Dec. 17, 1935. H. L. EVANS ET AL 2,024,438

WRAPPING MACHINE

Filed May 19, 1933 6 Sheets-Sheet 1

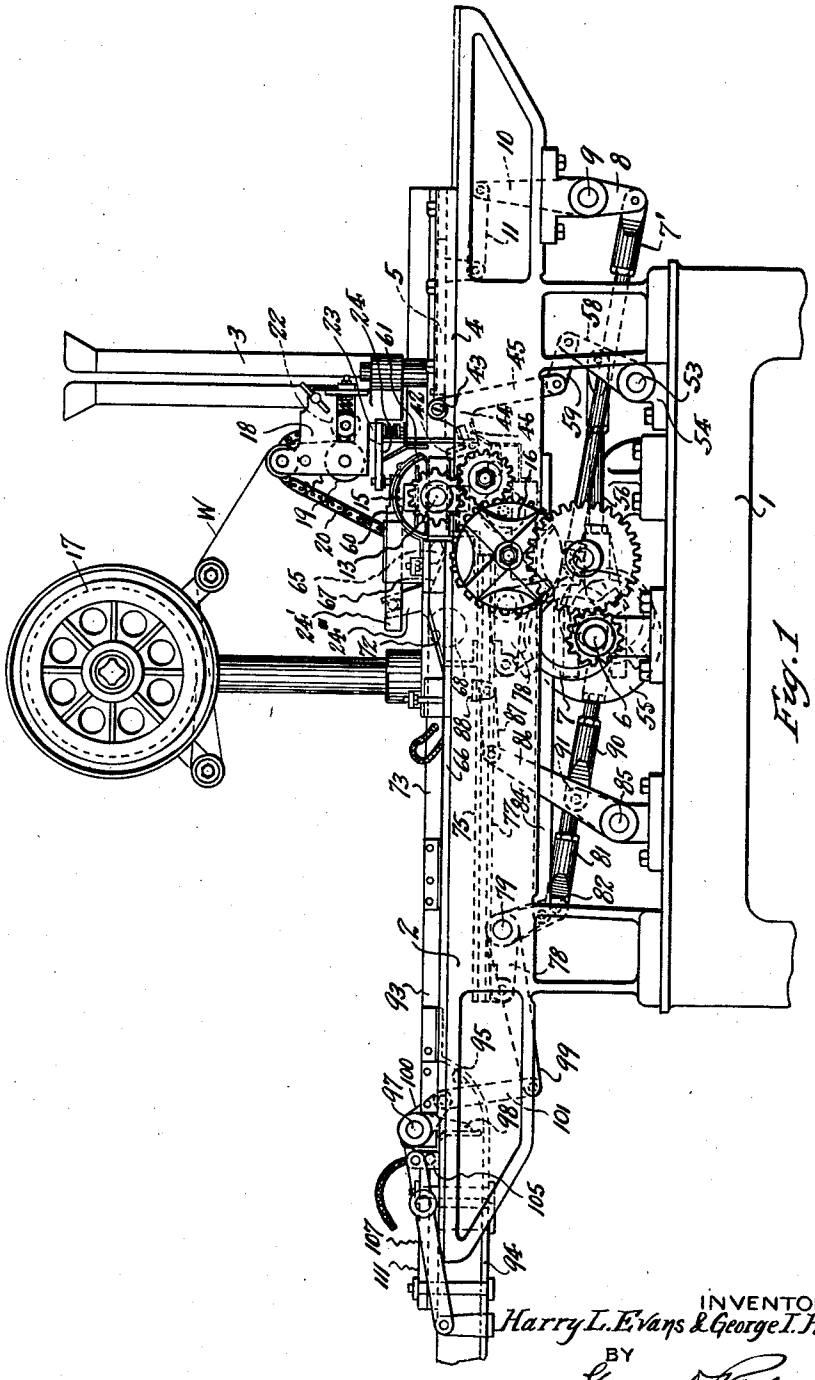


Fig. 1

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WRAPPING MACHINE

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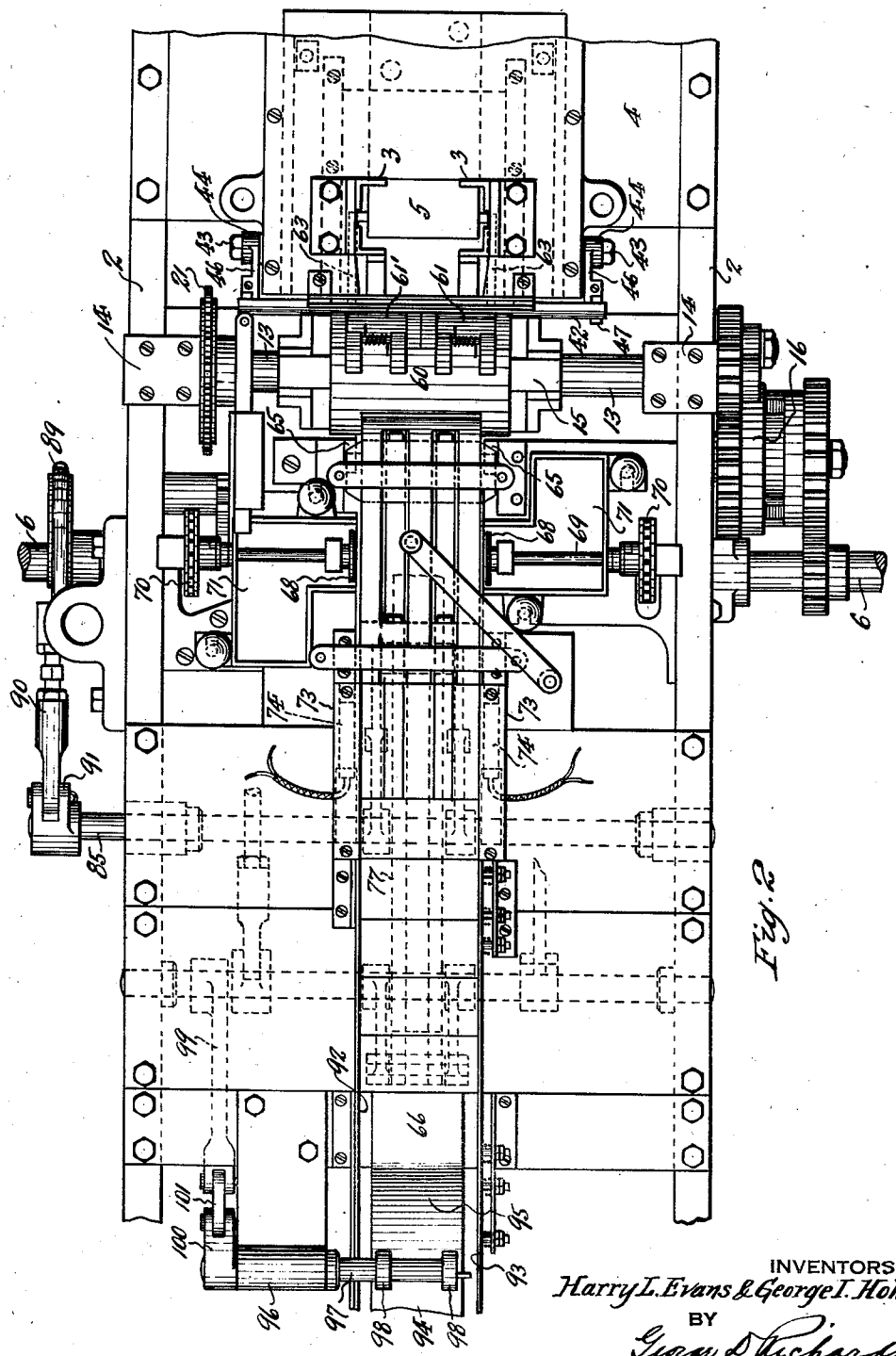


Fig. 2.

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WRAPPING MACHINE

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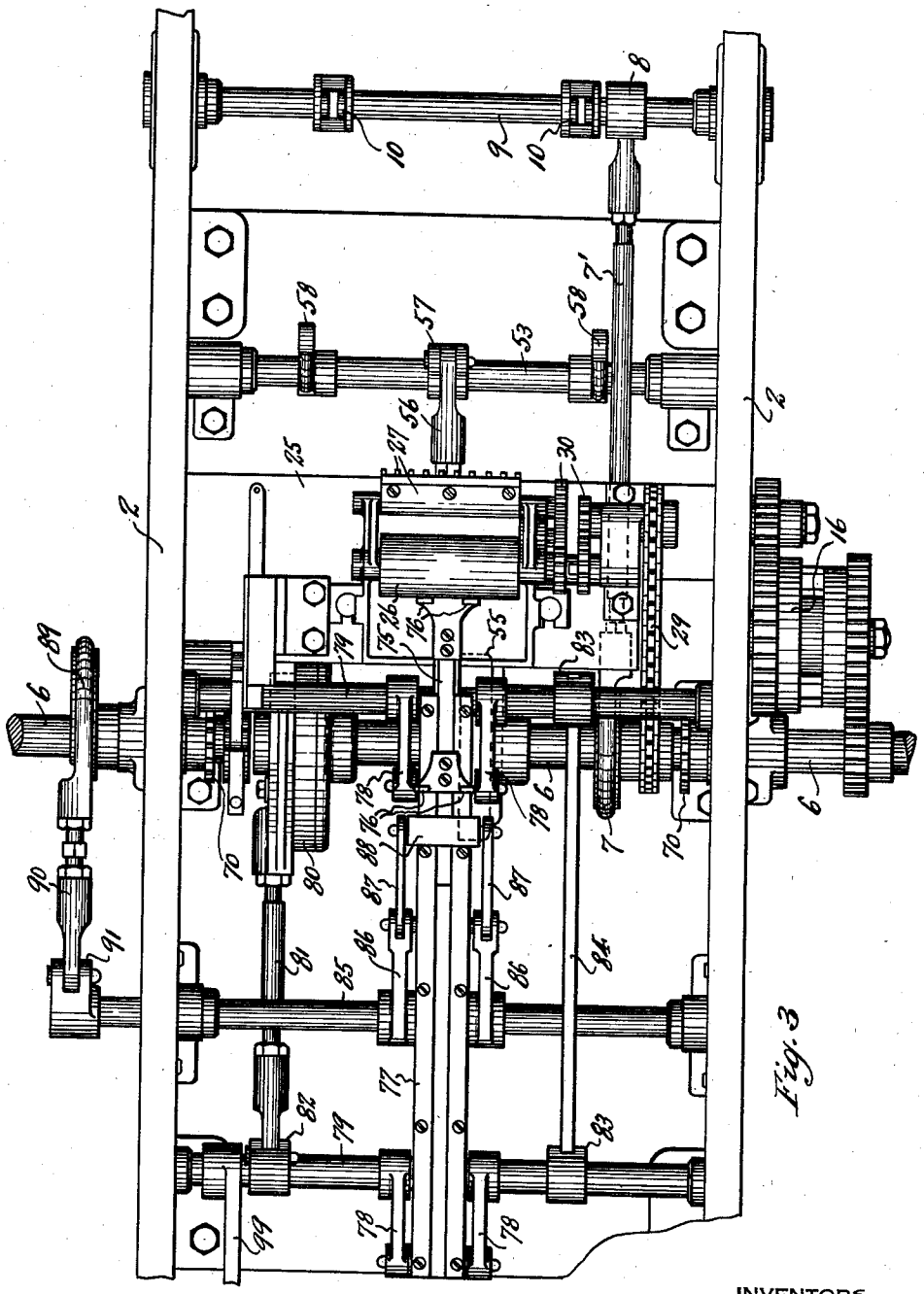


Fig. 3

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WRAPPING MACHINE

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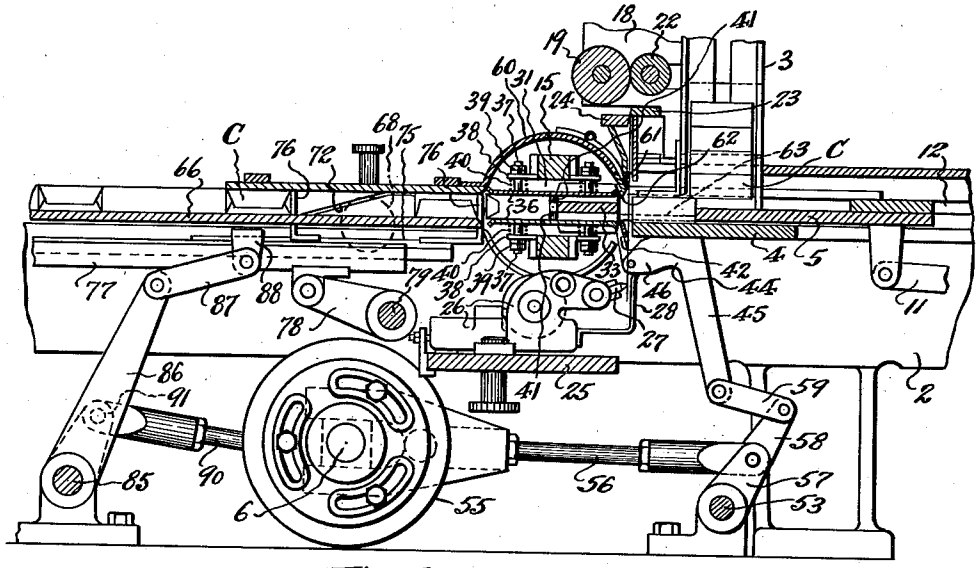


Fig. 4

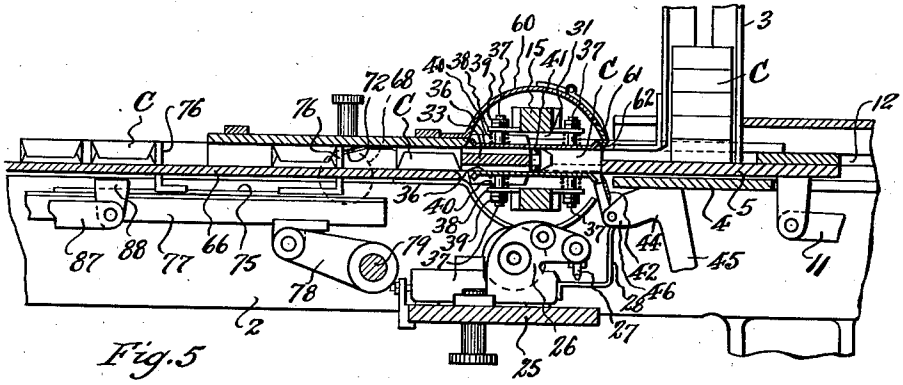


Fig. 5

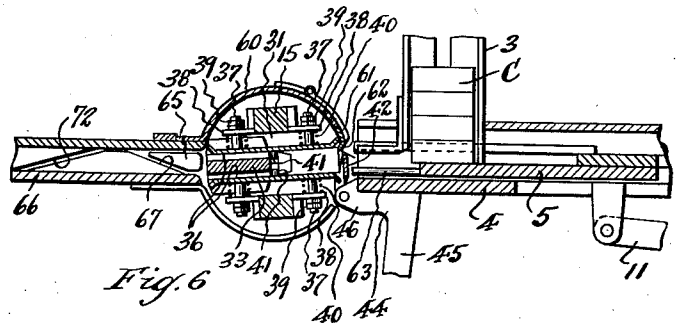


Fig. 6

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WRAPPING MACHINE

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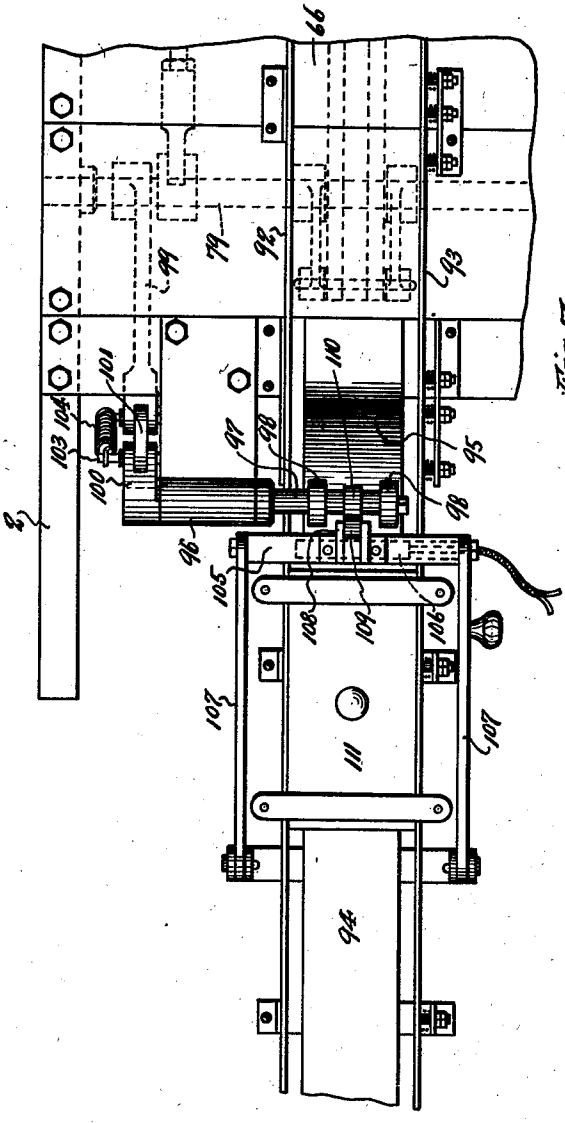


Fig. 7

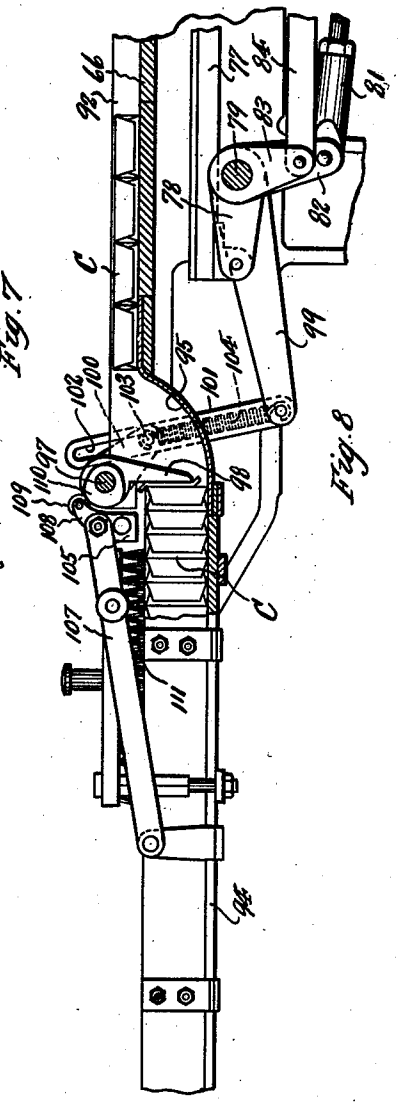


Fig. 8

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WRAPPING MACHINE

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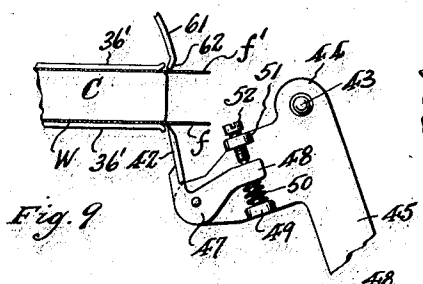


Fig. 9

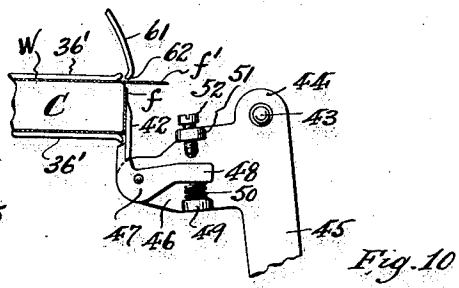


Fig. 10

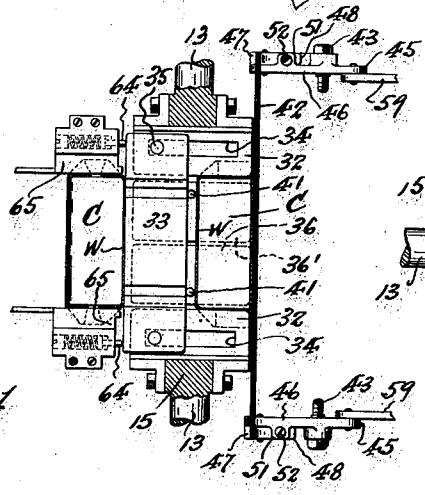


Fig. 11

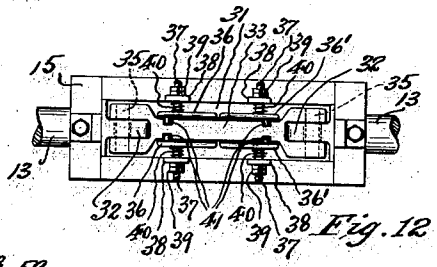


Fig. 12

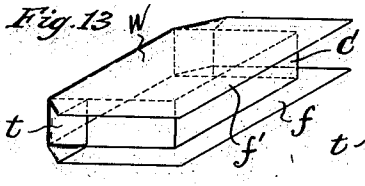


Fig. 13

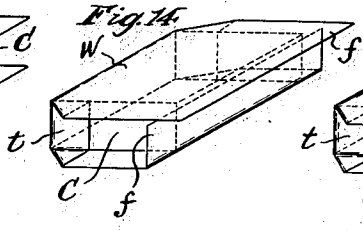


Fig. 14

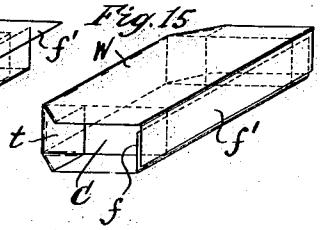


Fig. 15

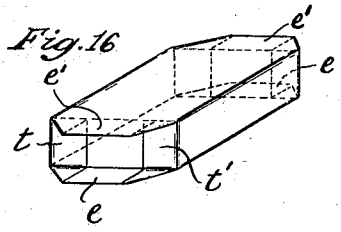


Fig. 16

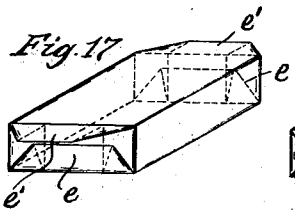


Fig. 17

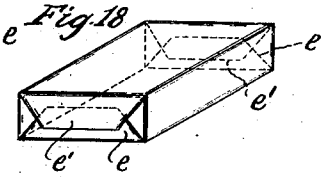


Fig. 18

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Patented Dec. 17, 1935 2,024,438

UNITED STATES PATENT OFFICE

2,024,438

WRAPPING MACHINE

Harry L. Evans, Newport, R. I., and George I. Hohl, Brooklyn, N. Y., assignors to Cartoning Machinery Corporation, Newport, R. I., a corporation of New Jersey

Application May 19, 1933, Serial No. 671,836

6 Claims. (Cl. 93—2)

This invention relates to improvements in wrapping machines; and the invention has reference, more particularly, to improvements in automatic machines adapted to apply an external enveloping wrapper or jacket about cartons, boxes and like symmetrical packages; the machine being further especially adapted to form and apply a wrapper or jacket of cellulosic sheet material of the kind known to industry and commerce under the trade name "Cellophane".

This invention has for its principal object to provide an automatic machine adapted to apply and secure a wrapper upon cartons and the like smoothly and tightly, notwithstanding slight variations in size or inequalities in the contours of the latter; and, furthermore, to accomplish these operations with rapidity and efficiency.

This invention has for more specific objects, to provide novel means for producing the various folds necessary to the formation of the wrapper in such manner that complete and efficient control of the wrapper material is maintained throughout the entire operations.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which:—

Fig. 1 is a side elevation of a wrapping machine according to this invention; Fig. 2 is a plan view of the same; Fig. 3 is a plan view showing the arrangement of transmission means actuated by a power shaft operating in properly timed relation the various mechanisms making up the wrapping machine; Fig. 4 is a longitudinal vertical section of parts of the machine adapted to apply the wrappers to the articles to be enveloped thereby, the same showing the folding roll positioned to receive a carton to be wrapped together with a section of wrapper material; Fig. 5 is a similar view showing the carton and wrapper material operatively entered into the folding roll; and Fig. 6 is a similar view showing the operation of the means for effecting the side folds of the wrapper; Fig. 7 is a fragmentary plan view of means for receiving and stacking the wrapped cartons; and Fig. 8 is a longitudinal vertical section through said wrapped carton receiving and stacking means.

Fig. 9 is a fragmentary view showing the means for producing the first side fold of the wrapper relative to the carton, said means being shown in normal initial position; Fig. 10 is a similar view showing said means in operative position; Fig. 11 is a fragmentary horizontal section through the folding roll, with the first side fold producing means in operative relation to a carton and wrapper section operatively positioned within said folding roll; and Fig. 12 is a side elevation of the folding roll.

Figs. 13 to 18 inclusive show the successive stages in the folding operations by which a wrapper section is applied to and around a carton to be enveloped thereby.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawings, the reference character 1 indicates the base of the machine, upon which are mounted the frame-work 2 in connection with which the wrapping mechanism is supported. At one end of the frame-work is a vertical magazine 3 in which are piled or stacked cartons C to be wrapped. Beneath the lower discharge end of said magazine 3 is a platform 4 upon which the stack of cartons rests, so that the lowermost carton initially lies in the path of a reciprocable plunger 5, the timed reciprocations of which successively feed the cartons to the wrapping mechanism. The plunger 5 is actuated from the main power shaft 6 of the machine by an eccentric 7, the connecting rod 7' of which is connected with the actuating lever 8 of a rock-shaft 9, and said rock-shaft 9 oscillates lever arms 10 which are connected by links 11 to the plunger 5, whereby the latter is reciprocated in its guides 12.

Located adjacent to the forward end of said platform 4 is a rotatable folding roll 15, the structure and functioning of which will be presently set forth. Said folding roll is provided with journal portions 13 mounted in bearings 14 which are supported by the frame-work 2. Said folding roll is actuated in timed relation to the carton delivery plunger 5 and from the power shaft 6 through a train of gears including an intermittent or Geneva gear movement 16.

Means are provided for feeding wrapping material W from a source of supply, preferably comprising a supply roll carrier or reel 17, downwardly between the forward end of said platform 4 and the adjacent folding roll 15. Said wrapping material feed means comprises a suitable bearing housing 18 in which are journaled a pair of feed rolls, one of which, viz. the roll 19, is driven by a transmission chain 20 from a sprocket 21 on a journal 13 of said folding roll 15, in properly timed relation to the movements of the latter, and

the other of which, viz. the roll 22, is yieldably pressed toward the roll 19 in pinching relation to the wrapping material passed between said rolls. Beneath said feed rolls 19—22 is a shear means for severing a downwardly fed section of the wrapping material preparatory to the delivery thereof, with a carton to be wrapped, into the folding roll 15. Said shear means comprises a stationary shear blade 23 and a movable shear blade 24, the latter being actuated at proper times by any suitable arrangement of operating means, including the reciprocable slide 24' and actuating lever 24''.

Arranged beneath said folding roll 15 upon a supporting plate 25, suitably affixed to the framework 2, is an applicator mechanism 26 adapted to coat a longitudinally foldable end of the wrapper section with glue or adhesive preparatory to folding operations. This glue or adhesive applicator means includes a rotatable dauber 27 and a resilient backer plate 28, between which parts the lower end portion of the wrapper section is initially disposed subject to glue or adhesive applying engagement of said dauber 27. The said glue or adhesive applicator mechanism is driven from the power shaft 6 by a chain and sprocket transmission 29 and gearing 30.

The folding roll 15 comprises a frame or body arranged to provide a transverse diametrically open passage 31 extending from side to side thereof. Secured to the respective ends of said frame or body so as to project into said passage 31 along each side thereof are fixed tucker blocks 32. Movable back and forth through the passage 31 between the open sides or mouths thereof is an ejector member 33 having bifurcate ends to straddle the tucker blocks 32. Said tucker blocks 32 are provided with slots 34 which serve as ways for guide pins 35 carried by the bifurcate ends of said transfer member. The faces of the transfer member are cut away between the bifurcate ends thereof to thus reduce the thickness of the central portion of the transfer member, and allow room for play of the tension plate sets of the folding roll. The tension plate sets are horizontally disposed in spaced apart relation within the passage 31 to bound the path of movement of cartons into and out of the latter. Each tension plate set comprises two separate plate members 36 and 36' lying in a common plane and arranged to be independently yieldable, each such member being movably supported by a pair of suspension studs 37 which extend outwardly through supporting brackets 38 affixed to the frame or body of the folding roll; said studs having stop nuts 39 on their exterior ends to engage said brackets 38 so as to determine the normal initial positions of the tension plate members. Compression springs 40, disposed around the studs 37 between the brackets 38 and the tension plate members, yieldably press the latter into operative engaged relation to a carton entered into the folding roll. Each tension plate member 36 and 36' extends from one open side or mouth of the passage 31 to the other. One or both sets of tension plates are provided at their middles with inwardly projecting carton stop pins 41.

The wrapping material W is fed down to position behind the folding roll 15 while the plunger 5 is advancing a carton C from the magazine toward the folding roll, and the dauber 27 applies glue or adhesive to the lower end of the wrapper material. As the advancing carton engages the wrapping material, the shears 23—24 are actuated to sever a wrapper section from the latter. Continued advance of the plunger 5 thereupon pushes the carton with the engaged wrapper section into the passage 31 of the folding roll and between the tension plate sets 36—36', whereby the wrapper section is folded into transverse U-shape about the carton, and at the same time the tucker blocks 32 produce the first end tucks *t* at the folded side of the wrapper section. The advance of the carton and wrapper section into the folding roll is arrested by the carton stop pins 41, whereby the carton can not, under momentum, advance into the folding roll beyond a desired predetermined position, or cant out of proper alignment to the roll, and consequently the projecting lever and upper side folds *f* and *f'* of the wrapper section are disposed exteriorly of the roll in correct positions to be properly engaged by the side fold forming devices to be subsequently described. The divided or separate and independently yieldable sections 36—36' of the sets of tension plates assure proper gripping of the entered carton and wrapper section notwithstanding any variation in thicknesses of the carton or inequalities of contour thereof, thus obtaining equal distribution of pressure upon the upper and lower faces of the carton so that the wrapper section is assured of being smoothly spread or laid over such face areas without wrinkles, bulges or displacement from proper symmetrical relation to the carton. For example, if a carton should be bulged out a little near one end, as frequently happens, especially when the content of the carton is hand packed, the divided and independently yieldable sections 36—36' would automatically adjust themselves to such conditions. Again it sometimes occurs that the cartons vary in thickness from end to end, one end sometimes being as much as one-sixteenth of an inch thicker than the other, consequently, with single or one-piece tension plates, the carton would have a tendency to switch or cant out of alignment by pivoting on the thicker part thereof. This is avoided by the compensating pressure effect by the divided and independently yieldable sections 36—36', while at the same time a firmer holding grip against displacement is exercised upon the cartons and the wrapper section folded around the same.

The means for effecting the side folds of the wrapper section comprises the following devices:

An adjustable and yieldably mounted folder spade 42 is utilized to produce the first side fold. Pivotally connected with the sides of the platform 4 by fulcrum studs 43 are bell-crank levers 44 having downwardly extending arms 45 and forwardly projecting arms 46. Pivotally mounted at the free ends of said forwardly projecting arms 46 are carrier members 47 to which the ends of the folder spade 42 are affixed so that the latter extends transversely therebetween adjacent to the rear side of the folding roll. Said carrier members 47 are provided with rearwardly projecting arms 48, and engaged between the undersides of said arms 48 and seating lugs 49, with which said bell crank arms 46 are provided, are compression springs 50 which yieldably rock said carrier members on their pivotal connections to normally swing said folder spade 42 toward the folding roll. Adjustably mounted in supporting lugs 51, with which said bell crank arms 46 are also provided, are stop-screws 52 disposed above the ends of said carrier member arms 48 so as to be engaged by the latter, whereby the normal

initial position of the upper edge of said folder spade 42 relative to the folding roll 15 may be predetermined. Normally the bell-crank levers 44 are disposed to hold said folder blade 42 in a lowered normal initial position, as shown in Figs. 4, 5 and 9. The means for producing timed oscillations of said bell-crank levers 44, and consequent operation of the folder spade 42, comprises a transverse rock-shaft 53 journaled in bearings 54 mounted on the base 1 of the machine. A cam wheel 55, actuated by the main power shaft 6, has its connecting rod 56 pivoted to a crank arm 57 affixed to said rock-shaft. Also affixed to said rock-shaft in proper locations are levers 58, the free ends of which are connected with the arms 45 of said bell-crank levers 44 by links 59.

Suitably fixed in stationary relation and concentric to the folding roll 15, and so as to extend over the upper side thereof, is a curved folder guard 60. Pivotally connected with the rearward end of said folder guard 60 is a set of spring pressed tensional folder leaves, comprising two separate leaf elements 61 and 61' arranged side by side and so as to be independently yieldable. The free margin of each leaf element is formed to provide an in-turned angular lip 62.

While the carton C is being delivered into the folding roll 15, as above described, the folder spade 42 occupies its lowered initial position, and when so disposed, the wrapper material W, when fed down, will pass behind the same and between the bell-crank arms 44. After the carton C and the section of wrapper material is entered into the folding roll 15, the lower side fold *f* will lie horizontally across the edge of the folder spade 42, as shown in Fig. 9. Before rotary movement is imparted to the folding roll 15, the bell-crank arms 44 are timed to swing forward, whereby the folder spade 42 is caused to rise. By such rising movement, and by reason of the yieldable support of the folder spade, the upper edge thereof will lift the side fold so as to turn the same upward against the rearward side of the carton C as exposed at the mouth of the folding roll, while at the same time the folder spade will tensionally move over the upturned side fold *f* thereby smoothly pressing and stretching the same along the carton side, as shown in Fig. 10. The marginal portion of the side fold *f* to which adhesive has been applied will be now disposed with the adhesive exposed on its outwardly facing surface. When the lower side fold *f* has thus been upfolded against the carton side, and before the folder spade is returned to lowered normal initial position, the operation of the folding roll actuating means is timed to turn the roll anti-clockwise. Such rotary movement of the folding roll carries the upper side fold *f'* into upwardly moving engagement with the lips 62 of the tensional folder leaves 61 and 61', whereby the latter operate to down-turn said upper side fold *f'* over the up-turned side fold *f*. As soon as the down-turned fold adjacent the angle of bend thereof engages the free edge of the up-turned side fold *f*, the folder spade 42 is retracted to its normal lowered position. In the meantime, the folding roll 15 is turned a half-revolution, whereby the side fold *f'* is pressed firmly and smoothly spread against the adhesive treated face of the side fold *f*, and as the roll comes to rest upon completion of a half revolution, the side folds of the wrapper will be completed, and the position of the carton will be reversed with folded sides of the wrapper forwardly presented for movement of the carton cut of the folding roll and into engagement with end folding devices to be subsequently described. The successive stages of the side folding of the wrapper are illustrated in Figs. 13, 14 and 15 of the drawings.

It will be noticed that by regulating the position stop-screws 52 that the folder spade 42 may be adjusted toward and from the face of the carton as initially disposed in the folding roll. By such adjustability the folder spade 42 may be initially set the correct distance for properly engaging the lower side fold *f* and the carton face, to not only smoothly spread the fold against the carton face when the folder spade 42 is actuated, but also to hold the fold during the initial roll turning movement until engaged by the down-turned upper side fold *f'*. Should the carton vary slightly in width, the flexible or yieldable support of the folder spade 42 will render the latter self-compensating as to any such variations.

The divided or separate folder leaves 61 and 61', by reason of their ability for independent yieldable movement, will be self-compensating relative to any variation in width of a given carton end to end, when the latter is positioned against the stop pins 41. For example, it sometimes happens that a filled carton is somewhat wider at its ends than at the portions intermediate the ends, but in such event, the separate folder leaves 61—61' will conform to such variations, consequently assuring complete and firm engagement of the wrapper side folds throughout the entire area of the latter, with resultant assurance of smooth spreading of the folds upon the carton side without production of wrinkles or other displacement.

Upon completion of the wrapper side folds in the manner described, the carton C as partially enveloped in the wrapper section is ready to be discharged from the folding roll 15, and delivered to and carried through wrapper end folding means. The discharge of the partially wrapped carton from the folding roll is accomplished as follows:—

As a succeeding carton is entered into the rear side of the folding roll by the advancing plunger 5, the partially wrapped carton, now disposed at the forward side of the folding roll, is pushed out by the forward movement of the ejector member 33 which is engaged by push fingers 63 carried by the plunger 5 so as to be positively pushed forward from the rear side to the forward side of the folding roll. On such forward movement of the ejector member 33, the same engages the partially wrapped carton and ejects the same from the folding roll. In order to assure that the ejected partially wrapped carton completely clears the mouth of the folding roll, the operation of the push-fingers 63 is such that the ejector member 33 is projected somewhat beyond the mouth of the folding roll, and against yieldable spring pressed buffers 64 suitably housed in portions of tucker blocks 65 to be later referred to (see Fig. 11 of the drawings). When the plunger 5 and push fingers 63 are retracted, the spring pressed buffers 64 will push back the ejector member 33 flush with mouth of the folding roll 15 preparatory to rotary movement of the latter.

The ejected partially wrapped carton is deposited upon a slideway 66, and as it moves on to the latter it passes between the stationary tucker blocks 65 which are respectively located at opposite sides of the receiving end of said slideway. In passing between the tucker blocks 65, the second end tucks *t'* are produced, thus completing at each

end of the carton wrapper outwardly and horizontally projecting lower and upper end folds *e* and *e'* respectively.

Beyond the tucker blocks 65 are upwardly inclined lower end fold turning blocks 67, which, as the partially wrapped carton is propelled along the slideway 66, first engage the lower end folds *e* so as to up-turn the same in folded relation against the ends of the carton. While the lower end folds *e* are thus being folded home, the upper end folds *e'* remain in horizontally extending position, and as the carton is propelled onward the underside of these upper end folds *e'* are carried in passing contact with continuously rotated adhesive applicator rolls or wheels 68, which are mounted on counter shafts 69 and driven from said power shaft 6 by chain and sprocket transmission means 70. These adhesive applicator rolls or wheels 68 are disposed over glue pans 71 in which the periphery of the rolls or wheels 68 dip so as to pick up and transfer the adhesive to the underside of said outwardly projecting upper end folds *e'*. Beyond the point of application of the adhesive to said upper end folds *e'* are downwardly inclined upper end fold turning blocks 72, which, as the carton is propelled along the slideway 66, engage and down-turn said upper end folds *e'* into overlying and adhering relation to the up-turned end folds *e*, thus completing the wrapping of the wrapper section in desired enveloping relation to the carton C. The successive stages of the end folding of the wrapper are illustrated in Figs. 16, 17 and 18 of the drawings.

Beyond the fold turning blocks 72, and bordering the sides of said slideway 66, are heater blocks 73 served by electrical heater elements 74. These heater blocks 73 engage the end folds of the carton wrapper and serve to rapidly dry and set the adhesive holding said end folds in position preparatory to discharge of the wrapped cartons to the stacking mechanism.

The means for propelling the cartons through the slideway 66 and thereupon delivering the same to stacking mechanism, comprises a reciprocable propeller bar 75 having upstanding push-pieces 76. This propeller bar 75 reciprocates in a channeled guide cradle 77 which is supported by levers 78 mounted on rock-shafts 79. Timed oscillations are imparted to said rock-shafts 79 by a cam drive means 80 on the power shaft 6, through a connecting rod 81, the end of which is connected with a rocking lever 82 affixed to one of said rock-shafts 79. The rock-shafts are connected for simultaneous movement by means of levers 83 and an interconecting link 84. The propeller bar 75 is longitudinally reciprocated in the cradle 77 by means of a rock-shaft 85 having lever arms 86 connected by links 87 to a cross-strap 88 carried by the propeller bar 75. The rock-shaft 85 is oscillated in properly timed relation by an eccentric 89 actuated by the power shaft 6, the connecting rod 90 of said eccentric being connected with an actuating lever 91 affixed to said rock-shaft 85. In the operation of the cradle 77 the same is raised to elevate the propeller bar so as to bring the push-pieces 76 into operative propelling engagement with the cartons C; the cradle 77 remaining in elevated position during the forward driving stroke of the propeller bar. At the end of the driving stroke of the propeller bar, the cradle is lowered to disengage the push-pieces 76 from the cartons C so that the same pass beneath said cartons while the propeller bar is being retracted preparatory to a succeeding carton propelling stroke.

Beyond the heater elements 74, the sides of the slideway 66 are bounded by up-standing guide plates, one of which, viz. the guide plate 92 is stationary, and the other of which, viz. the guide plate 93 is spring-pressed toward the stationary plate. As a consequence of this the wrapped cartons, as they are propelled along the slideway 66 to the discharge end thereof, are gripped endwise between said guide plates 92—93. Located at the discharge end of the slideway 66 is a stacking chute 94 which is disposed in a plane below that of the slideway 66, and which is connected with the latter by a curved skidway 95. The guide plates 92—93 extend outwardly over this skidway 95 so as to grip and hold a wrapped carton suspended above the same, until such carton is positively engaged and moved by a turn-over paddle and thereby transferred to the stacking chute 94. Mounted in a bearing 96 is a spindle 97 having its free end extending transversely above the skidway 95. Fixed on this spindle 97, so as to be oscillated thereby, is a turn-over or carton transfer paddle 98 which is arranged to swing through said skidway 95. Means are provided for actuating said paddle 98 in timed relation to the movement of wrapped cartons off of the slideway 66. Such actuating means comprises an actuating lever 99 which is affixed to the outer rock-shaft 79 so as to be oscillated thereby. The spindle 97 is provided with a lever arm 100. Connecting said actuating lever 99 with said lever arm 100 is a link 101. This link has an elongated slot 102 in which the pivoting pin 103 connecting said lever arm 100 thereto is engaged. A pull spring 104 anchored at its lower end and having its upper end coupled to said pivoting pin 103, normally holds the latter in operative engagement with the lower end of said slot 102, but yieldable for movement in said slot, to thereby yieldably engage the paddle rocking means with the actuating means therefor. Initially the paddle 98 is up-swung to substantially horizontal plane above the path of travel of the wrapped cartons between the guide-plates 92—93. As the wrapped cartons are intermittently moved outwardly along the slideway 66, one of the same will be moved off of slideway and suspended by the gripping pressure of the guide-plates 92—93 flat wise above the skidway 95 and beneath the paddle 98. Subsequent to such disposition of a wrapped carton, the paddle actuating means operated to swing down the paddle 98, whereby the same engages the suspended carton and sweeps the same downward through the skidway 95, while at the same time turning the same sidewise so that it is delivered upon the stacking chute 94 upstanding on one side, the side at which the side folds *f—f'* of the wrapper are located being uppermost. If for any reason a carton should become jammed during the period of transfer thereof to the stacking chute, the paddle will yield thereto without strain upon the same or the actuating mechanism therefor, since, in such case, the spring 104 would yield and allow the slotted link 101 to move relative to the lever arm 100 without imparting movement or undue strain to the paddle as arrested by a jammed carton. This arrangement provides a safety factor which eliminates any risk of accidental breakage of either the carton or the paddle mechanism.

As the paddle 98 successively delivers wrapped cartons upon the stacking chute, such cartons will be stacked together and progressively moved

along the chute preparatory to removal thereof for packing or other purposes.

It will be observed, as above stated, that the adhered wrapper side folds *f*—*f'* are disposed uppermost when the cartons are delivered upon the chute **94**. In order to assure thorough drying and setting of the adhesive applied between the side folds *f*—*f'*, before the wrapped cartons are finally removed from the machine, a timed means for applying drying heat thereto is provided. This means comprises a heater block **105** equipped with an electrical heater element **106**. Said heater block **105** is supported for up and down swinging movement by lever arms **107** which are pivotally connected with the sides of the stacking chute **94**. As thus supported, said heater block **105** is normally transversely disposed above the cartons as delivered to said stacking chute. Connected with said heater block **105** is a lift arm **108** provided at its free end with an anti-friction roller **109** which is operatively engaged by a cam **110** that is fixed on and oscillated by said spindle **97**. The heater block, by timing control of said cam **110**, is lowered and temporarily held in contact with the side folds *f*—*f'* of the carton wrappers, as the cartons are successively delivered upon the stacking chute and beneath the heater block. As the wrapped cartons are moved outwardly through the stacking chute, the same pass beneath and in contact with a brush member **111** which wipes the seam side of the carton wrappers, after which the wrapped cartons may be removed from the machine by packing operations or discharged to packing machinery.

From the above description, the construction and operation of the wrapping machine will be understood, and it will be obvious that the machine is fully automatic, and maintains, throughout the wrapping operations, very efficient control of the cartons or packages while application of wrappers thereto is carried out, all to the end that high speed operation of the machine is possible and a maximum output of wrapped cartons continuously maintainable.

As many changes could be made in the above described construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, as defined in the following claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. In a wrapping machine, an intermittently rotatable folding roll having a diametric article receiving passage containing an ejector member movable therein, tension plate sets respectively bounding both horizontal sides of said receiving passage, each set comprising a pair of spring-pressed independently yieldable plates each of a width approximating one-half of the mean width of said receiving passage, the plates of each pair being arranged side by side and normally occupying a common plane with their inner longitudinal margins closely adjacent.

2. In a wrapping machine, an intermittently rotatable folding roll having a diametric article receiving passage containing an ejector member movable therein, tension plate sets respectively bounding the horizontal sides of said receiving passage, each set comprising a plurality of spring-pressed independently yieldable plates arranged side by side and normally occupying a common plane, and article stop pins connected with said tension plates to limit the movement of an article and wrapping material into said folding roll passage.

3. In a wrapping machine, an intermittently rotatable folding roll having a diametric article receiving passage, an ejector member movable therein, tucker blocks fixed within said passage at the vertical sides thereof, said ejector member having bifurcated sides to straddle said tucker blocks, tension plate sets respectively bounding the horizontal sides of said passage, each set comprising a plurality of spring-pressed independently yieldable plates arranged side by side and normally occupying a common plane, and article stop pins connected with said tension plates.

4. In a wrapping machine, an intermittently rotatable folding roll having a diametric article receiving passage, an ejector member movable therein, tucker blocks fixed within said passage at the vertical sides thereof, said ejector member having bifurcate sides to straddle said tucker blocks, tension plate sets respectively bounding the horizontal sides of said passage, each set comprising a plurality of spring-pressed independently yieldable plates arranged side by side and normally occupying a common plane, article stop pins connected with said tension plates, means for inserting an article and wrapping material into the folding roll passage, a vertically oscillatable folder spade disposed exteriorly of said folding roll and adjacent to the receiving end of its passage, means timed to actuate said folder spade after the article and wrapping material are entered into said folding roll whereby said spade folds upwardly against the outwardly exposed side of the article a lower projecting portion of said wrapping material to form a first side fold, means contiguous to said folding roll and operative when the latter is rotated for down-folding an upper projecting portion of said wrapping material to form a second side fold overlapping said first side fold, and means through which the partially wrapped article is moved upon ejection from said folding roll for completing end folds of the wrapper.

5. In a wrapping machine, an intermittently rotatable folding roll having a diametric article receiving passage, an ejector member movable therein, tucker blocks fixed within said passage at the vertical sides thereof, said ejector member having bifurcate sides to straddle said tucker blocks, tension plate sets respectively bounding the horizontal sides of said passage, each set comprising a plurality of spring-pressed independently yieldable plates arranged side by side and normally occupying a common plane, article stop pins connected with said tension plates, means for inserting an article and wrapping material into the folding roll passage, a vertically oscillatable folder spade disposed exteriorly of said folding roll and adjacent to the receiving end of its passage, means timed to actuate said folder spade after the article and wrapping material are entered into said folding roll whereby said spade folds upwardly against the outwardly exposed side of the article a lower projecting portion of said wrapping material to form a first side fold, a substantially semi-cylindrical folder guard contiguous to the upper half of said folding roll, a plurality of spring-pressed independently yieldable folder leaves arranged side by side and each pivotally connected to said folder guard, said leaves having at their free ends inwardly projected lips contiguous to the upper margin of

the receiving end of said folding roll passage, said folder leaves being adapted upon rotation of the folding roll to down-fold and smoothly stretch an upper projecting portion of said wrapping material to form a second side fold overlapping said first side fold, and means through which the partially wrapped article is moved upon ejection from said folding roll for completing end folds of the wrapper.

6. In a wrapping machine, a folding roll having a diametrically disposed article receiving passage, means for inserting an article and wrapping material into said roll, and means for up-folding a lower projecting portion of the wrapping material against the exposed side of the article to form a first side fold of a wrapper therefor, said means comprising a pair of pivoted bell-crank levers with their forward extensions in straddling relation to said roll, carrier members pivoted to said forward extensions of said bell-crank levers, an upstanding folder spade connected to and between said carrier members and normally disposed below and contiguous to the lower margin of the receiving end of said roll passage, said carrier members having rearwardly extending arms, spring means connected with said forward extensions of said bell-crank levers to yieldably press said folder spade toward the folding roll, adjustable stop-means also carried by said forward extensions of said bell-crank levers and engageable by said carrier member arms to determine the normal initial position of said folder spade relative to the receiving end of the folding roll passage, and means timed to actuate said bell-crank levers after the article and wrapping material are entered in said folding roll whereby said spade is raised to fold turning, wiping and holding position.

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