No. 740,457. PATENTED OCT. 6, 1903.

T. G. McGIRR.

WRAPPING MACHINE.

APPLICATION FILED JAN. 3. 1902.

NO MODEL. 5 SHEETS—SHEET 1.

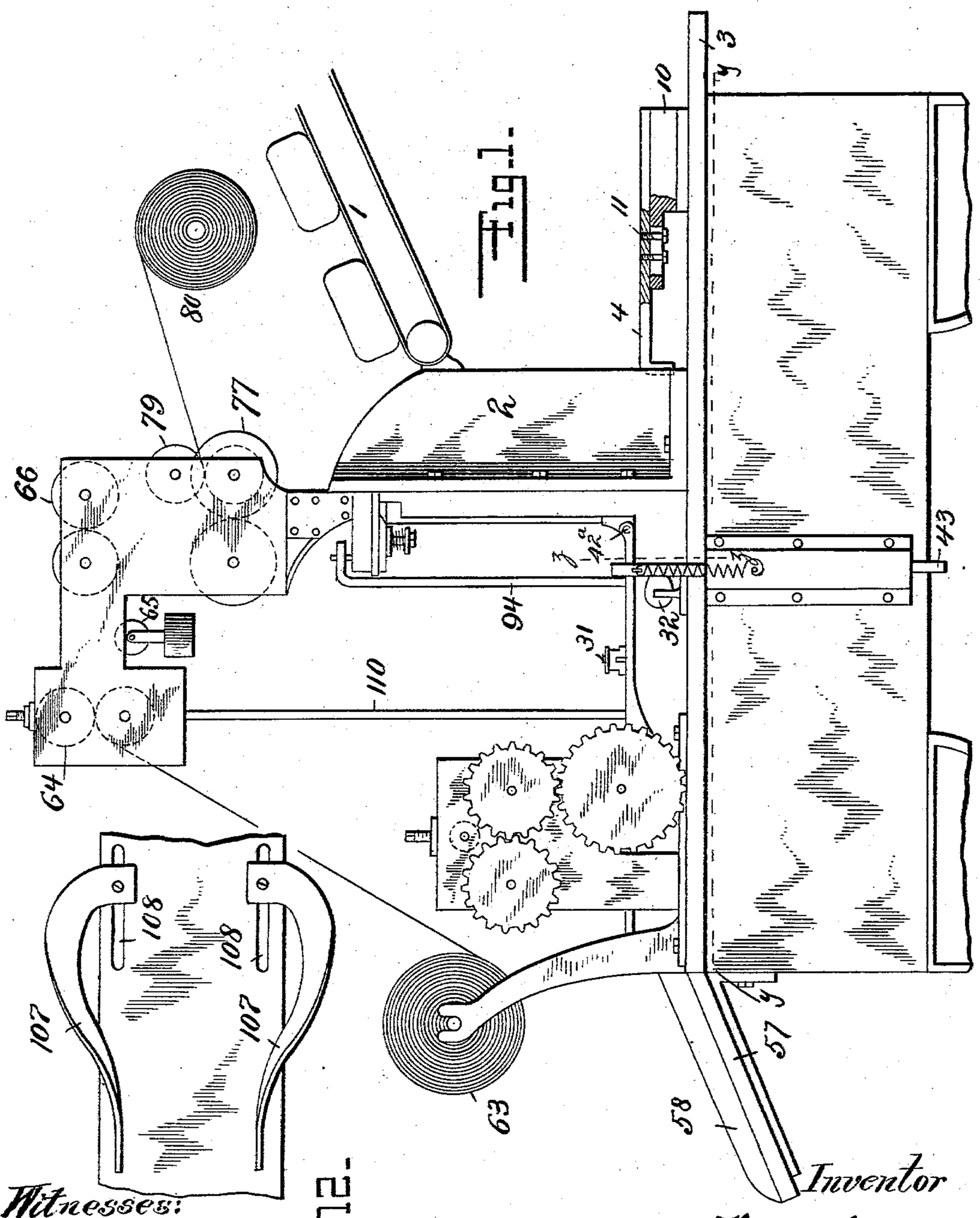

Fig. 1.

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NO MODEL. 5 SHEETS—SHEET 2.

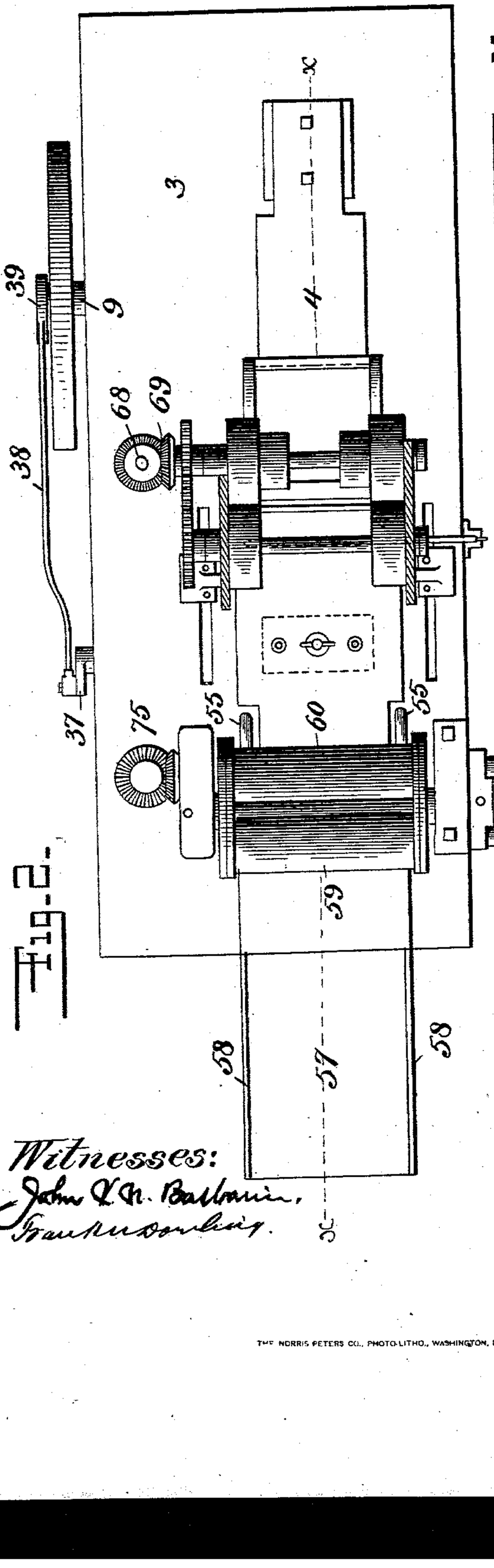

Fig. 2.

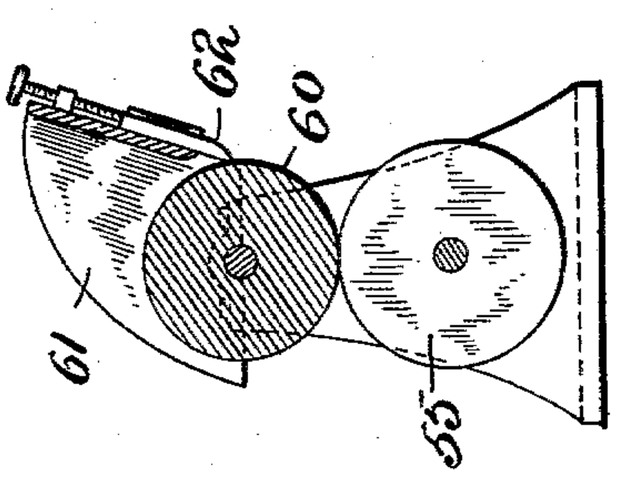

Fig. 11.

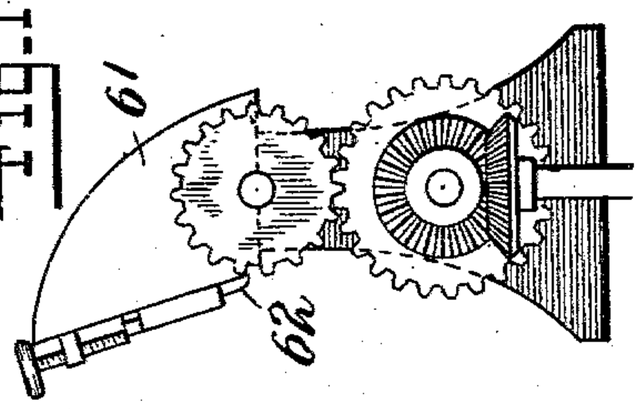

Fig. 10.

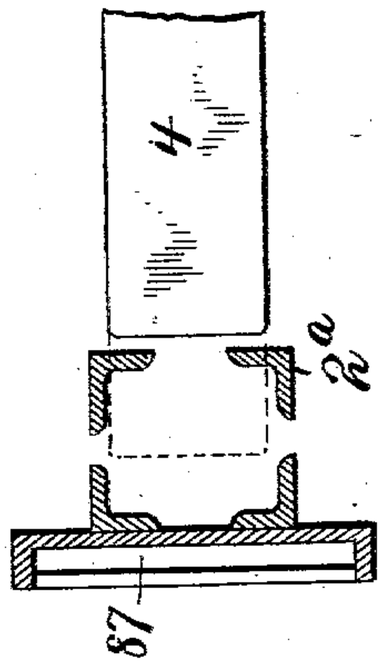

Fig. 9.

Witnesses:
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NO MODEL. 5 SHEETS—SHEET 3.

Fig. 6.

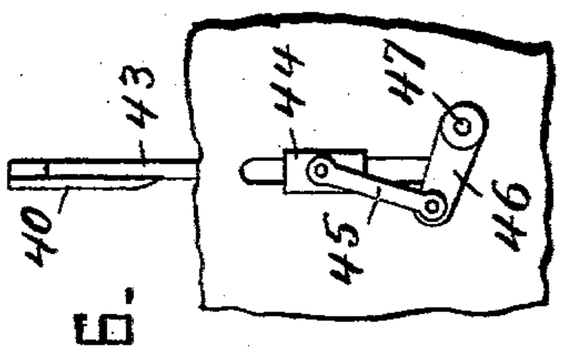

Fig. 8.

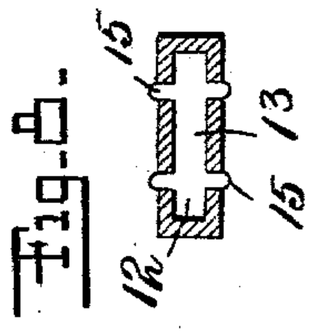

Fig. 7.

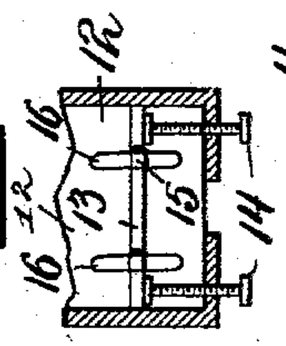

Fig. 4.

Fig. 5.

Fig. 9.

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NO MODEL. 5 SHEETS—SHEET 4.

Fig. 4.

Fig. 20.

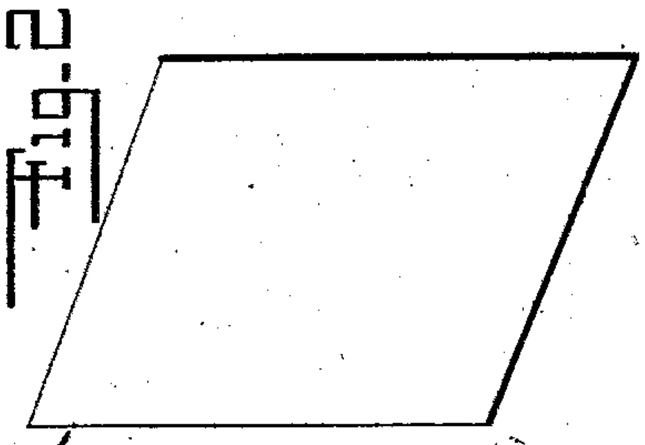


Fig. 21.

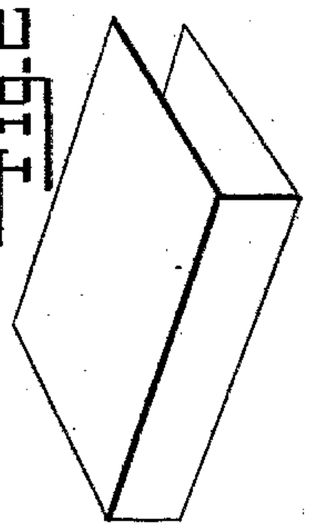


Fig. 22.

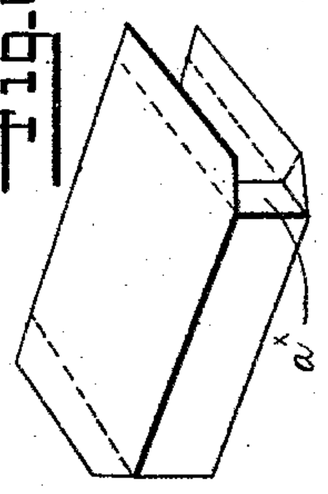


Fig. 23.

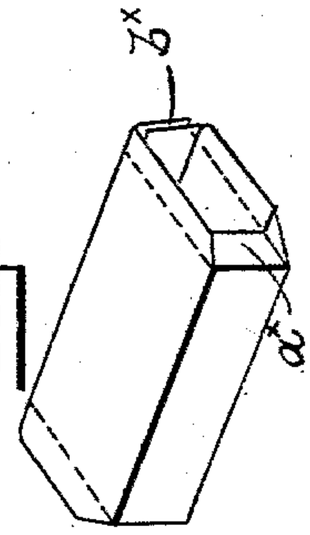


Fig. 24.

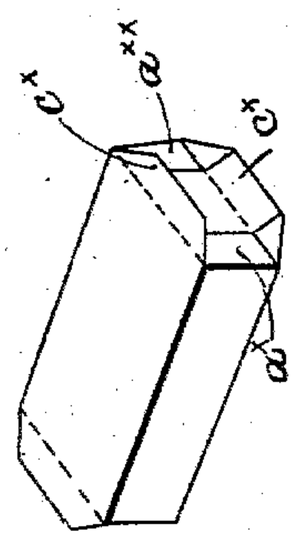


Fig. 25.

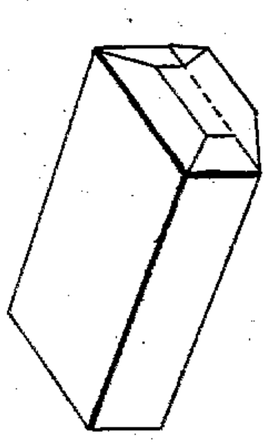
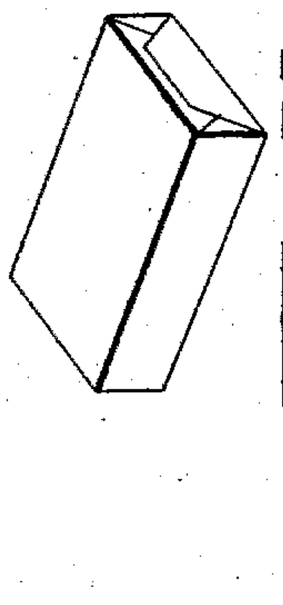


Fig. 26.



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No. 740,457. PATENTED OCT. 6, 1903.

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WRAPPING MACHINE.

APPLICATION FILED JAN. 3, 1902.

NO MODEL. 5 SHEETS—SHEET 5.

Fig. 14.

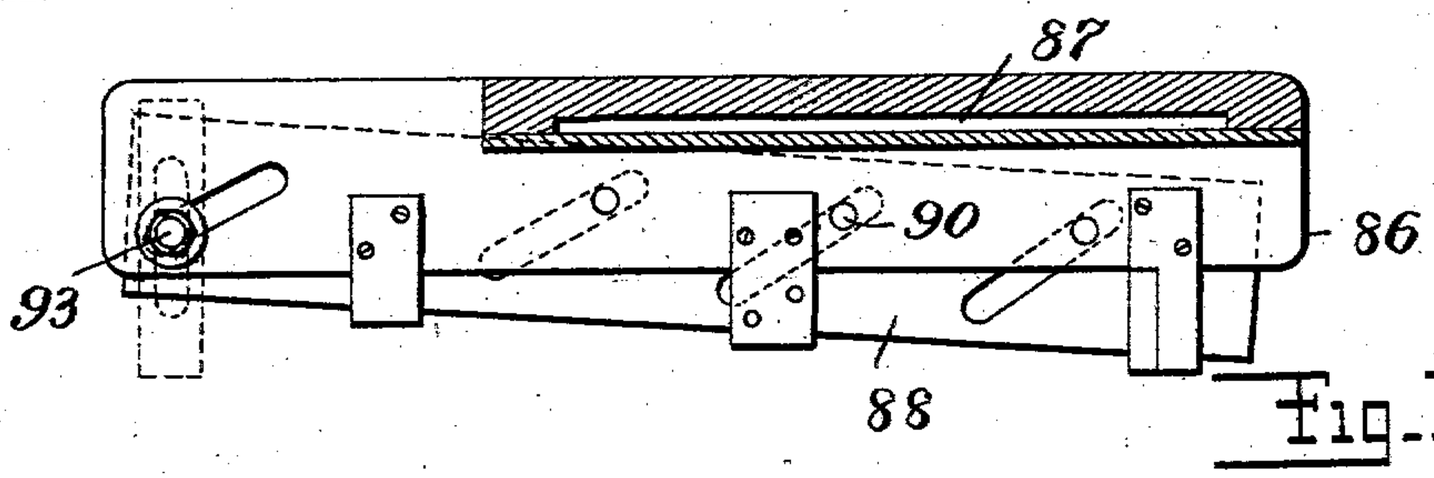


Fig. 15.

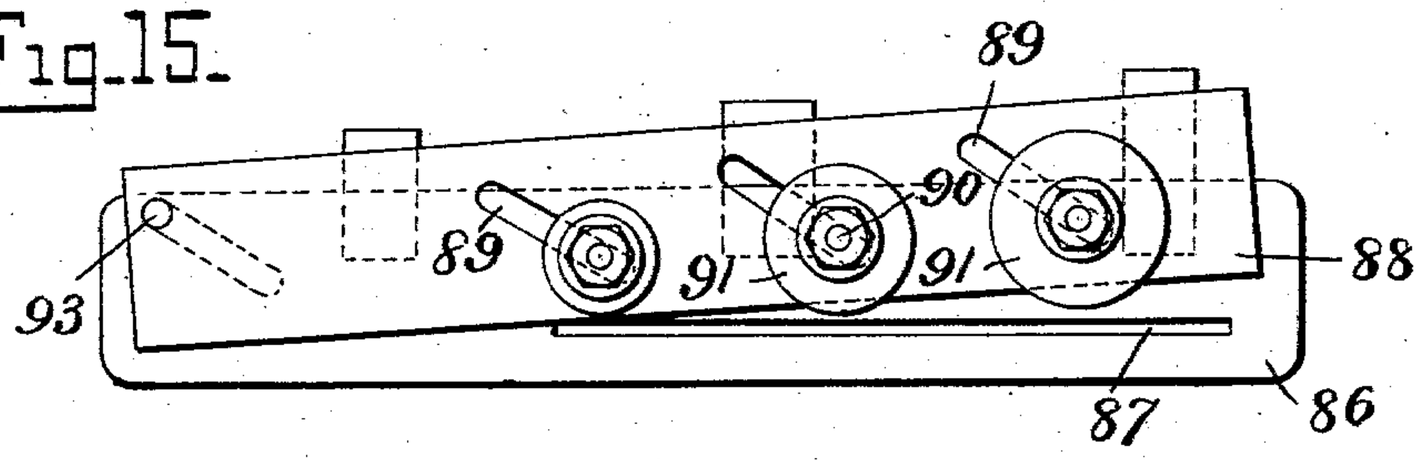


Fig. 16.

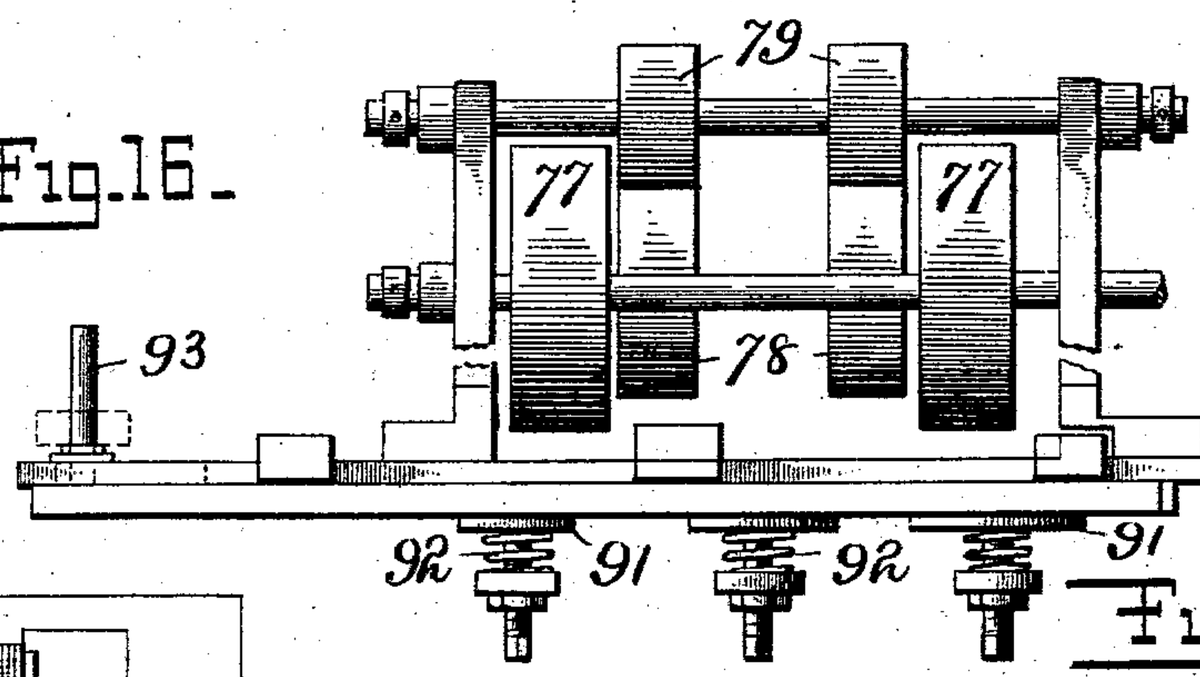


Fig. 19.

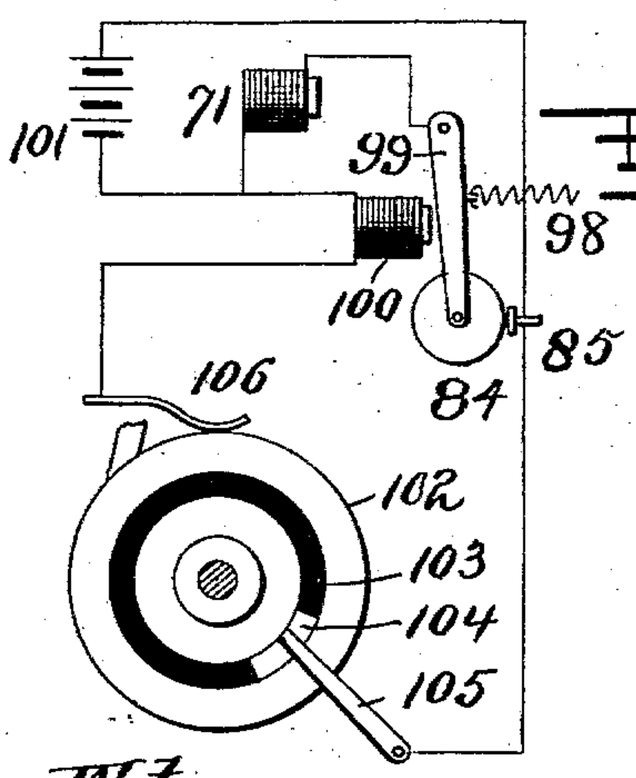
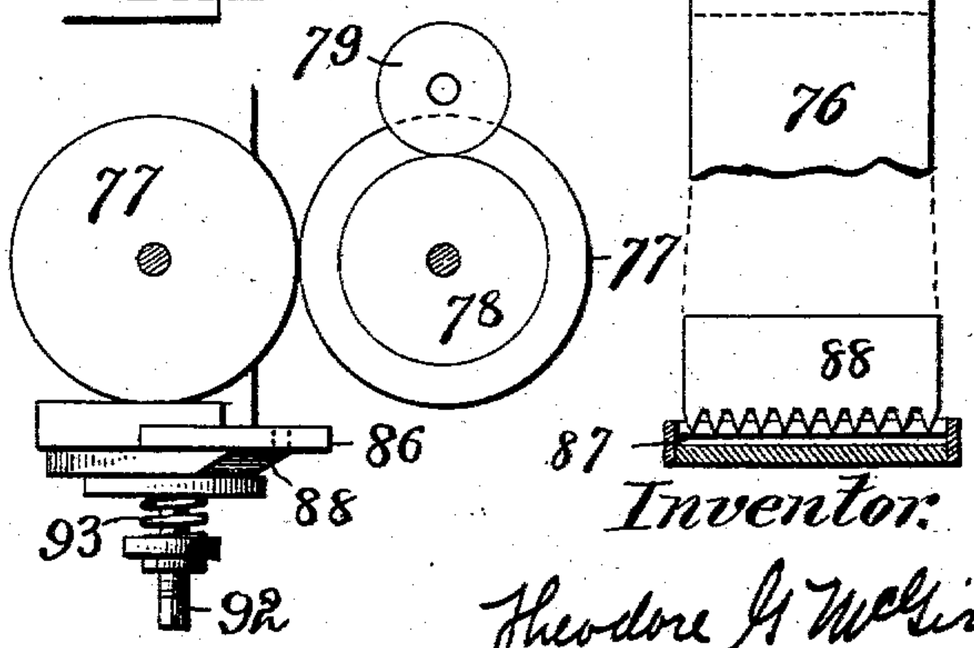


Fig. 18.

Fig. 17.



Witnesses:
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Frank Moon Esq.

Inventor:
Theodore G. McGirr

No. 740,457. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

THEODORE G. McGIRR, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMERICAN WRAPPING & BOX MACHINE COMPANY, OF NEW YORK, N. Y.

WRAPPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 740,457, dated October 6, 1903.

Application filed January 3, 1902. Serial No. 88,259. (No model.)

To all whom it may concern:

Be it known that I, THEODORE G. McGIRR, a citizen of the United States, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Wrapping-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to machines for wrapping packages, whether of goods in boxes or cans or such packages as cakes of soap. It is herein illustrated as employed for wrapping soap, although it may be employed equally well for wrapping other kinds of package goods.

My invention comprises the novel features which will be hereinafter more particularly pointed out in the claims.

Reference is to be had to the drawings accompanying herewith and forming part of this specification, in which similar reference characters indicate similar parts in the various figures.

Figure 1 is a side elevation of my machine. Fig. 2 is a top plan view. Fig. 3 is a sectional side elevation, as on line *x x*, Fig. 2. Fig. 4 is a sectional plan taken beneath the table on line *y y* Fig. 1 and showing slight differences in the means employed for operating the parts. Fig. 5 is a cross-sectional elevation taken through the table and folding-channel at the point where the edge-folders are located, as on line *z z*, Fig. 1. Fig. 6 is a detail showing the means for operating one of the folding-blades. Figs. 7 and 8 are respectively a sectional elevation and a plan of the pocket which receives the lower end of the wrapping-paper. Fig. 9 shows a modification in cross-section of a skeleton or open construction for the feed-chute. Fig. 10 is an end elevation of the paste-applying mechanism. Fig. 11 is a sectional elevation of the parts shown in Fig. 10 as viewed from the other direction. Fig. 12 shows in plan spring fingers or plates which act upon the paper at the ends of the package to fold it down. Fig. 13 is a cross-section of the wrapping-chute and the spring-held plate which engages the top of the package. Figs. 14 and 15 are views, respectively, from above and below, showing the paper-cutting devices. Fig. 16 shows the paper-feeding rollers and paper-cutting knife in elevation. Fig. 17 is an end elevation of the same parts. Fig. 18 is a diagram giving the connections for operating the paper-feeding clutch electrically. Fig. 19 shows a modified form of cutting-knife. Figs. 20 to 26, inclusive, show the wrapping-paper in the various and consecutive forms assumed in being folded about the package.

The packages to be wrapped are placed either by hand or by any form of automatic delivery device, such as the belt 1, within the hopper or feed-chute 2, Figs. 1 and 3, said chute being of such size as to freely permit passage of the packages therethrough and yet retain them in regular superposed order. The chute 2 is above a table 3, Figs. 1 and 3, upon which the lowermost package rests. Extending from the feed-chute toward one end of the table is a wrapping-chute C, (more clearly seen in Fig. 3,) through which the packages are singly and successively passed. The top 42 of the wrapping-chute is hinged at 42^a adjacent the end where the packages are inserted, so that it may have a light rise and fall to accommodate itself to packages of slightly-different thicknesses and produce a yielding pressure thereon. The packages are caused to travel through the wrapping-chute by the action of a reciprocating pusher 4, Figs. 1 and 3, which is guided in a slot 5, extending longitudinally of the table and in line with the wrapping-chute, the pusher being actuated by means of a slotted lever 6 and pin 7, carried by a disk or crank 8 upon the main shaft 9, Fig. 3. This plunger is preferably adjustable in such manner that the point to which it pushes the package may be varied as may be required by packages of different sizes. This is herein shown as secured by making the plunger in two parts 4 and 10, (see Fig. 1,) which are connected by slot and screws 11.

Just back of the package-feeding chute 2 or upon the side toward which the packages are moved from the feed-chute is the vertical paper-chute 12. An extension of this chute is seen in Fig. 3 extending beneath the table or upon the opposite side of the wrapping-chute. The paper cut to proper size is fed

into the upper end of the paper-chute by mechanism which will be hereinafter described and drops to the bottom thereof, where when the next package is advanced by the plunger 4 the package will engage the paper approximately at its middle and will carry the paper along into the wrapping-chute, thus folding the paper into contact with three sides of the package.

To adjust the paper-chute to different lengths of paper, as are required for packages of different size, the lower extension of the chute lying beneath the table is terminated by a movable plate 13, Figs. 3, 7, and 8, which snugly fills the chute and is supported by threaded rods or bolts 14, Fig. 7, by which it may be raised or lowered. This plate may, if desired, have projections 15, engaging slots or grooves 16 in the side walls of the chute. As the package is removed from the feed-chute by the plunger it is carried to a point in the wrapping-chute where it lies beneath and is engaged by the spring-pressed plate 17, Fig. 3, which is shown in detail in Fig. 13. The edge of this plate first engaged by the package is preferably beveled or slightly turned up, so that the package may easily lift it. This plate is held down by springs 18, which surround stems 30, which serve as guides for the plate. One stem, as a central one 31, acts as a stop to prevent the plate from dropping too low, said stem having a collar or nut $31^{\times}$ secured to its upper portion. Located one upon each side of the wrapping-chute, where they will engage the projecting portion of the wrapping-paper at the passing of the package, are the two tucking-plates 32. These are mounted upon blocks 33, Fig. 3, which slide in guides lengthwise the wrapping-chute and are moved by links 34, which connect them with a lever 35, which may be of any suitable form. This lever is secured to a shaft 36, which is rocked from one end by means of a crank 37 and link 38, (see Fig. 2,) which connects it with a crank-pin or eccentric 39, carried upon the main shaft 9. The relative movement of these tuckers and the package is so timed that they pass in one direction to fold the paper at the edge of the package covered by the middle of the paper sheet, as at $a^{\times}$, Fig. 22, and then after these ends of the paper sheet have been folded the tuckers move in the other direction to fold the paper over the other edge of the package at the ends of the sheet, as at $a^{\times\times}$, Fig. 24. The first fold or tuck is caused by moving the package past the tuckers and the second tuck by reciprocating the tuckers while the package is stationary. These successive conditions of the paper are shown in Figs. 22, 23, and 24. The package when advanced by the plunger 4 is left so that the edge which was engaged by the plunger has just passed the folding-blades 40 and 41, Fig. 3. These blades reciprocate through slots formed, respectively, in the plate 42, forming the top of the wrapping-chute, and in the table. One plate is placed sufficiently in advance of the other, so that their edges may pass. These blades are caused to reciprocate, so as to fold down the ends of the wrapper, as at $b^{\times}$, Fig. 23, before the tuckers 32 return to form the second edge tuck $a^{\times\times}$ at the end of the package.

The upper plate 40 is carried by an arm or rod 43, Figs. 1 and 6, which is restrained to move vertically by means of a suitable block 44 and a slot in the frame, Fig. 6, and is reciprocated by means of link 45 and crank-arm 46 upon the shaft 47, (see Figs. 3 and 6,) said shaft being oscillated by means of an arm 48, Fig. 2, which engages a cam 49 upon shaft 50, which shaft is turned from the power-shaft 9 by means of double gears 51 and 52. The other blade 41 is reciprocated by direct connection with arm 53, which is loose or pivoted upon shaft 47 and engages cam 54.

After the package has been operated upon by the tuckers and folding-blades 40 and 41 it is advanced along the wrapping-chute by the pressure of the package next following it in the chute. As it advances along the chute the upper and lower side tucks or flaps $c^{\times}$ $c^{\times}$, Fig. 24, at the ends of the package are turned by suitable folders, the upper by the turning-guides 54, which consist of curved plates projecting downwardly from the plate 42, which forms the top of the wrapping-chute. These turning-guides are so curved as to fold the upper side tuck down against the end of the package. At this point the lower side tucks or flaps still extend horizontally and by the progress of the package are passed beneath two paste-wheels 55, Figs. 3 and 11, one on each side of the package, whereby they are given such a coat of paste that when they are folded up against the end of the package they will stick there. The paste is supplied to the wheels 55 by means which will be described later. After passing the paste-wheel the lower end tucks or flaps are engaged by the folders 56, which turn these flaps up against the end of the package. In Fig. 3 these are shown as being plates which extend upwardly from the table; but I prefer a construction such as is shown in Fig. 12, in which they consist of long blades or spring-arms 107, which are supported from the table by one end and are also made adjustable lengthwise the wrapping-chute by slots 108 in the table, within which the securing-bolt lies, such adjustment being desirable to accommodate the wrapping of packages of different sizes. By this construction they are made flexible, so that they will act equally well without adjustment upon packages varying considerably in size. The other set of folders may be similarly constructed. After the folding operation has been completed the package remains momentarily between the folding or turning guides 56, and the paste has a chance to set. The package is then discharged upon the delivery-chute 57, which is also preferably provided with side bars or plates 58, which also hold the pasted flap down, so that by the time the package

has left the delivery-chute the paste has thoroughly set.

The pasting device, as shown in Figs. 1 and 3, consists of two contacting rollers 59 and 60, the tops of which turn toward each other and one of which engages the wheels 55. As the paste used is stiff and only a small amount is used at a time, no side wall is needed. The turning of the rollers will tend to force the paste toward the central line between the rollers. The frame in which the rollers turn acts as end walls. These rollers are turned by means of a vertical shaft 73 and two sets of bevel-gears 74 and 75, which connect it, respectively, with the shaft 50 and the shaft of the roller 60.

A preferred form of pasting device is shown in Figs. 10 and 11 in which but a single roller 60 is used. This is turned in the same way from the shaft 50 and has a paste box or holder 61 placed upon it. This box is open on its bottom where it engages the roller, either in whole or in part. At the edge from which the paste passes out it is provided with an adjustable scraper or gate 62, by which the thickness of the paste-layer on the roller may be adjusted.

A single or a double wrapper may be used in my machine. In the drawings I have shown two wrappers, an inner and an outer; but it is evident that either of these may be omitted. The paper should be in rolls, which would be mounted at any convenient point. The roll from which the paper 76 forming the outer wrapper is drawn is not shown in Fig. 3, but is shown at 63 in Fig. 1. This paper passes first through feed-rollers 64 and then between a pair of idler guide-rollers 66, the paper between these two pairs of rollers hanging in a loop, in which is placed a weighted roller 65, which is suspended by the paper.

The feed-rollers 64 are constantly driven by means of a shaft 110, Fig. 3, which is connected by bevel-gears with the feed-rollers and with the shaft 50. The outer paper 76, after passing the guide-rolls 66, passes between the feed-rolls 77, at which point it meets the inner wrapper 80, which proceeds from a roll conveniently placed.

Where an inner wrapper is used, it is generally of oiled paper or similar material and is neither as wide nor as long as the outer wrapper. When supplied from a roll a rate of feed different from that of the outer wrapper is required. The feed-rolls 77 consist of comparatively narrow disks placed to engage the outer wrapper only at its edges. These disks are sufficiently separated to permit the inner wrapper passing between them. Feed-disks 78 and 79 are provided for the inner wrapper, the disks 78 being secured to the same shaft as one set of the disks 77, but are of smaller diameter than the disks 77, or at least those which are secured to the same shaft with the disks 77 are smaller than said disks 77. As they are equally rotated, it follows that the inner wrapper is fed a less amount than the outer wrapper.

The paper-feed rollers or disks 77 and 78 are given an intermittent movement and are driven by the shaft 68, which is connected thereto by bevel-gears 69 and is itself driven from the shaft 50 by bevel-gears 70 and 81. The bevel-gear 81 is secured to a sleeve 82, Fig. 3, which will slide freely upon the shaft 50, but must turn with it. A spring 83 holds the two gears together. When the two gears are in contact, the feed-rollers 77 and 78 are turned, and when the gears are out of contact the feed-rollers are not turned. The position of the gear 81 is controlled by a lever 72, which forms or carries the armature of an electromagnet 71. The wrapper 76 is provided with a series of perforations spaced apart a distance corresponding with the length of paper required for the outer wrapper. Two contact members, as 84 and 85, which are placed in the circuit of the electromagnet 71, engage opposite sides of the paper and are insulated from each other by the paper until one of the perforations in the paper is reached, when the circuit is closed, the magnet energized, and the bevel-gear 81 moved out of contact with the bevel-gear 70, and the paper-feed rollers 77 and 78 stopped. At about this time the knife which severs the wrappers is brought into operation. This knife is shown in detail in Figs. 14, 15, 16, and 17. 86 is a fixed top plate having a slot 87, through which the wrapping-papers pass. 88 is a cutting plate or knife, which is held against the plate 86 by bolts 90, passing through inclined slots 89 in the knife-plate. Springs 92 beneath plate 88 form a yielding support therefor.

A lever 94, which is pivoted to the frame, is connected with the knife-plate 88 to reciprocate it. As herein shown, this lever engages a pin 93 on the knife-plate. As the knife-plate is advanced the inclined slots force it over the slot 87, and the papers are cut. The lever 94 is actuated by a cam 95 on shaft 50 or by any other suitable means, so as to give it a quick and limited motion once at each revolution of the shaft. This motion is timed to correspond with the other parts, so as to drop the severed wrappers between the insertion of successive packages in the wrapping-chute. In Fig. 19 is shown a knife with serrated edge, which may be employed and may be given a straight-line motion across the paper-slot.

After the circuit has been closed through the perforations in the paper it will remain closed and the magnet will therefore hold the bevel-gears separated unless the circuit is first broken. This result, which is essential before the feed can be resumed to supply the next wrapper, is accomplished by a device such as is shown in Fig. 18, which also shows the electrical circuits. The magnet 71 is the one which acts to separate the bevel-gears. 84 and 85 are contact members correspond-

ing with the contact members 84 and 85 of Fig. 3, which are placed on opposite sides of the paper. There are two circuits, one through the magnet 71 and lever 99 and contact members 84 and 85. The other is through the magnet 100 and the contact members 105 and 106 and connected wires, as shown, and their circuit-wires.

The disk 102 is secured to turn with some rotating member of the machine, which, like the shaft 50, turns once for each complete wrapping operation. This disk has a circular ring 103, of some insulating material, which supports the contact finger or brush 105. The ring 103 is not complete and is completed by a segment 104 of conducting material, so that when the finger 105 is on the segment 104 the current is free to pass through said finger and the disk 102 to the finger or brush 106, and thus to complete the circuit. This disk is timed so that the circuit is completed through the disk and magnet 100 shortly after the current has been completed through the magnet 71. The lever 99, which carries the member 84, which makes contact through the perforations in the paper, forms the support for the armature of the magnet 100, so that when the circuit is completed through the magnet 100 the contact members 84 and 85 are separated. The inauguration of the paper-feeding movement inserts the paper between these contact members and prevents closing the circuit through them when they are brought together by the spring 98. The member to which the disk 102 is secured is not material, although as a matter of convenience it would probably be secured to the shaft 50.

In Fig. 9 is shown a skeleton-like construction for the feed-hopper. This consists of angle-shaped members 2^a, one for each corner, thus leaving an opening at each side.

In Fig. 4 is shown a slightly-different arrangement of the mechanism in which two shafts 501 and 502 are employed as a substitute for the single shaft 50 of the other figures. The electromagnet 71 is also shown further removed from the bevel-gear and is connected therewith by a link.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a wrapping-machine for wrapping packages, the combination with a chute or passage through which the package is adapted to be passed, of an end-tucker, and means for reciprocating said tucker to fold or tuck the wrapper on opposite sides of the end of the package.

2. In a machine for wrapping packages, the combination of a folding chute or passage through which the package is adapted to be passed, a tucker, means for reciprocating said tucker lengthwise of the chute or passage to fold the wrapper over the opposite edges of one end of the package.

3. In a wrapping-machine the combination with a folding-chute, a tucker and means for reciprocating said tucker to successively fold the wrapper edges over opposite edges of the package, of two folders and means for reciprocating them to fold down the overlapping wrapper ends intermediate the time of making the two folds by said reciprocating tucker.

4. In a wrapping-machine the combination with a folding-chute, means for passing the packages therethrough, and means for presenting a wrapper across the entrance to said chute before the insertion of a package therein, of an end tucker or folder adapted to engage the wrapper to fold it down over the advancing end edge of the package, folders adapted to fold the overlapping ends of the wrapper, over the following side edges of the package, and means for moving the end-tucker from the rear of the package to fold the wrapper over the following end edge of the wrapper.

5. In a wrapping-machine, the combination with means for passing the wrapper about the package and for moving the package through the machine, of end-tuckers adapted to engage and fold the projecting edges of the wrapper over the advancing end edges of the package, and means for moving the end-tuckers from the rear of the package to fold the wrapper over the following end edges of the package.

6. In a package-wrapping machine, the combination with a chute through which the packages are passed while being wrapped, and means for advancing the packages in said chute, of spring folding-blades at the sides of said chute adapted to engage the wrapper edges to fold it upon the package, and means for adjusting the distance of the folding-blades lengthwise of the chute to and from the package-feeding device, substantially as set forth.

7. In a wrapping-machine, the combination with a chute or guide for the package being wrapped, and means for intermittently advancing the packages in said chute, of spring folding-blades supported from one end only and engaging the wrapper to fold it as the package passes, and means for adjusting the said folding-blades in said chute to and from the package-feeding devices to correspond with a position of dwell of the package, substantially as set forth.

8. In a wrapping-machine the combination of a folding-chute, means for feeding packages through said chute, devices within said chute for folding the ends of a wrapper upon the package, said chute having the wall constituting the upper side of the chute hinged to accommodate packages of different sizes and provide ready access to the interior of the chute.

9. In a package-wrapping machine, the combination with a chute, wrapping means in the chute, and means for forcing the package being wrapped therethrough, of a presser-plate within said chute between the inlet and dis-

charge ends thereof and adapted to bear upon the package in passing, guiding and supporting stems for said plate, and a stop limiting the movement of said plate inward of the chute, substantially as set forth.

10. In a package-wrapping machine, the combination with a chute through which the package passes in being wrapped, means for forcing the packages therethrough and wrapping devices in said chute, of a presser-plate disposed within the chute between the ends thereof and adapted to engage the incompletely-wrapped package therein, supporting and guiding stems for said plate, springs forcing the plate upon the package, and a stop limiting the movement of said plate by the springs, substantially as set forth.

11. In a package-wrapping machine, the combination with a chute, wrapping devices disposed within said chute, and means for moving through said chute the article to be wrapped with its wrapper folded over it, of a presser-plate disposed between the wrapping devices and engaging the package in said condition, supporting and guiding stems upon said plate, and a spring forcing the plate toward the package, substantially as set forth.

12. In a package-wrapping machine, the combination with wrapping means, a wrapping-chute, and means for forcing the article to be wrapped within one end of said chute with the wrapper folded over the same, of a spring-held presser-plate disposed in the chute between the wrapping means and adapted to engage and hold the wrapper upon the article and to accommodate itself to variations in size of said article, substantially as set forth.

13. In a package-wrapping machine, the combination with means for folding a wrapper about an article by successive steps, of a yielding presser-plate disposed in the path of the article within the chute and between the ends of the chute and adapted to adjust itself to variations in size of the articles and to engage and hold the wrapper closely to the article during the preliminary wrapping steps, substantially as set forth.

14. In a package-wrapping machine, the combination of a folding chute or passage through which the packages are adapted to be passed, means for presenting a wrapper across the path of said packages, end-tuckers, and means to reciprocate said tuckers to fold the end edges of the wrapper toward each other, and means disposed within the chute for completing the folding of the wrapper about the package after the action of the end-tuckers.

15. In a package-wrapping machine, the combination of a folding-chute, means for forcing the articles to be wrapped through said chute, end-tuckers, means for reciprocating said tuckers to fold first the advancing end of the wrapper and thereafter the following end, and folders for completing the wrapping of the package as it moves through the folding-chute.

16. In a package-wrapping machine, the combination of a folding-chute, means for forcing the articles to be wrapped through said chute, end-tuckers, means for reciprocating said tuckers to fold first the advancing end of the wrapper and thereafter the following end, folders for completing the wrapping of the package as it moves through the folding-chute, and pasting devices for applying an adhesive material to the end folds of the package.

17. In a wrapping-machine, the combination of a folding-chute, means for passing packages therethrough, means for presenting a wrapper across the path of the package, end-tuckers adapted to engage the wrapper to fold it over the advancing edge of the package, folders operative thereafter to fold the ends of the wrapper about the package, means for then moving the end-tuckers to fold the wrapper over the following edge of the package, and turning-guides for thereafter turning the upper and lower edges of the wrapper over the ends of the package.

18. In a wrapping-machine, the combination of a folding-chute, means for passing packages therethrough, means for presenting a wrapper across the path of the package, end-tuckers adapted to engage the wrapper to fold it over the advancing edge of the package, folders operative thereafter to fold the ends of the wrapper about the package, means for then moving the end-tuckers to fold the wrapper over the following edge of the package, pasting devices for applying an adhesive to one of the edges of the wrapper and turning devices for turning the edges of the wrapper over the ends of the package.

In testimony whereof I have hereunto affixed my signature, this 28th day of December, A. D. 1901, in the presence of two witnesses.

THEODORE G. McGIRR.

Witnesses:
CHAS. A. PEARD,
ARTHUR KNOX.