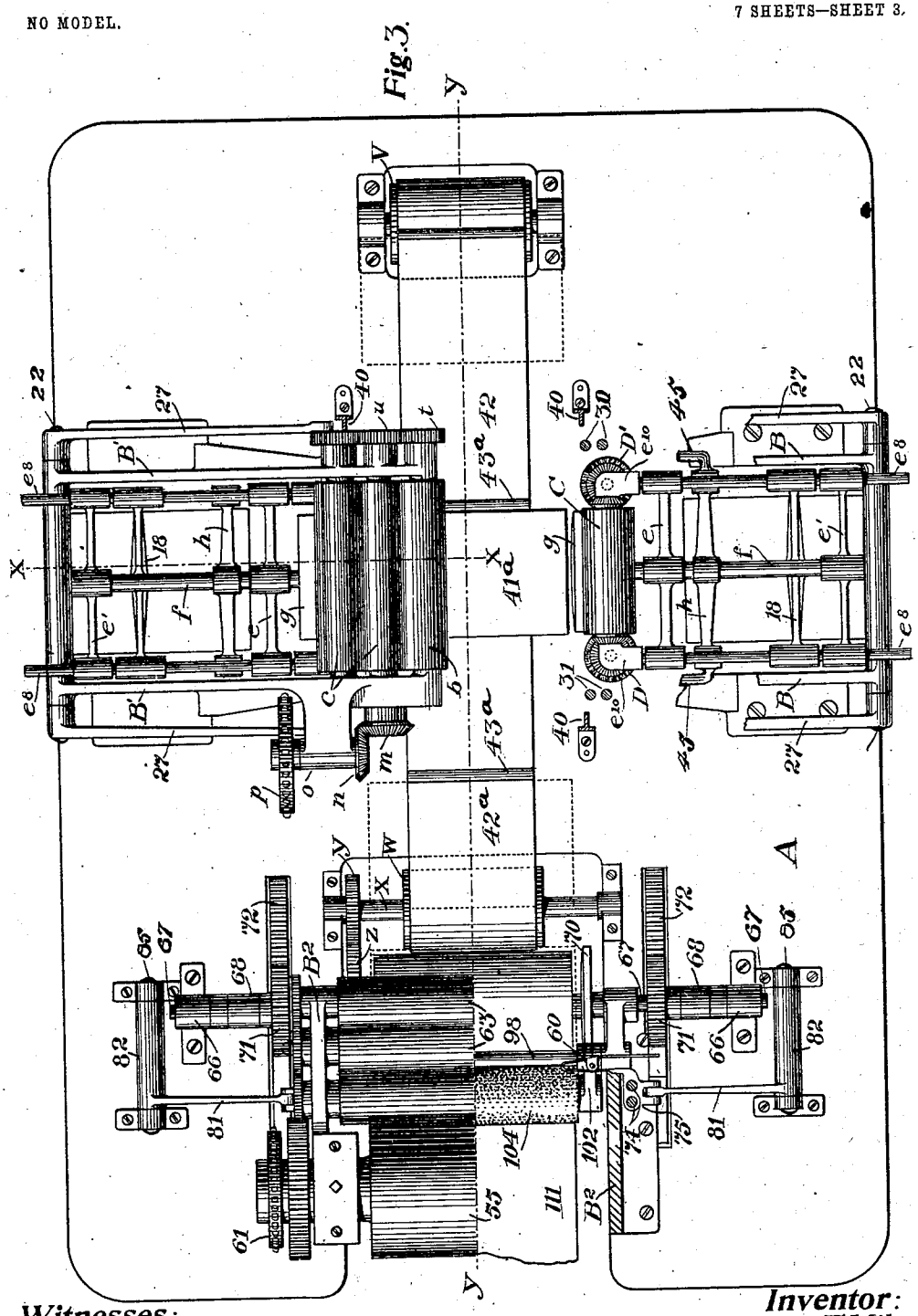
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PACKAGE WRAPPING MACHINE.

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NO MODEL. 7 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
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NO MODEL. 7 SHEETS—SHEET 4.

Fig. 4.

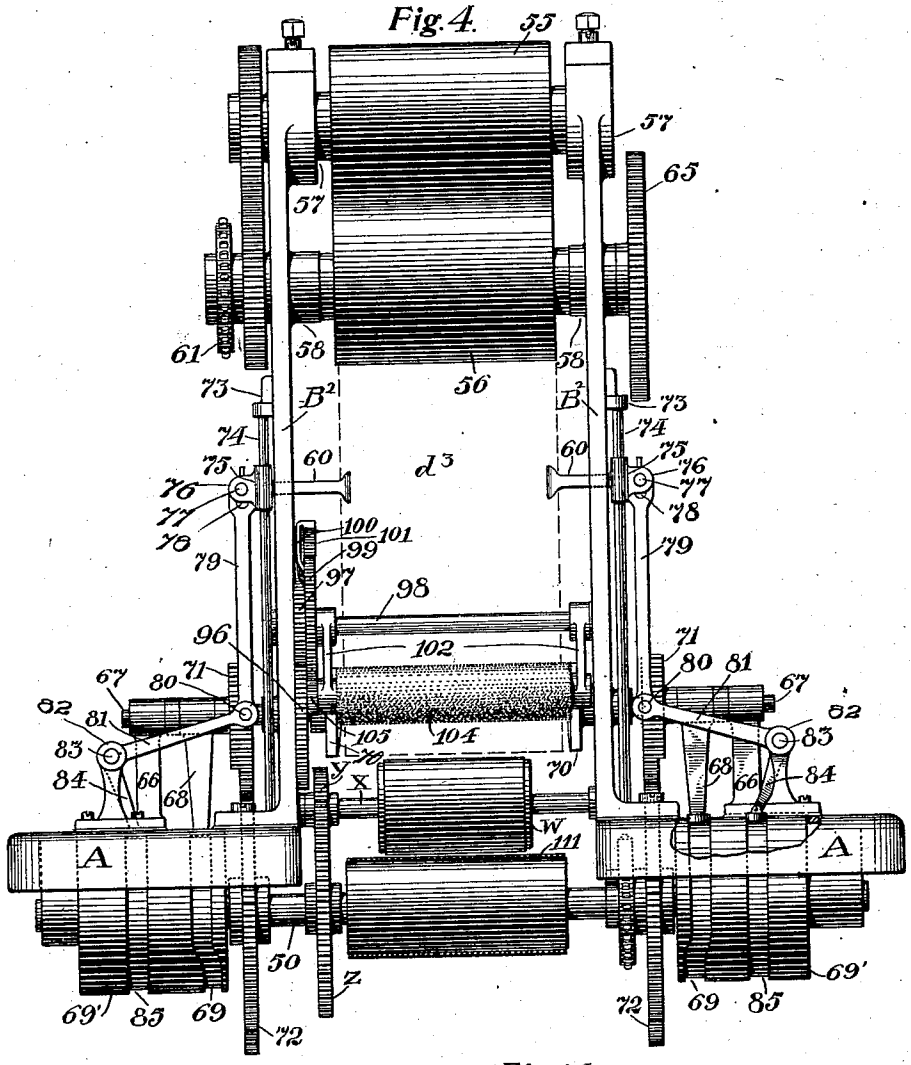


Fig. 14.

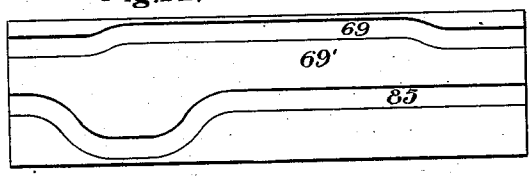


Fig. 7.

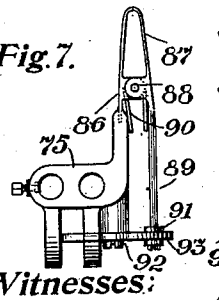


Fig. 8.

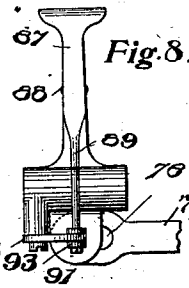
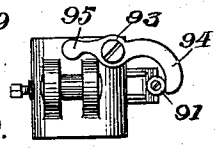


Fig. 9.



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NO MODEL. 7 SHEETS—SHEET 5.

Fig. 5.

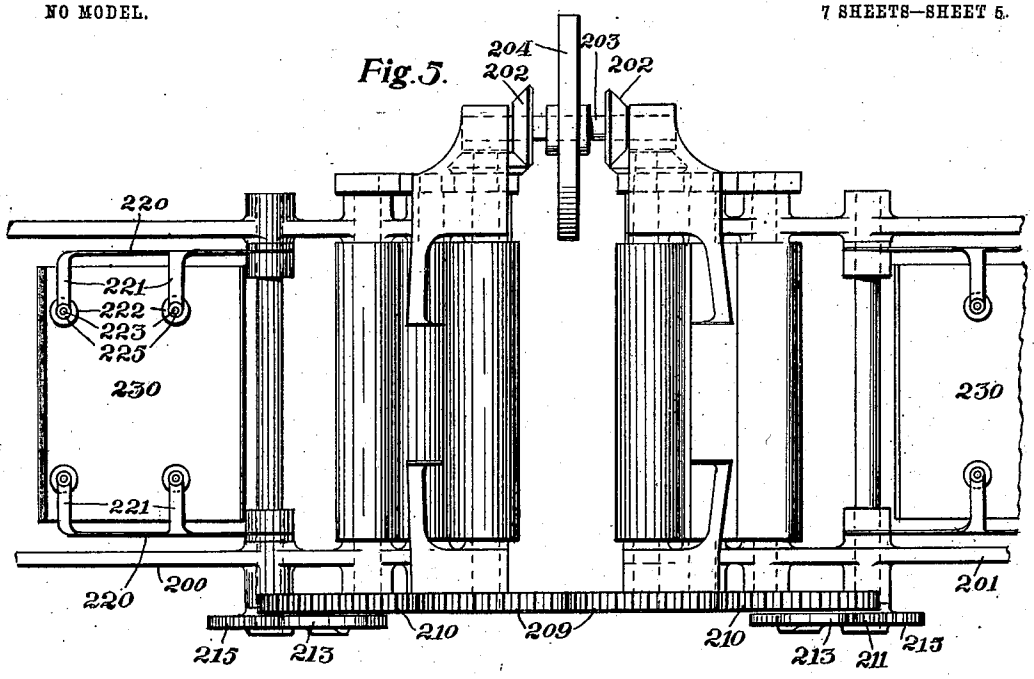
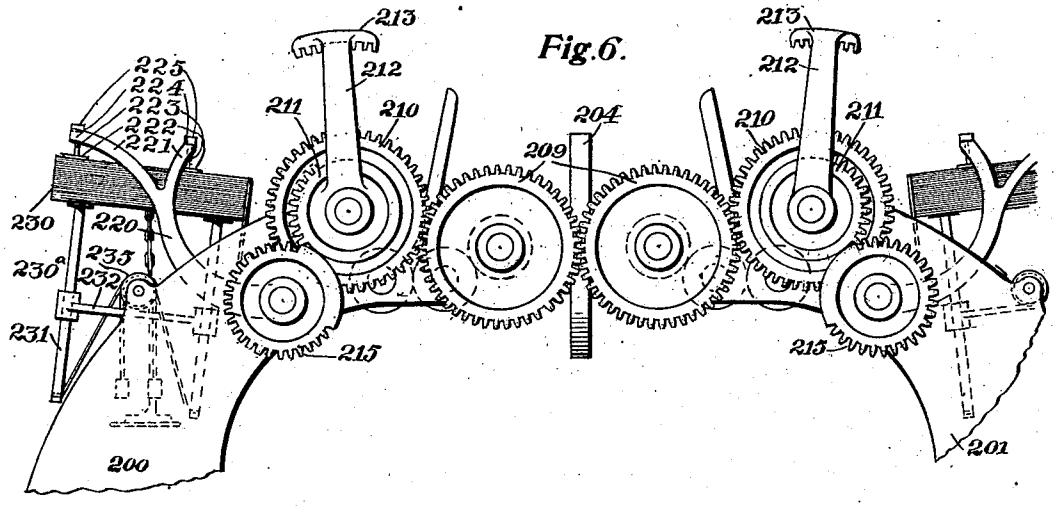


Fig. 6.



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APPLICATION FILED JUNE 14, 1902.

NO MODEL. 7 SHEETS—SHEET 6.

Fig. 10.

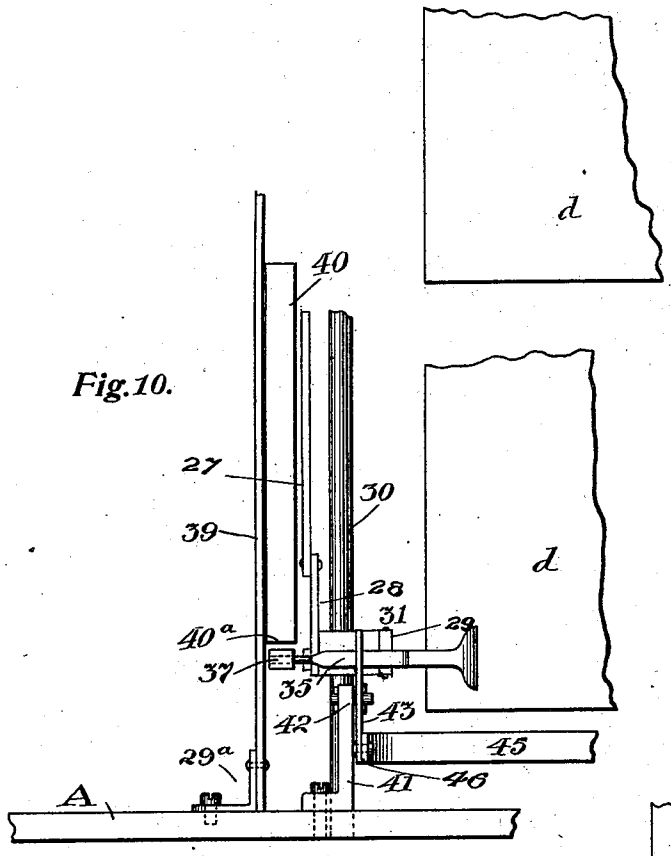


Fig. 11.

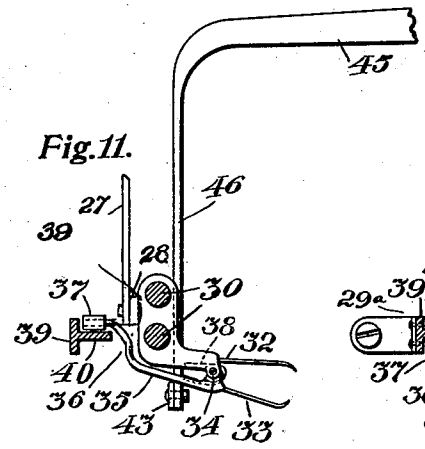
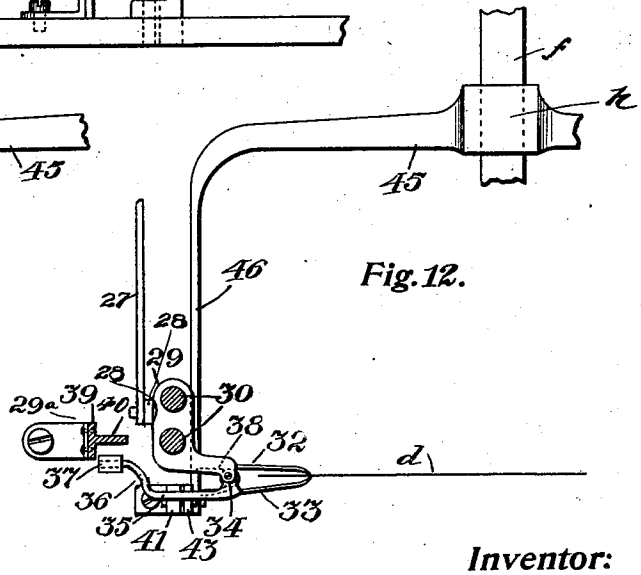


Fig. 12.



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APPLICATION FILED JUNE 14, 1902.

NO MODEL. 7 SHEETS—SHEET 7.

Fig. 15.

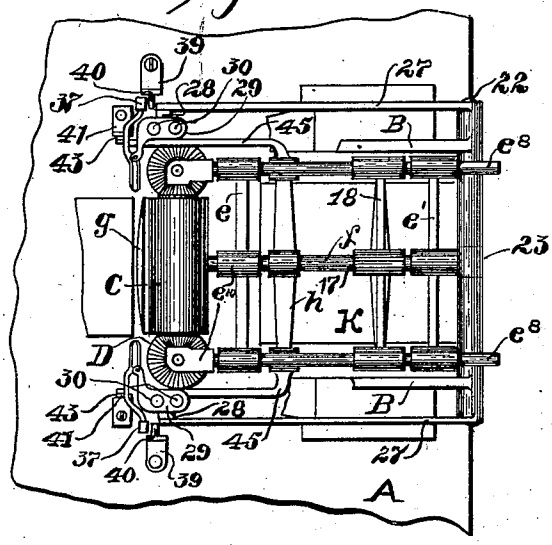
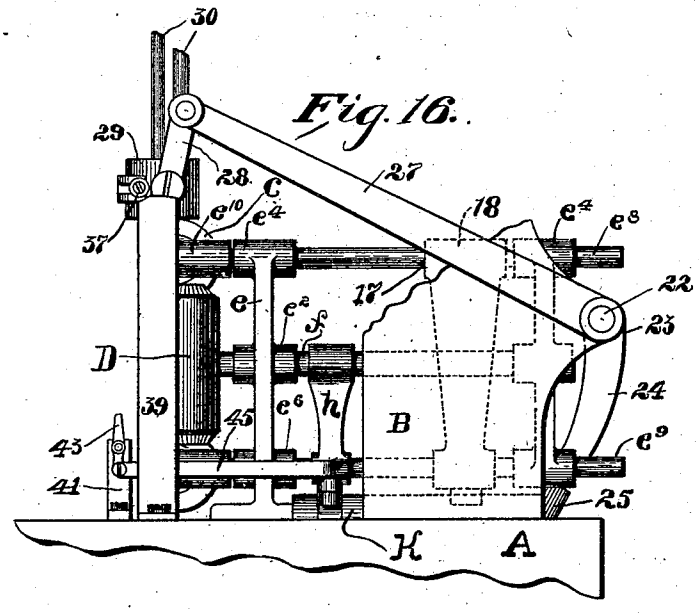


Fig. 16.



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UNITED STATES PATENT OFFICE.

EUGENE E. MILES, OF AKRON, OHIO.

PACKAGE-WRAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,485, dated April 7, 1903.

Application filed June 14, 1902. Serial No. 111,789. (No model)

To all whom it may concern:

Be it known that I, EUGENE E. MILES, a citizen of the United States, residing in Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Package-Wrapping Machines, of which the following is a specification.

This invention relates to package-wrapping machines; and it consists substantially in the improvements hereinafter particularly described.

The invention has reference more especially to that type of package-wrapping machines in which separate portions of the wrappers are applied to different parts of the packages by the successive operation of component mechanisms; and the principal object of the invention is to provide a machine of this kind which is comparatively simple in the construction and organization of the different elements or parts thereof and one also which operates with great efficiency and reliability.

A further object of the invention is to provide means whereby the wrappers are applied to the packages in an air-tight manner, as well as evenly and smoothly, and also to provide simplified and effective devices for actuating the component mechanisms of the machine at proper intervals of the wrapping operations.

These and additional objects are attained by means substantially such as are illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of my improved package-wrapping machine looking at the same from one end thereof, said view being partly in section on the line x x, Fig. 3, and indicating the construction and organization of the devices or elements constituting the mechanisms by which portions of the wrappers are simultaneously applied to the ends of the packages. Fig. 2 is a longitudinal sectional view of the machine on the line Y Y of Fig. 3, parts being in elevation; and Fig. 3 is a top plan view with the cutter-rolls and paste-rolls removed from one side of the machine to more clearly indicate other mechanism. Fig. 4 is an elevation of the machine looking at the same from the end opposite that from which Fig. 1 is viewed and showing the mechanism for effecting the application to the packages of the body portions of the wrappers. Fig. 5 is a top plan view of a modification of one of the component mechanisms of the machine, indicating devices for feeding the wrapper portions in separate sheets instead of from continuous rolls. Fig. 6 is a side view of Fig. 5. Fig. 7 is a top plan view of one of the gripping devices at one part of the machine for operating upon the portions of the wrappers which are applied to the body portions of the packages. Fig. 8 is a side view of the gripping device shown in the preceding figure; and Fig. 9 is an end view of said gripping device, showing more clearly the means for actuating the movable jaw thereof preceding the upward movement of the device to grip an edge of the wrapper-sheet. Figs. 10, 11, and 12 are detail views indicating the construction of the gripping devices for the portions of the wrappers applied to the ends of the packages and also representing the means by which the movable jaws of said gripping devices are actuated preceding the upward movement of the devices to grip or engage the edges of the wrapping material. Fig. 13 is a view showing the development of the cams employed in connection with the mechanism for effecting the application of the end portions of the wrappers to the packages. Fig. 14 is a similar view showing the development of the cams employed with the mechanism for effecting the application of the body portions of the wrappers to the packages. Fig. 15 is a top plan view in detail of one of the component mechanisms of the machine to more clearly indicate the construction and organization of the elements of such mechanism, and Fig. 16 is a side view in detail of such component mechanism.

Before proceeding with a more detailed description it may be stated that in constructing my improved package-wrapping machine I provide suitable means for carrying or conveying the packages one by one to a certain position on the machine where a temporary arrestment of the package takes place, and I employ suitable mechanisms for applying portions of the wrapping material to the ends of the package while the latter is in such position. I also employ additional mechanisms for applying the body portion of the wrapper to the package, this operation taking place

after the package has been advanced to a second position on the machine and again temporarily arrested, and during the application of the body portion of the wrapper to the package the latter is subjected to certain manipulations to insure the complete wrapping thereof, whereupon the wrapped package is passed from the machine and conveyed to any desired place. I may employ any suitable material for the wrapper, such as paper, and the end and body portions of the wrappers may be supplied from endless rolls or in separate sheets, as desired, it being understood that a suitable paste is applied to the inner surface of each of such portions previous to the application or fitting of the same to the package.

Each of the component mechanisms of my improved package-wrapping machine comprises a special construction and organization of elements for the performance of the particular function thereof, and said mechanisms are themselves so organized or combined as to coöperate in the production of a machine of this kind giving the best results in practice.

Specific reference being had to the accompanying drawings by the designating characters thereon, A represents the base or supporting-table of the machine, which is supported in an elevated position by means of legs *a*, arranged at any suitable points thereof, said base being open at different places for the accommodation of connections between working parts of the machine both above and below the base and also having other structural features to be hereinafter referred to in explanation of the general embodiment of machine herein shown. Supported on opposite sides of the table, a suitable distance from one end thereof, are duplicate brackets or overhanging members B B and B′ B′, between the upper ends of each pair of which are supported paste-rolls *b* and cutter-rolls *c*, the space between the latter being coincident with the space between two of the former, the web or strip *d* of wrapping material for an end of the package passing downwardly between such spaces, as shown in Fig. 1, the said pairs of cutter-rolls *c* being provided with suitable devices *c′* for partially severing portions of the wrappers from said webs *d*, as will hereinafter appear. In this embodiment of my invention the said webs *d* are supplied to the machine from rolls (not shown) supported in any suitable position. Also supported on opposite sides of the base or table A, intermediate the said pairs of brackets or overhanging members B B and B′ B′, are supporting-frames each comprising members *e* and *e′*, having centrally thereof suitable bearings e^2 e^3 for the support of a rod *f*, extending longitudinally of the machine, each of said rods being provided at its inner end with a presser plate or disk *g*, the face of which is convex, as shown, said plates constituting the devices for effecting the application to the package of the end portions of the wrapper, as will hereinafter appear. Fitted to each of the rods *f* is the upper end of a pendent arm *h*, the lower end of which is provided with a roll *i*, working in a cam-groove *j*, formed in a cam-cylinder *k* beneath, the sides of said cam-grooves acting upon such rolls to cause the rods *f* and their presser-plates *g* to be moved inwardly transversely of the machine at regular intervals in the operation of the latter. The said frame members *e* and *e′* are also provided at the upper corners thereof with bearings e^4 and e^5, respectively, and at the lower corners with bearings e^6 and e^7, respectively, each pair of said upper bearings supporting a rod e^8, having endwise movement longitudinally of the machine and each pair of said lower bearings supporting a similar movable rod e^9, said upper rods being provided at their inner ends with bearings e^{10}, in which are supported the ends of the shaft of a revolving horizontal brush C, and the inner ends of said lower rods being likewise provided with bearings e^{11} for supporting the ends of the shaft of a similar revolving brush C′, said brushes being thus brought transversely of the machine, as is apparent. The pairs of bearings e^{10} and e^{11} are also constructed to receive and support the ends of the shafts of vertically-disposed revolving brushes D and D′, as shown, the said horizontal and vertical brushes on each side of the machine being geared together, as indicated at 1, 2, and 3, Fig. 2, to revolve in the same direction and receiving their motion from the shaft of one of the vertical brushes, the lower end of said shaft being extended at 4, Figs. 1 and 2, for this purpose and provided with a gear-wheel 5, engaged by a gear-wheel 6 on a shaft 7, each end of which is supported, by means of a retainer 8, beneath the base or table A, said gear-wheel 6 being provided with a feather or spline (not shown) working in a groove or way 9 in said shaft 7 for the purpose hereinafter fully set forth. The shaft extension 4 is supported by the retainer 8, and both the gear-wheels 5 and 6 are within the sides of said retainer, it being here mentioned for clearness that a similar organization of retainer and gears (not shown) is of course provided on the shaft 7 beneath the other set of horizontal and vertical brushes. The shaft 7 is operated, by means of gear-wheels 10 and 11, Fig. 2, from a shaft 12, which in turn is driven from the main shaft 15 of the machine by means of a chain 16, preferably of the so-called Renold "silent" type, and it will be understood that the cam-cylinders *k*, hereinbefore described, are mounted upon and rotated by the said shaft 12.

The upper and lower movable rods e^8 and e^9 on either side of the machine are rigidly connected at 17, Figs. 1 and 3, by means of a spider or frame 18, which is provided with an arm 19, carrying a roll 20, which works between the sides of a cam-groove 21, formed

in the cam-cylinder *k* beneath, the organization being such that the opposite sets of said rods are simultaneously actuated at intervals to carry the horizontal and vertical revolving brushes inwardly from each side of the machine, so as to turn over and apply the edges of the end portions of the wrappers against four sides of a package at the same time, as will appear.

Having its bearings in projections from each pair of brackets or overhanging members B B and B′ B′ is a shaft 22, and pivoted to each end of said shaft at the outer side of said brackets or overhanging members is an angle-lever 23, the shorter arm 24 of which is provided with a roll 25, acted upon by a cam-surface 26 on the corresponding or adjacent cam-cylinder *k*, while the longer arm 27 thereof is inclined upwardly and inwardly, Fig. 1, and movably connected at its upper end with a link 28, which in turn is in movable connection with a block 29, sliding up and down on the guide-rods 30. Said sliding blocks 29 are provided with gripping devices 31, (see Figs. 10 to 12, inclusive,) organized in pairs beneath the paste and cutter rolls at the opposite sides of the machine and operating to grip the webs of wrapping material and draw portions thereof down in position to be applied to the ends of the packages. Each of said gripping devices 31 comprises a stationary jaw 32, secured to its block 29, and a movable jaw 33, pivoted at 34 to said stationary jaw and formed with a tailpiece 35, curved rearwardly at 36 and provided with a roller 37 at the end, said movable jaw being acted upon by a spring 38, tending to normally close the same. Secured at 29^a to the base or table A, on the outer side of each pair of guide-rods 30, is an upright 39, projecting inwardly from which is a vertical guide-rail 40, the lower end 40^a of which extends only to a point slightly above the lowermost position of said gripping devices 31, (see Fig. 10,) and also secured to the base or table slightly in advance of each pair of said guide-rods 30 is a support 41, to the inner side of which is pivoted at 42 a lever 43, the upper end of which extends upwardly to a position in front of said tailpiece 35. Each of the arms *h* on the rods *f* is provided with a yoke 45, Figs. 15 and 16, the members 46 of which extend inwardly in such manner that the ends thereof engage the lower ends of the pivoted levers 43, and on each inward movement imparted to said rods *f* from the cam-cylinders *k* the said yokes are of course carried inwardly therewith and the upper ends of said levers 43 are carried against the tailpieces of the movable jaws of the gripping devices 31 to carry said jaws to an open position, as indicated in Fig. 11. When the said gripping devices 31 are at their lowermost positions, the movable jaws thereof are closed, and the rollers 37 on the tailpieces 35 are then located slightly beyond the inner sides of the guide-rails 40, (see Fig. 12,) whereas on engagement of the lower ends of levers 43 by the ends of the yoke members, as explained, said rollers are carried to positions beyond the outer sides of said guide-rails by the opening of the movable jaws, and as soon as this action takes place the sliding blocks 29 begin to ascend, the movable jaws being held open during the full upward movement of said blocks, owing to the riding of the said rollers 37 upon the said outer faces of the said guide-rails 40. During the upward movement of the gripping devices they move freely over the edges of the hanging portions of the wrapping-webs *d* of course; but as soon as they have reached the limit of such movement the springs 38 force the rollers 37 over the upper ends of guide-rails 40, thereby closing the movable jaws 33, and thus the webs *d* are seized upon at the edges and portions thereof are drawn downwardly with the downward movement of the gripping devices. The packages 41^a are carried through the machine from end to end by means of an endless carrier-belt 42^a, provided with cleats 43^a to give the packages a positive forward movement, and said belt is stopped temporarily as each package is brought to position with the ends thereof in line with the presser plates or disks *g g* on the rods *f f*. It is at the time of this arrestment of the package that the gripping devices 31 are caused to descend, with edges of portions of the webs *d* between them, said webs being carried through or between the cutter and paste rolls much faster than results from the normal operation of said rolls, and this action results in severance of portions of the webs by means of the devices *c′* of the cutter-rolls, which portions are carried by the said gripping devices to positions between the ends of the package and the presser-plates *g*, whereupon the rods *f* are actuated from the cam-cylinders *k* to carry said presser-plates inward against the ends of the package simultaneously, and thus are the end portions of the wrappers made to adhere to the ends of the package in an obvious manner. The end portions of the wrappers are of greater dimensions than the area of the ends of the package, and thus marginal edges of these wrapper portions are left at all four sides of the package, which edges are turned down against the sides of the package by means of the horizontal and vertical brushes on each side of the machine, which brushes are simultaneously operated from cam-cylinders *k* to be moved inwardly as far as the dotted lines 45^a 45^a, Fig. 1, as soon as the presser-plates *g* have been reciprocated. Said horizontal and vertical brushes move over the sides of the package at the ends, and thus turn over and smooth down the marginal edges of the end portions of the wrappers, the said end portions of the wrappers being thus made to adhere to the ends of the package. By constructing the presser plates or disks *g* with convex faces they are made to slightly press into the end surfaces of the packages with the end wrap-

per portions, and thus all air is forced out or expelled from between the ends of the package and said wrapper portions, and the latter are applied without formation of air-blisters thereon.

The cutter-rolls *c* at each side of the machine are operated by means of a bevel-gear *m*, attached to the shaft of one of them and engaged by a similar gear *n*, carried by one end of a short shaft *o*, Fig. 3, on the other end of which is mounted a chain-gear *p*, driven by means of a drive-chain *s*, receiving its motion from a pulley on the drive-shaft 15. (See Fig. 2.) The paste-rolls *b* at each side of the machine are geared together, Fig. 1, and a gear *t* on one of them is engaged by a gear *u* on one of the cutter-rolls, thus operating said paste-rolls to revolve both to draw the web *d* downwardly with a relatively slow motion and at the same time to apply paste to said web. Paste may be supplied to said rolls in any well-known manner; but preferably I employ a paste-trough 30^a, Fig. 1, suspended from any suitable support (not shown) by means of a hanger 31^a, said trough having supported between opposite sides thereof suitable paste-supply rolls 32^a 32^a, which are rotated in the trough by contact with the innermost one of the sets of paste-rolls *b* at the opposite sides of the machine, said innermost rolls thus having paste continuously applied thereto, and which paste in turn is applied to such of the rolls *b* as are in contact with the inner surfaces of webs *d d*, it being in this way that the application of paste to such surfaces is effected. I may also employ suitable scrapers, such as indicated at 33^a, for removing excess of paste from said paste-supply rolls.

The endless carrier-belt 42 for the package passes around a drum *v* at one end of the machine and a similar drum *w*, located near the opposite end of the machine, the shaft *x* of said latter drum being provided with a gear-wheel *y*, which is engaged by an intermittent gear-wheel *z*, carried by a shaft 50, which is provided with a gear 51, connecting with a gear on the main driving-shaft 15 by means of a chain 52. (See Fig. 2.) The intermittent or mutilated gear-wheel *z* is provided with teeth enough only, as shown, to impart one revolution to belt-drum *w* each time said gear-wheel *z* engages the gear-wheel *y* on the shaft *x* of said drum, and it is in this way that the carrier-belt for the packages is operated intermittently for the purpose explained. Of course said operation could be attained by other means, if desired, and I am not limited to the particular devices herein shown.

Mounted and secured in place upon the base or table A, at the left of the machine in Fig. 2, and substantially at right angles to the brackets or overhanging members B B and B′ B′ are brackets or uprights B^2 B^2, between the upper parts of which the cutter-rolls 55 and 56 for the body portions of the wrappers have their bearings, as shown at 57 and 58, Fig. 4, said rolls being provided with cutting devices 59, by which severance of the wrapper portions is effected by the quick pull exerted on the pendent portion of the web d^3 by the gripping devices 60, about to be described. Said rolls are operated by means of a gear-wheel 61, carried at one end of the shaft of roll 56 and connecting with a suitable gear on the drive-shaft 15 by means of a chain 62. (See Fig. 2.) Also having their bearings between inward extensions of said brackets or uprights B^2 B^2 are the pasting-rolls 63 for the body portions of the wrappers for the packages, said rolls being geared together, as shown in Fig. 2, and the shaft of one of them having a gear-wheel 64, which is engaged by an enlarged gear-wheel 65 on the shaft of the cutter-roll 56. (See Figs. 2 and 4.) The web d^3 for the body portions of the package-wrappers passes between the cutter-rolls and pasting-rolls therefor, and in this instance is supplied to the machine in a continuous manner from a suitably-situated roll. (Not shown.) This innermost pasting-roll 63 is supplied with paste from a supply-roll 63^a, supported in opposite sides of a paste-trough 64^a and rotated by contact with said innermost roll, the paste applied to this latter roll being transferred to the roll against which the inner surface of web d^3 works, such web-surface being in this way supplied with paste.

Secured to the base or table A at the outer side of each of the said brackets or uprights B^2 B^2 is a bearing-support 66 for one end of a short shaft 67, which is also supported near its other end by a projection on the adjacent bracket or upright, said shafts each being provided near its middle portion with a rigid pendent arm 68, having a roll at its lower end working between the sides of a cam-groove 69, formed in a cam roll or cylinder 69′, carried by the shaft 50, hereinbefore referred to. At the inner end thereof each shaft 67 is provided with a disk or plate 70, and said shafts are each also provided with a gear-wheel 71, which is engaged by the teeth of an intermittent gear-wheel 72, also mounted on said shaft 50, the said wheels 72 having teeth sufficient to impart two revolutions to said wheels 71 to each revolution made by themselves, and it will be noted that the organization of elements just described is such that the shafts 67 are first moved inwardly (which motion occurs while gears 71 and 72 are disengaged) by the action of the cam rolls or cylinders 69, after which said shafts are rotated, the purpose of these movements being more fully explained hereinafter. Just prior to the completion of the second revolution of said gear-wheels 71 the shafts 67 are again moved outwardly, also as will appear.

Held in place by suitable supports 73, Fig. 4, therefor on the outer sides of the brackets or uprights B^2 B^2 are vertical parallel guide-rods 74, on which work vertically-reciprocating carrier-blocks 75 for the gripping devices

60, hereinbefore referred to, said carrier-blocks each being provided with ears 76, (see Fig. 4,) connected by a pin 77, and said pins each extending through a vertical slot 78 in the upper end of a connecting-rod 79, the lower end of which is in movable connection at 80, Fig. 4, with the inner end of the longer arm 81 of an angle-lever 82, pivoted at 83, and the end of the shorter arm 84 of which is provided with a roll working between the sides of the cam-groove 85 in the cam roll or cylinder 69′ beneath. It is apparent that during the rotary movements of said cam-cylinders the said carrier-blocks 75 will be reciprocated vertically at intervals of operation of the machine. The said gripping devices 60, Figs. 7, 8, 9, each comprises a rigid jaw 86, supported by one of the blocks 75, and a movable jaw 87, pivoted to said rigid jaw at 88 and provided with an extension 89, said movable jaw being held normally closed by a spring 90. The extension 89 of the movable jaw of each of said gripping devices 60 is provided at its end with a small roller 91, and pivoted at 92 on the side of each block 75 is a curved lever 93, the arm 94 of which extends above and transversely of the roller 91, and the weighted arm 95 of which is in position to be engaged by the upper end of the adjacent connecting-rod 79. The said connecting-rods have a slight independent movement in virtue of the slots 78 in the upper ends thereof, so that the movable jaws of said gripping devices 60 are opened before the blocks 75 begin to ascend and are again closed immediately preceding the starting of said jaws to descend. On the upward movements of said rods the upper ends thereof engage the weighted arms of levers 93, thus causing the arms 94 thereof to engage the rollers 91, and thereby open the movable jaws of said devices 60, whereupon as said rods start to descend the said weighted arms of the levers are lowered, thus releasing said movable jaws, it being in this way that the said web d^3 is gripped or taken hold of by the grippers.

A gear-wheel 96 on shaft 67 (at the left of Fig. 4) engages with a pinion 97, carried at the corresponding end of a shaft 98, said shaft 98 also carrying a mutilated gear-wheel 99, having a radial arm 100, formed or provided with a segment of internal gear 101. Suspended from said shaft 98 by means of hangers 102, Fig. 4, is the shaft 103 of a circular rotary brush 104, one end (left in Fig. 4) of said shaft being provided with a pinion 105, which pinion is operated both by the gear-wheel 99 and segmental internal gear 101, as will be explained hereinafter. Some of the teeth of gear-wheel 99 are omitted directly beneath said internal gear 101, so that the said pinion is caused to operate in opposite directions by the continuous rotation of said wheel 99.

Located at the delivery end of the endless conveyer for the packages is a light frame 107, pivoted at 108 and provided with an arm 109, having a counterweight 110, and at 111 is indicated a traveling belt onto which the wrapped packages are dropped one by one to be conveyed away to any desired place, said belt being operated independently in any suitable way.

The machine being started to operate, the packages are successively carried to the first position of arrestment thereof, as already explained, whereupon the gripping devices 31 are elevated to take hold of the webs d at the edges and then draw down upon such webs to bring portions thereof in position between the ends of the package and the presser-disks g. In the act of being drawn down these portions of the webs are pulled upon with a sort of jerk, which causes them to be separated or cut off by means of the cutting devices c' of the cutter-rolls d, and the inner surfaces thereof are supplied with paste from the pasting-rolls b on passing between the latter. The rods f are next operated to force the end portions of the wrappers against the ends of the package by means of said presser-disks g, and following upon this action the horizontal brushes C C′ and vertical brushes D D′ are simultaneously operated from opposite sides of the machine to apply the said-mentioned end portions of the wrappers in the manner already explained. After this the package is moved forward to the second position of arrestment thereof, another package taking the position of the first, and so on continuously. On reaching such second position of arrestment a portion of the wrapping-web d^3 is similarly drawn down by the action of the gripping devices 60, so that the lower edge of such portion extends to a point about in line with the axis of the suspended rotary brush 104 in position to be applied to the body portion of the package by said brush. The shafts 67 are also shifted by cam rolls or cylinders 69 to cause the disks or plates 70 to take hold of the package at the ends, whereupon said shafts are then rotated by engagement with the gear-wheels 71 of the intermittent gear-wheels 72. As said shafts are thus rotated the package is of course carried around also, the said rotary brush 104 being at the time rotated against the package in the direction of the arrow 120 by engagement of the gear 99 with the pinion 105 in the shaft of said brush, the said package and the said brush being rotated in opposite directions to each other, the brush serving to apply the body portion of the wrapper to the package evenly and smoothly, as is apparent. When the package has been carried around so that the rotary brush is at the first corner thereof, the motion of said brush is reversed by the teeth of gear-segment 101 engaging said pinion in place of gear-wheel 99, and as the brush 104 is hung from the shaft 98 it is evident that said brush bears with some pressure on the package, and thus the frame is now pressed down-

wardly to deliver the wrapped package upon the belt 111, said frame being restored to position by the counterweight 110.

I have herein shown and described an organization of horizontal and vertical brushes which are simultaneously operated against four sides of a package at the ends, as explained; but it is evident that such organization may be changed in accordanee with the number of sides possessed by the package. It is also apparent that for packages which are concave or convex on the sides the shapes of the said horizontal and vertical brushes may be altered from end to end in accordance therewith. Other changes from the construction and organization of elements of the different mechanisms herein specifically described may also be made without departing from the spirit of my invention.

In some instances instead of supplying the end portions of the wrapper to the machine from continuous rolls of wrapping material I may first cut such portions to the required length or sizes and supply the same to the machine in separate sheets, and for which purpose a somewhat-different mechanism is required to deliver the said sheets or wrapper portion to the paste-rolls. Thus in Figs. 5 and 6 I have shown a modification for this purpose and wherein the numerals 200 and 201 designate brackets or upright members corresponding to the brackets or upright members B B and B′ B′. (Shown in the preceding figures.) Supported between each pair of said upright members 200 and 201 are the paste-rolls, which are geared together, and the two sets of the said rolls are operated by means of bevel-gears 202, carried by a short shaft 203, having an enlarged gear-wheel 204, which is driven in any suitable manner from the main driving-shaft of the machine. At the end of one of each set of the paste-rolls, opposite to the connecting-gearing thereof, is a gear-wheel 209, engaging with gears 210, said gears 209 also engaging with each other and the shafts of the gears 210 each having thereon an intermittent gear 211, provided with an arm 212, having at the end thereof internal gear-segments 213, which segments are brought around at intervals of operation of the mechanism to engage with and partially rotate the mutilated gear-wheels 215. (Clearly indicated in Fig. 6.) On the shaft of each of the said last-mentioned gears are fitted two arms 220, terminating in fingers 221, which in the present instance consists of plain metal disks 222, fastened at the end of short rods 223, passing through bearings 224 and held yieldingly in position by suitable springs 225. On the under side of each of said disks a piece of felt or other material may be applied and charged with some sticky substance to take up the sheets one at a time from the pile of package-wrappers 230, or I may use rubber cups that may be pressed down by means of the springs referred to, so as to adhere to the said sheets. A pile of wrappers is supported on a frame 230^a at each side of the machine, said frame having supporting-guides 231, passing through a spider 232 and provided with a cord or chain running over pulley 235, to which cord a suitable counterbalancing-weight may be attached, as shown.

From the construction described and shown it is obvious that the separate sheets will be taken up one by one and supplied to the machine in a manner to be applied to the end portions of the packages similarly as in the instance hereinbefore referred to with regard to the other figures of the drawings.

Where reference is made to the different sets of cutter-rolls in the embodiment of invention shown in Figs. 1 to 4, inclusive, for instance, it will be understood that the cutter devices of such rolls do not completely sever the wrapper portions from the strip, but simply partly cut or sever such portions on broken lines—such, for instance, as are indicated just beneath the cutter-rolls *c* in Fig. 2—the detachment of the wrapper portions being effected by the different gripping devices succeeding the passage of the partially-severed portions of the wrapper-strips through the respective sets of pasting-rolls therefor.

Having described my invention, I claim—

1. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, and means for folding the margins of said wrapper portions against the sides of the package.

2. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, and means for folding the margins of said wrapper portions against the sides of the package.

3. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

4. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrap-

per portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

5. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, and means for folding the margins of said wrapper portions against the sides of the package.

6. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, and means for folding the margins of said wrapper portions against the sides of the package.

7. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such portions into contact with the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

8. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to press such wrapper portions into contact with the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

9. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices operating to carry the wrapper portions to position, means operating to press such wrapper portions into contact with the package, and means for folding the margins of said wrapper portions against the sides of the package.

10. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, and means for folding the margins of said wrapper portions against the sides of the package.

11. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

12. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

13. A package-wrapping machine comprising an endless traveling belt for the package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, and means for folding the margins of said portions against the sides of the package.

14. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary

position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, such wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, and means for folding the margins of said wrapper portions against the sides of the package.

15. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

16. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, gripping devices for carrying the wrapper portions to position, presser-plates operating to press such wrapper portions into contact with the package and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

17. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such wrapper portions into contact with the package, and means for folding the margins of said wrapper portions against the sides of the package.

18. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, presser-plates operating to affix such wrapper portions to the package, and means for folding the margins of said wrapper portions against the sides of the package.

19. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such portions into contact with the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

20. A package-wrapping machine comprising means for supporting a package in stationary position upon the machine, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, presser-plates operating to affix such wrapper portions to the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

21. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such wrapper portions into contact with the package, and means for folding the margins of said wrapper portions against the sides of the package.

22. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, presser-plates operating to affix said wrapper portions to the package, and means for folding the margins

of said wrapper portions against the sides of the package.

23. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such wrapper portions into contact with the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

24. A package-wrapping machine comprising an endless traveling belt for a package, means for temporarily arresting the motion of the belt to bring the package to a stationary position, opposite sets of pasting-rolls for feeding sets of pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, presser-plates operating to press such wrapper portions into contact with the package, and revolving brushes operating to fold the margins of said wrapper portions against the sides of the package.

25. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, means for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package.

26. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, means for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package.

27. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, revolving brushes operating to fold the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package.

28. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, revolving brushes operating to fold the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package.

29. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such wrapper portions into contact with the package, means for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package and means for applying such wrapper portion to the package.

30. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, presser-plates operating to affix such wrapper portions to the package, means for folding the margins of said wrap-

per portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package.

31. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such wrapper portions into contact with the package, revolving brushes operating to fold the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package.

32. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing such jaws on the upward and downward movements thereof, respectively, presser-plates operating to affix such wrapper portions to the package, revolving brushes operating to fold the margins of the wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package.

33. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, means for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package, such means including a swinging brush, and devices rotating the same in opposite directions, and devices for rotating the package in contact with said brush.

34. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, means for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package, said means including a swinging brush and devices rotating the same in opposite directions, and devices for rotating the package in contact with said brush.

35. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such portions into contact with the package, revolving brushes operating to fold the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package, said means including a swinging brush and devices rotating the same in opposite directions, and devices for rotating the package in contact with said brush.

36. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, presser-plates operating to affix such wrapper portions to the package, revolving brushes operating to fold the margins of such wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body portion of the package, said means including a swinging brush and devices for rotating the same in opposite directions, and means for rotating the package in contact with said brush.

37. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding sets of pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such wrapper portions into contact with the package, means for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapping portion to the machine for application to the body of the

package, and means for applying such body portion to the package, said means including a swinging brush and devices for rotating the same in opposite directions, and means for rotating the package in contact with said brush.

38. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, presser-plates operating to affix such wrapper portions to the package, means for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package and means for applying such body portion to the package, said means including a swinging brush and devices for rotating the same in opposite directions, combined with devices for rotating the package in contact with said brush.

39. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, means operating to press such portions into contact with the package, revolving brushes operating to fold the margins of said wrapper portions against the sides of the package, additional rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, and means for applying such body portion to the package, said means including a swinging brush and devices for rotating the same in opposite directions, combined with devices for rotating the package in contact with said brush.

40. A package-wrapping machine, comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, said wrapper portions being supplied from continuous strips, sets of cutter-rolls for said strips, vertically-reciprocating gripping-jaws for carrying the wrapper portions to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, presser-plates operating to affix such wrapper portions to the package, revolving brushes for folding the margins of said wrapper portions against the sides of the package, additional pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package and means for applying such body portion to the package, said means including a swinging brush and devices for rotating the same in opposite directions, combined with devices for rotating the package in contact with said brush.

41. A package-wrapping machine comprising an intermittently-operating traveling belt for a package, opposite sets of pasting-rolls for feeding pasted wrapper portions to the machine for application to the ends of the package, means for carrying the wrapper portions to position, means operating to press such wrapper portions into contact with the package, means for folding the margins of said wrapper portions against the sides of the package, additional rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, said body portion of the wrapper being supplied from a continuous strip, a set of cutter-rolls for said strip, vertically-reciprocating gripping-jaws for carrying the body portion of the wrapper to position, means for opening and closing said jaws on the upward and downward movements thereof, respectively, and means for applying the body portion of the wrapper to the package, said means including a swinging brush and devices for rotating the same in opposite directions, combined with means for rotating the package in contact with said brush.

42. A package-wrapping machine comprising a counterweighted support for a package, a set of pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, transversely-reciprocating devices for gripping the ends of the package, and means for intermittently rotating said devices, a rotary brush for applying the wrapper portion to the package, and means for operating said brush in opposite directions.

43. A package-wrapping machine comprising a counterweighted support for a package, a set of pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, transversely-reciprocating devices for gripping the ends of the package, and means for intermittently rotating said devices, a hanging rotary brush for bearing against the package to apply the wrapper portion thereto, and means for operating said brush in different directions, said means including a rotary mutilated external gear-wheel having an arm provided with a segment of internal gear each engaging a pinion on the shaft of the brush.

44. A package-wrapping machine comprising a counterweighted support for a package, a set of pasting-rolls for feeding a pasted wrapper portion to the machine for application to the body of the package, said portion

being supplied from a continuous strip, a set of cutter-rolls for said strip, vertically-reciprocating gripping-jaws for carrying the wrapper portion to position, and means for opening and closing said jaws on the upward and downward movements thereof, respectively, transversely-reciprocating devices for gripping the ends of the package and means for intermittently rotating said devices, a hanging rotary brush for bearing against the package to apply the wrapper portion thereto and means for operating said brush in different directions, said means including a rotary mutilated external gear-wheel having an arm provided with a segment of internal gear each engaging a pinion on the shaft of the brush.

EUGENE E. MILES.

Witnesses:
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