

E. L. SMITH & A. E. PHELON.  
WRAPPING MACHINE.  
APPLICATION FILED AUG. 6, 1917.

1,269,969.

Patented June 18, 1918.  
6 SHEETS—SHEET 1.

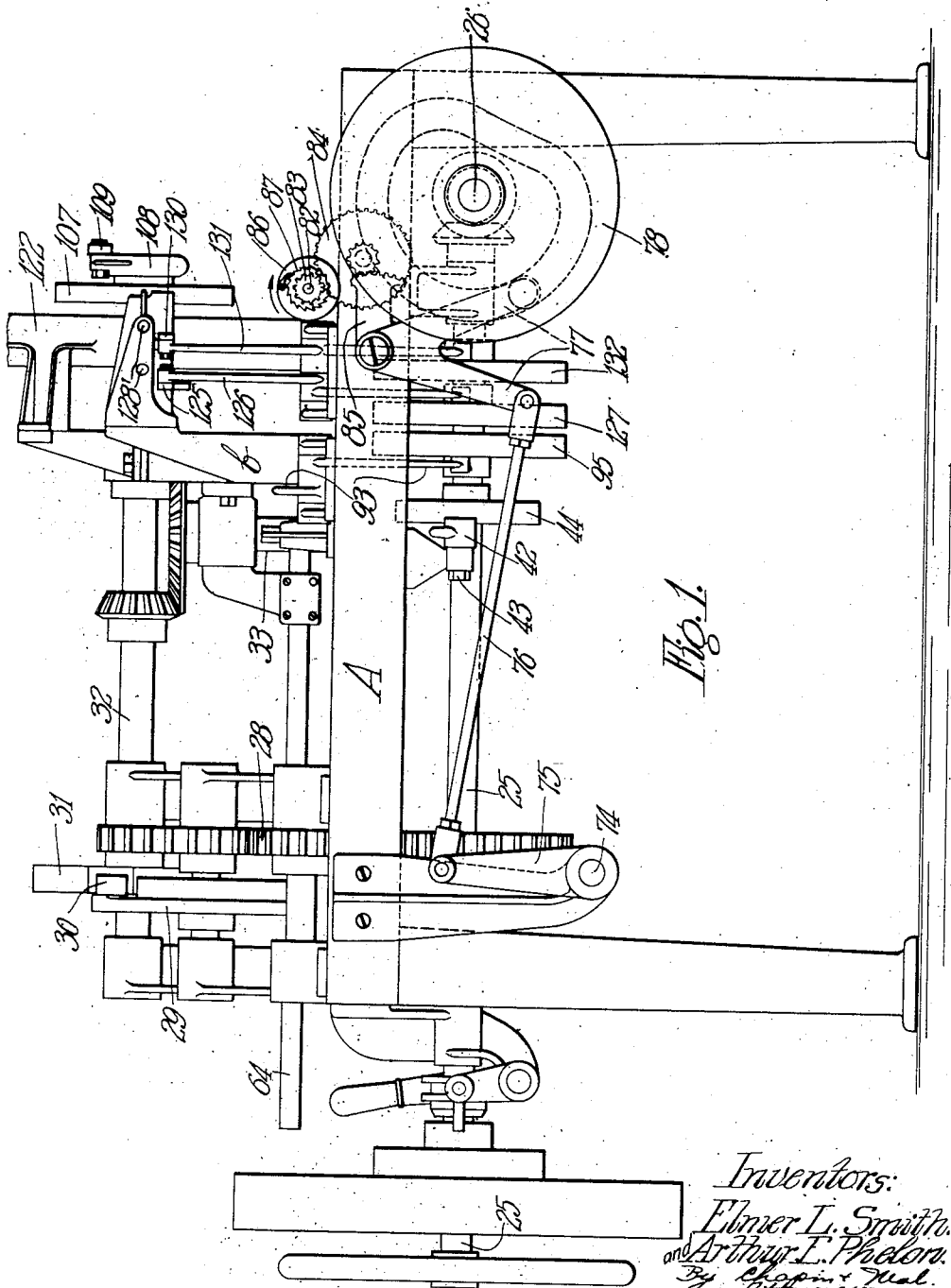


Fig. 1.

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By *Chas. H. Neal*  
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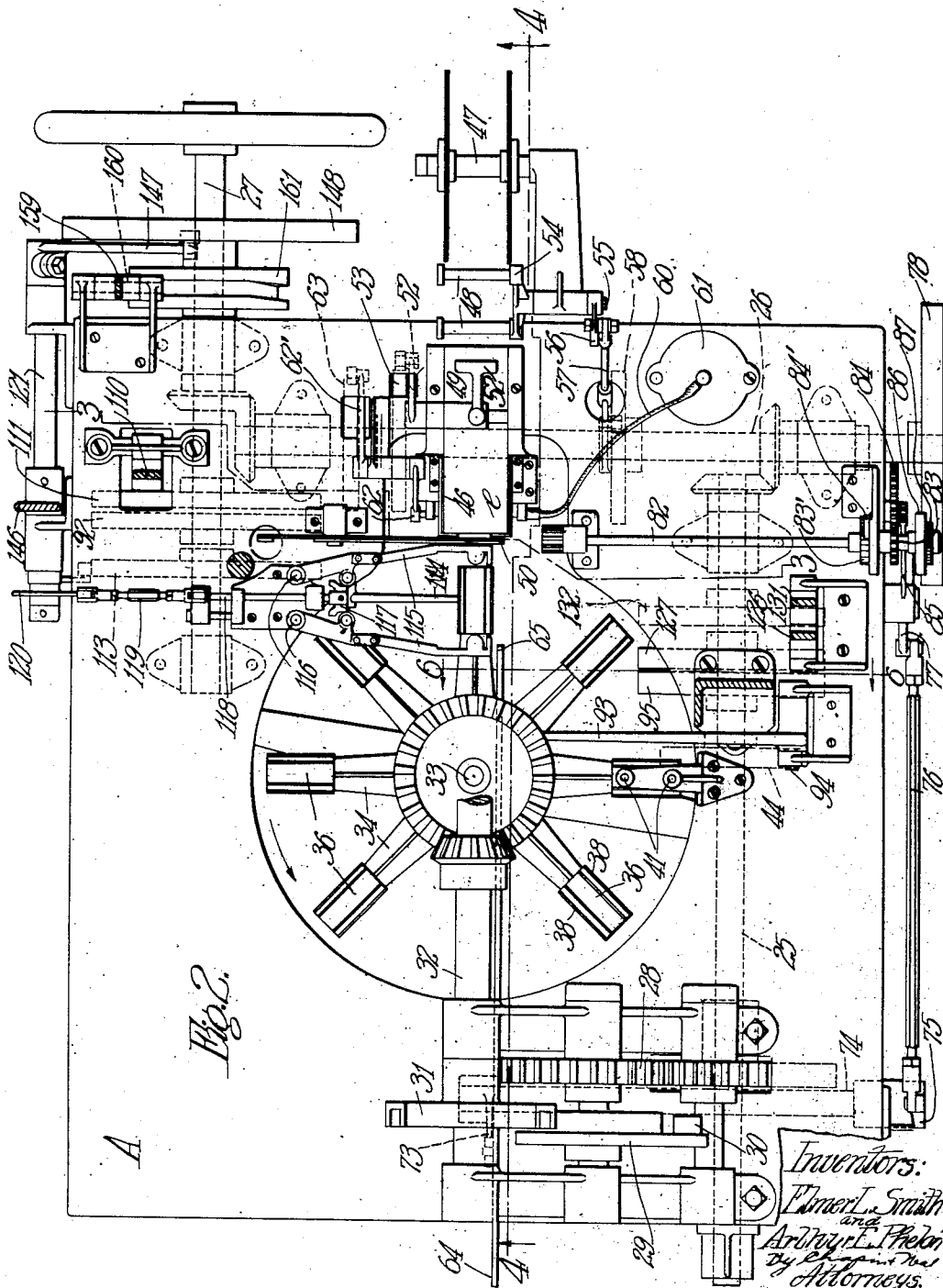
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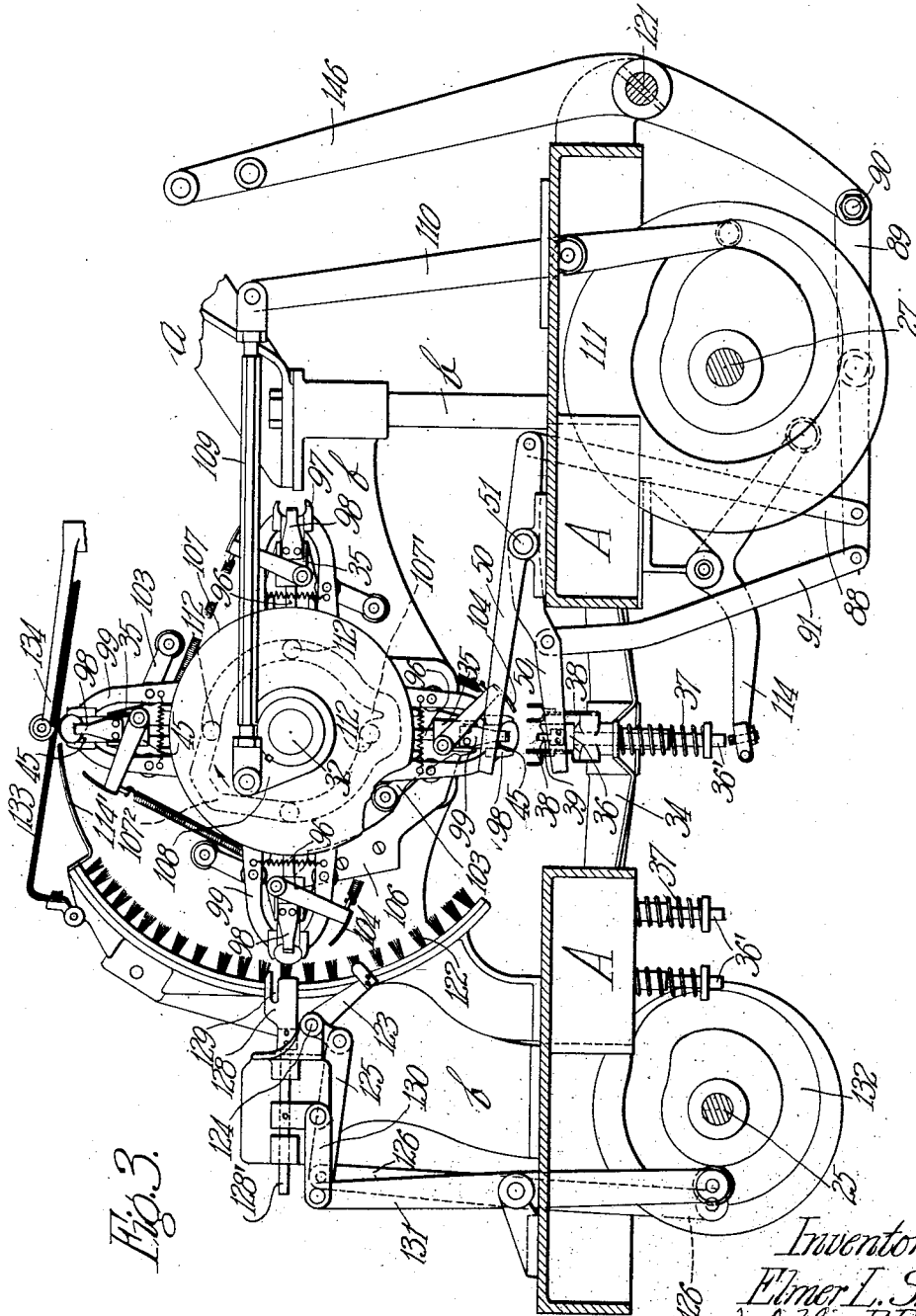


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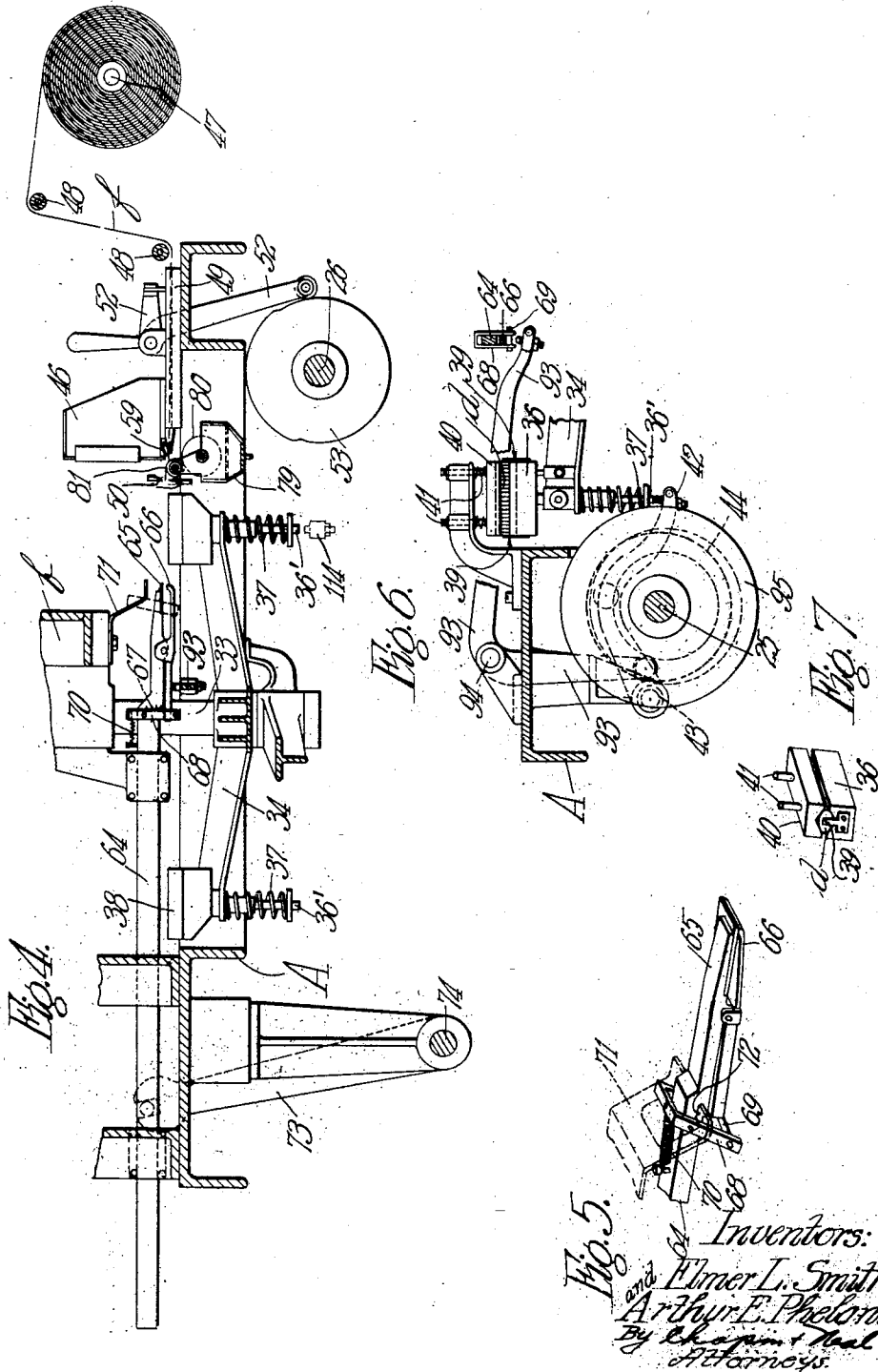
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6 SHEETS—SHEET 5.

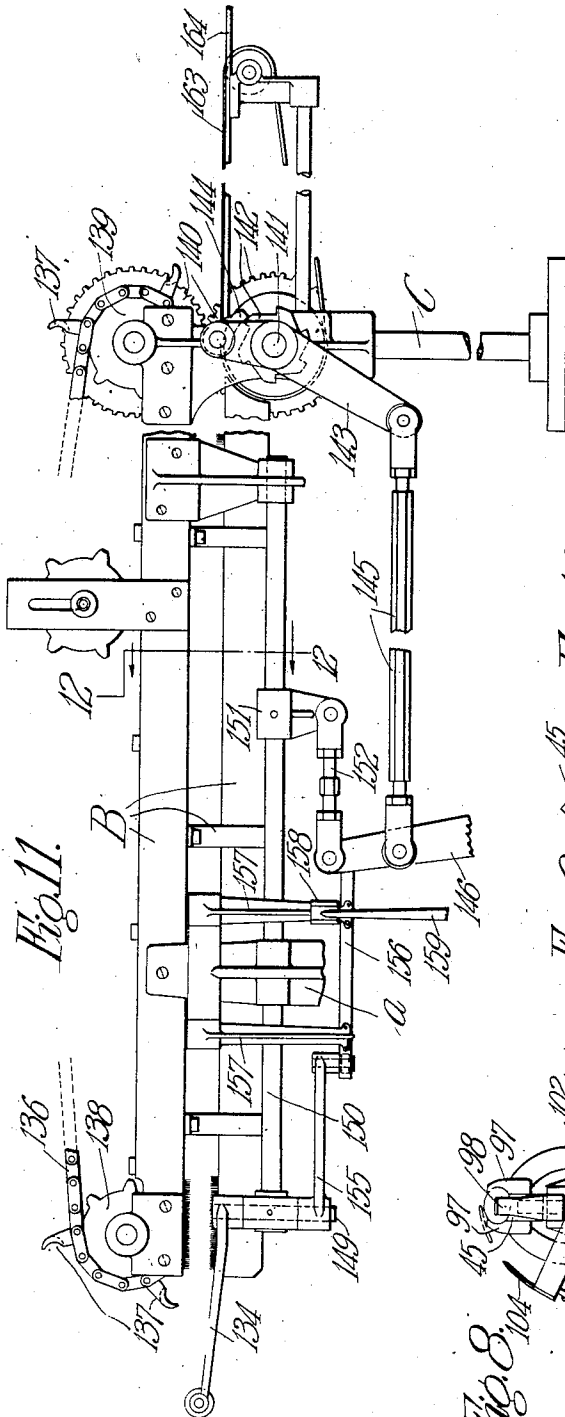


Fig. 11.

Fig. 14.

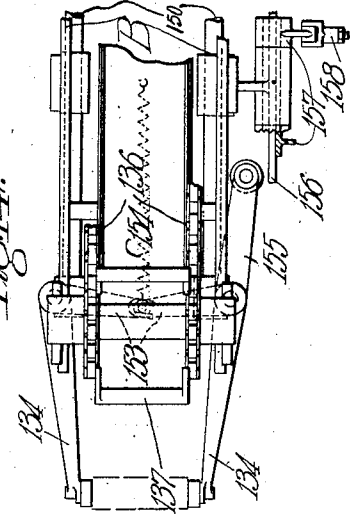


Fig. 10.

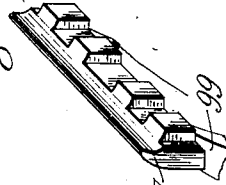


Fig. 9.

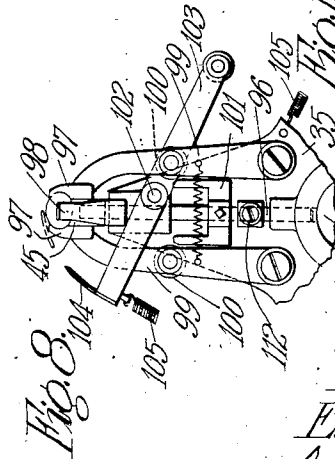
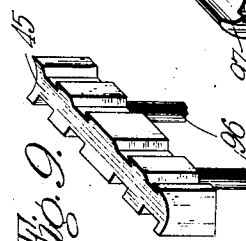


Fig. 8.

Fig. 12.

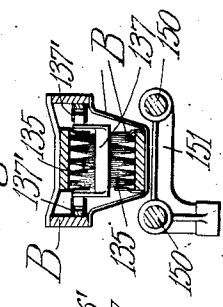
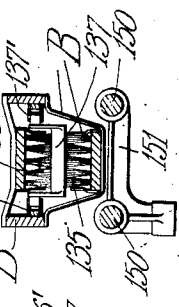


Fig. 13.



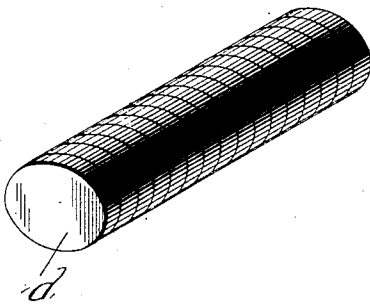
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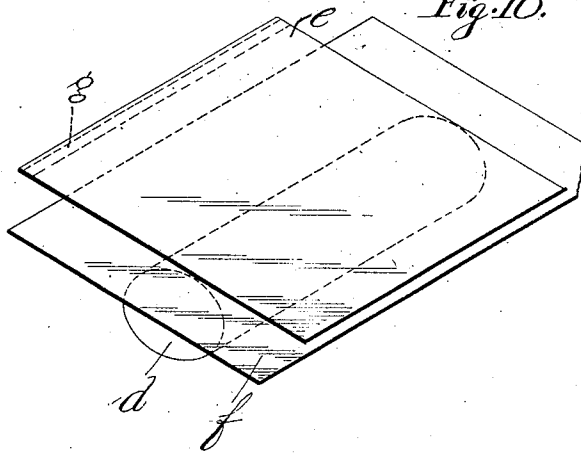
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6 SHEETS—SHEET 6.

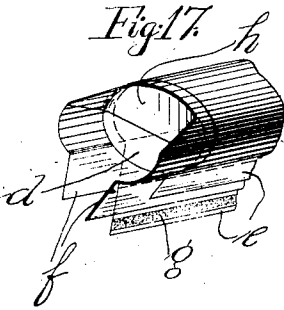
*Fig. 15.*



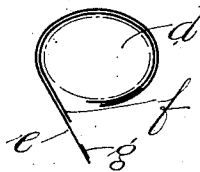
*Fig. 16.*



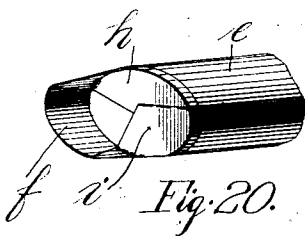
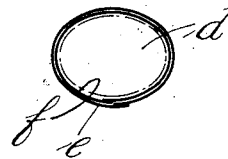
*Fig. 17.*



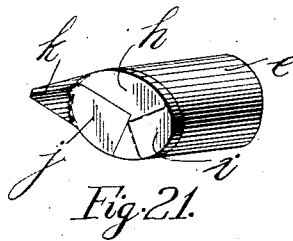
*Fig. 18.*



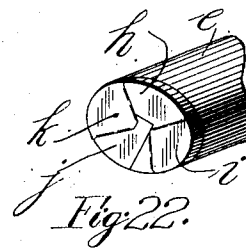
*Fig. 19.*



*Fig. 20.*



*Fig. 21.*



*Fig. 22.*

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# UNITED STATES PATENT OFFICE.

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ASSIGNORS TO PACKAGE MACHINERY COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## WRAPPING-MACHINE.

1,269,969.

Specification of Letters Patent.

Patented June 18, 1918.

Application filed August 6, 1917. Serial No. 184,644.

*To all whom it may concern:*

Be it known that we, ELMER L. SMITH and ARTHUR E. PHELON, citizens of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Wrapping-Machines, of which the following is a specification.

10 This invention relates to improvements in wrapping machines and, while the invention is capable of general application, it finds one advantageous specific use as a means for automatically packaging stacks of articles, such as lozenges and the like, for example.

15 According to one feature of the invention, a plurality of articles to be wrapped are carried on a turret movable step by step and are automatically transferred to, and carry therewith suitable wrapping material into, another step by step movable turret, wherein the articles are wrapped, and subsequently discharged therefrom.

25 According to another feature of the invention, a plurality of pockets are provided in an intermittently movable turret and are each adapted to receive and hold an article to be wrapped, and each pocket consists of relatively movable members which are normally held in coöperative relation to grip the articles and prevent movement thereof in any direction, means being provided to automatically and successively open the pockets to receive the articles to be wrapped and wrappers therefor, together with means to wrap the articles while held in the pockets and to automatically and successively open the latter to release the wrapped articles.

40 According to another feature of the invention, the articles are entirely wrapped while positioned in an intermittently movable turret by improved wrapper folding devices carried in part by the turret and in part adjacent the path of movement thereof, characterized in that folding operations occur during each period of rest and each step by step movement of the turret from article receiving to package discharging position.

50 According to a further feature of the in-

vention, the articles are wrapped while carried in an intermittently operable turret, the wrapping involving an overlapped gummed seam, and means are provided to carry wrapped packages slowly to the desired discharge point while the overlapped gummed seam is held from opening until the adhesive has set, together with means to automatically eject the wrapped packages from the turret and carry them to the last-named means. The construction is particularly characterized by the ejection of the package so that the gummed seam is forced against a yieldable plate and in that the seam of the package is drawn along and held in contact with the plate during its transfer to the carrying means, whereby the seam is effectively pressed together and the wrapper is ironed free from wrinkles.

Other features and advantages of the invention will appear in the following description and in the appended claims.

The invention, in an embodiment at present preferred, is shown for illustrative purposes in the accompanying drawings, in which—

Figure 1 is a front elevational view of the machine with parts broken away;

Fig. 2 is a plan view thereof with the wrapping mechanism and delivery apparatus omitted to reveal other parts;

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 2 and illustrates the wrapping mechanism;

Fig. 4 is a sectional elevation taken on the line 4—4 of Fig. 2 and illustrative of the mechanism for feeding wrapping material;

Fig. 5 is a fragmentary perspective view illustrative of the nippers;

Fig. 6 is a fragmentary cross sectional view taken on the line 6—6 of Fig. 2;

Fig. 7 is a perspective view of a part of Fig. 6;

Fig. 8 is a fragmentary elevational view showing part of the wrapping turret;

Fig. 9 is a perspective view of the movable supporting member on the wrapping turret;

Fig. 10 is a perspective view of one of the movable clamping members on the wrapping turret;

Fig. 11 is a side elevational view of the delivery apparatus shown as removed from the machine;

Fig. 12 is a cross sectional view taken on the line 12—12 of Fig. 11;

Fig. 13 is an enlarged cross sectional view of a part of Fig. 12;

Fig. 14 is a plan view with parts broken away of a part of Fig. 11;

Fig. 15 is a perspective view of the stacked articles to be wrapped; and

Figs. 16 to 22 are perspective views illustrating successive steps in the wrapping of the articles.

The machine in general involves two turrets or wheels which are movable step by step and are arranged with their axes at right angles so that a face of each is nearly tangential with the periphery of the other.

In one turret, the articles are suitably positioned for wrapping and means are provided to automatically transfer the stacks from this turret to the other. Wrapper feeding mechanism is provided to supply wrappers between the turrets and in the transfer

of articles from the first to the second wheel the stack is partially wrapped. Other means are provided to complete the wrapping of the stacks of articles during the travel of the second turret and above the latter is a

discharge apparatus together with means to remove wrapped articles from the second turret and position them in the apparatus. In the latter, the packages move slowly

step by step to the desired point of discharge and during their travel through the apparatus, the overlapped gummed edges of the wrappers are held together until the adhesive has firmly set.

The general frame structure and main driving connections of the machine will now be described. Referring to Figs. 1 and 2; A represents a bed plate suitably supported from the floor and mounted below and adjacent the front wall of the frame is the

main drive shaft 25, which is adapted to be driven from a suitable source of power from the pulley shown in Fig. 1. Arranged at right angles to shaft 25 and driven there-

from by the bevel gears shown is a shaft 26, which in turn drives by bevel gears a shaft 27 arranged adjacent the rear wall of the frame. Upon shafts 25, 26, and 27 are mounted the various operating cams to be

later described. Shaft 25 drives by a gear train 28 a master cam 29 which carries a roll 30 to drive a "Geneva" cam 31 fixed on a horizontal shaft 32 arranged above bed A. Shaft 32 may thus be driven intermittently

by cams 29 and 31 in a now well known manner and is arranged to turn ninety degrees on each rotation of shaft 25. A vertical shaft 33, mounted substantially centrally on bed A, is driven by the bevel gears shown in

Figs. 1 and 2 from shaft 32 and, in this in-

stance, at half the speed thereof. Fixed to shaft 33 near the lower end thereof is a turret 34 which is adapted to carry the articles to be wrapped by a step by step movement to the wrapping mechanism.

The turret 34 is movable as shown in Figs. 2 and 4 in a suitable opening formed in bed A. The shaft 32 has been shown in Fig. 2 as broken off but, as indicated in Fig. 1, it extends beyond shaft 33 and, as shown in Figs. 3 and 8, has fixed thereto a wrapping turret 35. Both turrets 34 and 35 are movable step by step by the means described, but the former, as described, moves only at half the speed of the latter and as will appear has provision to accommodate twice as many articles. The axes of turrets 34 and 35 are arranged at right angles and the face of each is nearly tangential to the periphery of the other.

The apparatus for delivering wrapped articles from turret 35 is carried by a frame B and will be later described in detail. Frame B is supported above turret 35 and extends from the latter in a direction at right angles to shaft 32 to and beyond the rear wall of bed A. Frame B is supported at one end by a bracket *a* (Figs. 3 and 11) from a frame *b* secured to bed A and at the other end from the floor by means of a suitable standard *c* (Fig. 11). The frame *b* is arranged to support an end of each shaft 32 and 33 and other devices to be later described.

The means for feeding the articles to be wrapped to the wrapping turret will next be described. Referring particularly to Figs. 2 and 3, the turret 34 in the illustrated embodiment consists merely of a plurality (eight in this instance) of radial spokes and slidably mounted on a rod 36' in the outer end of each is a supporting cradle 36, which is normally held against the upper face of the spoke as illustrated in Fig. 3 by a spring 37. The upper surface of cradle 36 is concaved to conform to the lower peripheral contour of the articles to be wrapped. The articles, in this instance, lozenges of elliptical shape, are stacked face to face as shown in Fig. 15, and the stacks are placed in the cradles, as by an operator, as the cradles successively come to rest in the upper left hand quadrant (Fig. 2). Spring fingers 38 secured to the spokes of turret 34 extend upwardly and engage the sides of the stacked articles in the cradle as best shown in Fig. 3 and on the ends of the cradles are other spring fingers 39 which engage the ends of the stack, whereby the latter is held against movement in all directions except upwardly.

The turret 34 moves step by step in the direction of the arrow (Fig. 2) and each stack of articles successively comes to rest in under a plate 40 (Fig. 6) which is supported by rods 41 slidable vertically in a bracket

secured to frame A. Plate 40 is spring pressed downwardly and is limited in its downward movement by suitable collars on rods 41, whereby the plate 40 is so supported  
 5 that the stacked articles *d* on turret 34 may move freely thereinunder. While turret 34 is at rest, a tapper lever 42 pivoted at 43 to frame A and having a roll to ride in the path of a cam 44 is elevated to engage the  
 10 slidable supporting rod of the cradle 38 which is positioned under plate 40. The stack of articles is thus carried upwardly and forced against the yieldable plate 40, as shown in Figs. 6 and 7, which functions  
 15 to bring all the articles of a stack into exact alinement before the wrapping operation. The cradle 36 is subsequently lowered before turret 34 is given its next step by step movement.

20 After leaving the plate 40 the stacked articles are successively carried to and brought to rest in the position shown in Fig. 3, wherein the cradle 36 lies vertically below a corresponding cradle 45 mounted in the wrapping turret 35. The stack of articles is  
 25 adapted to be transferred from one cradle to another while their respective turrets are at rest by means to be later described.

The means for feeding the wrapping material to the articles will next be described. The wrapping material consists of labels *e* which are vertically stacked within a magazine 46 (Figs. 2 and 4) and a sheet *f*, in this instance foil or like material. The foil in  
 30 roll form is supported on an arbor 47 and is guided therefrom by rolls 48 to a channel 49 in frame A. The strip *f* extends under magazine 46 and beyond the latter, the forward edge of the strip being disposed in the  
 40 vertical plane of action of a pair of shear blades 50, pivoted together and to frame A at 51, as best shown in Fig. 3. A pivoted bell crank brake lever 52 (Fig. 4) has a part on one arm to engage the upper face of strip  
 45 *f* in channel 49 and a roll on the other arm to ride in the periphery of a cam 53 fixed on the described shaft 26. With the parts positioned, as shown in Fig. 4, the brake lever acts to hold strip *f* against movement in  
 50 channel 49 and, while the strip is thus held, rolls 48 act to draw a portion of the strip from the roll on arbor 47. Rolls 48 are mounted on a bracket 54 (see Fig. 2) rotatably supported intermediate its ends on a  
 55 shaft 55. An arm 56 fixed on the latter is pivotally connected to an arm 57 which has thereon a roll riding in a path cam 58. The latter is constructed so that shaft 55 is oscillated first in a counterclockwise and then in a  
 60 clockwise direction, whereby rolls 48 first draw out a portion of strip *f* and then recede leaving a slackened portion which is subsequently drawn into the machine by means to be described.

65 At the forward lower portion of magazine

46 is the usual pivoted suction plate 59 (Fig. 4) which is connected by a flexible hose 60 to a suitable pump 61, indicated conventionally in Fig. 2 and actuated by suitable means not shown. The suction plate is  
 70 rocked downwardly at the proper time by levers 62 and 62' (Fig. 2) which are connected together at their ends and pivoted to frame A. The other end of lever 62 is pivotally connected to the suction plate 59 and  
 75 the other end of lever 62' has a suitable roll to ride on a cam 63 fixed on the described shaft 26. The suction plate functions in the usual known manner to draw the forward end of the lower label *e* in magazine 46  
 80 downwardly into the plane of the strip *f* so that both the strip and label may be gripped by a single means and simultaneously drawn into the machine. Further description and illustration of the suction plate and its associated mechanism is unnecessary to an understanding of this invention as such construction is now well known in the art.

The strip *f* and label *e* are drawn into the machine by reciprocatory nipper mechanism which will now be described with particular reference to Figs. 4 and 5. A nipper  
 90 slide 64, having a fixed jaw 65 thereon, is mounted in frame A to reciprocate in a horizontal plane between the described turrets 34 and 35 and in a vertical plane slightly offset from that passing through the axis of their driving shaft 32 (see Fig. 2). The lower nipper jaw 66 is pivoted intermediate its ends to slide 64 and a coiled spring  
 100 67 (Fig. 4) in the latter tends to force the rear end of jaw 66 downwardly to close the nippers. A member 68, substantially of the shape of an inverted U, is pivoted to slide 64 and its lower ends are connected by a  
 105 cross bar 69, which normally underlies the rear part of jaw 66 and holds it in the illustrated position in Fig. 4. A spring 70, connected at one end to slide 64 and at the other to the upper portion of member 68, tends to move the cross bar 69 toward the forward end of slide 64. A spring plate 71 secured to the described bracket *b* as shown in Fig. 4, has a recess therein, through which the slide 64 and upper part of member 68 may pass,  
 115 as best shown in Fig. 5. On the lower part of plate 71, however, are inwardly turned projections 72 (Fig. 5) which, when the slide 64 is moved forwardly, engage the forward face of both legs of the member 68 below its pivot and, on continued movement of the slide, the member 68 is forced rearwardly to withdraw bar 69 from under jaw 66 allowing the latter to be moved into engagement with jaw 64 by spring 67. The described closing movement of jaw 66 takes place at the end of the forward movement of slide 64 at which point the forward end of strip *f* and label *e* lie between the nipper  
 120 jaws.  
 125  
 130

The nipper slide 64 is reciprocated by the following mechanism. A lever 73 fixed on a shaft 74 rotatably supported, as indicated in Figs. 1 and 4, in brackets from frame A, has a forked upper end to receive a pin projecting from the rear portion of the slide. Referring to Fig. 1, a lever 75 fixed to shaft 74 is connected by a link 76 to one arm of a pivoted bell crank lever 77, and, in the other end of the latter, is a roll which rides in a path cam 78 fixed on the described shaft 26. Cam 78 is constructed to cause slide 64 to advance to strip and label gripping position and to then retract to bring the label *e* and the strip *f* therebelow, over the stack of articles *d* in the manner shown in Fig. 16, while the articles are supported by turret 34 below a cradle 45 in turret 35. As the label *e* is drawn from the magazine, adhesive *g* is applied to its lower face adjacent one edge thereof in the manner shown in Figs. 16, 17, and 18.

The mechanism for applying the adhesive will now be described. An adhesive container 79 is mounted in frame A below the path of the label and rotatably supported therein are wheels 80 and 81, the former being arranged to dip into the adhesive and transfer it to the latter which in turn applies the adhesive to the label. The wheels 80 and 81 are driven in any suitable manner. For example, they may be gear connected with a shaft 82 (Fig. 2), the connections having been omitted in Fig. 2 to avoid confusion of lines. Shaft 82 is driven intermittently by the following means. A gear 83 (see Fig. 1) loose on shaft 82 is driven through a gear train 84 from a segmental gear 85 which is fixed to the described bell crank lever 77. Gear 83 is fixed to a pawl carrying disk 86 also loosely mounted on shaft 82 and adjacent disk 86 is a ratchet 87 which is fixed to shaft 82. It will thus be seen that the latter may be rotated intermittently in one direction, namely, that shown by the arrow in Fig. 1, during the retraction of slide 64. Referring to Fig. 2, a ratchet 83' is fixed to shaft 82 and a pawl 84' pivoted to frame A is arranged to engage ratchet 83' to hold shaft 82 from moving during the advance movement of the slide 64.

After the strip has been drawn over the stack of articles as described, it is severed by the shear blades 50, which are actuated by the following means. The upper blade 50 extends to the right of pivot 51 (Fig. 3), and this extended portion is connected by a link 88 to a lever 89 pivoted at 90 to a bracket on frame A. The lower blade 50 is also connected by a link 91 to the lever 89, the pivotal connection of the latter and the lower blade 50 being disposed to the left of pivot 51. A cam 92, which is indicated only in Fig. 2 and is fixed on the described shaft

27 is constructed to actuate lever 89 and close the shear blades at the proper time and then to open the blades and hold them open until a succeeding portion of strip *f* has been drawn therebetween.

After the foil has been positioned over the articles and after shears 50 have operated, the jaw 66 of the nippers is opened in the following manner. Referring to Fig. 6, a bell crank lever 93 pivoted at 94 to frame A has a roll on one arm to ride in a path cam 95 fixed on the described shaft 25. The end of the other arm underlies the pivoted jaw 66, as shown in Figs. 4 and 6, and at the appropriate time is moved upwardly to raise the rear part of jaw 66. As the latter is raised to release the grip on the foil and label, the spring 70 moves member 68 so that bar 69 underlies jaw 66 and holds it in the illustrated position in Fig. 4.

The wrapping turret will next be described with particular reference to Fig. 8. The turret 35 consists merely of four radial spokes, one of which is shown in Fig. 8. In each spoke of the turret, a pair of spaced rods 96 are radially slidable and each pair of rods 96 supports the described cradle 45, the upper face of which is concaved as shown in Fig. 9 to receive the stack of articles *d*. On each side of cradle 45 are holding blocks 97 and the faces of the latter, adjacent to the cradle, are recessed to receive the rounded sides of the stack. The two blocks 97 cooperate as shown in Fig. 8 to hold the stack of articles against sidewise movement in cradle 45 and endwise movement in the latter is prevented by spring fingers 98 secured to and extending upwardly from the ends of cradle 45. The members 45, 97, and 98 constitute what may be termed a wrapping pocket. Fingers 98 also have a wrapping function as will appear. Each block 97 is fixed on the outer ends of a pair of spaced arms 99, and the pairs of arms are pivoted in spaced relation to turret 35 adjacent shaft 32. Intermediate the block 97 and the pivot of each arm 99 is a roll 100 and fixed on each of the described rods 96 is a spreader 101, which, when the rods are moved outwardly by means to be described, engage rolls 100 and separate the blocks 97 from the cradle 45. The blocks 97 are normally held to the cradle 45 by suitable springs which, as shown in Fig. 8 connect the arms 99 of one block to the corresponding arms of the other block. Preferably the blocks 97 have a tongue and recess interlocking engagement with cradle 45, as best shown in Figs. 9 and 10 to prevent endwise movement of the blocks relatively to the cradle.

Pivoted intermediate its ends at 102 to the turret 35 and adjacent each cradle 45 is a lever 103 on one end of which is a suitable roll and on the other end of which is a fold-

ing finger 104. The latter is curved from pivot 102 as a center and is coextensive in length with the length of cradle 45. The fingers 104 are normally held in the positions illustrated by springs 105 but are movable to the position, indicated by dotted lines in Fig. 8, when the rolls on levers 103 come in engagement, as will be later described, with a stationary cam plate 106 secured to the described frame 6, as shown in Fig. 3.

The means for moving the rods 96 and thus separating blocks 97 from cradles 45 will next be described. A plate 107 is loosely mounted on shaft 32 adjacent the wheel 35, as shown in Figs. 1 and 3. Referring to Fig. 3, fixed to plate 107 is a crank 108 which is connected by a link 109 to the upper end of a lever 110. The latter is pivoted intermediate its ends to frame A and on its lower end bears a roll which rides in a path cam 111. The latter is constructed so that plate 107 will be turned in the same direction as and at the speed with turret 35 through an arc of substantially ninety degrees and then in a reverse direction back into the illustrated position. A roll 112 is rotatably mounted on one of the rods 96 of each cradle 45 and all the rolls ride in a cam path formed in plate 107. This path is concentric with shaft 32 except for two substantially opposite portions 107' and 107<sup>2</sup>. It will be obvious that, as cam 107 turns in unison with turret 35 during each step by step movement, the relative positions of the rolls 112 with respect to the portions 107' and 107<sup>2</sup> do not change. The lowermost roll 112 will thus move through an arc of ninety degrees with the cam portion 107' always behind it while another roll 112 will move into the lowermost position and above cradle 36. As turret 35 comes to rest, cam 107' will be turned back to its initial position and will engage the last-named roll 112 and move it downwardly, whereby the blocks 97 will be separated, and cradle 96 will be lowered toward the cradle 36 on wheel 34. The plate 107 is so moved that cam 107' has a short dwell to hold blocks 97 away from cradle 45 during the transfer of the articles thereto.

At this time cradle 36 will be elevated to transfer the stack of articles therein into cradle 96. The means for accomplishing this result are shown in Fig. 3 and consist of a cam 113 (see Fig. 2) on the described shaft 27, which is arranged to actuate a pivoted lever 114. The latter is engageable with the lower end of rod 36' and thus lifts cradle 36 against the tension of spring 37. The cam 113, which does not show in Fig. 3 but which is indicated in Fig. 2, is constructed to raise cradle 36 so that the stack of articles meets cradle 96 during the relatively short interval in which cradle 96 is lowered and blocks 97 separated from the latter. The cradle 96 is moved upwardly as cam

107' comes to rest in the position shown, by cradle 36 which moves in unison therewith until the blocks 97 have moved back into holding engagement with the articles and the cradle 96 is fully elevated.

The means for wrapping the articles will next be described. Before the articles have been transferred to cradle 96, the strip of and label *e* are positioned thereabove, as shown in Fig. 16 and as already described. The transfer of the stacked articles from turret 34 to turret 35 will then cause the label *e* and strip *f* to be partially wrapped about the periphery of the stack and the spring fingers 98, already described, will cause upper portions of the tubular end extensions to be folded down against the ends of the stack, all as shown in Fig. 17, wherein *h* represents the end folds formed by fingers 98.

Although the latter will of themselves effect the end folds *h*, it is preferred to first crease the strip *f*, to facilitate the folding, and the creasing means will next be described with reference to Fig. 2. Two fingers 115 pivoted in spaced relation to frame A at 116 and drawn toward one another by suitable springs (not shown) which are coiled around the pivot pins 116, have parts to overlie the ends of the strip *f* when the latter is positioned over a stack of articles in cradle 36. Thus, when the stack is forced upwardly with the strip *f* and label *e* thereabove, the ends of the strip are bent downwardly to crease the paper and start the fold *h* which may then be readily completed by fingers 98.

Immediately after the strip *f* has been creased as described, the fingers 115 are spread apart to permit the ends of the strip to freely pass thereby. To accomplish this function a spreader 117 fixed on a rod 118 is arranged to move forwardly between the fingers 115 and engage rolls thereon, whereby the fingers may be spread apart in an obvious manner. Rod 118 is connected by a link 119 with a lever 120 which is loosely mounted intermediate its ends on a rod 121 and which has a roll riding on a cam formed on the periphery of the described cam 113.

The means for completing the wrapping of the stacks of articles will next be described. The stack of articles having been positioned in the lowermost cradle 45 of turret 35, and the blocks 97 having been moved into holding engagement therewith, the label *e* and strip *f* are brought into the positions shown in Fig. 17 as already described. The turret 35 then starts on its step by step movement and the articles are carried in a clockwise direction through an arc of ninety degrees. During the first part of this movement, the roll on lever 103 is forced inwardly toward shaft 32 by the described stationary cam 106 which causes finger 104

to move into the position shown by dotted lines in Fig. 8. The movement of finger 104 wraps one of the downward extensions of label *e* and strip *f* around the periphery of the stack, as indicated diagrammatically in Fig. 18.

While the finger 104 is held in the position shown by dotted lines in Fig. 8, the other downward extensions of label *e* and strip *f* are engaged by a stationary brush 122, of arcuate form and concentrically arranged with respect to shaft 32. Thus, the last-named downward extension is laid over the first-named extension; the finger 104 being drawn back in time to permit the gummed edge *g* to engage the other edge of label *e* in overlapping relation. The two overlapped edges of the label, now in the tubular form shown in Fig. 19, are brushed into intimate engagement during the remainder of the first step of movement of wheel 35 and are held together by the brush during the folding of the tubular end extensions of wrapper *f*.

The end folding operations, other than the described end folds *h*, occur largely while the articles are at rest intermediate the upper and lower extremities of brush 122. When the articles are thus positioned finger 104 is completely retracted by spring 105 and folding fingers 123, pivoted to frame *b* at 124, are swung upwardly and force portions *i* of the tubular end extensions of the wrapper *f* flat against the ends of the stack, as shown in Fig. 20, the folds *h* being still held by fingers 98. The fingers 123 are connected by a link 125 with a lever 126, which is pivoted intermediate its ends, as shown in Fig. 3, to frame *A* and has a roll riding in a path cam 127 secured to the described shaft 25. The cam 127 is directly in back of another cam to be described and does not, therefore, appear in Fig. 3, but it is clearly indicated in Figs. 1 and 2. Cam 127 is constructed to move fingers 123 upwardly to complete folds *i* and thereafter to retract the fingers and hold them retracted until a succeeding stack of articles is to be operated upon.

Immediately after the retraction of fingers 114, folding fingers 128 fixed on rods 128' slidably mounted in frame *b*, are moved radially inward toward wheel 35, and these fingers fold the parts *j* (see Fig. 21). As shown in Fig. 21 the end folds are now completed except for small extensions *k*, and the latter are received in slots 129 in fingers 128. The rods 128' are connected together and are connected by a link 130 to the upper end of a lever 131 which is pivoted intermediate its ends to frame *A* and has a roll on its lower end which rides in a path cam 132 fixed to shaft 25. Cam 132 is constructed to move the fingers 123 inwardly to form the folds *j* and then to hold the fingers stationary un-

til the turret 35 starts its next step by step movement. It will thus be seen that the extensions *k* being positioned in slots 129 will be laid downwardly against the ends of the stack, as shown in Fig. 22. The fingers 123 are then retracted and held thus positioned until a succeeding stack of articles is to be operated upon.

The articles, completely wrapped as described, are carried by the next step of movement of turret 35 into the uppermost position illustrated in Fig. 3. A plate 114' fixed to brush 122 forms a continuation of the latter and coöperates with the brush to hold the overlapped seams together until the stacks are discharged in a manner to be described. It will be remembered that, during this step of movement, cam plate 107 moves in unison with wheel 35 whereby the rods 96 are kept stationary, and the wrapped articles are held to cradle 45 by the blocks 97. Immediately as the wheel 35 comes to rest, however, cam plate 107 swings back to the position illustrated in Fig. 3 and in its rearward movement cam path 107<sup>2</sup> engages the uppermost roll 112 and moves its upwardly, raising rods 96 and spreading apart the blocks 97. The wrapped package is thus released from blocks 97 and as it is released the rods 96 lift cradle 45. The wrapped package with the overlapped seam in label *e* uppermost and in engagement with a spring plate 133, which is fixed to the upper end of brush frame 122 and extends over the wheel 35 is thus moved to lift the plate 133. The gummed seam of wrapper *f* is thus pressed together between plate 133 and the stack of articles, and the latter is lifted until it aligns axially with the rounded ends of two levers 134. The latter are part of the means for transferring the wrapped package from wheel 35 to the discharge apparatus shown in Figs. 11 to 14, inclusive.

The discharge apparatus will next be described. Referring to Figs. 11, 12, and 13, upper and lower brushes 135 are horizontally arranged and supported from the described frame *B*, as best shown in Figs. 11 and 12. The adjacent ends of brushes 135 are spaced apart a distance less than the thickness of the wrapped package. The wrapped packages are adapted to be moved intermittently between the brushes by a conveyer and are transferred to the conveyer by the described levers 134. The conveyer involves two spaced sprocket chains 136 which support between them a plurality of spaced lugs 137. Referring to Figs. 12 and 13, chains 136 have rolls 136' thereon which, during the lower travel of the chains, ride in tracks 137' fixed on frame *B*, and the lugs 137 are thereby held so that their package engaging portions lie between brushes 135. The conveyer chains are mounted on pairs of sprockets 138 and 139, the former being idlers, whi-

the latter are driven by gears 140 from a shaft 141. Fixed to the latter is a ratchet 142 and loosely mounted intermediate its ends on shaft 141 is a lever 143 which carries at one end a pawl 144 to engage ratchet 142 and at the other end is connected by a link 145 to a lever 146. The latter is broken off in Fig. 11 on account of space limitations but is completely shown in Figs. 2 and 3, from which figures it will be seen that the lever is fixed on the rod 121, already described. Also fixed on rod 121 is a lever 147 (see Fig. 2) which has a roll riding in a path cam 148 fixed to the described shaft 27. Cam 148 is so constructed that lever 146 is rocked to the right, as viewed in Figs. 3 and 11, shortly after the wrapping wheel has come to rest and thereafter returns to its illustrated position. Thus the conveyer 136 will be driven step by step in one direction, but will not move in the other direction due to the pawl and ratchet driving connection described.

The means for transferring the wrapped packages from wheel 35 to the brushes 135 into such a position that they may subsequently be moved step by step by the conveyer will next be described. Each of the levers 134 described is fixed to a vertical rod 149 which is mounted near one end of a rod 150. The two rods 150 are slidably supported in frame B and are connected together by a bracket 151 (Figs. 11 and 12). The latter is connected by a link 152 to the upper end of the described lever 146. Thus, the levers 134 may be shifted from the position shown in Figs. 3 and 11, wherein their ends are axially aligned with the ends of the wrapped package, to the left end of the brushes 135. The levers 134 are connected together by arms 153 (see Fig. 14) so that a movement of one will cause a like movement of the other, and they are normally drawn toward one another by a spring 154. On the lower end of one pin 149 a lever 155 is fixed and on the free end of this lever is a roll, which is forced by spring 154 toward a cam plate 156. The latter is supported on the lower ends of arms 157 which are pivoted at their other ends to frame B, as shown in Fig. 11. One arm 157 is connected by a link 158 (Figs. 11 and 14) to the upper end of a lever 159. The latter is not completely shown in Fig. 11 but from Fig. 2 it will be seen that it is pivoted at 160 to a bracket on frame A. The lever 159 extends below pivot 160 and has a roll which rides in the grooved cam 161 (Fig. 2). Cam 161 is constructed to hold plate 156 in such a position that the ends of levers 134 will be held apart a distance greater than the length of the package until the said ends are aligned with the ends of the package in turret 35. The cam then causes the plate to move to the position shown in Fig. 14, so as to permit spring 154 to draw the ends of levers 134 to-

ward one another to grip the package therebetween. The plate 156 then remains stationary while the package gripped at its ends by levers 134 is carried by the latter to and between the brushes 135. It is to be noted that the articles in their travel to the latter are carried so that the overlapped gummed edges bear against plate 133, and this plate has the function of ironing out the seam. As the package is deposited between brushes 135, the cam 161 moves the plate 156 so that the levers 134 are spread apart and then remains stationary during the return stroke of levers 134 into the illustrated position.

During the return stroke of levers 134, the chains 136 are operated by the means described and a lug 137 will engage the package previously inserted between the brushes, as already described, and move it one step. The packages are thereafter carried step by step between the brushes, the upper of which functions to hold the gummed seam of label e, until the adhesive is thoroughly set. It is particularly to be noted that the wrapped articles, being of substantially cylindrical form, would, when propelled by lugs 137, tend to roll, due to the frictional engagement of the upper brush 135 therewith. For example, considering Fig. 11, the articles would tend to roll in a counterclockwise direction when moved to the right and engaged by the upper brush 135. To prevent such rolling and the consequent disengagement of the upper brush 135 with the overlapped seam, the lower brush 135 is provided, which exerts a like degree of frictional resistance to movement of the articles. The articles, when moved to the right and engaged by the lower brush, tend to roll in a clockwise direction, and thus the function of the lower brush is to neutralize the undesirable effect of the upper brush on the articles and to prevent the latter from rolling. The lugs 136 eventually move the package from the brushes 135 onto a conveyer 163, the driving drum of which is fixed on the described shaft 141 and is moved intermittently thereby. The packages may be delivered by the conveyer 163 to a table 164 or any other suitable means, as desired.

The operation will now be briefly summarized. The articles, such as the stacks of elliptical lozenges illustrated or other generally cylindrical articles, are manually fed to the turret 34 and successively carried step by step to a position adjacent turret 35. In the event that stacks of articles to be wrapped are out of alinement the stacks are successively and automatically straightened and alined before they reach the wrapping turret by the mechanism shown in Fig. 6. Wrapping material, involving in this instance foil and labels, to the latter of which adhesive is applied, are fed above the articles

shortly after they come to rest in under the turret 35. Each stack of articles is raised from turret 34 and, as it rises, a cradle 45 descends toward the stack. The articles are thereby gripped between the cradles 36 and 45, and the latter move together until the devices 97 move into gripping engagement with the stack. This operation is characterized in that a stack of articles may be held against movement in all directions during their transfer.

Preferably the end portions of the foil *f* are first creased by the fingers 115 during the transfer of the articles to facilitate the formation of the fold *h* by the fingers 98 when the articles and wrappers are forced therebetween and against cradle 45. The insertion of the articles in the latter causes the stack to be partially wrapped circumferentially and immediately on movement of the turret finger 104 moves to lay the ungummed part of the label, and the foil thereinunder, against the stack. The finger 104 holds the wrappers in the position shown in Fig. 18 until the turret on further movement brings the gummed edge of label *e* into engagement with the brush 122, whereby the gummed edge is laid down into overlapping engagement with the ungummed portion. The turret then comes to rest and while at rest fingers 123 and 128 successively fold portions *i* and *j* of the tubular end extensions of wrapper *f* into overlapping relation flat against the ends of the stack. The folding of parts *j* results in the remaining end extension *k* being lodged in slots 129 and, as the turret moves, these portions are laid flat against the ends of the stack and in overlapping relation with the folds *h* and *j*. The particular manner of forming the end folds of the package is considered important and advantageous in the wrapping of substantially cylindrical articles or substantially cylindrical stacks of articles, for the tubular extensions are subdivided into a plurality of sections which are successively folded in overlapping relation to form an effective end seal for the package.

The articles completely wrapped are raised, as the turret again comes to rest, into engagement with the yieldable plate 133 and the overlapped gummed seam of the label is thereby firmly forced together. The gripper levers 134 seize upon the ends of the wrapped package as the cradle 45 recedes therefrom, and thereafter the levers are shifted to carry the package into and between the brushes 135. The gripper levers have another important function which is to compress the end folds against the ends of the wrapped stack of articles. During the transition from the turret 35 to the brushes 135, the seam of label *e* is drawn along plate 133 and is thoroughly ironed to

free the label from wrinkles. The plate furthermore functions to prevent the gummed edges from opening. The lugs 137 move into engagement with the packages deposited between brushes 135 and carry them slowly therebetween by a step by step motion to the delivery conveyer 163. The packages are confined between the brushes for a period sufficient to allow the adhesive to firmly set. A feature of importance in the operations described is that the gummed overlapped edges of the label are held continuously from the time when they are overlapped until the adhesive has set, first by the brush 122 during the movement of the turret, then by plate 114', then by plate 133 during the transfer to brushes 135, and lastly by the latter.

The invention has been described in an embodiment for illustrative purposes, but the scope of the invention is more properly defined by the appended claims rather than by the foregoing description.

What we claim is—

1. A wrapping machine, comprising, a feeding turret, a plurality of pockets thereon, each adapted to receive and carry groups of articles to be wrapped in stacks, a second turret, means to transfer groups of articles from the first to the second turret, means to wrap the articles while on the latter, and means engageable with each group of articles prior to said transfer to insure that the articles are properly alined in stack form.

2. A wrapping machine, comprising, a turret movable step by step, a plurality of devices on the turret each adapted to receive and hold a plurality of articles stacked face to face, means to successively engage each stack of articles to insure that all the articles in a stack are in proper alinement, a second turret movable step by step, a plurality of members thereon to receive articles to be wrapped, means to successively transfer stacks of articles from the first to the second turrets, means to supply wrapping material in position to be carried with the articles into said pockets, and means to wrap said material about the articles while in said pockets.

3. A wrapping machine, comprising, a turret movable step by step, a second turret movable step by step in proximity to the first turret, a plurality of devices on the first turret, each arranged to receive and hold a plurality of articles arranged in stacks, a plurality of members on the second turret, each arranged to receive and hold a stack of articles from the first-named turret, said devices and members including movable parts, means to move said parts toward one another to hold the articles therebetween against movement in all directions and thereafter in unison in the same direction to

carry the articles to the second turret, means to hold the articles to the second turret, and means to withdraw said part on the first turret from the articles after they have been engaged by the holding means, all constructed and arranged for the transfer of a stack of articles while positively held against relative movement from one turret to the other.

4. A wrapping machine, comprising, a turret movable step by step and having a plurality of pockets, each adapted to receive articles to be wrapped and wrappers therefor, each of said pockets comprising a movable cradle in which articles may rest, movable members coöperating with the cradle to grip the articles, and means operable by movement of the cradle to move said members from holding engagement with the articles, means to wrap articles while held by said cradle and members, means to simultaneously move relatively to the turret one of said cradles to a position to receive articles to be wrapped and another to a position to discharge the wrapped articles.

5. A wrapping machine, comprising, a turret movable step by step, a plurality of cradles radially movable on the turret, a cam engageable with all said cradles, movable members normally held in coöperating engagement with each cradle to form a wrapping pocket, means operable by movement of the cradle to move said members and open the wrapping pocket, said cam being movable as the turret comes to rest to simultaneously move two of said cradles radially of the turret, whereby one pocket is opened to receive an article to be wrapped and its wrapper and another to release a wrapped article, said cam being movable to close the pockets while the turret is at rest and movable in unison with the turret, whereby all the pockets are closed, and means to wrap the articles while on the turret.

6. A wrapping machine, comprising, a turret movable step by step, a plurality of pockets on the turret in which articles may be held for wrapping, each pocket comprising relatively movable parts normally held in coöperating engagement to grip articles to be wrapped and positively hold them from movement in all directions, means to successively open said pockets to receive articles and wrappers therefor, means to wrap the articles while held in said pockets, and means to successively open said pockets to discharge the wrapped articles therefrom.

7. A machine for wrapping substantially cylindrical articles, comprising, a turret movable step by step, a plurality of multi-part wrapping pockets on the turret, means to successively feed wrappers, means to successively open the pockets as they come to rest adjacent the wrappers, means to successively feed articles to the open pockets ar-

ranged so that the wrappers are carried therewith into the pockets to partially encompass the peripheries of the articles, means to successively close the pockets after the articles and wrappers have been positioned therein to grip the articles and leave extensions of the wrappers on each side of the pockets, folding fingers pivoted to the pockets, a stationary cam adjacent the path of the turret arranged to successively move said fingers during the travel of the turret and fold one of said extensions against the articles, and a stationary brush adjacent the path of the turret at a distance from the article feeding means, to lay the other extensions against the articles on further movement of the turret, said cam arranged to hold the finger in its moved position until the second extension has been laid in overlapping relation over the first extension.

8. A wrapping machine, comprising, a turret movable step by step, a plurality of pockets in which the articles with the wrappers may be positioned, means to wrap the articles except for tubular end extensions flat against the ends of the articles in a plurality of overlapping folds, including fingers provided with slots, said fingers being movable while the turret is at rest to form end folds and arranged so that extensions of the wrapper are positioned in said slots, and means to hold said fingers in their moved positions until the articles have been carried past the fingers on movement of the turret, whereby said extensions are laid flat against the ends of the articles.

9. A wrapping machine, comprising, a turret having a plurality of pockets in which articles and their wrappers may be positioned, means to wrap the articles while in said pockets including means to form overlapped gummed seams in the wrappers, means to eject wrapped packages from the turret, a yieldable member against which said overlapped seams are forced by the ejection of the packages, a discharge apparatus through which the packages are carried and in which said seams are held until the adhesive has set, and means to transfer the packages from the ejecting means to said apparatus, characterized in that the seams of the packages are carried along said member while held thereagainst so that said overlapped seams are firmly pressed and ironed during the transfer.

10. A wrapping machine, comprising, a turret to carry articles to be wrapped, means to wrap the articles while in the turret, means to move the wrapped articles radially outward from the turret, fingers between which the ends of the package are positioned by the last-named means, means to move the fingers endwise of the package to grip the latter, a delivery conveyer at a

distance from the turret, and means to bodily shift said fingers to carry the articles to and upon said conveyer.

11. A wrapping machine, comprising, a turret to carry articles to be wrapped, means to wrap the articles while in the turret including means to form overlapped gummed seams in the wrapper, a yieldable plate adjacent the turret, means to move the package from the turret against said plate with the overlapped seam in contact therewith, fingers between which the ends of the package are positioned by the last-named means, means to move the fingers to grip the ends of the package, and means to bodily shift the fingers to carry the package along said plate with its seam held thereagainst, whereby the latter is effectively pressed and ironed.

12. A wrapping machine comprising, a turret to carry articles to be wrapped, means to wrap the articles while in the turret, including means to form overlapped gummed seams in the wrapper, a yieldable plate adjacent the turret, means to move the package from the turret against said plate with the overlapped seam in contact therewith, fingers between which the ends of the package are positioned by the last-named means, means to move the fingers to grip the ends of the package, means to bodily shift the fingers to carry the package along said plate with its seam held thereagainst, whereby the latter is effectively pressed and ironed, and a discharge apparatus in which the package is positioned by the shifting movement of said fingers and through which the package is carried with its seam held until the adhesive has set.

13. A wrapping machine, comprising, a turret with a series of receiving pockets, means to feed the article to be wrapped and the wrapper in trough shape to a pocket, a flap laying device pivoted on the turret adjacent each pocket operable to lay the rear flap of the trough against the article during the movement of the turret, an arch-shaped stationary brush adjacent the turret path to lay the forward flap over the other and against the article, wrapping mechanism operable during a pause in the turret's operation to complete the end folds of the wrapping, except for one last fold on each end, means having an abutment associated with the wrapping mechanism to complete the last folds upon the movement of a pocket away from such mechanism, and actuating means for the operable elements.

14. In a machine for wrapping generally cylindrical articles, a turret having a series of pockets, each consisting of a cradle mounted in the turret to move radially, yieldable end walls mounted on the cradle, movable side walls to partially encompass the peripheries of the articles, arms pivoted

on the turret to carry such side walls, means operable to spread the side walls and move the cradle outwardly, and feeding mechanism to force an article against the cradle and push the latter inwardly, and means to cause the pivoted arms to approach and the side walls to grip the article.

15. A wrapping machine, comprising, a horizontally arranged assembling and feeding turret, a vertically arranged wrapping turret arranged with respect to the feeding turret for the articles carried by either to be in vertical alinement at a transfer point and mechanism located in part on one turret and in part on the other turret operable to effect the transfer of articles from one turret to the other.

16. In a wrapping machine, a folding blade movable to and from folding position, and comprising two portions with a slot therebetween, one portion adapted to make a fold against an article of a portion of its wrapper when moved against the wrapper and article, and the slot adapted to receive a remaining unfolded portion of the wrapper, whereby the other portion of the blade acts as an abutment to lay down the remaining unfolded portion when the article is moved away from the folding blade.

17. In a wrapping machine, means to wrap the sides and ends of articles, such as assembled disks, bottles, and the like, a discharge mechanism, comprising, two spaced arms movable toward and away from one another, means to deliver wrapped articles in line with such arms, means to move the latter together to grip the ends of the articles placed in line therewith, receiving means to take the articles from said arms and actuating means to move the arms to releasing position for the articles to be delivered to the receiving means.

18. A wrapping machine, comprising, a horizontally arranged feeding turret, a plurality of pockets thereon, each comprising a movable bottom wall, yieldable side walls and yieldable end walls movable with the bottom wall, each of said pockets adapted to receive a plurality of articles to be wrapped in stacks, a vertically arranged wrapping turret arranged with respect to the feeding turret for the articles carried by either to be in vertical alinement at a transfer point, a plurality of pockets on the wrapping turret, each comprising a movable bottom wall, separable side walls and yieldable end walls movable with the bottom wall, means to move a bottom wall on one and a bottom wall on the other turret together to grip the articles therebetween and hold them against displacement during their transfer to the wrapping turret, means to separate the side walls of the wrapping pocket, and means to move the last-named side walls

together to grip the articles before the return movement of the bottom wall of the feeding pocket.

19. In a wrapping machine, means to wrap  
5 the sides and ends of articles, such as assembled disks, bottles and the like, including means to form an overlapped gummed seam in the wrapper, a discharge apparatus comprising a support upon which the  
10 wrapped articles are deposited and along which the articles are carried, means to deposit the wrapped articles on said support, means associated with the latter yieldingly engageable with the wrapped articles to hold  
15 the gummed seam from opening, and other means on said support to prevent the wrapped articles from rolling during their movement thereon, whereby the disengagement of said yieldable means with the  
20 gummed seam is prevented.

20. In a wrapping machine, means to wrap the sides and ends of articles, such as assembled disks, bottles and the like, a discharge mechanism, comprising two spaced arms movable toward and away from one  
25 another, means to deliver the wrapped articles in line with said arms, means to move the latter together to grip the ends of the articles placed in line therewith, means to  
30 receive articles from said arms, means to move the arms to releasing position for the articles to be delivered to the receiving means, means to carry the articles through the latter, and a common actuating means  
35 for the arms and carrying means to operate each in properly timed relation with the other.

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