H. J. KEMPF & G. L. MASON.

WRAPPING MACHINE.

APPLICATION FILED NOV. 22, 1912.

1,175,361.

Patented Mar. 14, 1916.

6 SHEETS—SHEET 1.

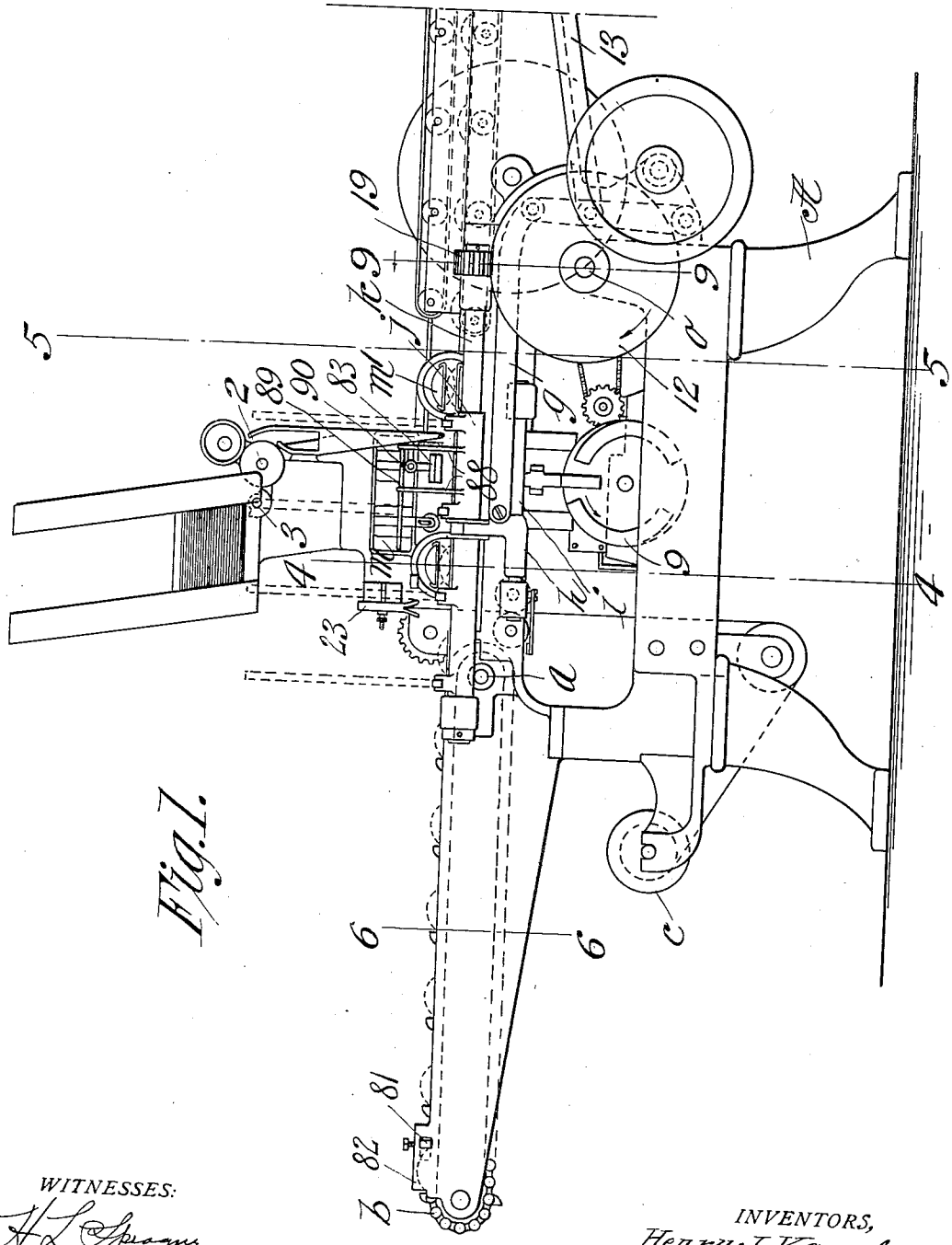


Fig. 1.

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6 SHEETS—SHEET 2.

Fig. 7.

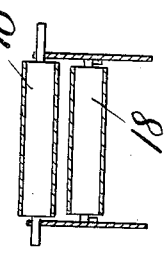


Fig. 1a.

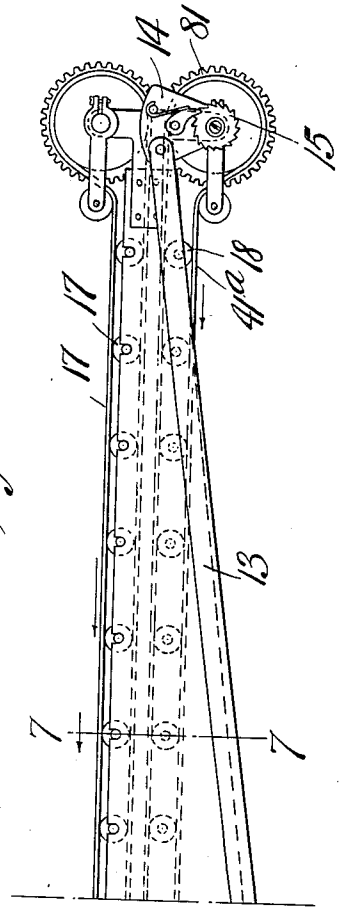
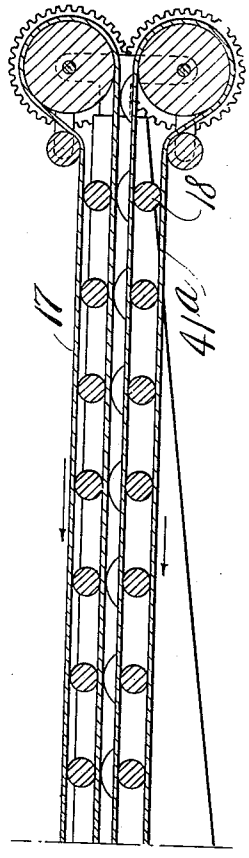


Fig. 2a.



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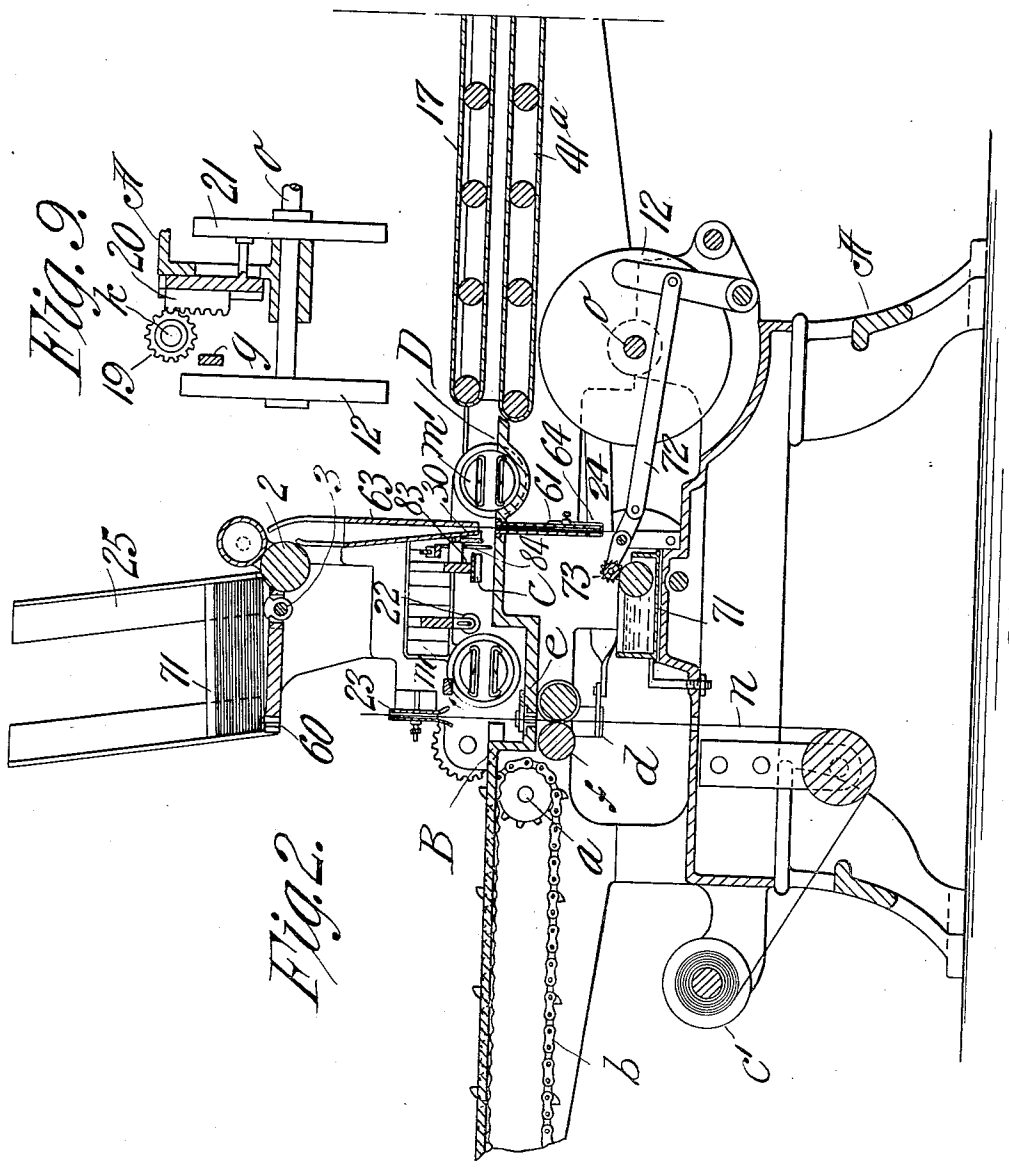
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6 SHEETS—SHEET 3.

Fig. 2.



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6 SHEETS—SHEET 4.

Fig. 8.

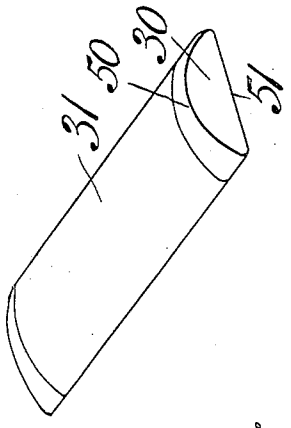


Fig. 3.

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Fig. 6.

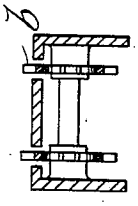
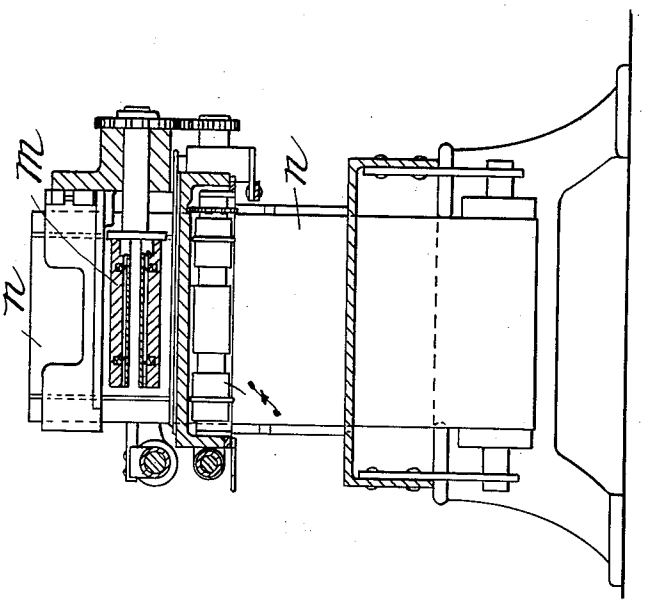


Fig. 4.



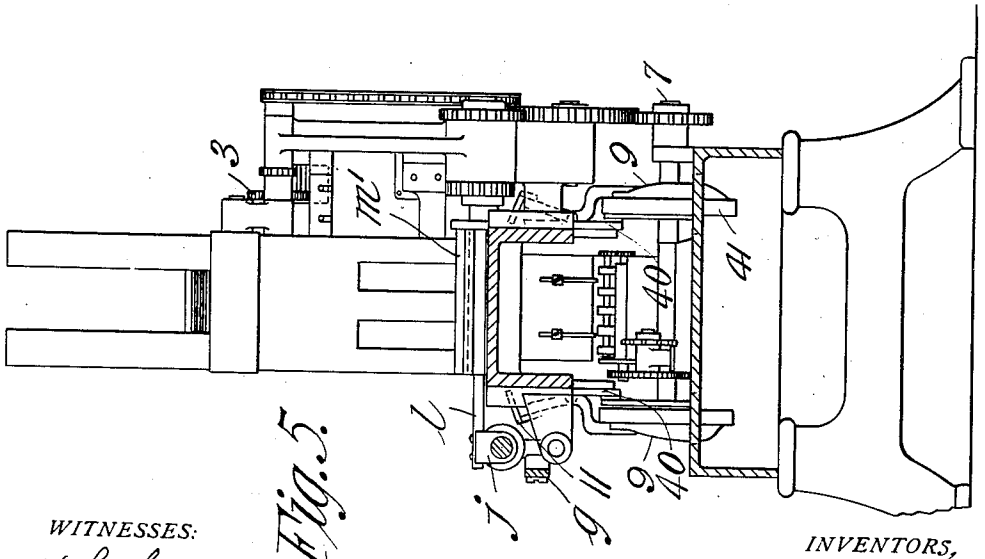


Fig. 5.

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6 SHEETS—SHEET 6.

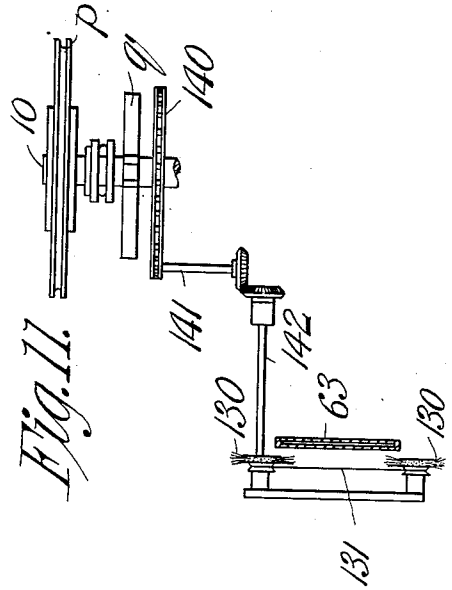


Fig. 11.

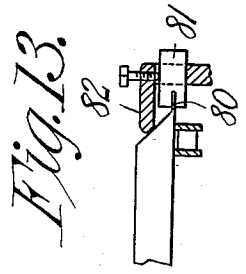


Fig. 13.

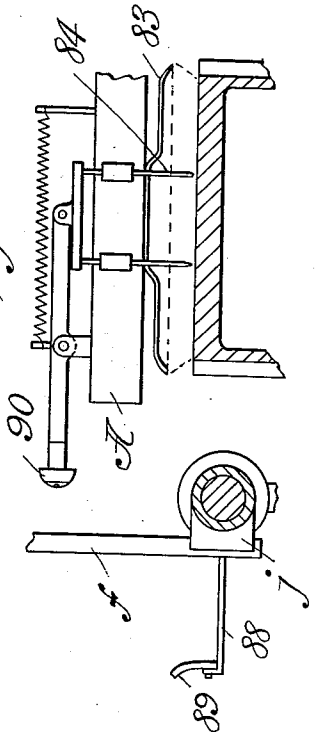


Fig. 12.

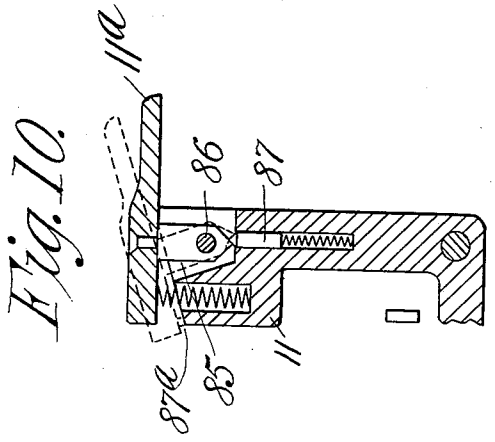


Fig. 10.

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UNITED STATES PATENT OFFICE.

HENRY J. KEMPF, OF SPRINGFIELD, MASSACHUSETTS, AND GEORGE L. MASON, OF WAREHOUSE POINT, CONNECTICUT, ASSIGNORS, BY MESNE ASSIGNMENTS, TO PACKAGE MACHINERY COMPANY, A CORPORATION OF MASSACHUSETTS.

WRAPPING-MACHINE.

1,175,361. Specification of Letters Patent. Patented Mar. 14, 1916.

Application filed November 22, 1912. Serial No. 732,851.

To all whom it may concern:

Be it known that we, HENRY J. KEMPF and GEORGE L. MASON, citizens of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, and at Warehouse Point, in the county of Hartford and State of Connecticut, respectively, have invented new and useful Improvements in Wrapping-Machines, of which the following is a specification.

This invention relates to wrapping machines and has for its object to wrap articles cheaply and quickly.

A special object of the invention is to wrap an article first with one kind of material, as tin-foil, and then to band the article with a label.

It is common in the art at the present time to wrap articles in this way, as, for instance, chewing-gum which is wrapped with a piece of tin-foil, the ends turned in and the label put on as a band to hold the inturned ends against the stick. The invention herein shown involves a wrapping of this nature, but has, broadly, features not specifically limited to this special form of wrapping. The machine shown herein is a development of the machine shown in patent to James J. Sullivan, 851,907. In this patent the article to be wrapped is fed forward by a step-by-step plunger-arm movable into and out of the plane of the article's path. In the present machine there are four plunger-arms, similar in operation, to move the articles being wrapped at different stages of the wrapping operation.

The present machine is particularly designed to improve the several structural details and their mode of operation in wrapping articles in the way above mentioned.

The embodiment of the invention chosen for the purpose of illustration discloses means for wrapping a chocolate almond bar of a somewhat irregular shape, in which the first wrapping is of metal foil and the ends inturned, and the second wrapping a paper label or band which is wrapped around the article in a manner to hold the ends of the foil against the chocolate stick and give an appearance of being properly and completely wrapped.

Referring to the drawings,—Figure 1 is a side view of the assembled machine with a portion of one end cut away. Fig. 1ª is a view of the extreme end of the machine which has been separated or cut away in the view shown in Fig. 1, which separation is rendered necessary in the drawings by the size of the machine. Fig. 2 is a longitudinal sectional elevation of the main parts of the machine. Fig. 2ª is a similar sectional view of the extreme end of the machine which could not be conveniently shown in Fig. 2. Fig. 3 is a side elevation of the machine from the side opposite to the illustration in Fig. 1. Fig. 4 is a sectional view taken along the line 4—4 of Fig. 1. Fig. 5 is a sectional view taken along the line 5—5 of Fig. 1, looking in the direction of the arrows. Fig. 6 is a sectional view taken along the line 6—6 of Fig. 1. Fig. 7 is a view taken along the line 7—7 of Fig. 1ª. Fig. 8 is a perspective view of the specific article which the machine used for the purpose of illustrating the invention is designed to wrap. Fig. 9 is a detail sectional view showing the means of operating certain transfer fingers, taken along the line 9—9 of Fig. 1. Fig. 10 is a sectional detail view of the end folding arm. Fig. 11 is a detail view showing the manner in which the surfacing brushes are used. Fig. 12 is a detail sectional view, partly in section, showing the positive stop and holding device at the point in the machine where the end folds are made. Fig. 13 is a detail sectional view showing means for scraping off excess chocolate as the bars are fed to the machine.

All the parts of the machine are conveniently assembled on the frame A. A driving connection is made with the pulley *p* (see Fig. 3). On the same shaft 10 with the pulley *p* is a small gear meshing with gear 12 mounted on shaft *o*. This gear 12 operates a Geneva wheel *q* mounted on the shaft 10. This Geneva wheel *q* has fixed thereto a gear *s*, loose on shaft 10, which, through the driving connections described and shown in Fig. 3, receives an intermittent rotary movement in the direction of the arrow shown. The train of gears shown in Fig. 3 thus is given an intermittent rotary movement by the gear *s* and this movement is transmitted to the other parts of the ma-

chine. A connection from this train of gearing is made by means of a chain to the shaft 2 which operates the paper-feeding mechanism to be described. A second chain connection with this gear train operates a gluing or pasting mechanism to be described.

Referring to Fig. 1, the articles or chocolate bars, shaped in the manner disclosed in Fig. 8, are fed either automatically or by hand to the feed chain *b* which has thereon spaced lugs which positively move the articles into the machine. The illustrative embodiment of this invention is designed to wrap chocolate bars just as they leave the molds of a molding machine. When the bar is molded in the form shown in Fig. 8, the edges are liable to have fins, as at 80 in Fig. 13, which are caused by excess chocolate running over the edges of the mold. Inasmuch as a sharp fold at edge 51 (Fig. 8) is necessary in the tin-foil wrapping, such a fin as 80 is most objectionable. These fins are, therefore, removed by a knife 81 adjustably mounted at the sides of the machine at 82. They act to scrape off the excess chocolate in an obvious manner. As each piece of chocolate leaves the chain *b*, it rests on a stationary support B adjacent to the chain, as seen best in Fig. 2. Transfer fingers to be described move each article from this point and push it against a suitable piece of metal foil located between the point B and the folding slot in shaft *m*. The article is pushed together with the sheet of foil into the slot (see Fig. 2) and a U-shaped fold of the wrapper is made around the article in an obvious manner with the lower end within the slot and the upper end extending therefrom. The shaft *m* is mounted on the shaft 5 (see Fig. 3) and by the gear train previously described this shaft, at the proper time, is given a half turn, which turns the article, together with its metal foil wrapping, in a clockwise direction (see Fig. 2). The end of the wrapping extends considerably beyond the upper left-hand edge of the folding slot of shaft *m*, and as the shaft *m* turns, a stationary shield, shown in Fig. 1 partially surrounding the same, causes the trailing end of the wrapper to be folded around the shaft. After the shaft has made its half turn as described, the transfer fingers to be described push the article and its wrapper into the folding slot C and in this movement the trailing end of the wrapper is pushed around the article so that the same is completely wrapped in one direction with tubular end folds extending from each end thereof. As the article enters the folding slot C a self-weighted roller 22 mounted in vertically-arranged slots, as shown in Fig. 2, bears against the over-lapping ends of the foil wrapping and acts to lay the same flat against the article without rubbing the foil from the article being wrapped. This action of the roll is important, for in wrapping with tin-foil a scraping or friction action to lay the foil on the article would tend to tear the foil and spoil the wrapping. From under the roll 22 the article is pushed continuously to a point just below the shield 83 and against the positive stop-pins 84, which operate in a manner to be described. The end folds are made against the article on the flat side thereof, which, in the position described, is uppermost. These end folds are made by the folding members 11, one mounted on each side of the machine (see Figs. 5 and 10). The folding members are pivoted on a vertically-mounted slide 40 operated by a face-cam 41 on shaft 7. As the folding members are moved vertically by means of the cam 41 and the slides 40, they are at the proper time turned on their pivot points by means of cams 9, also mounted on the shaft 7. These cams are so designed that the innermost edges 11^a of the folding members 11 engage the tubular end of the metal foil wrapper at about point 50 (see Fig. 8), and as the folding members are raised by the cams 41, the cams 9 cause the folding members to turn outwardly just enough to cause the inner edge of the same to push the metal foil wrapping along the wedge-shaped surface between points 50 and 51 (see Fig. 8). Just as the innermost edges of the wrapping members reach point 51, the cams 9 cause the wrapping members to be turned in toward one another so that the tubular ends of the metal foil wrapper from points 51 are laid over the top of shield 83 and brushes to be described, then flatten the over-lapping ends against the flat side of the article.

The upper end folding members proper are yieldingly mounted on their supporting arms, with the normal position as shown in full lines in Fig. 10. The cross-section shows the structure and operation of this wrapping member. The part 11^a is pivoted at 86. The spring 85 and spring-latch 87 normally hold part 11^a in the desired position. When the arm swings in to make the fold around edge 51, the pivoted wrapping member 11^a pushes the end fold of the wrapper over and against shield 83. In this movement the pivot point of 11^a swings on an arc from the pivot point of arm 11. Just about at the end of the inward swinging movement the pivoted member 11^a snaps by the spring-latch 87, due to its downward pressure on shield 83, into the dotted line position. Then as this dotted-line position is maintained during the return movement, there is no danger of dragging back the fold laid over shield 83. The stop 87^a is engaged by the back end of 11^a on the return movement, and the latter is thus forced into normal full-line position, as shown in

Fig. 10. The operation on both sides of the machine is the same. If the metal foil end folds were laid directly on the article at this stage in the operations, they would be liable to buckle and the member 11ª could not retreat to normal position without liability of pulling back the fold just made. Although the shield is not absolutely necessary in the operation of the machine, it has been found to give a very material advantage. The stops 84, best shown in Fig. 12, square the article up in proper position under shield 83. The stops slide in bearings on a cross-piece of the main frame A and are connected at the top by a cross-bar. To the latter is pivoted a lever 90 with a roll on the end. This lever is pivoted intermediate its ends to frame A. On the sleeve *j*, the operation of which is to be described, are fastened arms 88 at right angles to the transfer arms *l*, as seen in Fig. 12. The sleeve *j* makes a quarter turn to throw arms *l* into horizontal position, after which the sleeve moves horizontally, while arms *l* move the wrapped articles through the wrapping channel. At this time, a cross-plate 89 on arms 88 bears against the roll 90 to lift the stop-fingers 84 while the articles and arms *l* pass through the channel. The plate 89 is of the proper length to run off the roll 90 and drop the stop-fingers 84 just as an article is taking its place under the shield 83. As the package being wrapped leaves its position under shield 83 after the end folds have been turned over in the manner described, brushes 30 lay the folds flat against the article and smooth them into proper place. These brushes are mounted just in front of the guide 63 for the bands and just back of shield 83, as indicated in Fig. 2. The brushes are operated in the manner shown in Fig. 11. A chain 140 passing around sprockets on shafts 10 and 141 drives, by suitable gearing, shaft 142 on which is one of the brushes 30. The other brush is driven by a cross-belt so that the brushes rotate toward one another to lay the folds flat and smoothly on the flat side of the article 50. In making the last of the end folds by the brushes 30, especially where a metal foil wrapper is used, a superior result is obtained when compared to folds made by folding-fingers or plates.

The article is now wrapped completely by the metal foil and it remains for the band to be put on in order to hold the inturned ends of the metal foil wrapper. The wrapping members 11 are operated by the cams 9 and 41 to move away from one another and downwardly into the position shown in Fig. 5, whereupon they are ready for another cycle of operations. After the end folds have been made at the point C the transfer-fingers push the wrapped article against a label (see Fig. 2) and together with the label into the folding slot of shaft m^1, forming a fold in the same manner as previously described in connection with the folding barrel *m*, except that the long extension of the label is from the lower left-hand corner instead of the upper. This shaft m^1 is mounted on shaft 1 (Fig. 3) and is given a half turn by the intermittent movement thereof already described. In this last case, however, the label is of less width than the length of the article so that no end folds of the label are necessary. The label is wrapped around the article by means of a half turn of the shaft m^1 in a counter-clockwise direction so that the extension of the label trails between the lower shield of the shaft m^1 and the shaft, and by the action of the transfer-finger in pushing the article together with the label over the flat surface D and to the bite of belts 41^a and 17 which have an intermittent motion to take the articles away from the machine in a manner to be described. As shown, the slots in shafts *m* and m^1 are provided with spring-pressed holding-plates. These, however, are not essential and may be dispensed with under some conditions.

The means for feeding the metal foil wrappers will now be described. A roll of metal foil C^1 (see Fig. 2) is mounted in the frame and after passing around a suitable guide-roller is led between two feed-rollers *f*. These feed-rollers are arranged, as shown in Figs. 2 and 4, so that a little groove is made in the foil as it passes between the rollers, there being a corresponding groove on one of the rollers *f*, and a projection on the other roller *f* to push the foil in said groove as the foil passes between the rollers. The rolls *f* are operated by the gear f^1 (see Fig. 3) in an intermittent manner. The grooves, indicated in full and dotted lines on the foil in Fig. 4, enable the foil to stand vertically in the desired manner. If it were not for this groove the foil would not have sufficient strength to stand up or feed vertically in the desired manner. A suitable guide 23 (see Fig. 2) holds the upper end of the foil in place while at the proper time a knife *e* operates to cut off the desired length of the foil. This knife is operated from the cam 12 mounted on the shaft *o* by means of a link connection 24 therewith, the knife being pivoted in a suitable bearing *d*. The knife-operating means is clearly shown in Fig. 2 and it is believed further description is unnecessary.

The label or band feed will now be described. The labels suitably cut and printed are placed in the container 25 so that the rear ends of the labels are engaged by a series of projections 60 and the front ends by a stripping segment mounted on the shaft 3. A flat weight-member 71 placed on

top of the labels causes the same to press downwardly to aid in the operations. By means of the driving connections already described and illustrated in Fig. 3, the shaft 3 is given an intermittent rotary movement and the lower label is stripped by the stripping segment shown from the projections 60 which prevent more than one label leaving the bottom of the container 25 at each operation. As the label is fed out on the lower end of the container, it is engaged by the rotating feed-wheels 2, which are suitably driven in the manner shown in Fig. 2. The label, as it is fed from rolls 2, falls vertically down the wedge-shaped guide 63 and into the guide 61 where it is held at the bottom by adjustable angle-wires 64. The bottom of the guide 61 is provided with suitable vertical slots so that the paste can be properly transferred to the edge of the label in a manner to be described.

With the label in the position shown in Fig. 2, it is in a position to receive its portion of paste from the container 71. This container has therein a wheel rotated by chain connection from shaft *o* to shaft 72 (see Fig. 3), continually picking up the paste so that the same may be transferred to the label. A link-motion 72 operated from cam 12 causes a small roll 73 to oscillate between the roll in the container 71 and the lower end of the vertical guide 61. The cam 12 operates this link-motion 72 so that the roll 73, which has annular projections to enter between the vertical slots in guide 61, will transfer the paste to the lower end of each label fed into the guide 61.

The means for operating the transfer fingers will now be described. These fingers, four in number, are shown dotted in Fig. 1 in their upper position and are shown in their lower position in end view in Fig. 5. These fingers are mounted to lie transversely of the travel of the articles through the machine and they are all mounted on a sliding sleeve *j*, which, in turn, is mounted to slide on a rotatable shaft *k* (see Fig. 1) mounted in suitable bearings. The sleeve *j* is feathered on the shaft *k* to rotate therewith. A forked member *h* engages the sleeve *j* to slide the same along the shaft *k*. This fork member *h* is operated by a link *g* and a connection with the came 12. The fork member *h* slides on a suitably-mounted stationary shaft *i* (see Fig. 1). With the sleeve *j* in the left-hand position shown in Fig. 1 with the transfer fingers in their lower position, as shown in Fig. 5, the machine is ready to operate, assuming that the articles have been fed thereto.

The left-hand transfer-finger, as the sleeve *j* is moved from its extreme left-hand position to the extreme right-hand position, determined by the cam motion and sleeve *j*, comes against the bearings of *k*, moves a distance sufficient to transfer one article to be wrapped against the metal foil and push the same into the folding slot of shaft *m*. The second transfer-finger from the left at the same time moves a partially wrapped article from the folding slot of *m* to the point C. The third transfer-finger from the left moves a completely wrapped article from the point C against a label and into the folding slot of m^1. The fourth transfer-finger at the same time moves a banded article from the slot of m^1 to a point between the belts 17 and 41. All of these operations, involving four articles in different stages of being wrapped, take place at the same time and this series of operations takes place intermittently as the sleeve *j* reciprocates back and forth. In order not to disturb the articles in their various stages of being wrapped, the transfer-fingers must be lifted to a vertical position while being transferred from their extreme right-hand position to their left-hand position in Fig. 1. Means for raising these transfer-fingers in the desired manner is best shown in Fig. 9, taken in connection with Fig. 1. A cam 21 mounted on the shaft *o* operates a rack 20 mounted to slide in frame A to turn the shaft *k* at a time when the transfer-fingers are in their lower right-hand position, as described. As this shaft *k* is turned 90° the transfer-fingers are raised to the vertical dotted line position shown in Fig. 1. While in this position the cam 12, operating through the link *g*, moves the sleeve and the transfer-fingers to their left-hand position after which the cam 21, shown in Fig. 9, operates the rack 20 to turn the shaft *k*, the sleeve and the transfer-fingers a turn of 90° so that the transfer-fingers, being again placed in their lower position, are ready to repeat the cycle of operation.

Means for delivering the articles by the belts 17 and 41^a will now be described. These belts are preferably of plush or like material. It is desirable in many cases to have the bands or labels which are placed around the metal foil wrapper printed with silvered lettering and when this is done any friction against the lettering will cause the same to blur and give the package a worn appearance. In order to avoid this, the belts 17 and 41^a are operated intermittently and moved with the article as the same is moved from the machine so that there is no relative movement between the band around the article and the belts 17 and 41^a. This intermittent movement is given to the belts by means of a link 13 mounted on the same rock-arm support as link *g* operated by the cam 12 at the same time that the transfer-fingers are operated to move the articles through the machine. It can be seen from Fig. 1^a that an intermittent reciprocating movement of the link 13 will, by means of

the pawl and ratchet mechanism 14 and 15, and the intermeshing gears 81, cause the belts 17 and 41ª to have an intermittent movement in the desired direction shown by the arrows. The belts 17 and 41ª are supported by means of a series of vertically-arranged pairs of rolls. These rollers are so spaced that at each intermittent movement of the belts, each article upon the belts will move from between one set of rolls to the next set. By making the top rolls of brass or other weighty material and mounting them loosely, as shown in Fig. 1ª, a certain amount of pressure will be applied to each article as it stops between the rolls. This will cause the band to be firmly fixed by its pasted end around the article before it leaves the end of the machine and this pressure will be obtained without any possibility of rubbing off the silvered lettering on the band. The relative mountings of the sets of rolls is best shown at 16 and 18 in Fig. 7.

While a specific machine operating to wrap a designated article has been shown and described, it is to be understood that this has been done by way of illustration rather than limitation.

What we claim is:

1. The combination in a wrapping machine for wrapping and banding articles, of a wrapping mechanism, a banding mechanism, a delivery mechanism, and transfer devices to transfer the article from one of said mechanisms to the other, operable in a step by step manner, said delivery mechanism comprising a pair of endless conveyers operable with the same surface speed to carry the wrapped articles from the banding mechanism between said conveyers without relative movement therewith, and operating means to move said conveyers step by step as the articles are fed thereto.

2. The combination in a wrapping machine for wrapping and banding articles, of a wrapping mechanism, a banding mechanism, a delivery mechanism, transfer devices to transfer the article from one to the other, operable in a step by step manner, said delivery mechanism comprising a pair of endless conveyers operable with the same surface speed to carry the wrapped articles from the banding mechanism between said conveyers without relative movement therewith, and operating means to move said conveyers step by step as the articles are fed thereto, and weighted members acting to press the conveyers against the wrapped article during each period of rest of the conveyers.

3. A wrapping machine comprising in combination a folding mechanism having a folding pocket or slot therein, means for feeding a metal foil wrapping material across the face of said pocket comprising a pair of rolls arranged to form one or more grooves in the sheet of foil whereby the foil can be properly maintained in position without bending together, with means for feeding an article to be wrapped against the foil and into the folding pocket, and devices for completing the wrapping of the foil around the article.

4. In a wrapping machine, the combination with means for folding a wrapper about an article leaving tubular extensions projecting from the opposite ends of said article, of end folding mechanism comprising a holding means constructed and arranged to bear only on one side of the article, and mechanism for folding the end extensions over and against said holding means.

5. A wrapping machine including in combination mechanism to fold a wrapper extension from one end over the edge and against the face of an article to be wrapped, and a shield with an edge positioned against the edge of the article over which the fold is made, constructed and arranged to insure a sharp fold along the said edge.

6. In a wrapping machine, the combination with means for folding the sides of a wrapper around an article and for feeding forward the article with its wrapper so partially folded, of pivoted folding levers, means for reciprocating said levers across the ends of the article and then swinging them along the article to fold down the projecting ends of the wrapper, means to force the ends of said folding levers out of their normal position and away from the article before making the return portion of the reciprocating movement along the article, and other means to return the ends of said levers to their normal position, all constructed and arranged to prevent the overlapping end folds from following the folding levers on said return movement.

7. A wrapping machine, comprising in combination means operable to fold the sides of a wrapper around an article, other means operable to overlap the ends of the wrapper upon the article, transfer mechanism to move the article from one of said means to the other and away from the latter, and brushes mounted to rotate and lay the wrapper ends flat against the article as it moves away from the end folding position.

8. In a wrapping machine, the combination with feeding devices and wrapping elements for the articles to be wrapped, of wrapper feeding mechanism comprising means to feed the wrapper across the path of the article to be wrapped and means for forming at the same time a permanent groove in the wrapper, whereby the wrapper is rendered self-sustaining in its extended position.

9. In a wrapping machine, the combination with means for advancing the articles to be wrapped and wrapping mechanism

therefor, of means for feeding wrappers comprising means to project an end of the wrapper across the path of said articles, and means to form a permanent groove in said projected portion of said wrapper whereby it is rendered self-sustaining.

10. In a wrapping machine involving wrapping elements, a wrapper feeding mechanism comprising rollers operative to project the end of a wrapper across the path of articles to be wrapped, grooving means to groove said projected end of the feed whereby the wrapper is rendered self-sustaining, all for the purpose described.

11. In a machine for wrapping articles having beveled ends, the combination with means for wrapping each article in a manner to leave tubular end extensions in the wrapper, of end folding means comprising pivoted folders adapted to wipe said end extensions against the beveled ends of the article, and to thereafter fold said ends over the sharp edge of said beveled ends.

12. In a machine for wrapping articles having beveled ends, the combination with means for wrapping each article in a manner to leave tubular end extensions in the wrapper, of end folding means comprising pivoted folders adapted to wipe said end extensions against the beveled ends of the article, and to thereafter fold said ends over the sharp edges of said beveled ends, and operating means for said folders arranged to cause them to move away from said folded ends and then return to their initial positions.

13. In a machine for wrapping articles having beveled ends, the combination with means for wrapping each article in a manner to leave tubular end extensions in the wrapper, of end folding means comprising pivoted folders adapted to wipe said end extensions against the beveled ends of the article and to thereafter fold said ends over the sharp edges of said beveled ends, and operating means for said folders arranged to cause them to move away from said folded ends and then return to their initial positions, said operating means being constructed to render said wiping and folding motions positive.

14. In a wrapping machine, the combination with wrapping mechanisms spaced from each other and means for advancing an article to be wrapped from one of said mechanisms to another, of means normally in the path of said article for positioning it for the operation of one of said mechanisms, and means operated by said advancing means for moving said positioning means out of said path to permit the article to be moved past it.

HENRY J. KEMPF.
GEORGE L. MASON.

Witnesses:
K. I. CLEMONS,
F. G. NEAL.