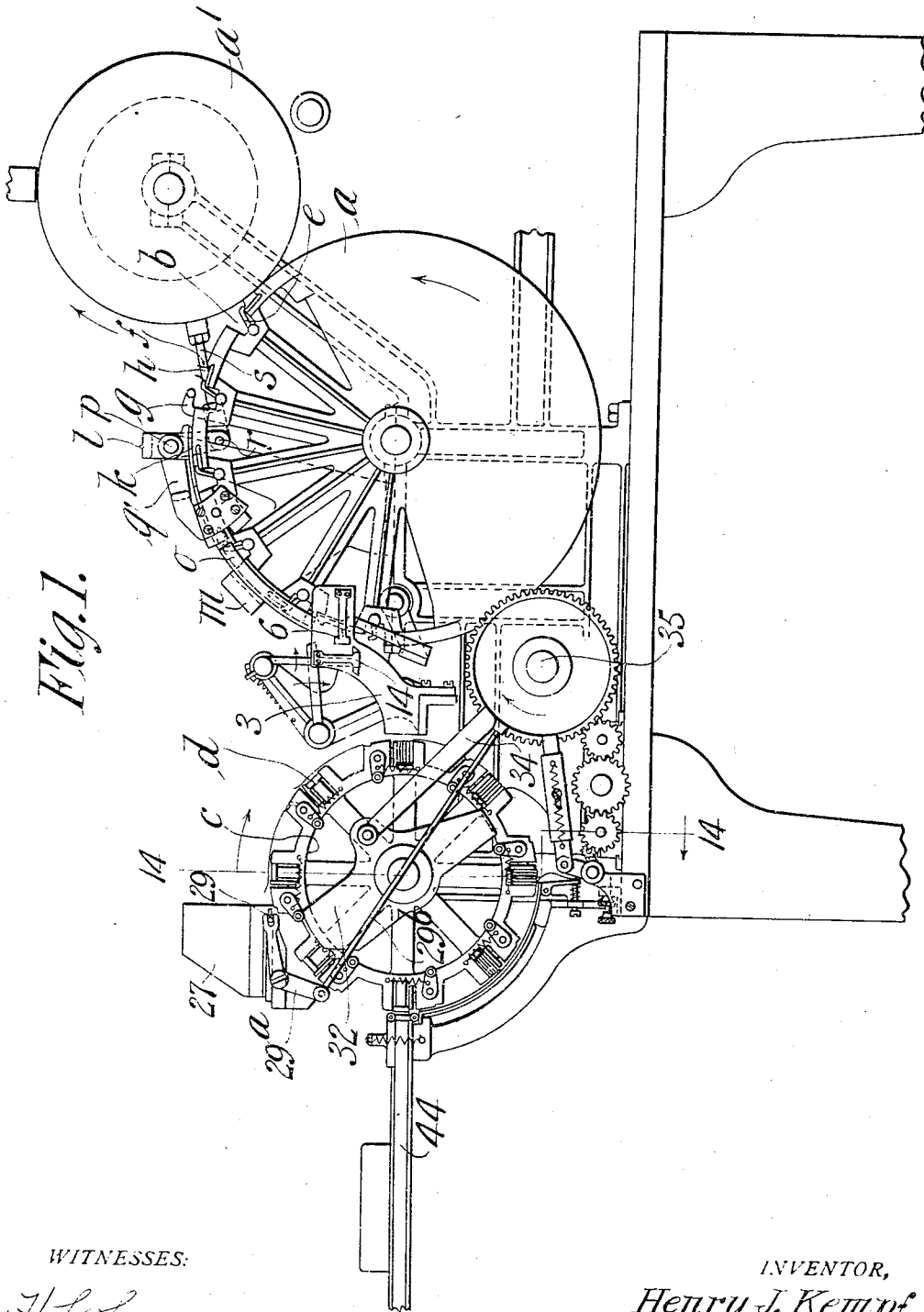


1,060,983.

4 SHEETS--SHEET 1.



H. L. Sprague

Harry W. Bowen.

 $B \cdot Y$

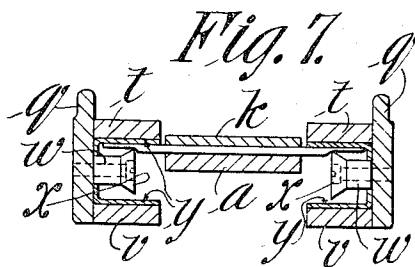
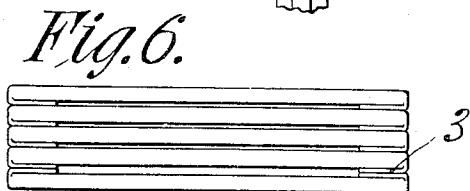
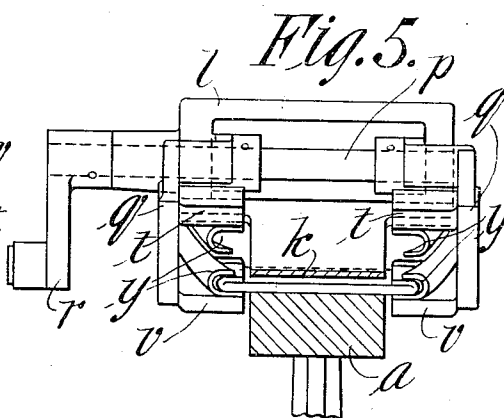
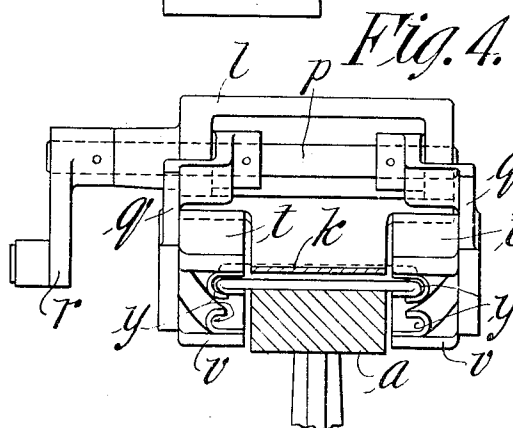
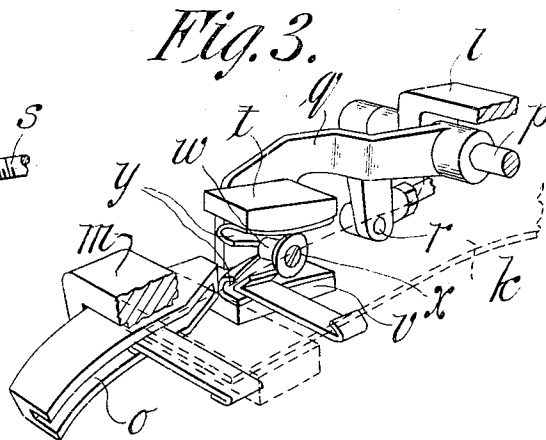
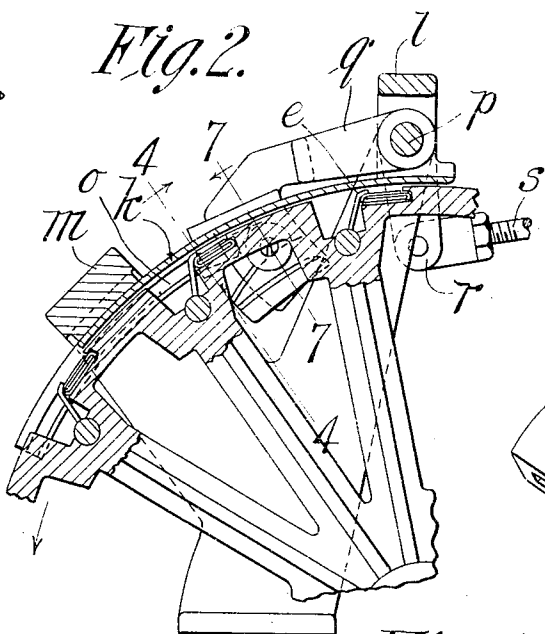
Chapin & Co.,
ATTORNEYS.

H. J. KEMPF.
GUM WRAPPING MACHINE.
APPLICATION FILED JULY 22, 1911.

1,060,983.

Patented May 6, 1913.

4 SHEETS-SHEET 2.



WITNESSES:

H. A. Sprague

Harry M. Zoren.

INVENTOR

Henry J. Kempf pf.

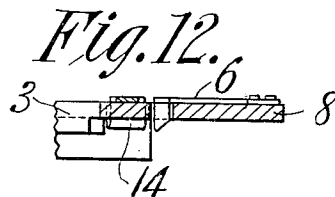
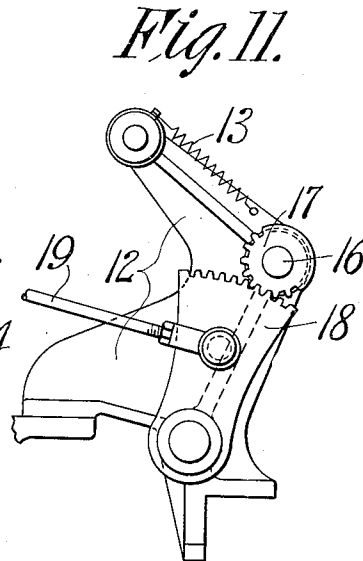
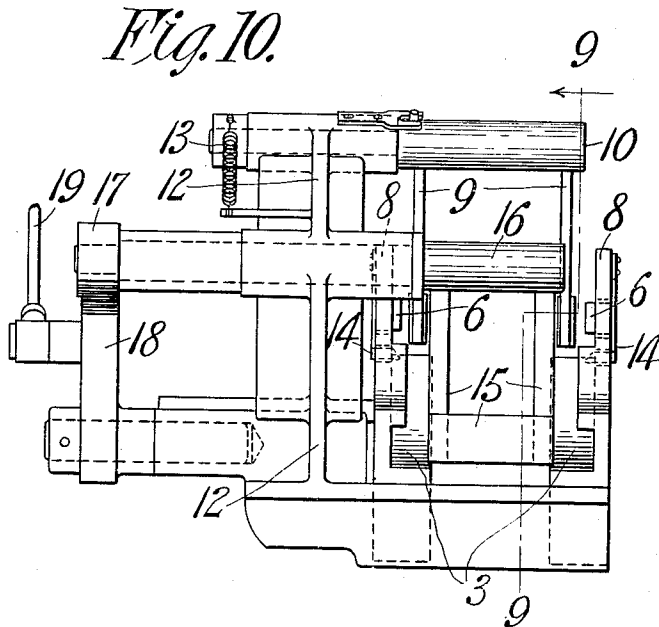
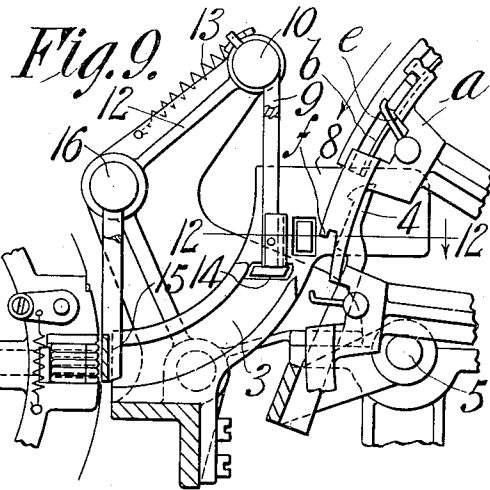
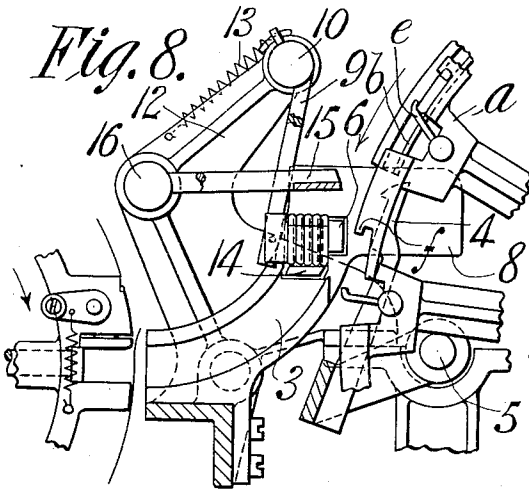
BY

Chapman & Co.
ATTORNEY.

1,060,983.

Patented May 6, 1913.

4 SHEETS-SHEET 3.



WITNESSES:

H. L. Sprague

Harry M. Brown

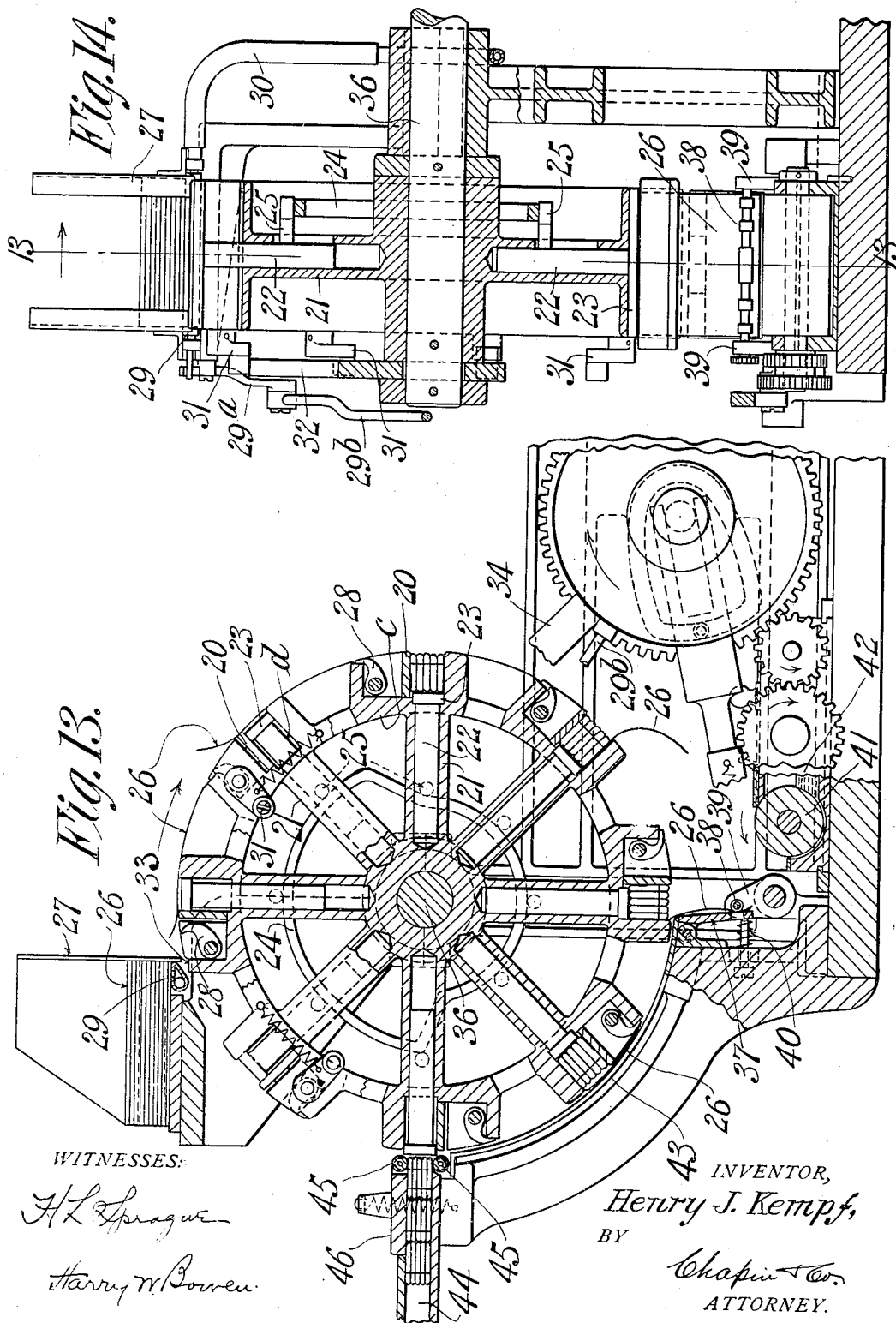
INVENTOR,
Henry J. Kempf,
BY
Chapin & Co.
ATTORNEY.

H. J. KEMPF.
GUM WRAPPING MACHINE.
APPLICATION FILED JULY 22, 1911.

1,060,983.

Patented May 6, 1913.

4 SHEETS—SHEET 4.



WITNESSES:

H. L. Sprague

Harry M. Bowen

INVENTOR,
Henry J. Kempf,

BY

Chapin & Co.
ATTORNEY.

UNITED STATES PATENT OFFICE.

HENRY J. KEMPF, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO BERGER MACHINE COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION.

GUM-WRAPPING MACHINE.

1,060,983.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed July 22, 1911. Serial No. 639,917.

To all whom it may concern:

Be it known that I, HENRY J. KEMPF, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Gum-Wrapping Machines, of which the following is a specification.

This invention relates to package wrapping machines and specifically to improvements in a machine adapted to wrap up in one package a plurality of articles of uniform size, such as chewing gum put up in rectangular pieces, each piece of which is first separately inclosed in a suitable wrapper. A good embodiment of a machine for this work is found in the United States patent issued to A. M. Price on December 7, 1909 and numbered 942,101, and the present invention consists in certain improvements applied to the machine described in said patent, having the characteristics and functions of the mechanism heretofore referred to, whereby the same result is attained as in said Price patent, but by improved means or devices which relate to certain steps in the operation of packaging together a number of articles of uniform size each of which is first separately inclosed in its own wrapper or wrappers. Only as much of the said Price machine is shown and described in this application as is necessary to a complete understanding of the structure and function of the improvements applied thereto.

The object of the invention is to provide means whereby, in the assemblage of the number of articles constituting the complete package, the last one of the articles added to the package will be so placed or manipulated that the infolded ends of the wrapper of said last piece and the ends of the wrapping of the next preceding piece will be placed in contact face to face to hold the end folds in place. Heretofore, this has been done by feeding into the machine to be packaged say four sticks of gum having the end folds of their wrappers all facing in one direction, then when the fifth stick is fed in, providing means to turn this stick so that its end folds will face the other way or to-

ward the end folds of the last of the other four sticks.

In the present invention means are provided to reverse the end folds of every fifth stick instead of reversing the stick, thus accomplishing the same object as if the end folds were all folded the same way and the stick reversed; but these improvements have this advantage that it is not only more simple to reverse the end folds of the wrappers than to reverse the every fifth wrapped up stick, and it does not necessitate carrying the stick out of its line of movement through the machine.

In the drawings forming part of this application,—Figure 1 is a side elevation of the wheel having equally spaced peripheral pockets to receive the individual sticks of gum to be wrapped, together with the wrapping mechanism therefor, and another wheel into the peripheral pockets of which these sticks are fed in groups forming the final package, and the transfer mechanism between these wheels; this view also shows applied thereto the wrapper mechanism for the final package and the gumming devices for sealing the wrapper of the final package. Fig. 2 is a side elevation, partly in section, of a part of the wheel for receiving the individual sticks of gum and illustrating more in detail the mechanism for consecutively folding the ends of the wrappers of a certain number of sticks in the same direction and then reversing the end-fold of the wrapper on one stick. Fig. 3 is a perspective view of certain parts of the end-folding mechanism shown in Fig. 2, showing the means employed for reversing the fold of the end of the wrapper. Fig. 4 is a sectional view of that part of the wheel shown in Fig. 2 in the plane of line 4—4, on said figure, looking to the right. Fig. 5 is a similar view to Fig. 4 showing the fold-reversing mechanism in a different position. Fig. 6 is a side elevation of the complete assemblage of sticks of gum showing four of the latter with their end-folds in one position with the end-fold of the last stick reversed. Fig. 7 is a section taken on line 7—7, Fig. 2, showing the position of a stick of gum in the fold reversing devices just

prior to the infolding of the ends thereof. Fig. 8 is a side elevation of a part of the wheel receiving the single sticks of gum and shows the transferring mechanism whereby these single sticks are grouped in bunches of five, preparatory to being introduced in one of the pockets of the wheel in which they are enwrapped to form the complete package. Fig. 9 is a view like Fig. 8 but showing the transfer mechanism after it has carried a bunch of the sticks into the pocket of the wheel in which said bunch is inclosed in a wrapper. Certain parts of Figs. 8 and 9 are in section, the plane of this section being indicated by the dotted line 9—9, Fig. 10. Fig. 10 is an elevation of the mechanism shown in Fig. 9 looking at the latter from the left, this view showing the relation of the swinging transfer arm and the curved trough through which the bunched sticks of gum are moved to the wrapping devices in the second wheel. Fig. 11 is an end elevation of the left-hand end of the mechanism shown in Fig. 10 showing how the swinging transfer arm is actuated. Fig. 12 is a plan view, partly in section, on the line 12—12, Fig. 9, showing certain detailed features applied to the upper end of the transfer trough, to hold the sticks in place while being bunched. Fig. 13 is a sectional elevation of the second wheel carrying the wrapping devices inclosing the bunched sticks of gum, and showing the gumming devices for said wrappers, the plane of this section being indicated by the line 13—13, on Fig. 14. Fig. 14 is a sectional elevation of the mechanism shown in Fig. 13 taken at right angles to the latter on the line 14—14, Fig. 13. These last two figures also show the mechanism for feeding the wrappers for the bunched sticks to the nippers on the wheel, whereby each of the peripheral pockets in the wheel is covered by a wrapper.

Referring to the drawings, and particularly to Fig. 1, *a* is a wheel having equally spaced peripheral pockets *b*, these pockets being made to receive a single one of the articles of which a predetermined number is to be bunched together and delivered into a pocket of the wheel *c*, which is also provided with peripheral pockets *d*. The wheel *a* has a continuous rotative movement to the left, and the wheel *c* a step-by-step movement to the right. If five articles are to be bunched together, five pockets in the wheel *a* will pass a given point between each step of the wheel *c*. As set forth in the above referred to Price patent, suitable feeding devices, indicated as a whole by *a*¹, located above and to the right of the wheel *a*, will feed the single articles to be wrapped into the pockets *b* of the wheel *a*, a suitable piece of wrapping material having been first

placed over said pockets, and then a nipper *e* is brought to bear against the forward edge of said piece forcing the other edge of the latter back under an overhanging edge of the pockets, and thus between the nipper and overhanging edge both sides of the wrapper will be more or less inturned over the opposite sides of said piece. An arm *g*, suitably formed to engage the partially upturned edge of the wrapper at this time, swings over the forward edge of the wrapper and down behind the rearmost edge, then sweeping forward viz.,—in the direction of the movement of the wheel, presses the rear edge of the wrapper, indicated by *h*, down against the stick of gum and holds it down until the forward edge of the piece passes under the end of the fixed curved strip *k*, concentric with the wheel, and thus folds the forward edge of the wrapper down over the other edge.—the arm *g* retiring at the proper time. The plate *k* is supported on two frame pieces *l* and *m* which extend transversely over the wheel *a*, the farther or left-hand end of this plate extending a little beyond, and between, two oppositely placed channel plates *o*, also concentric with the wheel, and which receive the ends of the wrapped sticks. One of these channeled plates is seen in Figs. 2 and 3 and in dotted lines in Fig. 1, and a part of them in Figs. 8 and 9. The ends of the sticks of gum, after the ends of the wrapper have been folded over them, enter and follow these channeled plates *o* whereby the end folds of the wrapper are held in place.

The mechanism, whereby the ends of the wrapper are folded over the ends of a certain number of sticks in one direction consecutively and then folded over the ends of a single stick in the opposite direction, occupies a position between the two frame parts *l* and *m* having a swinging movement on the part *l* on the shaft *p*, all of this mechanism being illustrated in Figs. 2, 3, 4, 5, and 7,—Fig. 3 showing, in perspective, it detached from its place in the machine. This mechanism is one of the essential parts of the invention and it comprises two arms *q* extending along opposite sides of the periphery of the wheel *a*, each having a hub fixed on the shaft *p*, and from this shaft an arm *r* extends at substantially a right angle, from which arm a connecting rod *s* extends back to the shaft carrying the mechanism indicated by *a*¹ on which shaft is a cam, not shown, whereby after the wheel *a* has been rotated step-by-step, a certain number of times, the cam just referred to will impart a swinging movement to the arms *q*, whereby the mechanism, about to be described, carried on the end of said arms, will shift its position, relative to the path of movement of the single sticks of gum, long enough to

bring into play the devices whereby the next stick of gum will have the ends of its wrapper folded over in a reverse direction from that of a certain number of the sticks immediately preceding the movement of said arm *g*. The mechanism just referred to, carried on the end of the arms *g*, comprises two jaws *t* and *v* on each of the arms for folding the ends of the wrapper over or under the sticks, the jaws being oppositely located and spaced apart; and in the space between the jaws is a roll *w* having its end formed into a beveled flange *x*, there being just room between the edge of this flanged head and the jaws *t* and *v* above and below to permit the extended ends of the wrapper to pass, and, in passing, to have a folding line creased therein. The walls of the jaws *t* and *v* are so formed with beveled or curved surfaces *y* extending into the path of the ends of the wrappers, that after the crease line has been formed therein, these ends will be turned over the stick of gum, as the movement of the wheel *a* carries it between the jaws, it being understood that said beveled surface *y* in the lower jaw *v* is so made as to turn the ends of the wrapper up and over the stick, and the like surface on the upper jaw *t* so formed as to turn them down and under the stick. It is therefore plain that by holding the arm *g* down in such position that the ends of the wrappers of a certain number of sticks will be turned under, and then shifting the arm *g* so that the next stick will have the ends of its wrapper turned up and over it, as at 3 Fig. 6, when a group or bunch of the sticks have been gathered together by this transverse mechanism and shifted into one of the pockets of the wheel *c*, we shall have them arranged in said pocket in the manner shown in Fig. 6, that is in a manner which will hold the folded ends of the wrapper on each stick of the bunch against displacement during subsequent operations.

Referring now to the transfer mechanism illustrated in Figs. 8 to 12 inclusive: it will be seen that this comprises a curved trough 3, the upper end of which lies about opposite the point where each pocket *b* will pass during the rotation of the wheel *a*, while the lower end of the trough will be opposite a pocket *d* in the wheel *c* when that wheel is at rest. As each of the pockets *b* passes the transfer trough, the hooked arm 4 on the rock-shaft 5 moves down and engages the edge of the stick of gum caught under the lip *f* of the pocket; the arm *e*, (which up to this time has held the gum in the pocket) engaging with an operating cam (not shown) and swinging down against the action of a spring (not shown), provides a support for the lower edge of the stick. Owing to the angle of the arm 4 and its

relation to its axis, viz.,—the shaft 5,—it will be so moved that after a slight downward movement, as described, it will swing forward and push the stick of gum past two spring clips 6 located in the path of the ends of the stick and supported on the two side plates 8, which constitute an extension of the two sides of the trough 3, one of these clips being shown in Fig. 12, the side plate 8 being in section and only one side of the trough being shown. A swinging frame 9 is hung on a shaft 10 on an arm 12 of the frame, and comprises two arms which are pressed forward by a spring 13 to bring their ends near the wheel *a* and just back of the spring clips 6. Beyond, and a little below, these clips are two other clips 14, oppositely located in the plates 8, and having beveled ends which extend into the trough in the path of the sticks of gum, these beveled ends serving to hold up the several sticks as they are grouped together before being transferred as one piece into a pocket of the wheel *c*. In Fig. 8 a group of these sticks is shown supported on the clips, or one of them. The beveled side of these clips is uppermost, as seen in Fig. 10. As the units constituting the group are one by one transferred, as described, from the pockets of the wheel *c*, they are positioned under the end of another swinging frame 15 mounted on a shaft 16 concentric with the curved transfer trough 3, and this frame just fits the space between the two sides of the latter, and the space between the ends of the two depending arms of the frame 9. The frame 15 is at the proper time given a rocking movement by means of the gear 17 on the end thereof in mesh with the sector 18, the latter being actuated by a connecting rod 19 extending to a cam not shown. The sweep of the frame 15 is such as to carry the group of sticks through the trough 3 and push the same into a pocket *d* of the wheel *c* which, at the proper time, becomes stationary opposite the delivery end of the trough. When the swinging frame 15 pushes the grouped sticks of gum into the trough, it forces the ends thereof past the beveled ends of the clips 14, which then snap back into position to receive other sticks of gum.

Referring now to Figs. 13 and 14, which illustrate the construction of the wheel *c* which receives the sticks of gum in groups in the pockets *d*, as described, and applies a wrapper thereto; a little narrower than the sticks, leaving the ends of the latter exposed. The pockets *d* are rectangular recesses extending across the periphery of the wheel, one of the sides of the pockets consisting of a plate 20, spring-pressed toward the opposite side, and back of each pocket is a hollow spoke 21 of the wheel in which is a

plunger 22 having a rectangular head 23. The plungers 22 are actuated by a cam 24 by means of a stud 25 extending through a slot in the spoke and bearing on the edge of the cam, the latter being so formed that at a point substantially opposite that at which the package of sticks of gum is placed in one of the pockets, the plungers 22 will be successively actuated to expel the package into a straight receiving trough (to be described) and from this point the head of the plungers will be maintained flush with the periphery of the wheel around to the point at which the pocket is to receive another package just before this point is reached. The stud 25 will run onto a receding part of the cam, leaving the plunger free to be pushed in radially by the package. When the head of the plunger is flush with the periphery of the wheel, it will have a frictional engagement with the spring plate 20 and thus when the package is moved against it, it will keep the units of the package in proper alinement. The spring plate 20 has the further function of applying a slight pressure to the units of the package to hold them in the pocket to prevent their displacement until the wrapper is sealed. This is effected by making the plunger-head a trifle narrower than the package and rounding the edges of the plate 20 and the opposite rigid wall of the pocket so that the package, when forced into the pocket, will just push said plate out of contact with the head of the plunger, see Fig. 13. The outside wrappers for the package of grouped sticks of gum are indicated by 26, and are shown stacked in the frame 27, Fig. 13. These are delivered one by one from the bottom of the pile and are caught at the forward end by the nippers 28, and so positioned that the rear end of the wrappers will overlap one of the pockets *d*, the terms "forward" and "rear" being used relative to the direction of movement of the wrappers, which direction is indicated by the arrow, on Fig. 13. To feed the wrappers 26, a rectangular opening is made in the forward edge of the bottom of the frame 27 and extending across the latter, and a tubular member 29 is located therein being pivotally supported near its rear edge so that its flat upper side will be in contact with the underside of the lowermost wrapper in the stack, and close to the forward end of the wrapper. This tubular member 29 has closed ends and has perforations along the upper face thereof in contact with the wrapper; and, as shown in Fig. 14, one end of this member has connected to it a tube 30 (see Fig. 14) extending to a pump (not shown) whereby the air is exhausted from said member through its axis. When the wheel *c* comes to a stop in its intermittent movement and one pocket is

receiving, and another having ejected therefrom, a package of sticks of gum, another pocket will be located near the lower front end of the frame 27, and as this pocket moves toward this position an arm 31, on the axis of the nipper 28, will come in contact with the edge of a cam-plate 32 (see Fig. 1) and swing the nipper over to the position shown just in front of the frame 27; and simultaneously the forward edge of the tubular member 29 will swing down carrying with it the forward edge of the lowermost wrapper in the stack, locating the latter over the rib 33. The tubular member 29 is actuated by the crank-arm 29^a and connecting rod 29^b extending to a cam on the shaft 35. At this moment the cam plate 32 will be given a quick rearward movement to release the nipper and allow the latter to snap down onto the edge of the wrapper just before the wheel *c* makes its next forward step. This cam-plate 32 has the further function of releasing the nipper from the wrapper of the package that has just been pushed into one of the pockets from the end of the transfer tube 3, the form of the cam-plate being such that when its upper end moves to the left to release the nipper in front of the stack of wrappers, the lower end will swing to the right and trip the opposite nipper, as just described, to release the end of the wrapper that is to be gummed. Immediately after the wheel *c* has commenced its forward step the cam-plate 32 will be swung back again to the position shown in Fig. 1, that is in position to cause the next following nipper to be swung open ready to engage another wrapper. This movement of the cam-plate 32 is effected by means of the connecting rod 34 extending to, and engaging, a suitable cam (not shown) on the shaft 35. As soon as the nipper in front of the frame 27 has engaged the edge of the wrapper, the wheel *c* makes another step forward and draws the wrapper out from beneath the stack in said frame. It will be seen that the length of the wrapper is such that its rear end will overlie, and extend some distance beyond, the next following, which is the pocket which will receive the package of gum this wrapper is destined to inclose, and that part of the wrapper which covers the area of the box *d* and extends somewhat to the rear thereof, is sufficient to nearly inclose three sides of the package. Before the pocket, which has had placed therein a package of gum, arrives at the position directly under the shaft 36 on which the wheel *c* is supported, and where the gumming devices are located, the nipper which still holds the front end of the wrapper is tripped, as described, and the wrapper allowed to fall forward and downward, as

shown, to the end that when it reaches the gumming devices, it will hang straight down in front of the plate 37, and while in this position, the gum-roll 38 carried in the pair of arms 39, will be swung up against the lower edge of the wrapper, as shown in Fig. 13, and the gum roll will remain in contact therewith until another rotative movement of the wheel draws the wrapper forward rotating the gum roll and applying gum from the point where the roll first touches the wrapper to the extreme end thereof. To insure good contact between the gum-roll and the wrapper, the plate 37 is hinged at its upper end and its lower end is held out by a spring 40 to meet the gum roll and yield slightly when the roll comes in contact with it. After the gum has been applied to a wrapper, the gum roll is swung over on the roll 41 in the gum-box 42, and takes up another supply of gum for the next wrapper. This gumming mechanism is well known, and, *per se*, forms no part of the invention. From the point where gum is applied to the wrapper to the point of delivery of the sealed package, viz.,—one fourth of one complete rotation of the wheel,—the periphery of the latter is encircled by a plate 39 concentric therewith and set as close to the wheel as necessary to hold the gummed end of the wrapper in position to be wrapped around the package when the latter is ejected from its pocket and pushed into the delivery trough 44, this ejection and transfer serving to press the free gummed end of the wrapper against the opposite end thereof. This ejection is made by the cam 24, as described, and the plunger 22, and at the mouth of the delivery trough two rolls 45 are mounted, transversely thereof, between which the package is forced, the lower of the two rolls being fixed and the upper being mounted in a plate 46 spring-pressed down against the packages as they are successively forced into the trough, thus pressing the gummed end of the package to a seat on the package.

What I claim, is:—

1. In a wrapping machine, mechanism to successively fold a wrapper around articles fed into the machine, together with end-folding mechanism interposed in the path of the articles passing through the machine, means to move said end folding mechanism across the path of the articles first in one direction and then in the other, all constructed and arranged so that the ends of the wrappers inclosing said articles are folded over the ends of certain of them in one direction and over the ends of certain other of said articles in the opposite direction.

2. In a wrapping machine, mechanism to

fed into the machine, other mechanism for bunching together a predetermined number of such articles to constitute a package, together with end-folding mechanism interposed between the wrapping and bunching mechanisms and comprising a member having a swinging movement across the path of the articles passing through the machine, means for folding the ends of the wrappers in opposite directions over the ends of the articles being located in different parts of said swinging member, means being provided to swing said member at predetermined intervals.

3. In a wrapping machine, a wheel having open peripheral pockets to receive articles of uniform size, and wrapping mechanism associated therewith to fold a wrapper around said articles in one direction; end-folding devices to fold the ends of the wrappers, certain of them over, and certain of them under, the ends of the articles, and a mechanism, operable during the rotation of the wheel, to collect said articles into groups having the same number of units, together with mechanism to inclose each of said groups in a wrapper.

4. In a wrapping machine, a wheel having peripheral pockets therein to receive single articles, another wheel having peripheral pockets therein to receive a group of said single articles, said wheels being rotatable in the same plane, and said second wheel having a step-by-step movement, means interposed between the two wheels to group together a certain number of said single articles, and means to transfer said group to a pocket in the second wheel, said means comprising two oppositely located members provided with like oppositely facing channels to receive the opposite ends of said grouped articles, and a member movable between said channeled members to move said group into the pocket of said second wheel, together with wrapping mechanism associated with said second wheel to inclose said group in a band wrapper.

5. In a wrapping machine, a wheel having open peripheral pockets to receive articles of uniform size, and wrapping mechanism associated therewith to fold a wrapper around said articles in one direction, end-folding devices to fold the ends of the wrapper, certain of them over and certain of them under the ends of the articles; another wheel having an intermittent rotative movement, and open peripheral pockets to receive a group consisting of a predetermined number of said articles, a transfer mechanism located between the two wheels and comprising channeled members, the opposite open ends of which are located respectively opposite a pocket in each of said wheels when said second wheel is at rest,

and spring-clips projecting into said channels to support said articles during the grouping thereof; means associated with said first wheel to transfer the articles from
5 the pockets thereof into the open end of said channeled members, and other mechanism, periodically operable, to move a group of said articles past said supporting clips

and through the channeled members into a pocket of the second wheel, together with 10 mechanism associated with the latter to inclose said group in a band wrapper.

HENRY J. KEMPF.

Witnesses:

WM. H. CHAPIN,

HARRY W. BOWEN.