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E. C. TAYLOR

WRAPPING MACHINE

Filed July 14, 1919 2 Sheets-Sheet 1

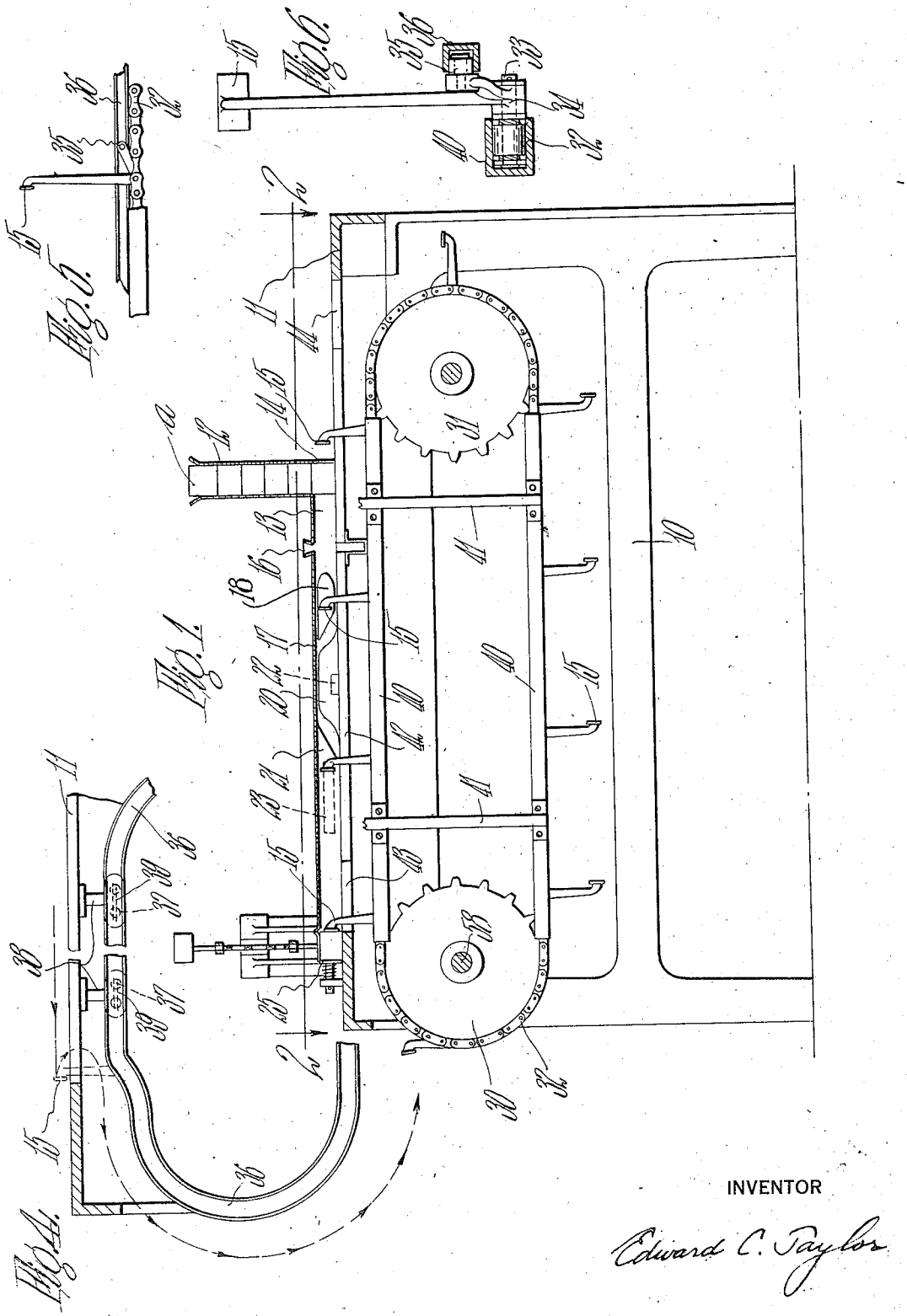


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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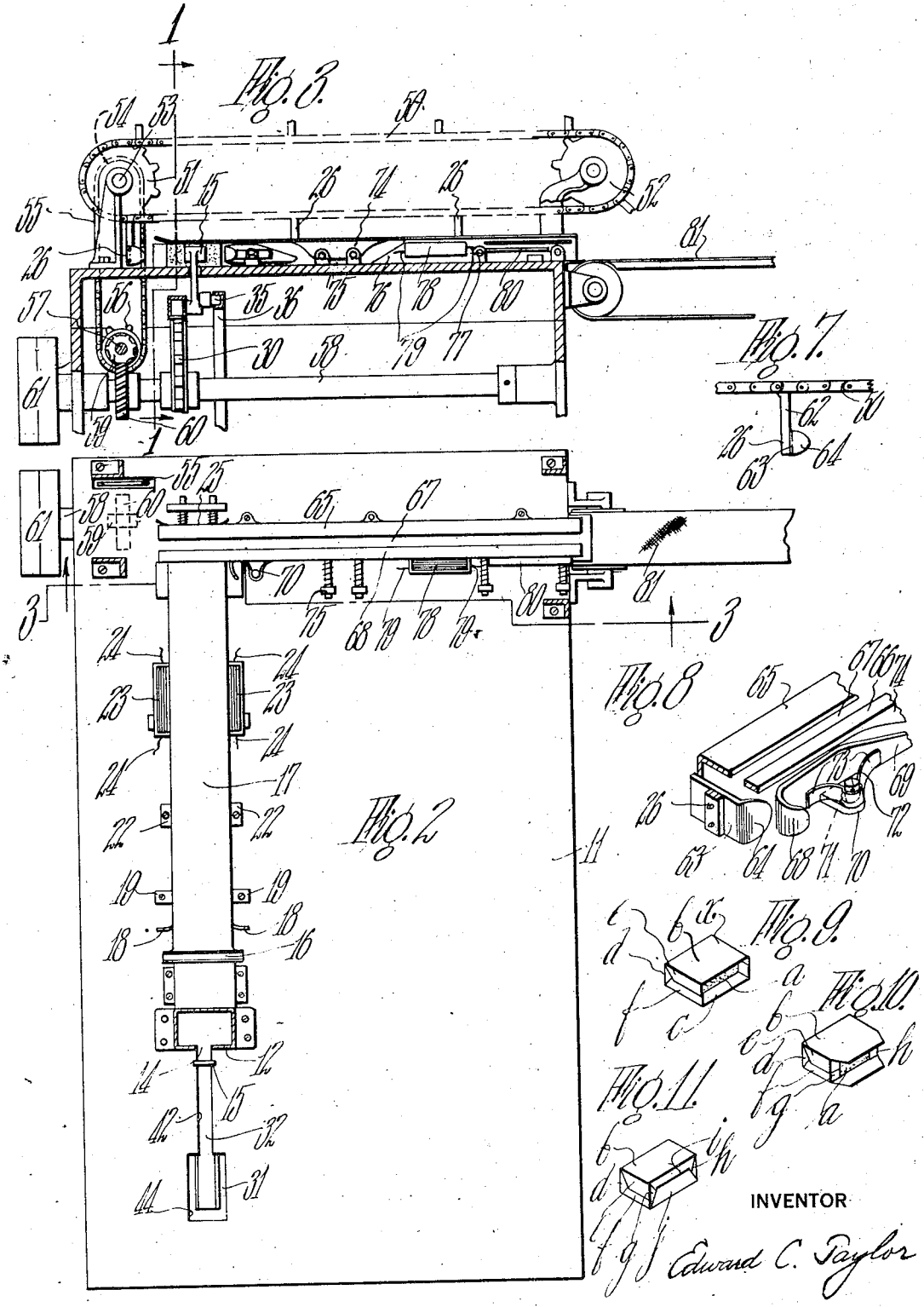


Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

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UNITED STATES PATENT OFFICE.

EDWARD C. TAYLOR, OF LONGMEADOW, MASSACHUSETTS.

WRAPPING MACHINE.

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To all whom it may concern:

Be it known that I, EDWARD C. TAYLOR, a citizen of the United States, residing at Longmeadow, in the county of Hampden and Commonwealth of Massachusetts, have invented certain new and useful Improvements in a Wrapping Machine, of which the following is a specification.

My invention relates to wrapping machines; and in particular to machines for enclosing substantially rectangular articles in a wrapper of paper or other similar material and sealing the same in place.

It has for its object the provision of a machine of the above type having a small number of moving parts.

It also has for its object the provision of a machine of the above type in which reciprocating or intermittent movements are eliminated, thus greatly simplifying the driving elements of the mechanism.

It also has for its object the provision of a machine that is simpler in construction than existing machines, and which can therefore be sold for a lower price, thus increasing the field in which wrapping machines may be substituted for manual wrapping.

It also has other and further objects which will appear from the description of the machine and the appended claims.

Referring to the drawings, in which like reference characters denote the same element throughout the several views,

Fig. 1 is a side elevation of a machine embodying my invention, partly in section, taken substantially on the line 1—1 of Fig. 3;

Fig. 2 is a plan view of the machine, partly in section, taken on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a detail of the cam track for operating the pushers of the first conveyor, showing diagrammatically the path of one of the pusher heads;

Fig. 5 is a detail of one of the pushers of the first conveyor;

Fig. 6 is a section through the first conveyor, showing one of the pushers, the cam track for operating it, and the intermediate support for the chain;

Fig. 7 is a detail of one of the pushers of the second conveyor;

Fig. 8 is a perspective view of the entrance to the second folding chute, showing also the lower end of one of the pushers of the second conveyor; and

Figs. 9, 10, and 11 are details showing steps in the wrapping of the article.

The wrapping mechanism is mounted on a frame 10 of any suitable type, surmounted by a table 11. The articles *a* are placed manually, or by any suitable feeding mechanism, in a hopper 12, to the bottom of which they are fed by gravity. The bottom of the hopper is cut away at one side to furnish a passage for the articles into a horizontal chute or channel 13, and at the other side has an aperture 14 through which pass a series of pushers 15, mounted as will be described below. Chute 13 is interrupted by a paper guide 16, of sufficient width to accommodate a sheet of paper enough wider than the article to be wrapped so that it can be folded down on the sides thereof. The bottom of this guide is preferably integral with the walls, as this is the cheaper construction, but it will be understood that it may be made adjustable if desired, as is well understood in the art. Paper is manually fed into this guide in advance of the article although any suitable automatic paper feed may be provided if the speed at which the machine is to be operated is sufficiently great to warrant it.

The folding chute itself is constructed in general in a well known manner. Its bottom is formed by the table top or by suitable guides attached thereto, and its top by a plate 17. As the article *a* is pushed through the wrapper *x* the latter is folded onto the top and bottom of the article as shown at *b* and *c*, leaving trailing portions behind the article which later serve to cover its rear side. Beyond the paper guide are tuckers 18, with their ends nearest the approaching article flared in the usual way so as to make the end tucks *d* on either side of the article. These end tuckers may be supported from the table top by brackets 19. Beyond the end tuckers are plow folders 20 and 21, the first named being spaced from the top of the chute to allow of the passage of the top flat *e* of the

wrapper, and having an inclined portion which serves to fold the lower flap *f* against the end of the article; and the second named having an inclined portion serving to fold the upper flap *e* down against the end of the article and over flap *f*. Folders 20 may be supported from the table top by brackets 22.

The present machine has been illustrated as provided with electrical heat sealing attachments, for melting paraffin or other adhesive contained in the wrappers; but it will be understood that any of the usual types of adhesive sealing devices, such as glue rolls, could be used if that type of seal were desired. A pair of heat sealers has been illustrated at 23, wires 24 leading from the resistance elements thereof serving for connection to a source of electric current. The heat sealers melt the paraffin carried by the wrappers and effectually seal the folds of the wrappers together, forming an air tight package, as is well understood in the art.

The package at this point is in the condition illustrated in Fig. 9, and is carried by the pushers 15 against a locating plate or article stop 25, preferably spring mounted as shown to allow for variations in the size of the packages. The pushers withdraw from the tubular rear extension of the wrapper as will be fully described later, and the packages are carried to one side (to the right in Fig. 2) by a second series of pushers 26 mounted on an endless chain. Before describing the action of these pushers and the construction of the second folding chute the mounting and operation of the first series of pushers will be described.

Over sprockets 30 and 31, located at opposite ends of the machine, passes a chain 32. As shown this chain is of the block type, having at intervals extended pivots 33. On each of these pivots is mounted a bell crank 34, carrying as one arm the pusher 15 and as the other, slightly offset from the plane of the pusher, a roller 35. This roller travels in a cam track 36 mounted in any convenient manner on the frame of the machine. Preferably, and as shown, the track 36 is adjustably mounted so that the articles to be wrapped may be brought into accurate alignment with the second folding chute. This is done by forming the track out of channel-shaped metal, and securing it, by screws 37, to brackets 38 on the frame of the machine; slots 39, through which the screws pass, enabling the track to be bodily adjusted in a direction parallel to the length of the first folding chute. In order to support the pushers firmly throughout their travel, intermediate guide members 40, formed as a deep channel, are secured to brackets 41 on the frame and support the chain 32 during its travel between the sprockets 30 and 31.

The shape of the cam track 36 deserves especial attention. As will be observed from Fig. 4, in which the dotted line carrying arrow-heads denotes the path of travel of the heads of the pushers 15, these pushers travel in a straight line until they reach the position in which the single pusher shown in Fig. 4 is illustrated. At this point they move backwardly and slightly downwardly, and then move abruptly downwardly until the pusher head is below the level of the table, when they are carried around sprocket 30. In order to permit of this motion, the slot 42 in the table in which the pusher arms travel is widened out as at 43 at its ends to permit of the heads of the pushers passing through. The pushers are preferably returned by the cam track to their original position normal to the chain as they pass around the sprocket 30 so that they are in their normal position when the chain starts on its lower straight line movement. This is of advantage in that the cam track at the other sprocket (that at the right in Fig. 1) is simplified into an arc of a circle, but if desired for purposes of space or other reasons the pushers may travel along the lower path of the chain in their retracted position, illustrated by the pusher shown in Fig. 1 passing around the left hand sprocket. In the latter event, the cam track adjacent the right hand sprocket must be so shaped that it will return the pushers to their normal position as they reach the upper path of the chain. An enlargement 44 of slot 42 is provided to permit the pushers passing through the table into position to remove an article from the hopper 12.

The construction and operation of the second series of pushers and the second folding chute will now be described. Pushers 26 are carried on a chain 50 passing over sprockets 51 and 52. The former of these is fixed upon a shaft 53, having thereon a second sprocket 54, connected by a chain 55 with a sprocket 56 on a short shaft 57 suitably journaled in the machine frame and driven from a shaft 58 through spiral gears 59 and 60. Shaft 58 may be driven from any suitable source of power, as by tight and loose pulleys 61, and carries the sprocket 30 on which the chain for the first series of pushers is carried.

The pushers 26 are preferably supported from the chain 50 by constructing them as enlarged links 62 thereof, and have head portions 63 provided with a thin tucker 64 at one side. As the pusher comes in contact with the article, which is located against plate 25 and from the rearwardly extending folds of which a pusher 15 is just withdrawing, tucker 64 folds down the flap *g*, as shown in Fig. 10, and the head 63 pushes the article into the second folding chute. This chute is composed of table 11, which serves as the base thereof; an angle iron 65, which serves as one side and part of the top; a

top piece 66, spaced slightly from the angle iron to leave a space 67 for the passage of the pushers 26; and various other members forming the fourth side of the chute and which will be hereinafter referred to.

As the article is pushed into the second folding chute it contacts with an end tucker 68, by which the second end tuck *h* is made. This tucker has an extension 69 which is adapted to hold the two tucks against the article until the first end fold is started, and is mounted on a bracket 70 having a slot 71 encircling a stud 72 secured to the table. A spring 73 is fastened to the stud and presses the tucker pivotally and yieldably against the article. Spaced slightly beyond the tucker and depending downwardly from the top plate 66 is a folder 74, which has a curved edge of the usual type for turning down the top end flap *i*. This folder may be attached yieldably to a bracket 75 secured to the table, and may serve as a partial support for the top plate 66. The final fold *j* is made by a plow folder 76 forming part of a side wall of the folding chute which also may conveniently be made integral with the top plate. This folder may be yieldably attached to a bracket 77 in any suitable manner. Beyond the folder 76 is a heat sealer 78, provided with lead wires 79. As stated with regard to the first folding chute, any desired sealing device may be substituted for the heat sealer in case it is not desirable to operate with waxed paper, but the construction shown is preferable from the standpoint of simplicity. The final portion of the side wall of the chute may be provided with a plurality of fins or flanges 80 which serve to cool the side wall and hasten the setting of the wax.

The top plate 66, together with the folding elements attached thereto, are preferably yieldably mounted in any known manner which forms no part of my invention, so as to avoid interference with the folder 64, although, due to the thinness of this folder, this precaution is not absolutely necessary.

The articles may be discharged from the machine in any suitable way, as by dropping them into a receptacle, or by delivering them from pushers 26 onto a conveyor 81, which may be driven from any suitable source of power which it is not necessary to show or describe. The article so delivered is completely wrapped and sealed in an air-tight package. If an air-tight package is not required the heat sealers 23 may be dispensed with entirely, as it will be found that flaps *i* and *j* by their engagement with tucks *g* and *h*, will hold the side flaps *e* and *f* sufficiently tightly for most practical purposes.

It will be observed that the construction described above does away with the necessity for reciprocating parts and movable cams, and that the machine is greatly simplified in comparison with machines of the usual types. All the parts are either stationary or continuously movable, and the shocks and jars, with consequent deterioration of the machinery, that are incident to the intermittent action of the usual machine elements, are entirely obviated. One of the conveyors is driven from the drive shaft directly, and the other receives motion therefrom by a simple connection; these two elements forming the only moving parts in the machine.

It will readily be recognized that the specific mechanical details do not form an essential part of my invention, and I do not wish to be limited by such details except in so far as they are incorporated into the appended claims.

Having thus described the preferred embodiment of my invention, I claim:

1. In a wrapping machine, a folding chute, continuously operating means to carry the article and wrapper through the chute, a second folding chute extending transversely of the first-named chute, continuously operating means to receive the partially wrapped article from the first-named chute and to carry it through the second-named chute, and means carried by the second-named carrying means to make a fold in the wrapper.

2. In a wrapping machine, a folding chute, a plurality of continuously operating pushers constructed and arranged to carry a series of articles and wrappers through said chute, a second folding chute extending transversely of the first-named chute, a conveyor having its two courses in a plane at right angles to the first chute, and a plurality of continuously operating pushers mounted on said conveyor and constructed and arranged to carry the partially wrapped article through the second-named chute, each of the last-named pushers carrying a folding member.

3. In a wrapping machine, a chute comprising a series of stationary folding members constructed and arranged to fold a wrapper about the front, top, bottom, and sides of an article as the article and wrapper are carried therethrough, continuously operating means to carry an article and wrapper through said chute, a second chute extending transversely of the first-named chute, continuously operating means to carry the partially wrapped article through the second-named chute and to fold down the rear extension of the wrapper at one side of the article, said second-named chute comprising stationary folding members constructed and arranged to fold down the rear extension of the wrapper at the other side and at the top and bottom of the article.

4. In a wrapping machine, a chute com-

prising a series of stationary folding members constructed and arranged to fold a wrapper about the front, top, bottom, and sides of an article as the article and wrapper are fed therethrough, whereby a tubular rear extension of the wrapper is left projecting behind the article, a continuously operating series of pushers to carry a series of articles and wrappers through said chute, a second folding chute extending transversely of the first-named chute and containing a series of spaced stationary plow folders, a continuously operating series of pushers to carry the partially wrapped article through the second-named chute, each of said second-named pushers carrying a folding member for making a fold of the said tubular rear extension, and means for controlling the first-named pushers so that they position the partially wrapped article for the action of the second-named series of pushers, and withdraw from the tubular extension of the wrapper in time to avoid interference with said second-named pushers.

5. In a wrapping machine, a folding chute comprising a folding member bodily yieldable away from the side of the chute and yieldably rotatable about an axis outside of the chute.

6. In a wrapping machine, a folding chute, and a pusher adapted to feed an article and wrapper through the chute and having a side extension adapted to fold down a portion of the wrapper, said chute comprising a folding member adapted to fold down a portion of the wrapper opposite that portion folded by the pusher, said member being rotatable about an axis and bodily yieldable away from the chute so that the passage of the side extension is not interfered with but the folding member remains in contact with the second-named folded portion of the wrapper.

7. In a wrapping machine, a folding chute comprising stationary folding members, a series of pushers constructed and arranged to carry an article and wrapper through said chute, a second folding chute extending transversely of the first-named chute and having a series of folding devices spaced along it to operate on articles passing therethrough, and a second series of pushers constructed and arranged to receive the partially wrapped article from the first-named chute and carry it through the second-named chute.

8. In a wrapping machine, a folding chute containing stationary folding members, a continuously operating series of pushers constructed and arranged to carry an article and wrapper through said chute, a second folding chute extending transversely of the first-named chute and having a series of folding devices spaced along it to operate on articles passing therethrough, and a second continuously operating series of pushers constructed and arranged to receive the partially wrapped article from the first-named chute and carry it through the second-named chute.

9. In a wrapping machine, a folding chute, continuously operating means to carry the article and wrapper through the chute, a second folding chute extending transversely of the first-named chute, continuously operating means to receive the partially wrapped article from the first-named chute, means carried by the second-named carrying means to make a fold in the wrapper, and stationary folding means located in the two chutes and adapted to make the remaining folds in the wrapper.

10. A conveyor adapted for use in wrapping machines having projecting pusher elements, and plates attached to each pusher element and extending forwardly at one side thereof so as to turn down a fold of the wrapper at one side of the article as the pusher comes into contact therewith.

11. In a wrapping machine, a folding chute containing stationary folding members, an endless chain carrying a series of pushers constructed and arranged to carry an article and wrapper through the chute, and forwardly projecting folding plates on a side of each of said pushers.

12. In a wrapping machine, a folding chute having folding members therein adapted to fold a wrapper about five sides of an article, leaving a tubular extension of the wrapper about the sixth side, a series of pushers constructed and arranged to carry an article and wrapper through said chute, a second folding chute extending transversely of the first chute and containing folding members adapted to fold down one side and the top and bottom of the tubular extension, and a series of pushers constructed and arranged to carry the partially wrapped article from the first chute to the folding members in the second chute.

13. In a wrapping machine, a folding chute, a series of pushers mounted on a carrier and constructed and arranged to carry an article and a wrapper through the chute, and a cam track located adjacent the carrier and constructed and arranged to coact with the pushers to cause them successively to locate an article in position for further operations and to then withdraw from contact with said article, said cam track being constructed of a continuous channel section having substantially straight top and bottom sections, a semicircular section, and a section shaped to cause the pushers to withdraw from contact with the articles, pass thereunder, and resume their normal position.

14. In a wrapping machine, a folding

chute comprising a series of stationary folding members constructed and arranged to fold a wrapper about the front, top, bottom, and sides of an article as the article and wrapper are fed therethrough, whereby a tubular rear extension of the wrapper is left projecting behind the article, a continuously operating series of pushers constructed and arranged to carry a series of articles and wrappers through said chute, a second folding chute extending transversely of the first-named chute, means to fold one side tuck of the said tubular extension, folders located along the second folding chute for folding the opposing side tuck and the top and bottom of the tubular extension, and a continuously operating series of pushers constructed and arranged to carry the partially wrapped article from the first chute into the second chute and into position for being operated upon by the folders located therein.

15. In a wrapping machine, a folding chute comprising a plurality of stationary folding members constructed and arranged to fold a wrapper about the front, top, bottom, and sides of an article as the article and wrapper are fed therethrough, whereby a tubular rear extension of the wrapper is left projecting behind the article, a continuously operating series of pushers constructed and arranged to carry the articles and wrappers through said chute, a second folding chute extending transversely of the first-named chute, means to fold one side tuck of the said tubular extension, folders located along the second folding chute for folding the opposing side tuck and the top and bottom of the tubular extension, means for controlling the first-named pushers so that they position the partially wrapped articles for the action of the second-named pushers, and withdraw from the tubular extension of the wrapper in time to avoid interference with the transverse motion of the article, and a continuously operating series of pushers constructed and arranged to carry the partially wrapped article from the first chute into the second chute and into position for being operated upon by the folders located therein.

EDWARD C. TAYLOR.