

April 20, 1937.

J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

23 Sheets-Sheet 1

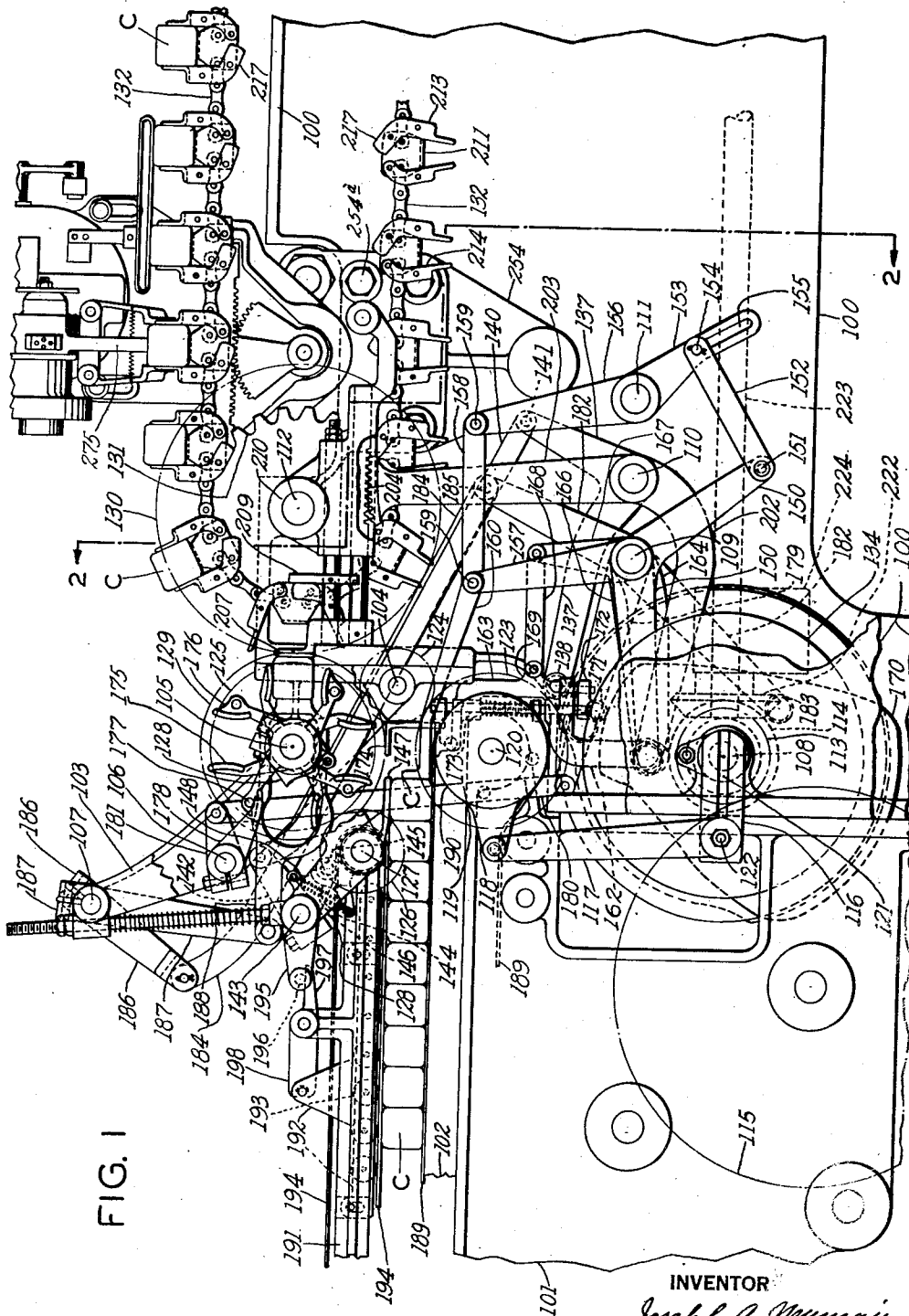


FIG. 1

INVENTOR  
BY *Joseph A. Neumair*  
*Sydney J. Prescott*  
ATTORNEY

April 20, 1937.

J. A. NEUMAIR

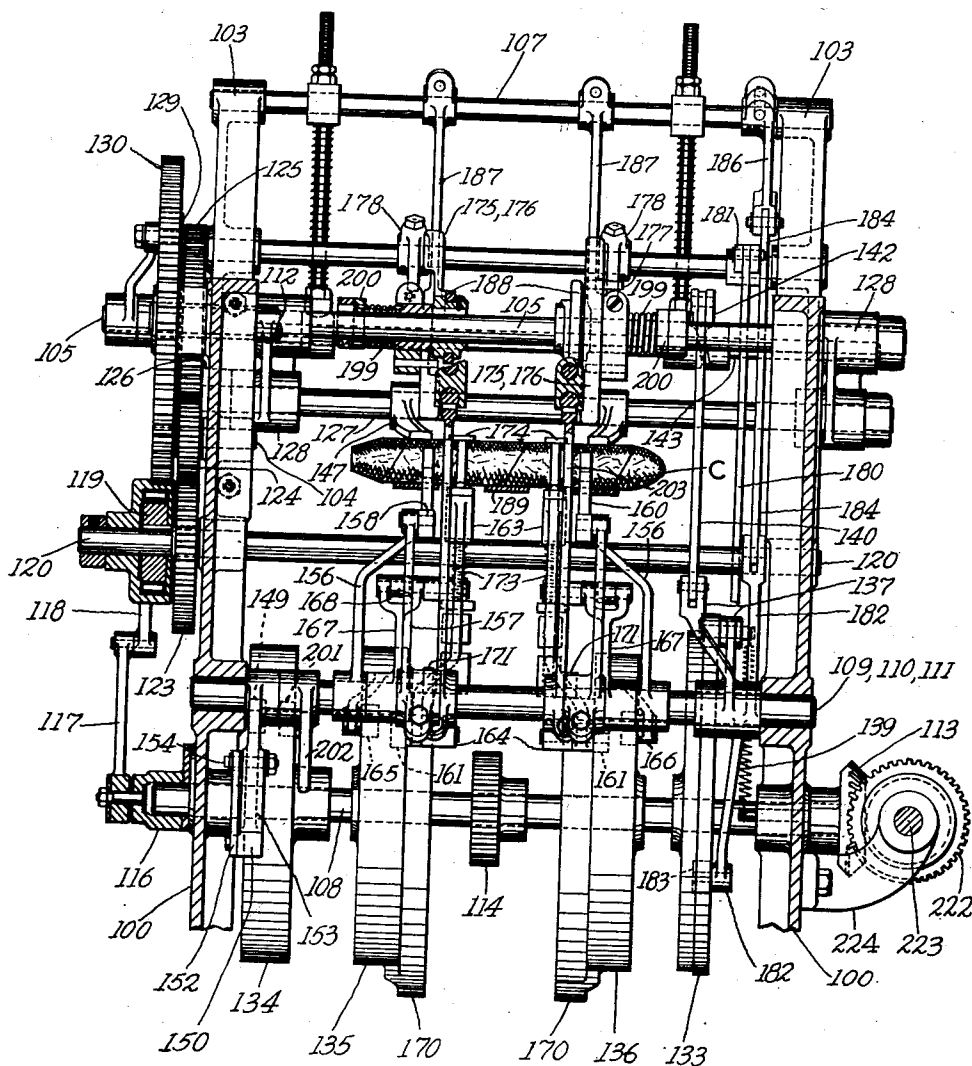
2,077,431

WRAPPING AND BANDING MACHINE

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FIG. 2



INVENTOR

Joseph A. Neumair

Sydney J. Percott

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April 20, 1937.

J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

23 Sheets-Sheet 3

FIG. 3

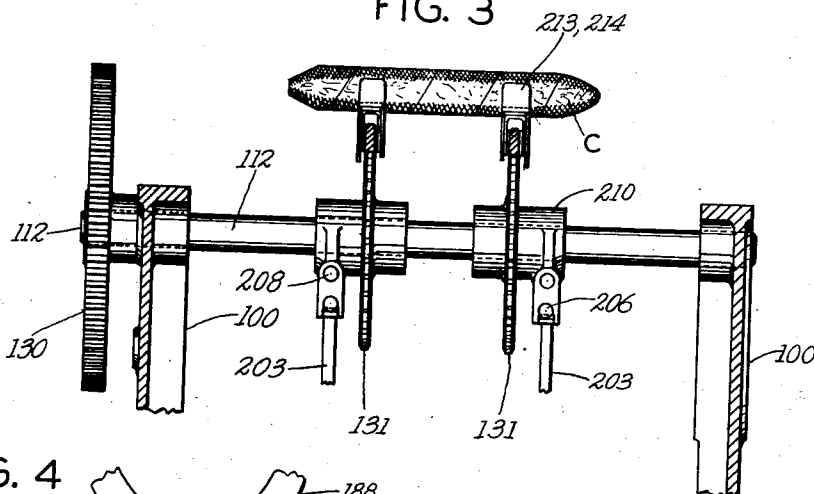


FIG. 4

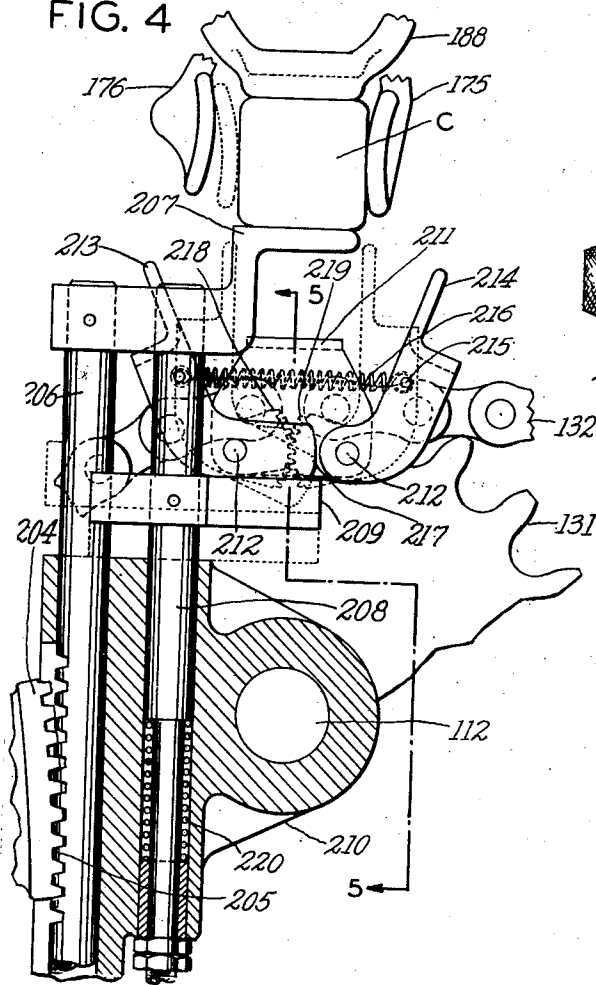
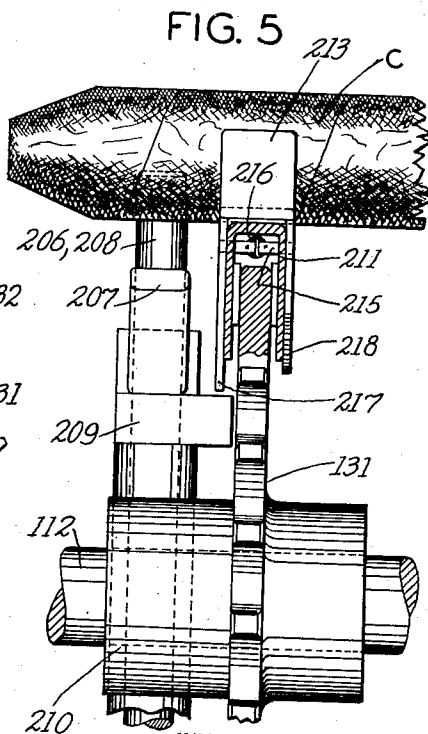


FIG. 5



INVENTOR  
Joseph A. Neumair  
By Sydney A. Prescott  
ATTORNEY

April 20, 1937.

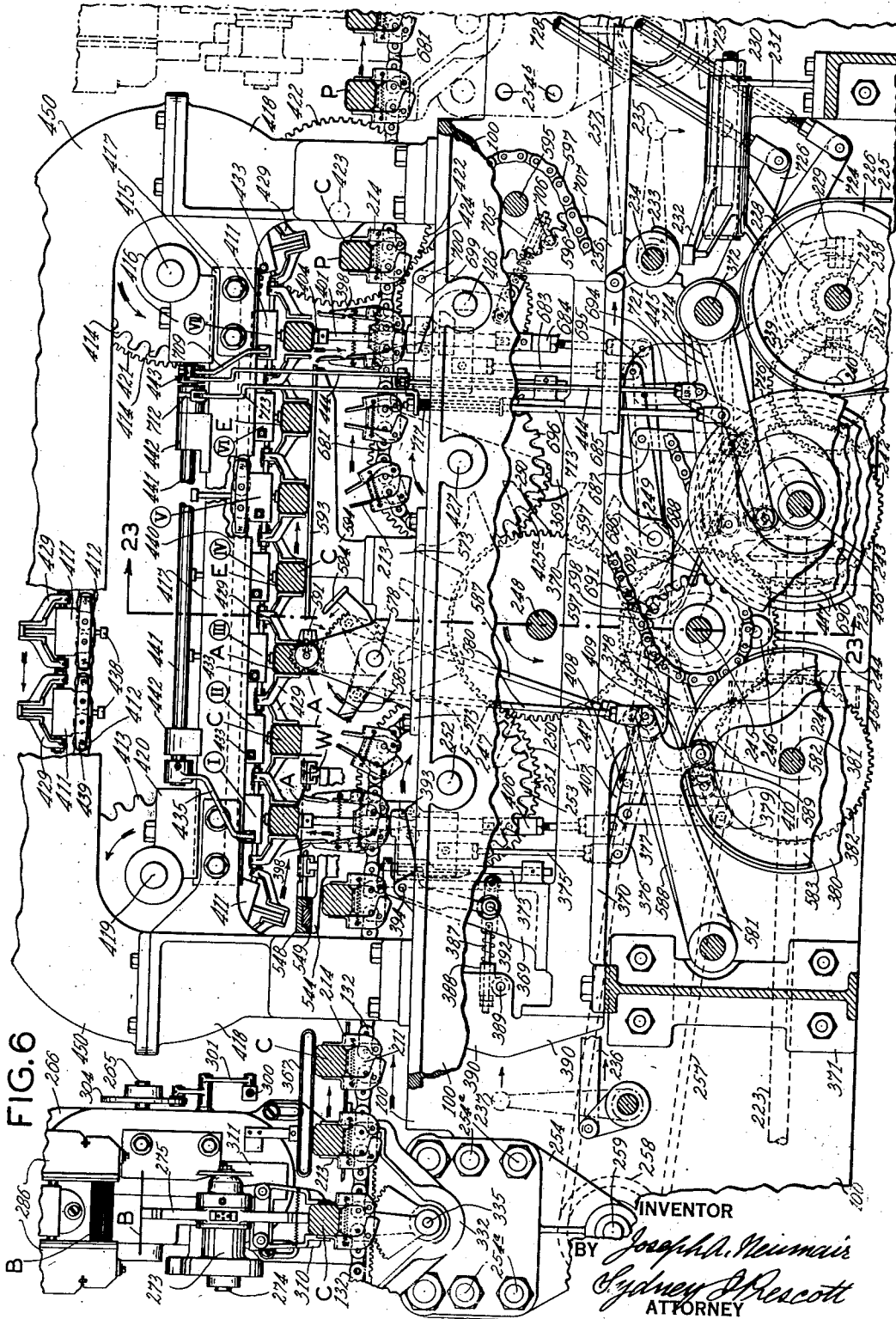
J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

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**April 20, 1937.**

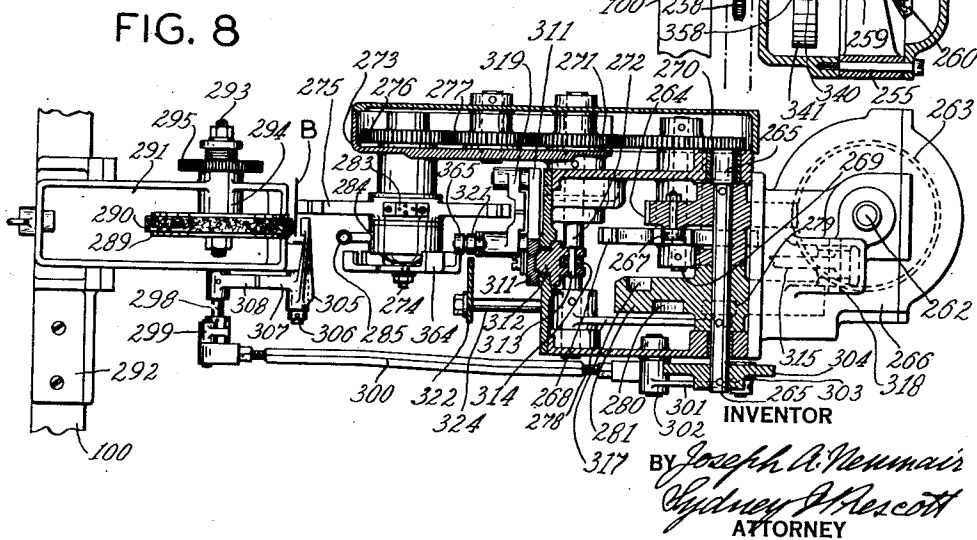
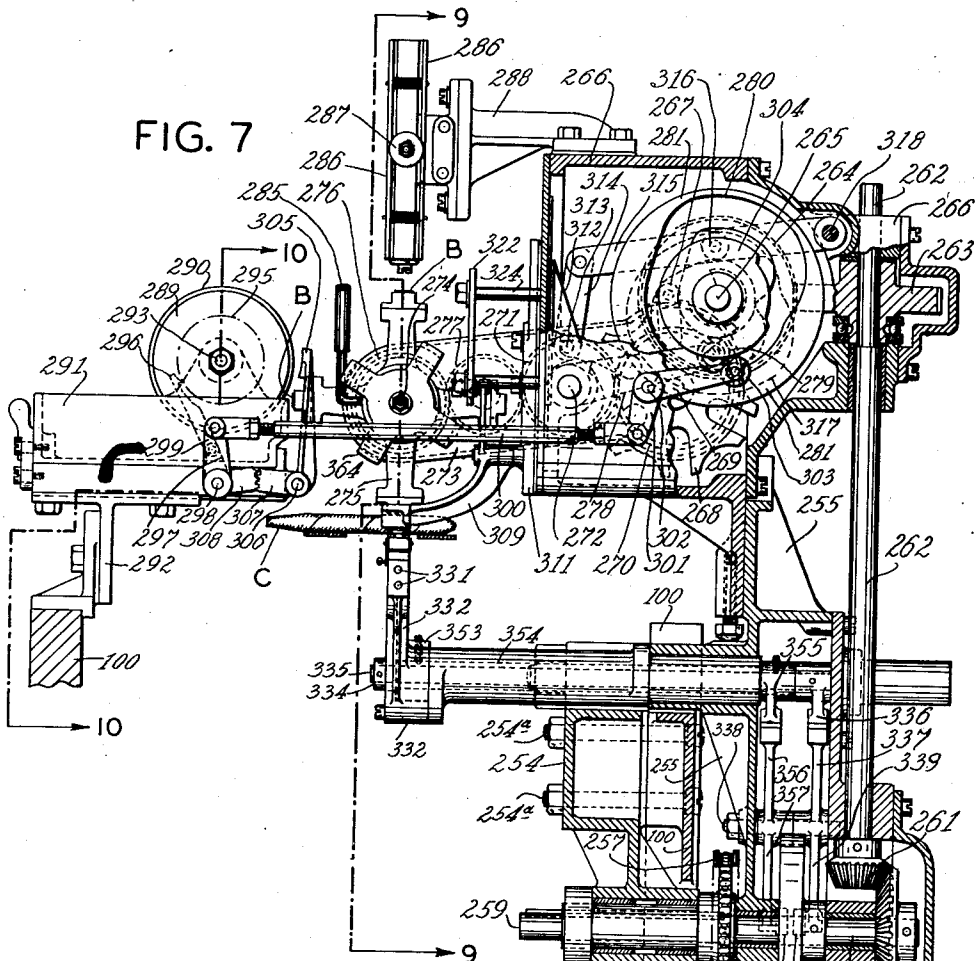
**J. A. NEUMAIR**

**2,077,431**

WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

23 Sheets-Sheet 5



INVENTOR  
BY *Joseph A. Neumann*  
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ATTORNEY

April 20, 1937.

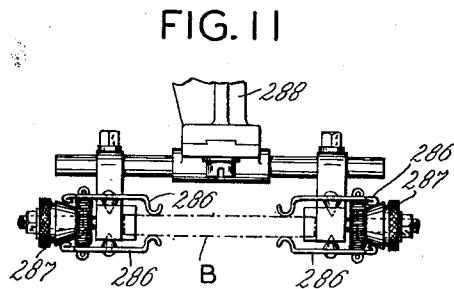
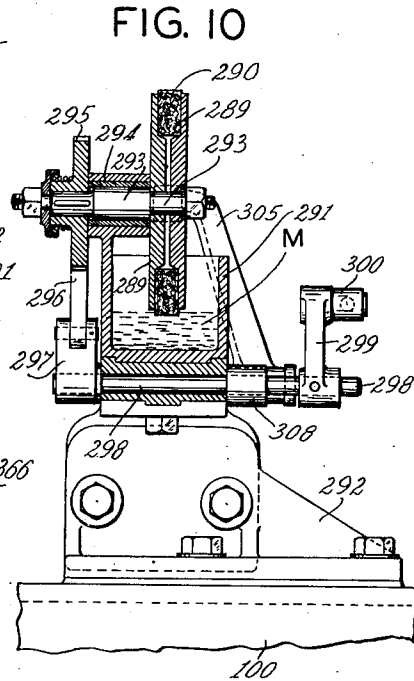
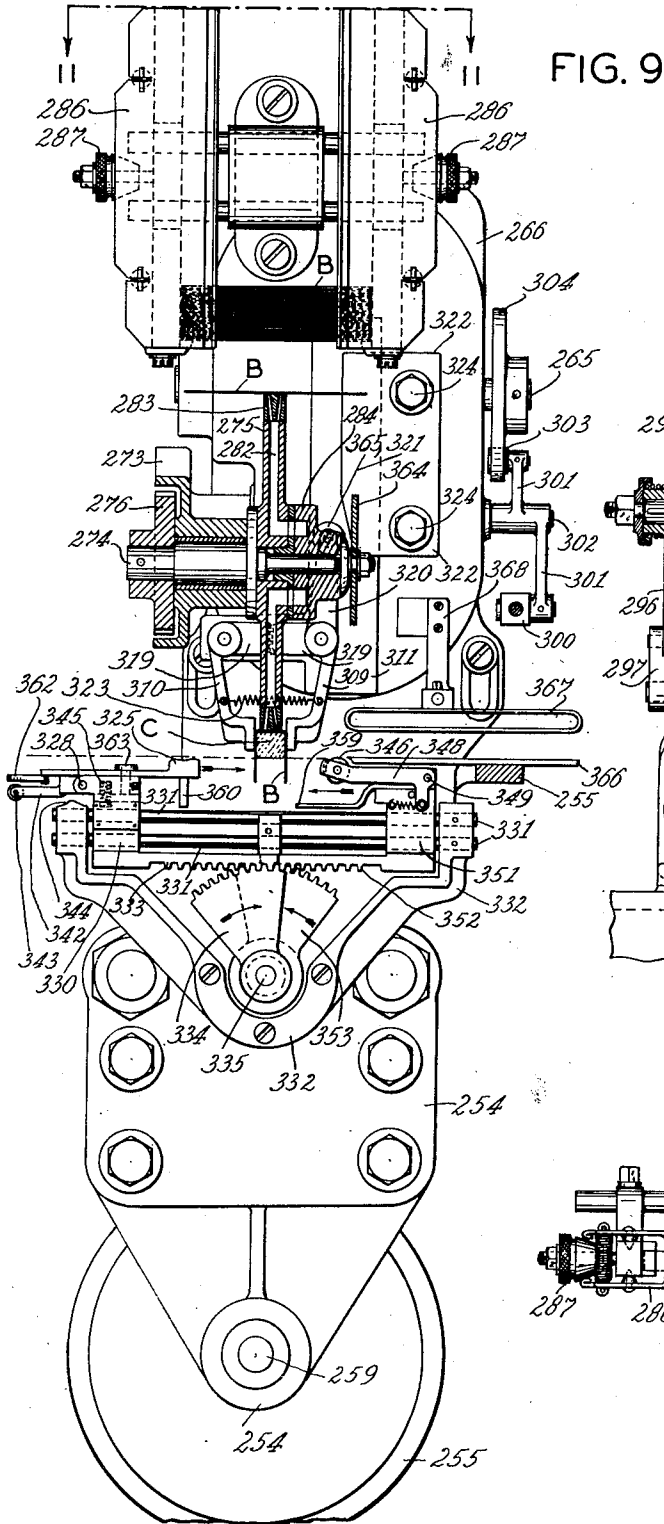
J. A. NEUMAIR

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WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

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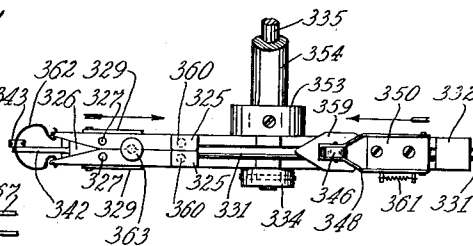


INVENTOR

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**2,077,431**

## 23 Sheets-Sheet 7



BY *Joseph A. Newmair*  
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April 20, 1937.

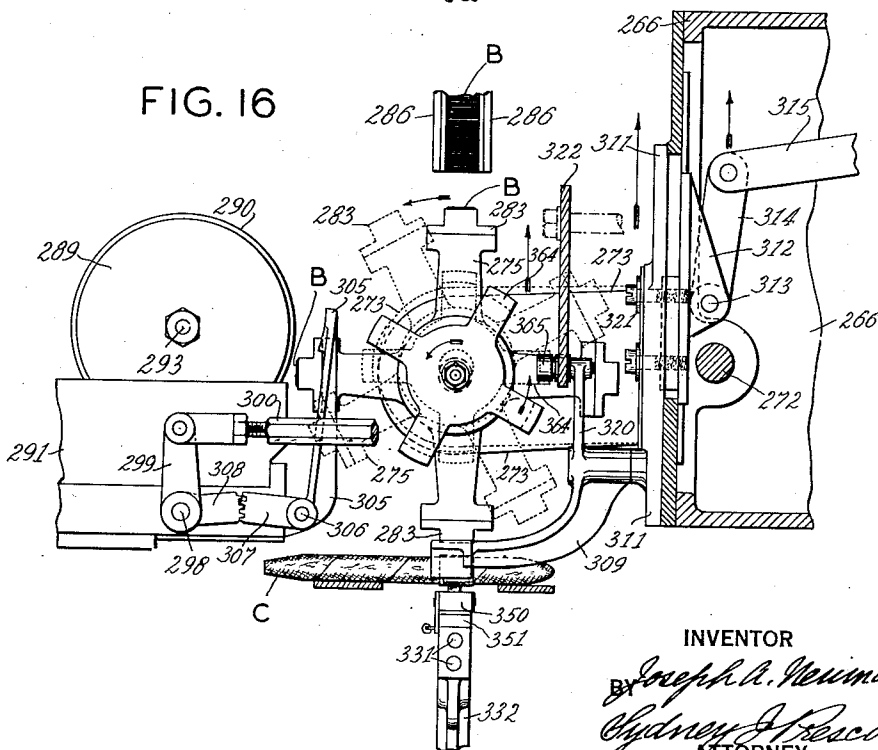
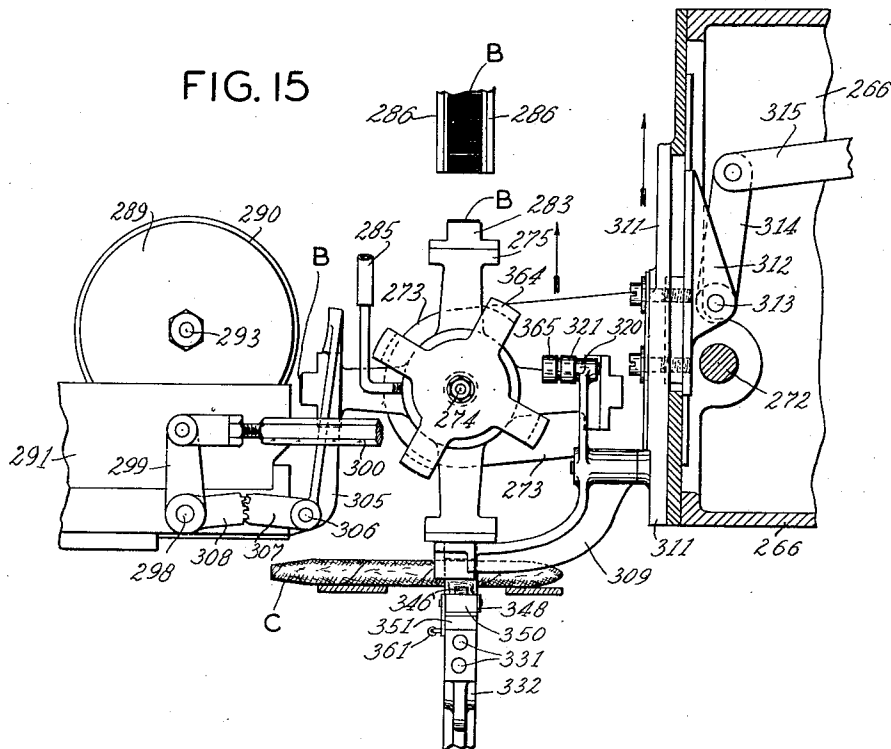
J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

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INVENTOR

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*Clydney J. Prescott*  
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April 20, 1937.

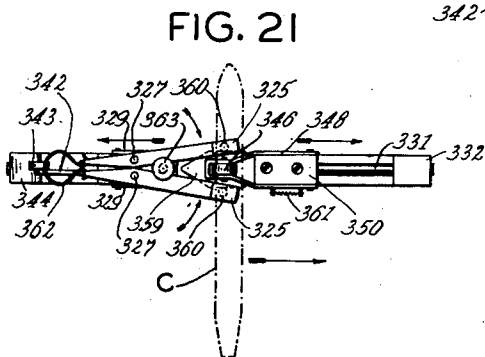
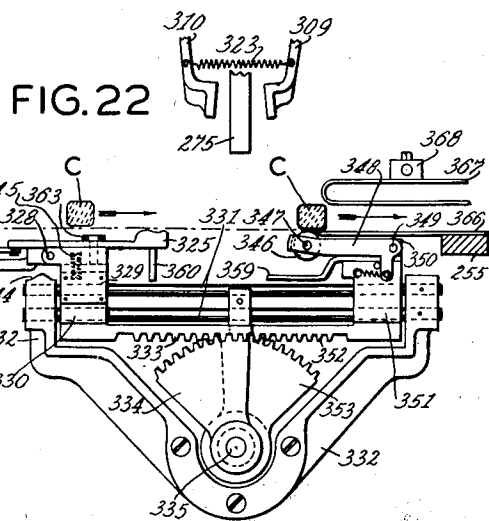
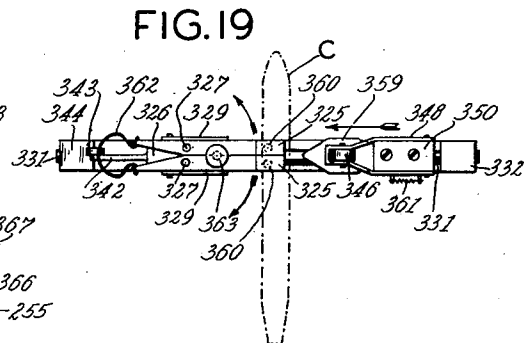
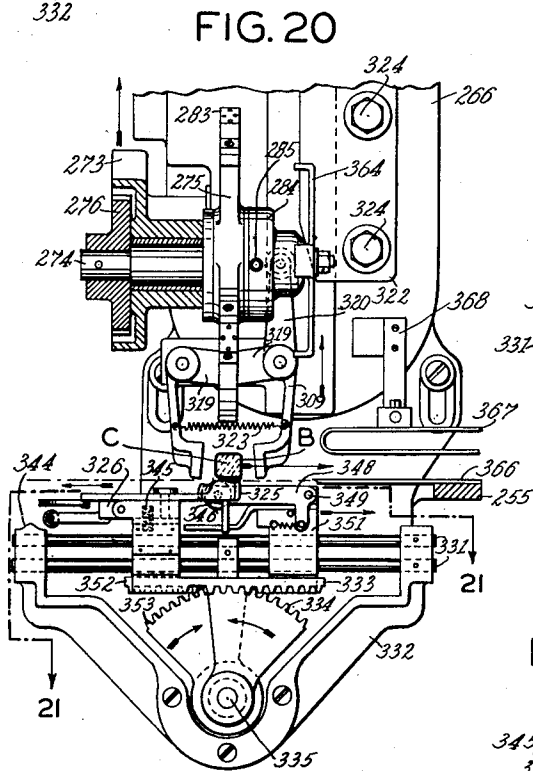
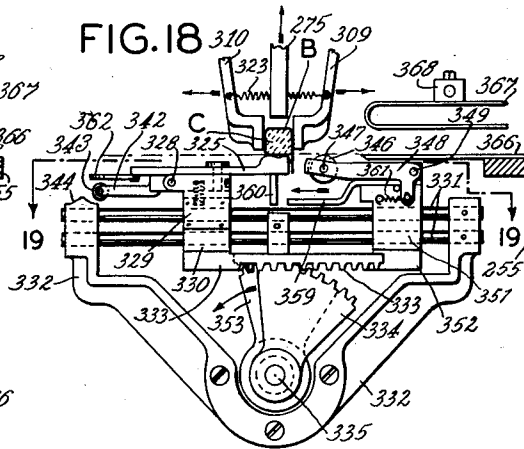
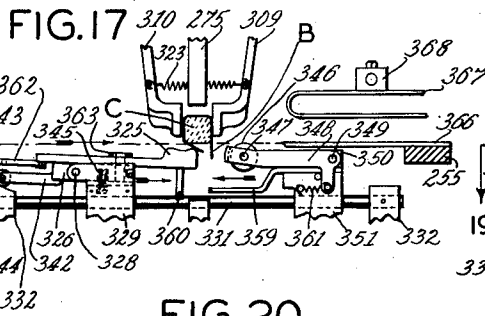
J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

23 Sheets-Sheet 9



INVENTOR  
Joseph A. Neumair  
BY Sydney J. Prescott  
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April 20, 1937.

J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

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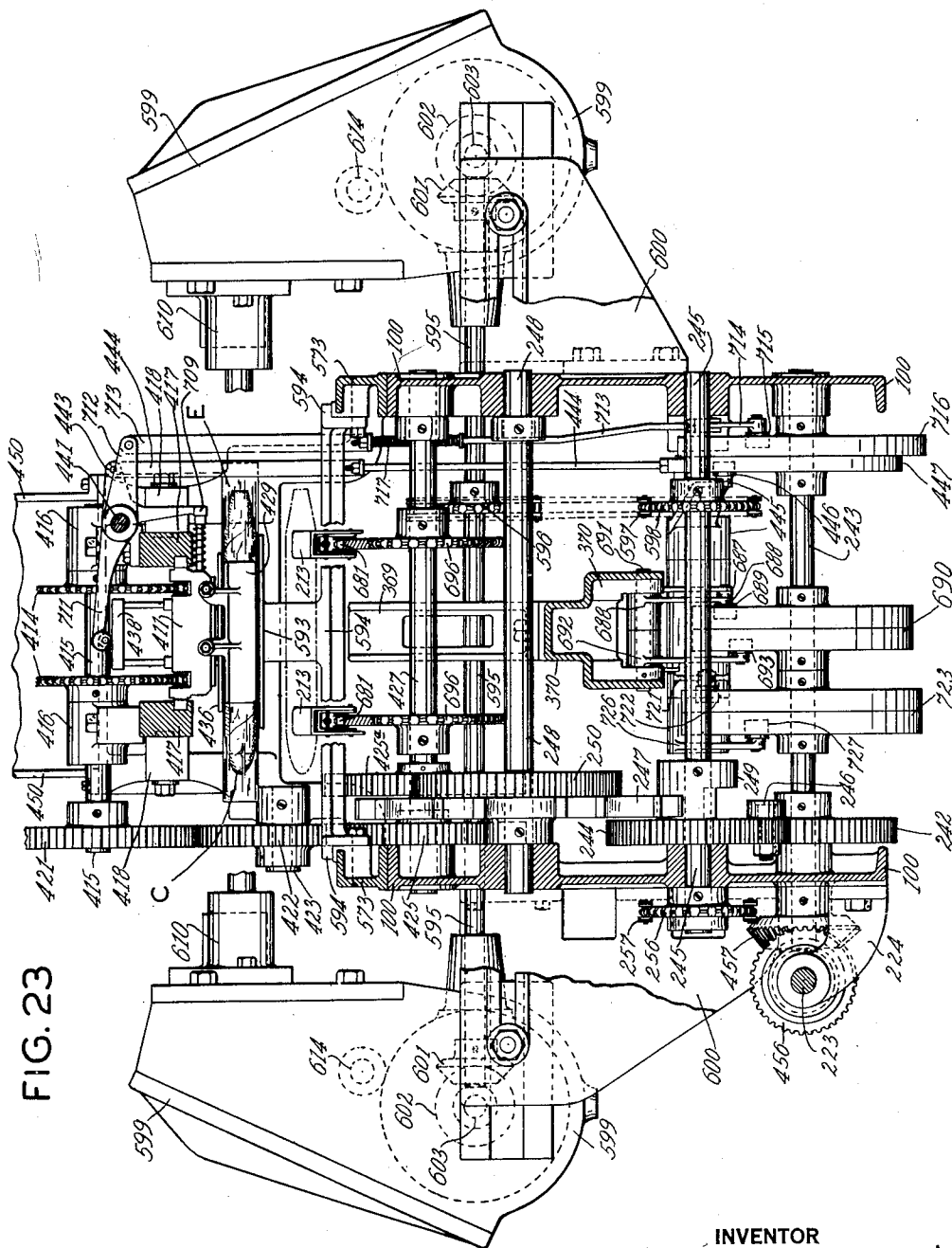


FIG. 23

INVENTOR

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*Sydney S. Prescott*  
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April 20, 1937.

J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

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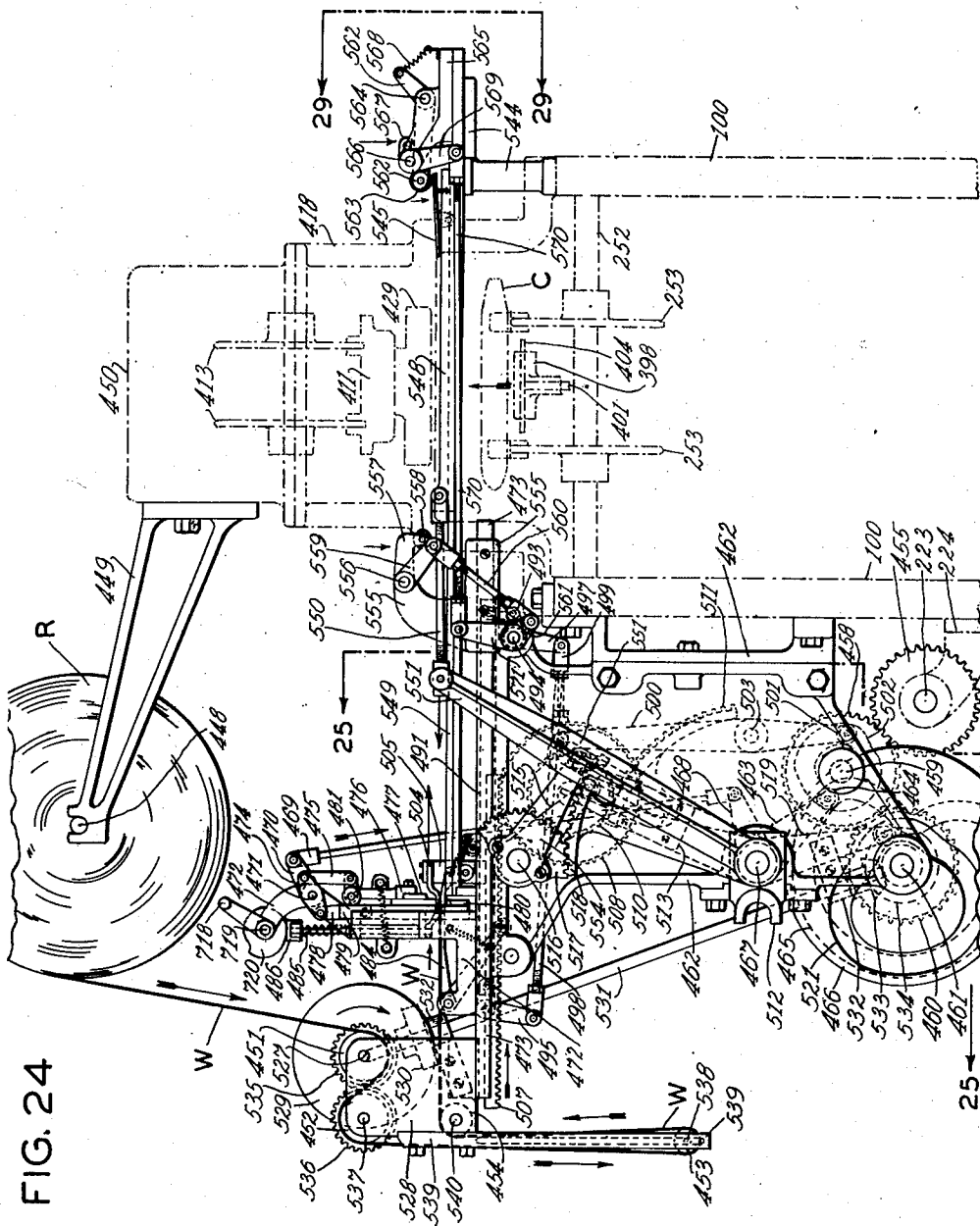


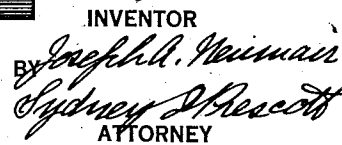
FIG. 24

INVENTOR

By *Joseph A. Neumair*  
*Sydney A. Percott*  
ATTORNEY

**2,077,431**

## 23 Sheets-Sheet 12



April 20, 1937.

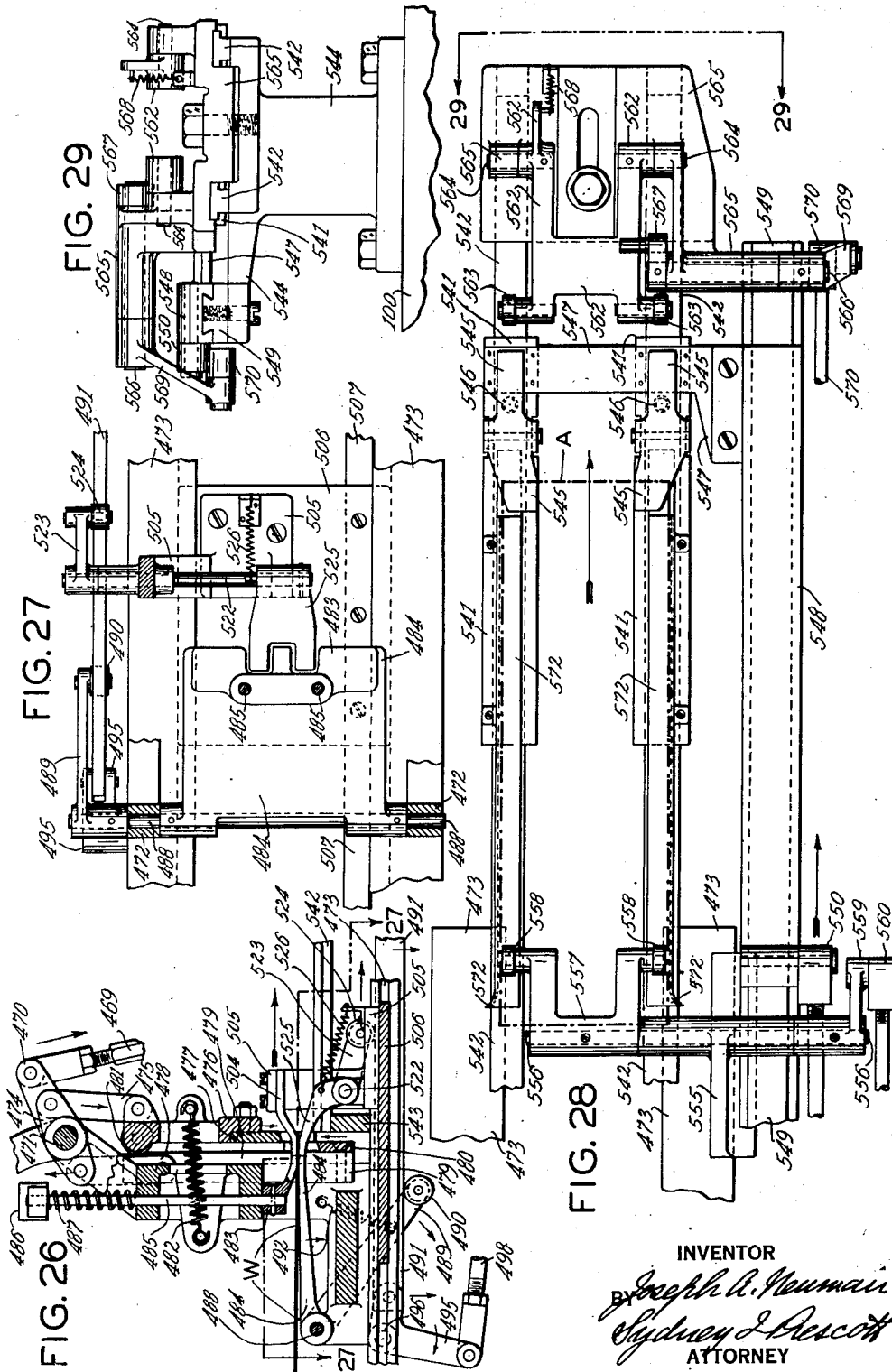
J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

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INVENTOR

Joseph A. Neumair

Sydney J. Percott

ATTORNEY

**April 20, 1937.**

J. A. NEUMAIR

**2,077,431**

## WRAPPING AND BANDING MACHINE

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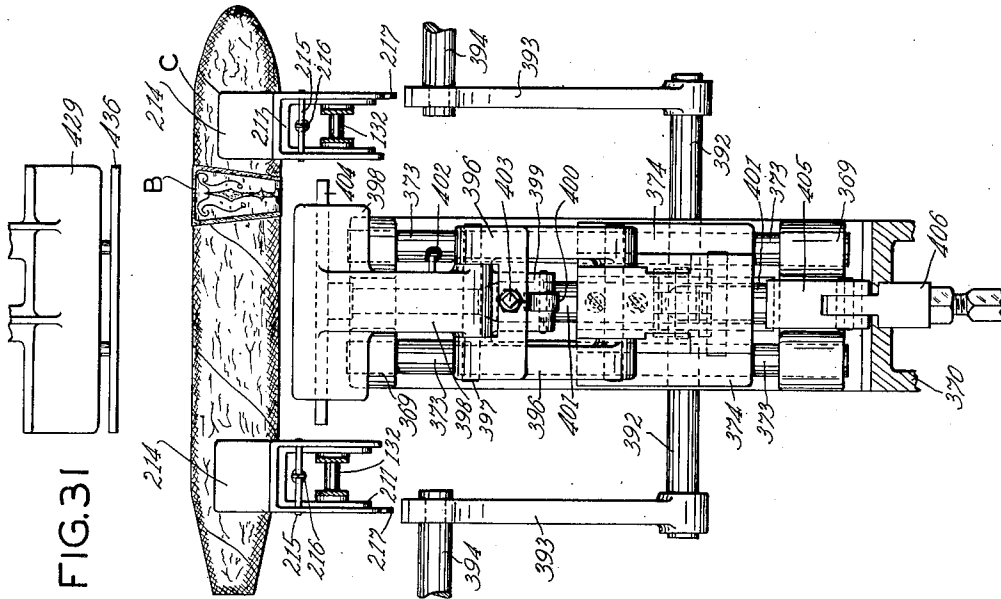


FIG. 31

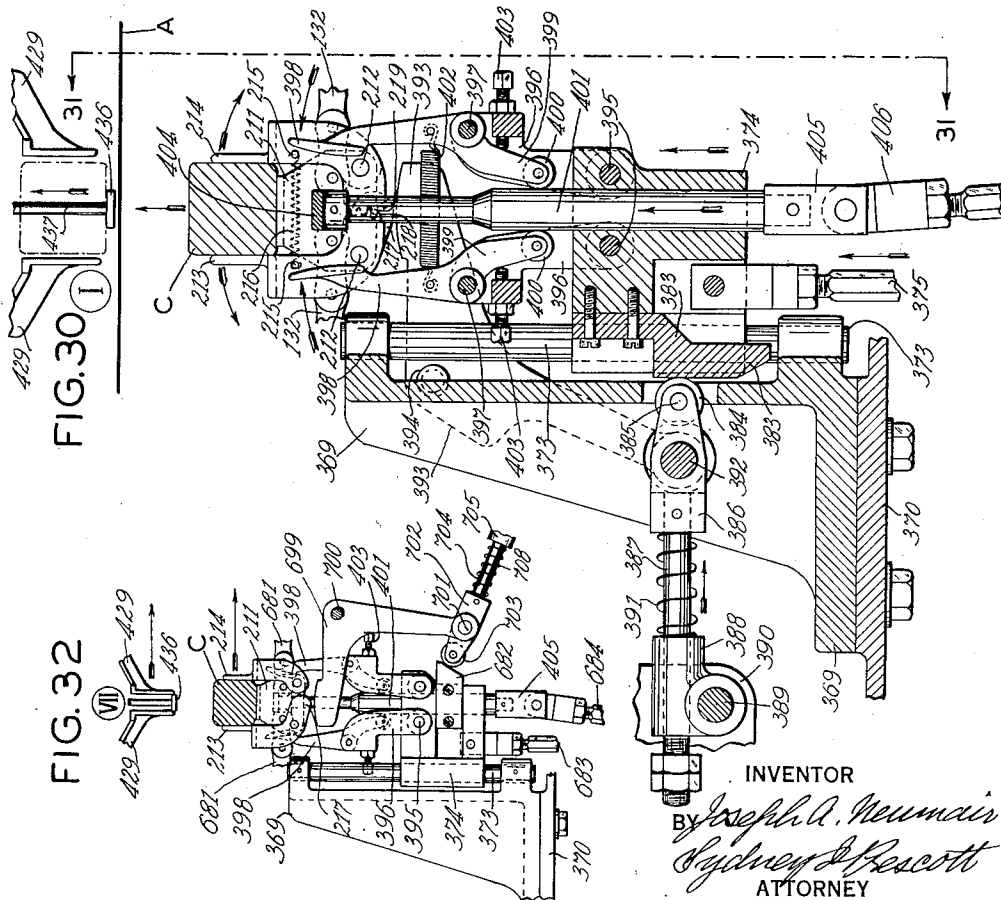


FIG. 30

FIG. 32

INVENTOR

BY *Joseph A. Neumair*  
*Sydney J. Prescott*  
ATTORNEY

April 20, 1937.

J. A. NEUMAIR

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WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

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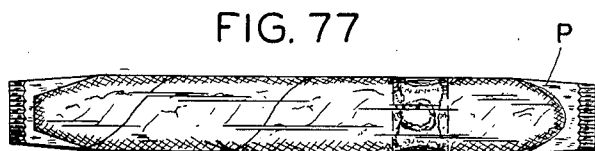
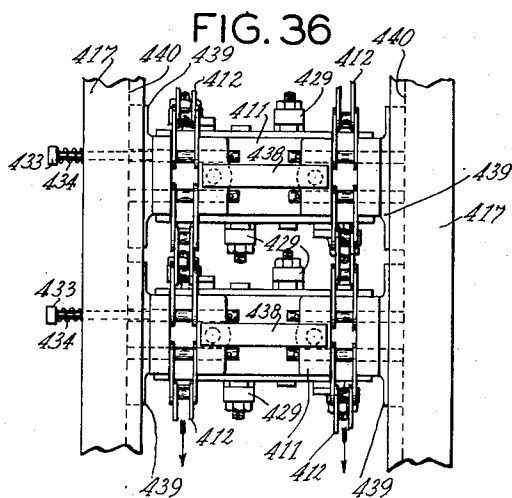
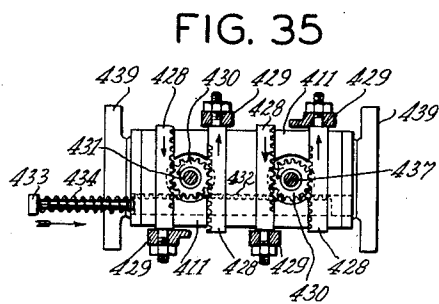
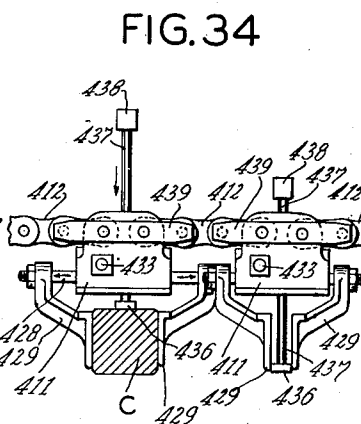
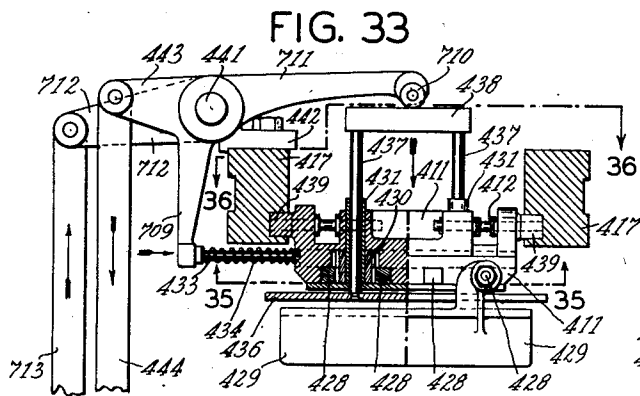
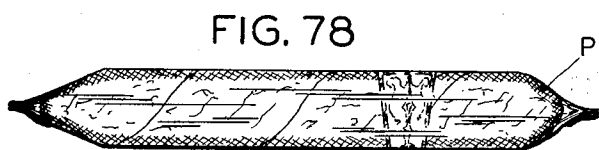


FIG. 79

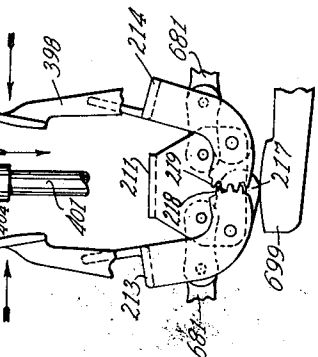
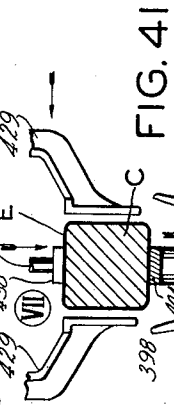
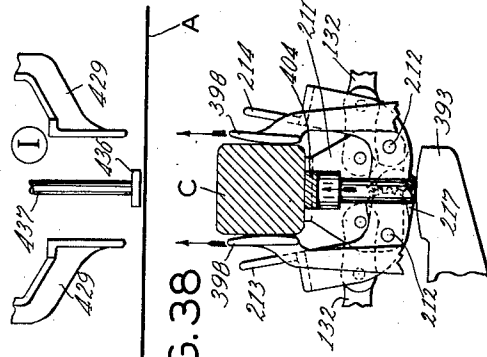
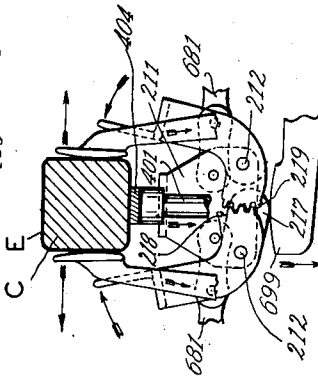
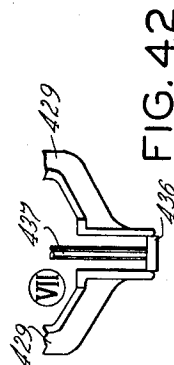
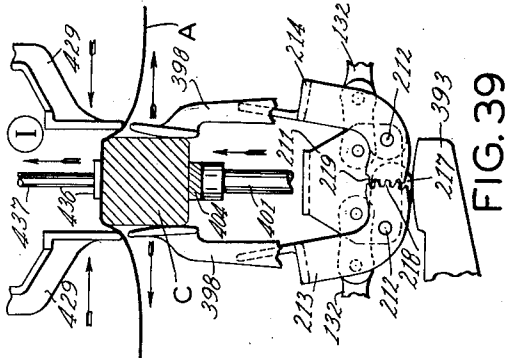
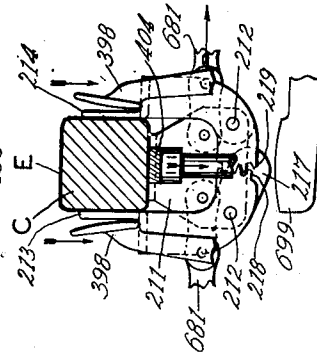
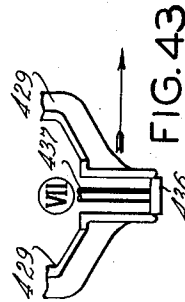
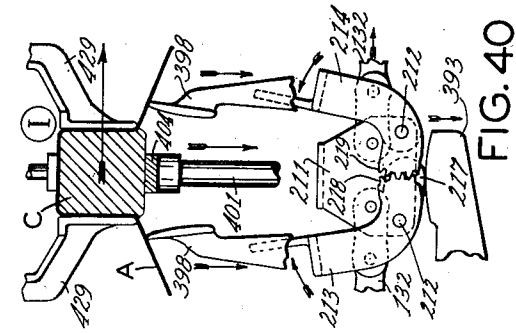


INVENTOR  
Joseph A. Neumair  
BY Sydney J. Prescott  
ATTORNEY

**J. A. NEUMAIR**

WRAPPING AND BANDING MACHINE

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BY *Joseph A. Newman*  
*Sydney Prescott*  
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April 20, 1937.

J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

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FIG. 44

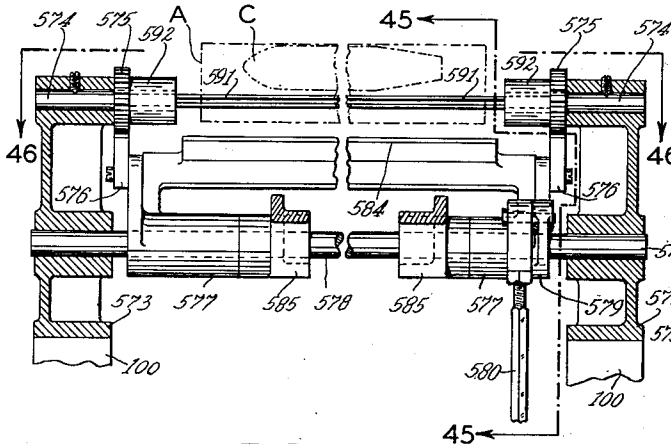


FIG. 45

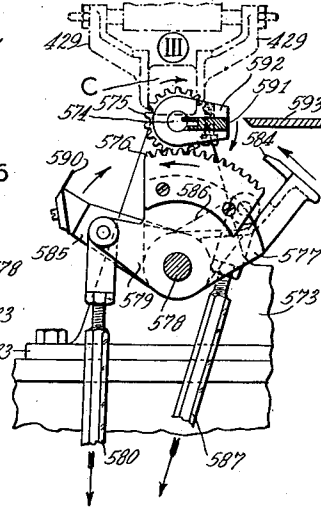


FIG. 46

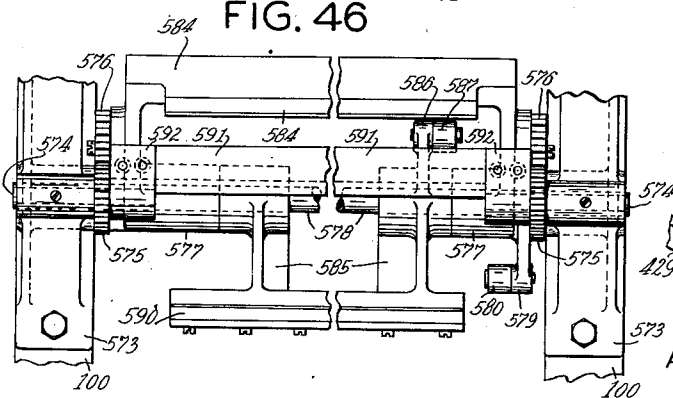


FIG. 47

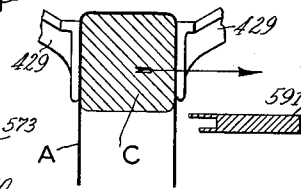


FIG. 48

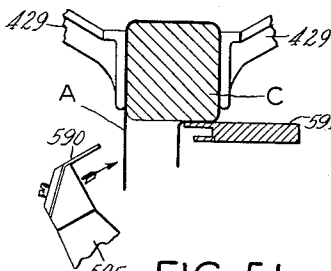


FIG. 49

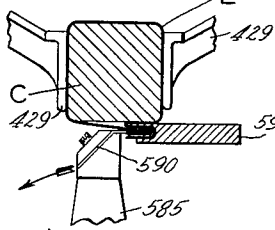


FIG. 50

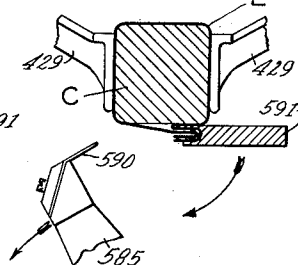


FIG. 51

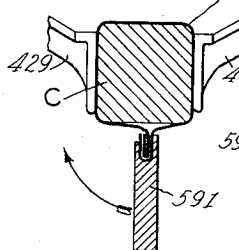
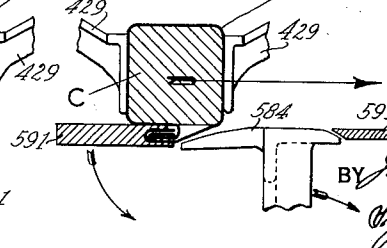


FIG. 52



INVENTOR

BY *Joseph A. Neumair*  
*Clyde Prescott*  
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April 20, 1937.

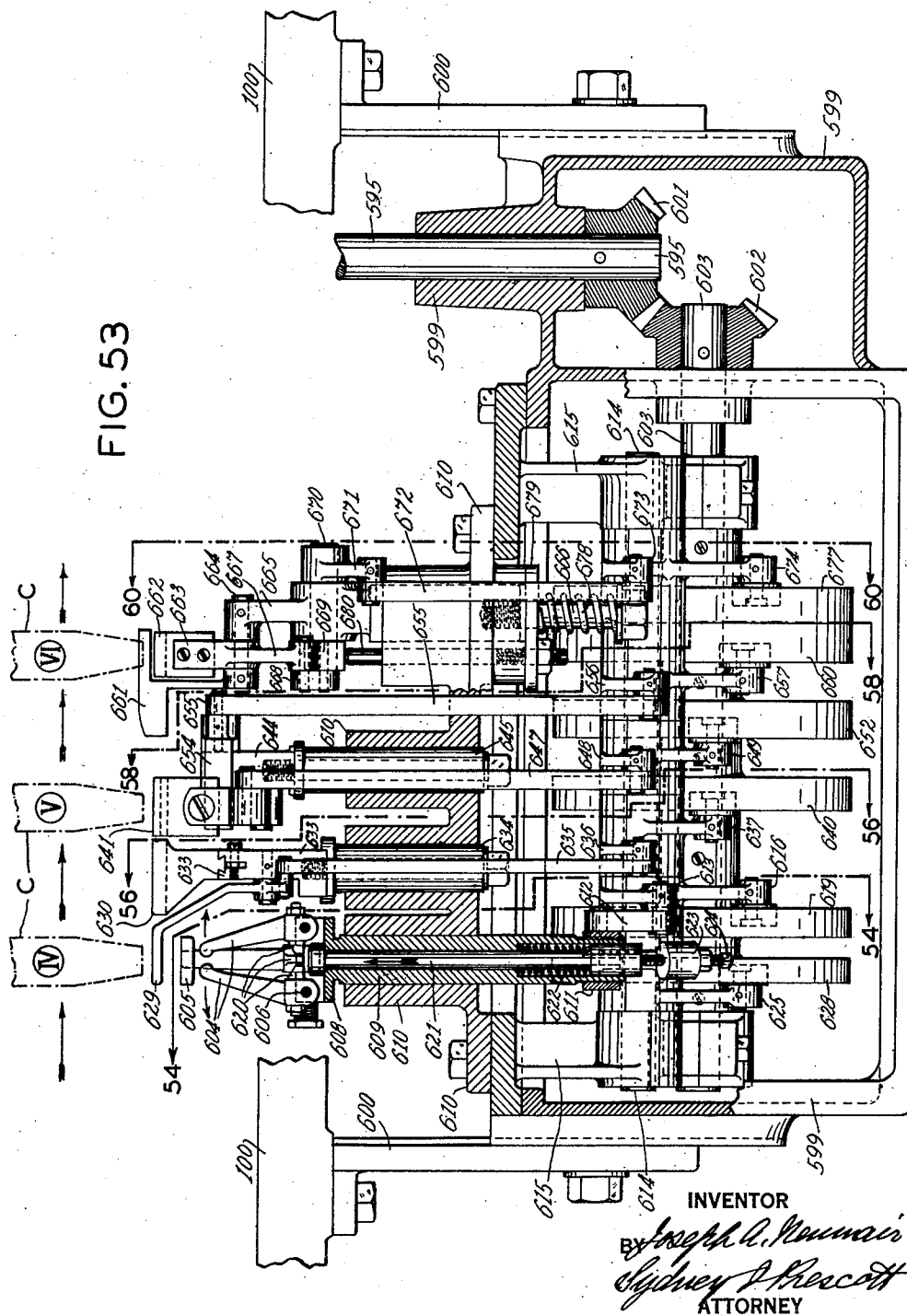
J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

Filed Aug. 22, 1932

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J. A. NEUMAIR

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WRAPPING AND BANDING MACHINE

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FIG. 54

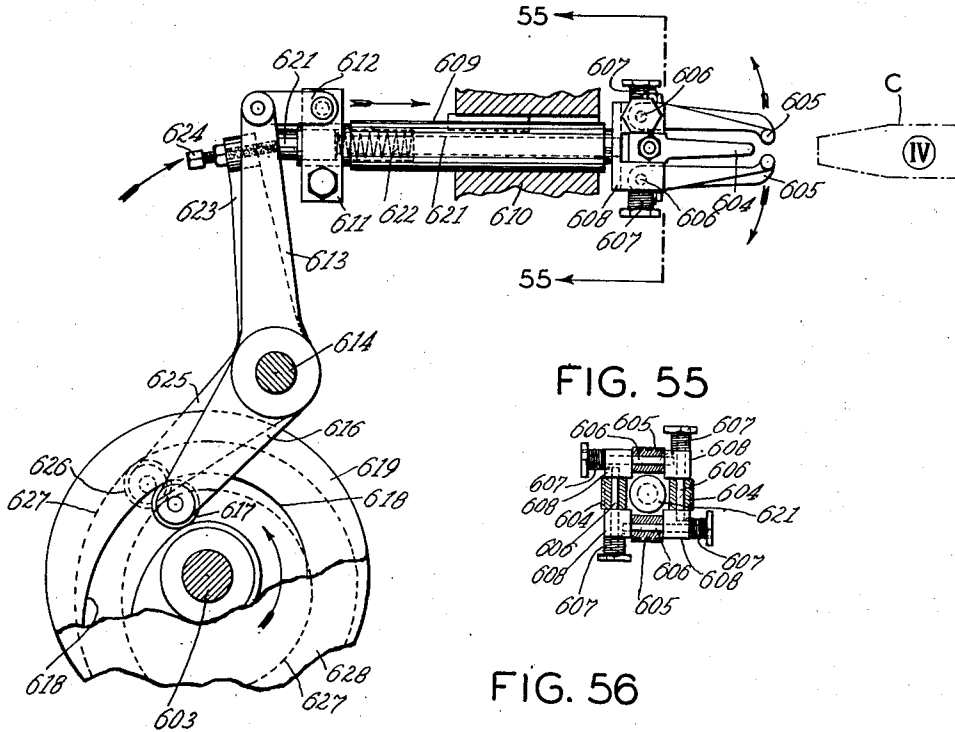
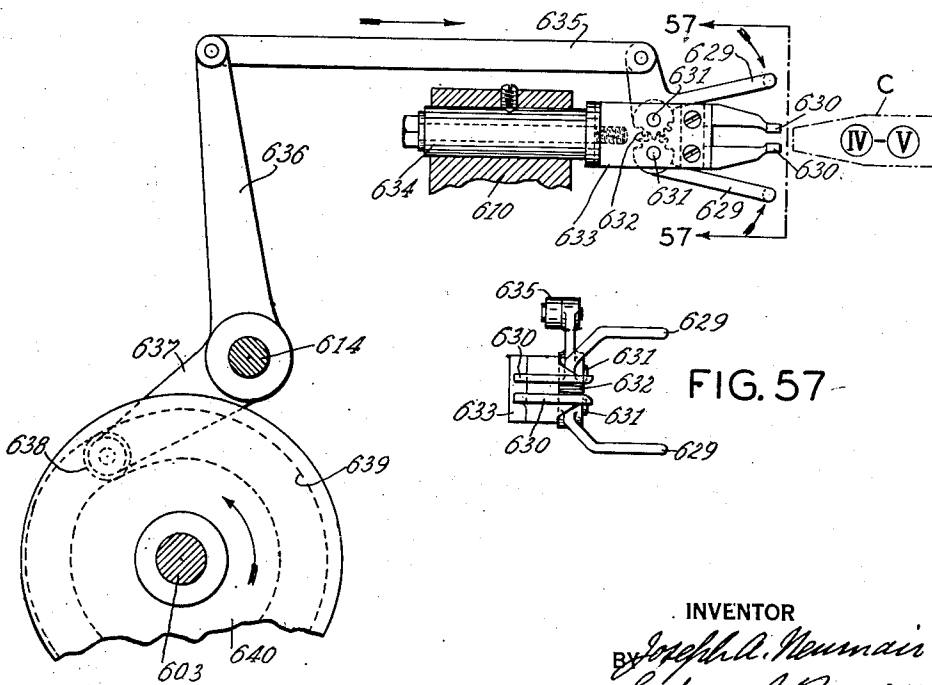


FIG. 56



INVENTOR  
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April 20, 1937.

J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

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FIG. 58

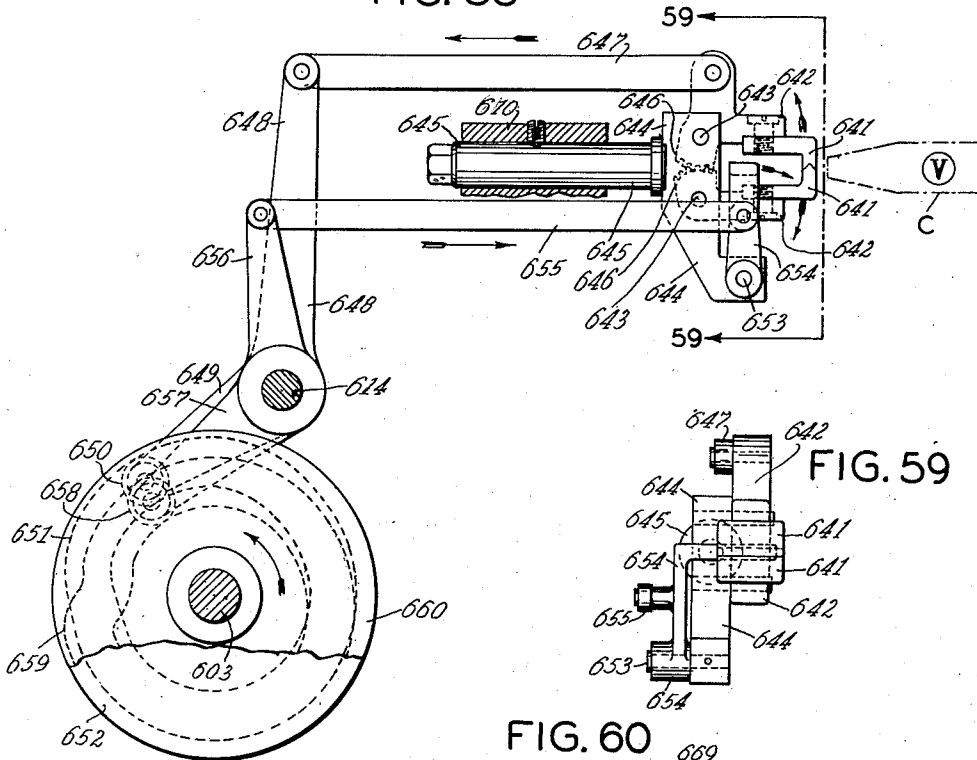


FIG. 59

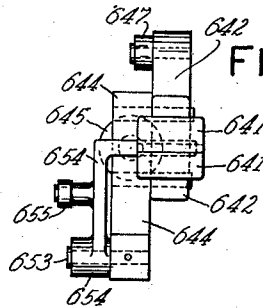


FIG. 60

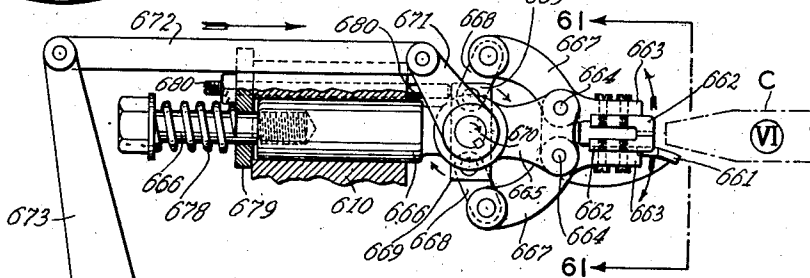
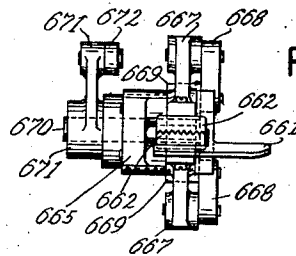


FIG. 61



INVENTOR

By *Joseph A. Neumair*  
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April 20, 1937.

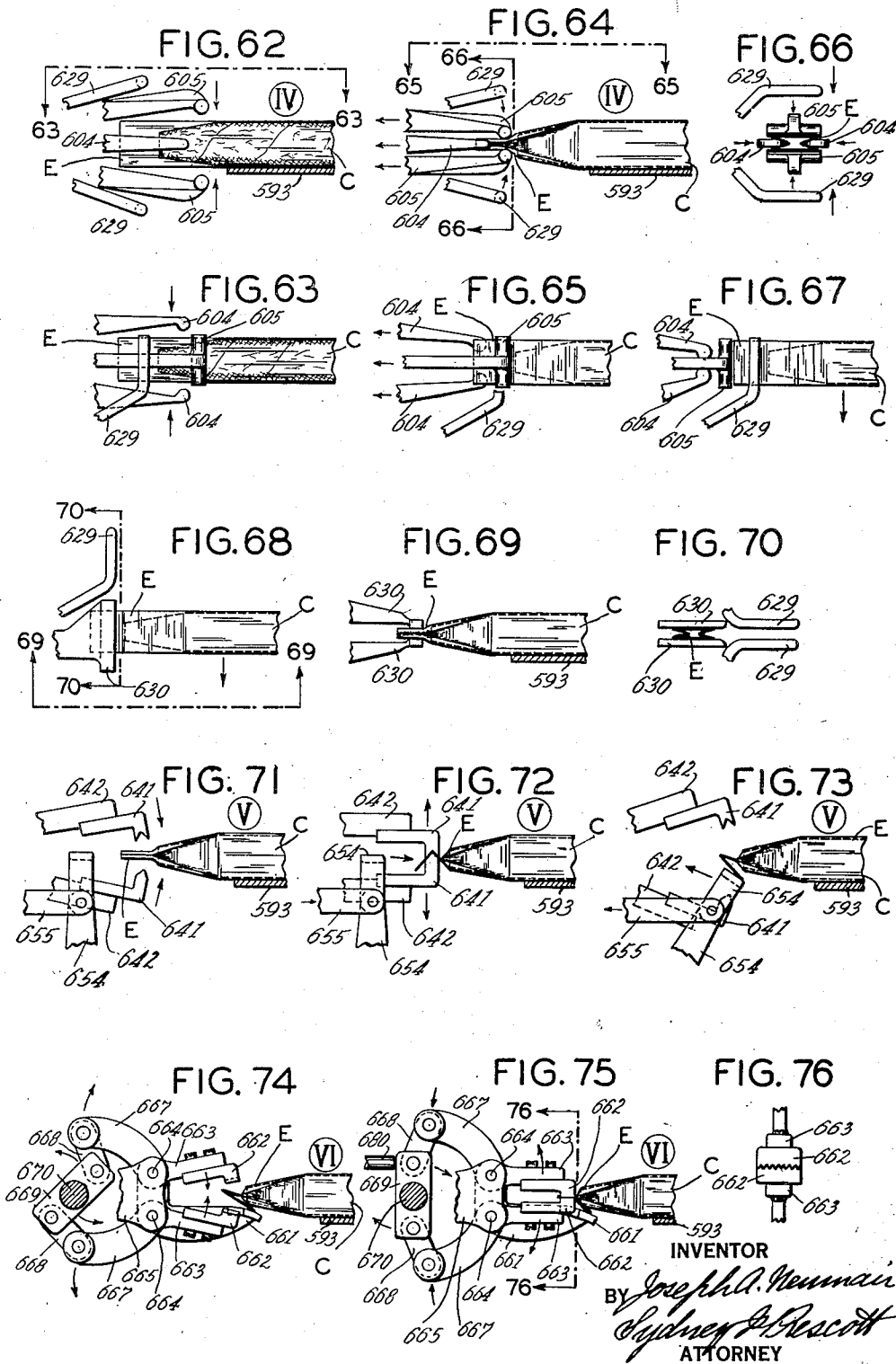
J. A. NEUMAIR

2,077,431

WRAPPING AND BANDING MACHINE

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WRAPPING AND BANDING MACHINE

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FIG. 80

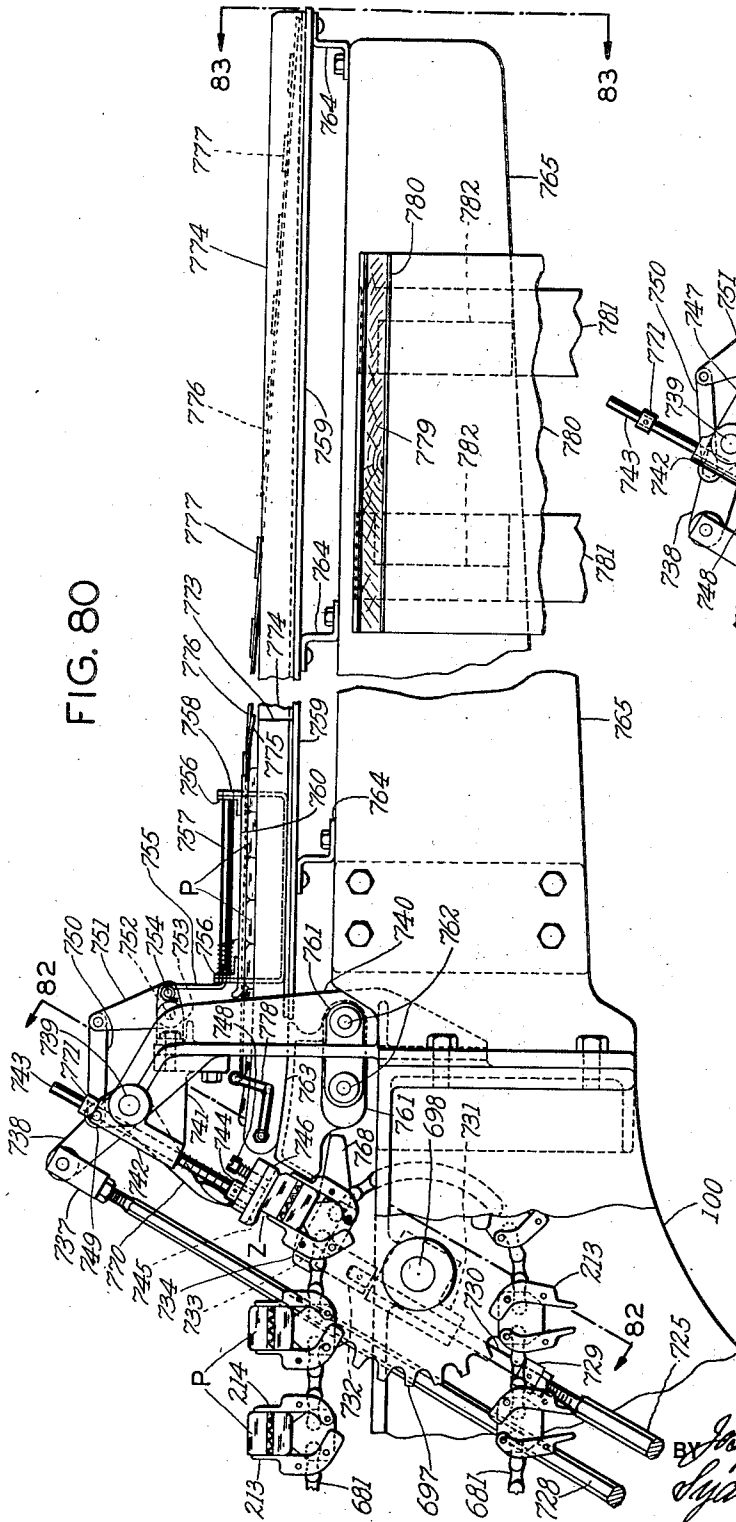
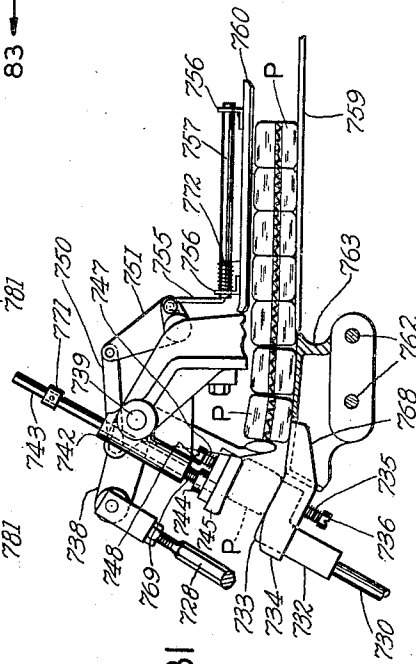


FIG. 81



INVENTOR

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April 20, 1937.

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2,077,431

WRAPPING AND BANDING MACHINE

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FIG. 82

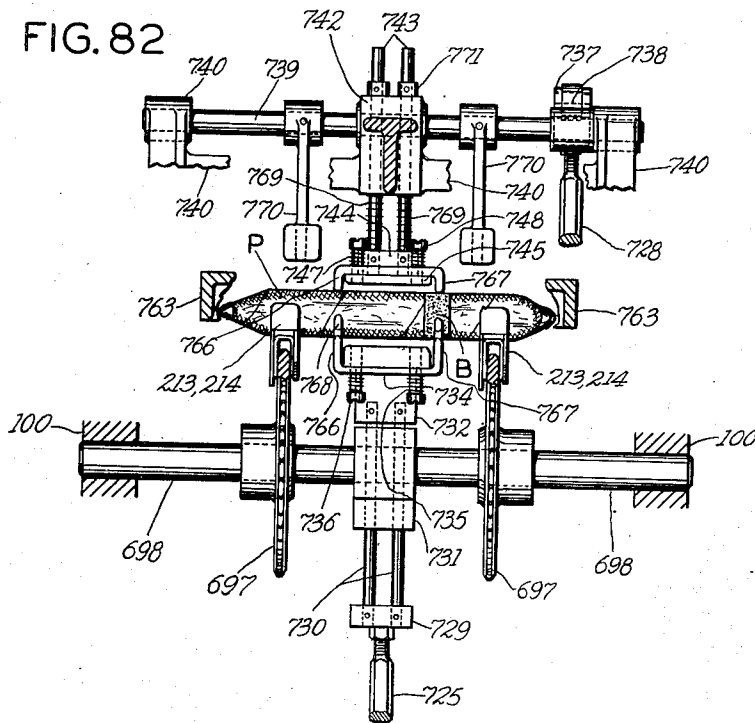
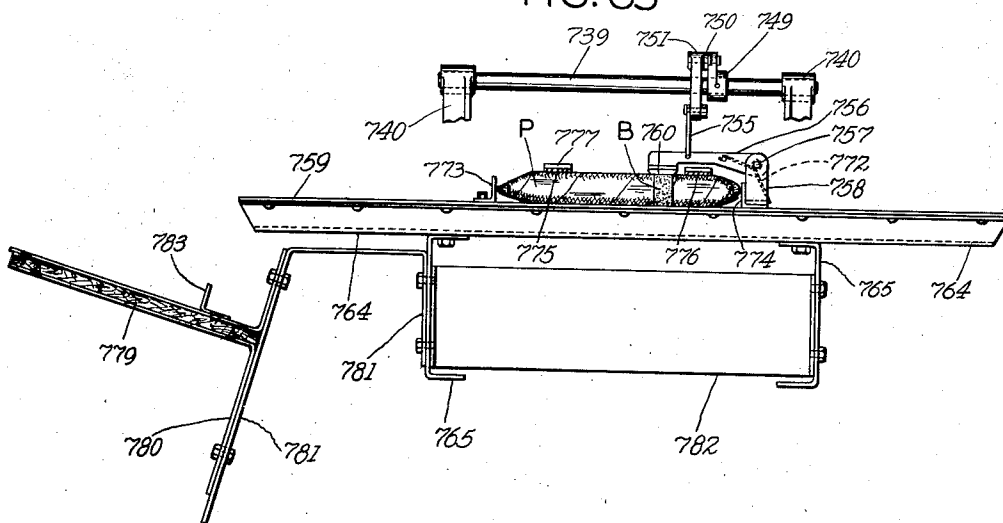


FIG. 83



INVENTOR

Joseph A. Neumair  
Sydney P. Prescott  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,077,431

## WRAPPING AND BANDING MACHINE

Joseph A. Neumair, Hollis, N. Y., assignor to International Cigar Machinery Company, a corporation of New Jersey

Application August 22, 1932, Serial No. 629,959

65 Claims. (Cl. 93—2)

This invention relates to wrapping and/or banding machines, particularly machines operating on cigars or other articles and capable of handling flexible wrapping materials such for example as the thin transparent cellulosic material known by the trade name of Cellophane. The invention also relates to an improved package particularly for cigars, and an improved method of making such packages.

It is one of the principal objects of the invention to produce an organized cigar feeding, wrapping and banding machine which will be faster than machines hitherto in use and which will combine in one the functions of two or more prior machines with a consequent saving of time, labor and floor space.

Another important object of the invention is to produce a machine, method, and a cigar package using the above mentioned material wherein the package is sealed throughout without the use of heat. Another object of the invention is to provide a machine, method and article employing a plicated or bellows type end fold and a longitudinal lock seam. To this end, it is also an object to retain the end folds in position by mechanical crimping not requiring heat, and of a type which is particularly efficient in overcoming the natural resilience of the above mentioned materials.

Another object is to produce a simple yet efficient and high speed banding mechanism designed particularly for use with the present wrapping mechanism, but capable of use alone, and which can be readily removed and replaced as a unit.

Since some cigar manufacturers prefer bands inside and others outside of the wrapper, the bander of the present machine is designed to be selectively arranged to band either way.

For those that box their cigars before banding or wrapping, it is desirable that the cigars should not lose their relative position with respect to each other since in the cigar boxes they are often arranged according to shade, with the best side up and also the cigars fit better when put back in the box in the same order and position. Also it is necessary to carefully retain the cigars against endwise displacement which would result in improper location of the band. Accordingly, it is an object of the invention to provide a machine which will perform the wrapping or banding operations or both, without accidental loss of relative position of the cigars. For this purpose, it is an object of the invention to provide means for maintaining a grip on cigars at all times during the feeding, banding and wrapping operations. It is therefore an object to provide transfer grip-

pers and transporters and conveyors which grip before their predecessors release.

Still another object of the invention is to provide a machine of great flexibility which will operate satisfactorily on cigars of widely different shapes and sizes. Thus, it is one of the objects of the invention to provide conveying and supporting means for delivering cigars at the operating position with the axis or centers of the cigars with the proper relation to the operating means, irrespective of the sizes of the cigars. For this purpose also the invention provides for a wide adjustment of the wrapping and banding mechanisms to fit different sizes of cigars.

Another object of the invention is the production of an improved band folding mechanism which does not release one end of the band while folding the other over it and which retains the folded and adhering ends during movement from banding position until the band ends have firmly adhered.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification and in which like characters of reference indicate the same or like parts, Fig. 1 is a side elevation of the cigar transfer from the magazine feed to the first conveyor of a machine constructed in accordance with the invention; Fig. 2 is a sectional end view on line 2—2 of Fig. 1; Fig. 3 is a partial end view of the first cigar conveyor; Fig. 4 is an enlarged partial side elevation of Fig. 1, at the ejecting station of the transfer turret; Fig. 5 is an end view of the same taken on line 5—5 of Fig. 4; Fig. 6 is a partial sectional side elevation of the machine showing the drive of the banding and wrapping mechanisms; Fig. 7 is a sectional side elevation of the entire banding mechanism; Fig. 8 is a sectional plan view of the same; Fig. 9 is a front elevation of the banding mechanism taken on line 9—9 of Fig. 7; Fig. 10 is a sectional end elevation of the moistening device taken on line 10—10 of Fig. 7; Fig. 11 is a detail plan view of the bander magazine; Figs. 12, 13, 15 to 18 and 20 and 22 are detailed views in elevation of the operating parts in different positions, showing the successive steps in the operation of the banding mechanism; Figs. 14, 19, and 21 are detail plan views of the preceding; Fig. 23 is a sectional end elevation of the machine taken on line 23—23 of Fig. 6; Fig. 24 is a side elevation of the entire wrapper feed mechanism;

Fig. 25 is a sectional end elevation of the same taken on line 25—25 of Fig. 24; Fig. 26 is a detail sectional side elevation of the cellophane cutting and clamping mechanism; Fig. 27 is a plan view of the clamping device taken on line 27—27 of Fig. 26; Fig. 28 is a plan view of the sliding transfer and tripping mechanism; Fig. 29 is an end elevation of the same taken on line 29—29 of Fig. 24; Fig. 30 is a sectional side elevation of the transfer from the first conveyor or bander chain to the wrapper chain; Fig. 31 is an end elevation of the same taken on line 31—31 of Fig. 30; Fig. 32 is a side elevation of the transfer from the wrapper chain to the second conveyor chain; Fig. 33 is an end elevation of the wrapper chain mechanism; Fig. 34 is a side elevation of the same; Fig. 35 is a sectional plan view of the wrapper chain, taken on line 35—35 of Fig. 33, showing the operating devices for the wrapper chain pocket walls; Fig. 36 is a plan view of the wrapper chain taken on line 36—36 of Fig. 33; Figs. 37 to 40 are side elevations of the operating parts of the cigar transfer from the first conveyor or bander chain to the wrapper chain; Figs. 41 to 43 are also side elevations of the operating parts in different positions of the cigar transfer from the wrapper chain to the second conveyor chain; Fig. 44 is a sectional end elevation of the lock seam folding mechanism; Fig. 45 is a sectional side elevation of the same taken on line 45—45 of Fig. 44; Fig. 46 is a plan view of the lock seam folding mechanism taken on line 46—46 of Fig. 44; Figs. 47 to 52 are sectional side elevations of the operating parts in different positions while creating the lock seam at the bottom of the envelope; Fig. 53 is an assembled sectional plan view of the entire end fold mechanisms; Fig. 54 is a side elevation of the end folding mechanism, taken on line 54—54 of Fig. 53; Fig. 55 is a sectional end view of the same taken on line 55—55 of Fig. 54; Fig. 56 is a side elevation of the end fold guide mechanism taken on line 56—56 of Fig. 53; Fig. 57 is an end view of the same taken on line 57—57 of Fig. 56; Fig. 58 is a side elevation of the creasing mechanism taken on line 58—58 of Fig. 53; Fig. 59 is an end elevation of the same taken on line 59—59 of Fig. 58; Fig. 60 is a side elevation of the crimping mechanism taken on line 60—60 of Fig. 53; Fig. 61 is an end elevation of the same taken on line 61—61 of Fig. 60; Fig. 62 is a side elevation of the operating parts of the end folding mechanism ready to make the end fold; Fig. 63 is a plan view of the same taken on line 63—63 of Fig. 62; Fig. 64 is a side elevation showing the operating parts making the end fold; Fig. 65 is a plan view of the same, taken on line 65—65 of Fig. 64; Fig. 66 is a sectional end view taken on line 66—66 of Fig. 64; Fig. 67 is a plan view showing the operating parts after completion of the end fold; Fig. 68 is a plan view showing how the end fold is guided through the operating parts of the guide mechanism; Fig. 69 is a side elevation of the same taken on line 69—69 of Fig. 68; Fig. 70 is a sectional end elevation of the operating parts of the guide mechanism taken on line 70—70 of Fig. 68; Figs. 71 to 73 are side elevations of the operating parts of the creaser mechanism showing the different positions of the same while creasing the end fold; Figs. 74 to 76 are side elevations of the operating parts of the crimper mechanism showing the different positions of the same during the crimping operation; Fig. 77 is a plan view of the finished banded and enveloped cigar; Fig. 78 is a side elevation of the same; Fig. 79 is an end elevation of the finished banded and enveloped cigar; Fig. 80 is a side view

of the delivery transfer mechanism; Fig. 81 is a partial side view of Fig. 80 at the cigar discharging station; Fig. 82 is an end elevation of the cigar ejecting mechanism, taken on line 82—82 of Fig. 80; and Fig. 83 is a partial end elevation taken on line 83—83 of Fig. 80.

The various means referred to below may be varied widely in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of many possible concrete embodiments of the same. The invention therefore is not to be restricted to the precise details shown and described.

The mechanism employed in carrying the invention into effect provides in combination with cigar wrapping mechanism conveying means for transporting cigars to and from said mechanism to be wrapped by the same, and a cigar bander operating to band the cigar while in said conveying means. Preferably means are provided for selectively supporting the bander in position to operate on a cigar in the conveyor mechanism before or after wrapping.

In the best constructions the wrapping mechanism comprises the combination with means for wrapping a sheet of material about a cigar with the ends projecting in tubular formation, of instrumentalities for tucking in the projecting ends together with mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves and mechanism for crinkling or corrugating the ends at the fold. In the best constructions said wrapping means includes lock seaming mechanism for uniting the longitudinal edges of the sheet.

The bander provides in combination with a band magazine, a moistener, band applying device, a rotating suction unit and means for operating said unit to withdraw a band from the magazine, carry it to the moistener and from there to the band applier. Preferably said operating means includes mechanism for giving said unit a reciprocating movement toward and away from said magazine to withdraw a band therefrom and to move a band thereon into contact with the article to be banded.

The method employed in carrying the invention into effect comprises wrapping a resilient transparent sheet material about the article with its ends projecting beyond the end of the article, folding back the projecting material, and crimping the material on the fold line with corrugated crimp, the corrugations of which extend transversely of the fold line.

The package employed in carrying the invention into effect comprises a tube surrounding the article to be packaged and having a longitudinal lock seam, the tube having its ends plicated, flattened and turned back on the end of the cigar, the portions of the tube end adjacent the hinge line formed by turning back the ends, having a corrugated crimp to retain the material in position, thereby producing a sealed package without employing either heat sealing or gluing.

While the invention will be referred to and disclosed as operating on cigars, it should be thoroughly understood that the invention is applicable to a wide variety of articles other than cigars, particularly those of an elongated round or polygonal shape or of stick shape. It will be noted that owing to the fact that one phase of the invention is to dispense with heat for closing or sealing wrapping materials with which heat has hitherto been used, the machine is particularly useful with an article liable to injury from heat, of which cigars, chocolate coated articles

and silk or silk covered articles are cited by way of example.

The main divisions of the machine, which will now be described in order, are the following:

- 5 Transfer from magazine feed to first conveyor chain.
- The banding mechanism.
- The transfer to the wrapper chain.
- The wrapping material feed.
- 10 The wrapping mechanism.
- The cigar delivery and delivery transfer.

*Transfer from magazine feed to first conveyor chain*

15 Referring to Figs. 1 and 2, the side frames 100, of the machine, support brackets 101 carrying a plate 102 forming the support table of the cigar magazine disclosed in my application No. 616,109 filed June 8, 1932. Attached to the side frames 20 100 are brackets 103 supporting shafts 104, 105, 106, and 107 while the frames 100 carry shafts 108, 109, 110, 111, and 112.

The shaft 108 is driven by a bevel gear 113 meshing with a gear 222 on shaft 223 supported in bearing brackets 224 carried by the frames 100. The shaft 108 also has a gear 114 meshing with a gear 115 of the cigar magazine drive. A crank 116 fastened to the end of shaft 108 is connected by an arm 117 to a lug 118 of a ball clutch 119 on a shaft 120 supported by brackets 101. The crank 116 has a slot 121 in which is located a stud 122 by which the arm 117 is attached to crank 116. The down stroke of crank 116 through its linkage causes the ball clutch 119 to engage and turn shaft 120. Upon the completion of the down or driving stroke of crank 116, the arm 117 raises to disengage the ball clutch 119, permitting the shaft 121 to remain stationary. In this manner, an intermittent driving motion is imparted to shaft 120. The shaft 120 carries a gear 123 meshing with a gear 124 mounted on stud 104, the gear 124 driving a gear 125 on shaft 105 which meshes with a gear 126 carried by a shaft 127 supported by swingable arms 128 suspended from shaft 105.

45 The shaft 108, constituting the main drive shaft for the transfer mechanism, carries cams 133, 134, 135, and 136. A bell-crank lever 137 mounted on shaft 110 carries a cam roller 138 held against the periphery of cam 133 by a spring 139. The bell-crank lever 137 actuates one end of a rod 140 pivoting on a stud 141. The other end of rod 140 connects to an arm 142 clamped to a shaft 143 carried by arms 128. Arms 144 attached to shaft 143 carry studs 145 which engage with projections 146 of fingers 147. Springs 148 attached to the arms 144 connect to the fingers 147. The cam 134 engages a roller 149 carried by a bell-crank lever 150 loosely mounted on shaft 109. The end of lever 150 has attached to it a stud 151 on which is pivotally mounted a link 152 connected to a slotted arm 153 fast on shaft 111. A stud 154 is adjustably mounted in the slot 155 of arm 153. The motion imparted to the shaft 111 rocks the arms 156 attached to shaft 111 and the arms 157 loosely mounted on shaft 109, the arms 157 being connected to the arms 156 by links 158 turning on studs 159. In this manner the cigar guide fingers 160 which are part of the links 158 are actuated.

One face of cams 135 and 136 engage rollers 161 attached to studs carried by lugs 162 of frames 163, arms 164 mounted on shaft 109 being attached to the lugs 162 by the roller studs. The opposite face of cams 135 and 136 engage rollers 165 carried by arms 166 loosely mounted on shaft 75 109. The extensions 167 of arms 166 carry studs

on which are mounted links 168 attached to studs carried by lugs 169 of frames 163. The cams 135 and 136 have ledges 170 engaging rollers 171 carried by blocks 172 attached to spring-actuated rods 173 having fingers 174.

The chains 132 intermittently driven by Geneva gear 247, drive sprockets 131 mounted on shaft 112. The shaft 112 carries a gear 130 meshing with a gear 129 driving turrets mounted on shaft 105. The turrets consist of stationary members 10 175 and of movable members 176, the members 176 carrying pins 177 engaging knockout arms 178 clamped on shaft 106. The cam 133 operates arm 179 on shaft 109 carrying a link 180 attached to an arm 181 actuating the shaft 108. 15 A cam lever 182 on shaft 109 having a cam roller 183 engaging in a track of cam 133 actuates a rod 184 mounted on a stud 185 in lever 182 and connected to a forked arm 186 clamped on shaft 107. Arms 187 clamped to shaft 107 connect to an ejector 188 slidably mounted in grooves in the hubs of the stationary turret members 175.

The cigars C when discharged from the cigar magazine enter upon forwarding or delivery belts 189 running over pulleys 190 intermittently driven by shaft 120. The belts 189 run faster than the discharge conveyor of the cigar magazine so that the cigars C become separated when being discharged from the latter, the cigars then passing under a top tension device consisting of a bracket 30 191 carrying a floating arm 192 supporting rollers 193 resting on a guide belt 194. The cigars are taken from the delivery belts 189, while at rest, at a speed corresponding to that of the cigar magazine conveyor, hence the cigars again accumulate in solid formation at the delivery point.

When the belts 189 are idle, the cam-operated fingers 147 clamp the cigar. The turning of shaft 143 carrying an arm 195 supporting a pin 196 depresses a trip 197 of a link 198 connected to the floating arm 192, thereby raising the latter and releasing the forward feeding pressure on the cigars. The cigar C' to be transferred encounters the cam-actuated guide fingers 160 which move forward with the cigar C' guiding it from turning until it enters the jaws formed by the platform of the lifter frames 163 and the fingers 174. When the belts 189 resume their travel the fingers 147 are raised and the top tension device is returned to its down position and applies a forward feeding pressure to the remaining cigars C. The turning of shaft 108 brings the low portions of cam ledges 170 beneath the cam rollers 171 thus allowing the spring-tensioned rods 173 to descend, thereby causing the fingers 174 to come to rest on the cigar C'. The lifter frame 163 is moved forward slightly, thus separating the cigar C' lodged in its jaws from the cigar C held by the fingers 147, this motion being achieved by the cams 135 and 136 through their linkage to the lifter frame 163.

The revolving of cams 135 and 136 engaging the rollers 161 raise the lifter frame 163, thus bringing the cigar into the path of the turret. The cam-operated arm 178 then descends, and torsion springs 199, Fig. 2, one end of which is carried by the hub of the movable turret members 176 and the other end anchored in a collar 200 on shaft 105, return the jaws to rest against the cigar. In the interim, the high portion of cam ledges 170 have come into engagement with the rollers 171, thus lifting the spring-tensioned rods 173 and releasing the fingers 174 from the cigar. The continued rotation of cams 135 and 136, through the arms 166 and 167, actuates the links 75

168 connected to lifter frame 163, which is returned from its up position in a circular path, being then ready to receive the next cigar to be transferred.

5 The cam 134 on shaft 108 engages rollers 201 carried by cam levers 202 fast on shaft 110, operating arms 203 having gear segments 204 meshing with racks 205 of rods 206, Figs. 4 and 5. The rods 206 carry fingers 207 sliding on spring-actuated plunger rods 208 carrying offset blocks 209. 10 The rods 206 and 208 are mounted in brackets 210 fastened on shaft 112. The conveyor chains 132 running over sprockets 131, have attached at spaced intervals, yokes 211 carrying pins 212 on which pivot fingers 213 and 214 having spring posts 215 which support springs 216. The U-shaped fingers 213 have extending ends 217 engaging with the block 209, and the opposite sides of the fingers have gear segments 218 meshing 15 with gear segments 219 of the U-shaped fingers 214.

The drive from the Geneva gear (not shown), revolves the turret 90°, at which station the cigars are ejected into pockets of conveyor chains 132. 25 Arriving at the ejecting station, the cam-operated ejector plunger 188 slides in grooves in the hub of the stationary turret member 175 and rests against the side of the cigar C'.

In the interim, the fingers 207 through their gear-and-rack arrangement move toward the cigar C', thus forming with the plunger 188 a clamp on the cigar. The cam-actuated arm 178 (Fig. 1) presses against the stud 177 of the turret 176 and swings away from the cigar C' which is 35 then held by plungers 188 and fingers 207. The plungers 188 and fingers 207 continue carrying the cigar towards the pocket in the conveyor chains 132, the fingers 207 on rods 206 moving back until they strike against the blocks 209, thereby moving the latter until they rest against the bracket 210 and compress the spring 220. 40 The blocks 209, in moving back allow the spring 216 to close the fingers 213 and 214 by means of the gear segments 218 and 219. When the cigars come to rest in the pockets formed by the fingers 213 and 214, the plungers 188 move back to their former position. The cigars thus delivered to the pocket of the chains 132 are then intermittently carried away to the banding unit 221.

It will be noted that the gripper fingers 213—214 acting on one cigar consist of two coacting sets or pairs of opposed grippers on the chain 132, the two sets being spaced lengthwise of the cigar to provide room between them for banding operations and to admit transfer fingers. 55

Since the opposed grippers 213 and 214 are geared together by gear segments 218 and 219, they will move equally and therefore the axis of a wide cigar will coincide with that of a narrow cigar. This is important to preserve a definite predetermined relationship between the cigar axis and the folding and banding mechanisms at the various operating stations. 60

The entire conveyor system and the wrapping and banding mechanisms (Fig. 6), are driven from a motor or a transmission (not shown), by a main drive belt 225 driving a pulley 226 attached to drive shaft 227 by means of friction clutch 228 operated by a fork lever 229 pivoted to a stud 230 which is supported by a bracket 231 mounted on side frames 100 of the machine. The fork lever 229 has an arm 232 which is actuated by a cam piece 233 mounted on stud 234 operated by means of a hand lever 235. In order to facilitate stopping the machine from any side of the machine, 70 cam piece 233 is connected through bar 236 to

several other hand levers 237 conveniently placed on the machine. To shaft 227 is mounted a gear 238 meshing with gear 239 on shaft 240 carrying another gear 241 which drives a gear 242 mounted on the cam shaft 243. Gear 242 in turn drives 5 a gear 244 fastened to shaft 245.

For intermittently driving the conveyor chains described below, the gear 244 carries a roller 246 operating a Geneva wheel 247 mounted on a shaft 248. The hub 249 of gear 244 is so constructed 10 that it locks the Geneva wheel 247 when roller 246 is not in engagement with the Geneva wheel 247. To Geneva shaft 248 is mounted a gear 250 transmitting motion through a gear 251 to shaft 252 to which are mounted sprockets 253 carrying 15 the conveyor chains 132, which support grippers conveying the cigar C to be wrapped from the cigar feed past the banding mechanism to the wrapping mechanism.

As hereinafter described, the machine is so constructed that the cigar can be banded before or after wrapping, i. e. with the bands inside or outside of the wrapper by simply placing the banding mechanism before the wrapping units (as shown) or after the wrapping units (as indicated with dot-dash lines in Fig. 6). 25

#### *The banding mechanism (Figs. 7 to 11)*

The banding mechanism is slidably supported by a bracket 254 mounted to the rear frame of side frames 100. To bracket 254 is attached the housing 255 carrying and enclosing the drive of the banding mechanism. The latter is driven from shaft 245 having a sprocket 256 (Fig. 23) driving through a chain 257 on a sprocket 258 35 mounted on shaft 259 supported by bearings in bracket 254 and housing 255. The shaft 259 carries a bevel gear 260 meshing with a bevel gear 261 mounted on a vertical shaft 262. This shaft also carries a spiral gear 263 meshing with another spiral gear 264 on shaft 265 supported in bearings of the upper part 266 of housing 255. 40

To intermittently rotate the bander turret, a gear 264 is equipped with a roller 267 actuating a Geneva wheel 268 mounted on shaft 269 carrying a gear 270 meshing with a gear 271 loosely mounted on shaft 272. To the latter is fastened a turret housing 273 supporting the turret shaft 274 to which is mounted the bander turret 275 for intermittent rotation. The turret shaft 274 50 carries a gear 276 which is actuated through an intermediate gear 277 from gear 271.

To give the turret movement, in addition to its rotation, to and from the band magazine and cigar, housing 273 receives vertical reciprocating or rocking motion from shaft 272 being actuated for this purpose from a cam lever 278 engaging with roller 279 in cam track 280 of cam 281 mounted on shaft 265. 55

The arms of turret 275 are bored to provide air channels 282 (Fig. 9) and at their ends are equipped with suction heads 283 for retaining the bands. To the hub of turret 275 is attached a stationary air regulating head 284 which is connected by means of a tube 285 to a standard suction pump (not shown). The regulating head 284 is so constructed and set that it connects only three of the four air channels 282 of turret 275 because only three arms of turret 275 carry on their suction heads bands B to be applied to the cigar C, Fig. 13. The fourth arm from which the band B is taken again receives suction when it arrives underneath the bander magazine 286 to take another band B. 70

The band magazine 286 is provided with side 75

walls of which are adjustable to different sizes of bands by means of conical thumb screws 287. The band magazine is adjustably supported by a bracket 288 secured to the housing 266.

5 A band moistening device (Fig. 10) is provided for moistening the standard cigar bands which are gummed on one end, while the turret unit retains the band B on the band retaining arm's first stop after leaving the magazine 286 where  
10 the gummed end is moistened. The moistening device consists of a moistening wheel 289 equipped with a felt ring 290 which is moistened by the water M stored in a moistening pot 291, which is adjustably held by a bracket 292 fastened to main frame 100. The moistening wheel  
15 289 is clamped to a shaft 293 supported by a bearing 294 of moistening pot 291. On the shaft 293 is mounted a ratchet 295 operated from a pawl 296 hinged to lever 297 which is fastened to shaft 298 supported in bracket 292. On the  
20 shaft 298 is mounted a lever 299 connected through a rod 300 to a bell crank lever 301 pivoted to stud 302 secured to housing 266. The bell crank lever 301 is equipped with a roller 303 which is in engagement with a cam  
25 304 mounted on shaft 265. The cam 304 gives a rocking motion to the bell crank lever 301 which also rocks pawl 296 thereby turning moistening wheel 289 and preventing the same from getting  
30 dry on the upper part.

In order to be assured that the gummed end of the band B is well moistened, a lever 305 presses the gummed end of the band B gently against the moistened felt ring 290 (Fig. 13).  
35 The lever 305 is pivoted to a stud 306 and is equipped with a gear segment 307 engaging with another segment 308 which is mounted on shaft 298, transmitting rocking motion received from cam 304 to lever 305.  
40 On the next turn of the turret 275 the moistened band is taken to a position adjacent the cigar C which is conveyed by the chains 132. The turret 275 places the band B as a result of the reciprocating movement referred to,  
45 against the top side of cigar C and holds it there by suction and pressure thereby preventing displacement of the cigar during the folding of the band.

The side folds of the band B (Fig. 9) are made  
50 by a pair of folding fingers 309 and 310 pivoted to a vertically sliding plate 311 slidably mounted in the front part of housing 266. The sliding plate 311 is equipped with a lug 312 carrying stud 313 to which is connected a link 314 pivoted  
55 to cam lever 315 having roller 316 which engages in cam track 317 of cam 281. Cam lever 315 is pivoted with a stud 318 to housing 266. Cam lever 315 transmits its up and down motion to sliding plate 311 which controls the up and  
60 down motion of folding fingers 309 and 310. The latter are in engagement with each other by means of gear segments 319 (Figs. 8 and 9) and therefore move equally. Finger 309 is equipped with a lever 320 carrying roller 321. When sliding  
65 plate 311 is in its upmost position, (Fig. 12), roller 321 rides against the stationary cam plate 322 thus causing fingers 309 and 310 to open. The latter are connected by a tension spring 323 to assure good control of the roller 321 against  
70 cam plate 322 held by studs 324 to the housing 266 and to assure a light, yielding pressure on the cigar regardless of size, the actual engagement with the cigar being by spring pressure alone.

75 Thus, while the mid portion of the band B is

securely held between the turret 275 and the cigar C, the fingers 309 and 310 move downward by the sliding plate 311 and lay the band smoothly over the side of the cigar (Fig. 9). The roller 321 is then free and the fingers 309 and 310 are  
5 held together by the spring 323 to exert resilient pressure on the sides of the cigar and remain in this position until the bottom fold of the band B is made. This is important because it prevents  
10 any bulging of the sides or upper corners during laying of the band ends.

The first bottom fold or laying of the band end is made by a pair of bottom fold fingers 325 (Figs. 17 and 18) which are pivoted in a scissor-like  
15 manner for imparting movement to a guide plate 326 by means of pins 327 (Fig. 19). The guide plate 326 is pivoted to a stud 328 supported by plates 329 mounted to a guide head 330 slidably mounted on guide rods 331 held by bracket 332  
20 attached to housing 255. Guide head 330 is equipped with a gear rack 333 operated from a gear segment 334 mounted on shaft 335 carrying another gear segment 336 (Fig. 7) meshing with a gear segment 337 pivoted on stud 338 supported  
25 by housing 255. Gear segment 337 is equipped with a cam lever 339 engaging with a roller 340 in one cam track of double cam 341 mounted on shaft 259. The above serves to give the finger movement transverse to and under the cigars and  
30 between and below the operating faces of grip- pers 213.

In order to prevent injuring the cigar and to assure a tight fold of the band, fingers 325, when  
35 advancing towards the cigar C (Fig. 17) are guided downward a little to clear the edge of the cigar and then immediately up again to continue their movement while pressing the cigar. This motion is created by an arm 342 attached to guide  
40 plate 326. Arm 342 is equipped with a roller 343, which rolls over a hump 344 on bracket 332. As soon as roller 343 leaves hump 344, a spring 345 mounted between guide plate 326 and guide head 330 presses fingers 325 firmly against the cigar C  
45 (Fig. 18) and assures a tight fold of the band B.

It will be noted that spring pressure alone  
50 presses finger 325 against the cigar so it can fit itself to irregularities of the cigars. As soon as the first bottom fold is made a folding roller or band end laying element 346 (Fig. 18) advances towards the cigar C and folds or lays the other  
55 end of the band B over the first folded end, (Fig. 20). The folding roller 346 is pivoted to a stud 347 supported by a forked guide shoe 348 pivoted by means of stud 349 to a supporting block 350  
60 (Fig. 18), mounted on a guide head 351, slidably supported by guide rods 331 and equipped with a gear rack 352 operated from a gear segment 353 mounted on a sleeve shaft 354 having another  
65 gear segment 355 (Fig. 7) meshing with gear segment 356 pivoted to stud 338. The segment 356 is equipped with a cam lever 357 engaging with roller 358 in the other cam track of double cam 341. Between supporting block 350 and guide head 351 is mounted a wedge shaped separating plate 359.

When the roller 346 advances toward the cigar  
70 C, the prow of cam plate 359 enters between two pins 360 mounted on fingers 325, which cause the latter to spread apart (Fig. 21) allowing just enough room to admit the roller between fingers  
75 325 while the edges of the latter will still be holding the first folded end against the cigar. The roller 346 rolls the moistened gummed end of the band B over the first fold thereby sealing the band. In order to assure a good tight fold

the guide shoe 348 supporting roller 346 is equipped with a spring 361 so that roller 346 will resiliently press the band firmly against the cigar C. By this means also the roller may yield to irregularities of the cigars. In order to assure the correct position of pins 360 against the prow of wedge shaped plate 359, fingers 325 are equipped with a spring 362 which also causes fingers 325 to close again upon the retreat of wedge plate 359. In order to keep fingers 325 parallel to guide block 326 a guide pin 363 is provided.

During the folding operation just described, the side fold fingers 309 and 310 remain in their closed position on the cigar, but as soon as the bottom fold is completed, fingers 309 and 310 release the cigar (Fig. 20) and move upward. The releasing of fingers 309 and 310 while in their lowermost position is caused by a star cam 364 (Figs. 8 and 20) mounted on turret shaft 274. A slight turn of the turret (see dotted position in Fig. 16) causes the engagement of star cam 364 with roller 365 on lever 320. Then turret 275 and fingers 309 and 310 on plate 311 move upward together to a position at which the other roller 321 on lever 320 engages with stationary cam plate 322. Turret 275 then resumes its rotation and star cam 364 leaves roller 365 and the fingers 309 and 310 are now held by roller 321 and cam plate 322.

After the band B is folded around the cigar C, conveyor chain 132 continues its intermittent cigar forwarding movement and while fingers 325 go back to their original position, roller 346 remains on the band following the movement of the cigar for this purpose, and guides the cigar until it reaches the stationary guide plate 366 (Fig. 12), mounted on a lug of housing 255. As the cigar leaves banding position the band is guided and held on the cigar between the lower guide plate 366 and a leaf spring upper guide 367 to prevent loosening or springing up of the band ends and to give time for drying of the seal. The spring guide 367 is adjustably mounted on a bracket 368 fastened to housing 266.

The banded cigar C is then conveyed to a transfer device, where the cigar is transferred from the conveyor chain 132 in which the cigars were gripped during banding to a wrapper chain consisting of a number of individual pockets traveling intermittently in synchronism with the bander chain 132.

The transfer to the wrapper chain (Figs. 30 and 31), is supported by a bracket 369 mounted on a bearing bracket 370 supported by an end frame 371 (Fig. 6) and a shaft 372 which is mounted in the two side frames 100. The supporting bracket 369 carries the two vertical guide shafts 373 to which is slidably mounted the transfer head 374, which is actuated through a link 375 from a lever 376 connected through another link 377 to a cam lever 378 engaging with roller 379 in one cam track of a double cam 380 mounted on shaft 381 (Fig. 6). The latter is driven by a gear 382 from gear 244 on shaft 245.

The transfer head 374 carries a cam piece 383 (Fig. 30) actuating a roller 384 pivoted to a stud 385 supported by fork 386 to which is fastened a rod 387 slidably supported by a guide bearing 388 pivoted to stud 389 mounted in lugs 390 of frames 100. Rod 387 is equipped with a tension spring 391 placed between guide bearing 390 and fork 386 thereby pressing roller 384 towards cam piece 383. The fork 386 carries another horizontal shaft 392 to which are pivoted bell crank levers 393

pivoted to studs 394 mounted to lugs of side frames 100. The transfer head 374 also carries on pivots 395 a pair of supporting levers 396 equipped with studs 397 to which are pivoted cigar gripping fingers 398 having each a lug 399 to which is pivoted a guide roller 400. These guide rollers are in constant engagement with a vertical camming and elevating shaft 401 slidably supported in transfer head 374. The engagement of rollers 400 with sliding shaft 401 is produced by a spring 402 mounted between fingers 398.

The distance between the two clamping fingers 398 can be adjusted to suit the diameter of the cigar by means of adjusting screws 403 placed in supporting levers 396. To the top part of shaft 401 is fastened a lifting plate 404 for engaging and elevating the cigar. The bottom part carries a fork 405 through which shaft 401 is operated by a rod 406 pivoted to a lever 407 (Fig. 6) connected through a link 408 to a cam lever 409 having a roller 410 actuated by a cam track of the double cam 380. The levers 376 and 407 are pivoted to the bearing bracket 370.

While the conveyor chains 132 which carry the banded cigars C, are in motion, the transfer head 374 is in its lowermost position (Figs. 30, 31, and 37), so that the cigar can pass over clamping fingers 398 and lifting plate 404. In this position roller 384 is held back by cam piece 383 causing bell crank levers 393 to be out of the way of the grippers on chains 132. As soon as the chain 132 stops its movement transfer head 374 goes upward, causing roller 384 to leave cam piece 383. The rod 387 goes forward due to the tension of spring 391 thereby actuating bell crank levers 393 in such a way that the upper free parts press against the extending ends 217 of the U shaped gripper fingers 213, the gear segments 218 of which are in engagement with gear segments 219 thereby opening the grippers. In the meantime, shaft 401 has come up and met with its lifter plate 404, the cigar C. The clamping fingers 398 have also moved upward with the transfer head 374 and the rollers 400 in engagement with shaft 401 have left the lower thick part of the same and in making contact with the upper thin part of the shaft 401, causes clamping fingers 398 to close and clamp the cigar C which then is transferred into the pockets of the wrapper chain (Fig. 38).

It will be noted from the above and Figs. 37 to 40, that during this transfer there is at all times a positive grip on the cigar. Even at the moment when the wrapper pocket walls 429 open to receive and transfer fingers 398 open to release the cigar, said cigar is securely gripped from above and below by plunger 404 and tension plate 436.

The wrapper chain (Figs. 33, 34, 35, and 36) consists of a number of supporting lugs 411 connected to each other by means of chain links 412 running over an idler sprocket 413 (Fig. 6) driven by a sprocket 414 mounted on shaft 415 in brackets 416 held by guide bars 417 mounted on the upper frame 418 attached to main frames 100. The sprocket 413 is mounted on shaft 419 supported by bearing brackets 420 also fastened to guide bars 417. The shaft 415 is driven from a gear 421 meshing with gear 422 (Fig. 6) on a stud 423. The gear 422 is driven from a gear 424 meshing with a gear 425 (Fig. 23). The gear 424 (Fig. 6) is mounted on shaft 426 and gear 425 is mounted on shaft 427 carrying another gear 425a which is driven from gear 250

on Geneva drive shaft 248. The supporting lugs 411 carry the gear racks 428 (Fig. 35) to which are fastened clamping lugs 429 (Figs. 33 and 35). The gear racks 428 are actuated by gear wheels 430 pivoted on sleeves 431 held by supporting lugs 411. The gear wheels 430 are operated by another gear rack 432 (Fig. 35) extending with a stud 433 out of the supporting lugs 411. The studs 433 are equipped with springs 434 this providing tension with which wrapper chain pocket walls 429 grips the cigar C, or when no cigar is between them to hold them closed (Fig. 34).

As a cigar is transferred from the bander chain 132 into the wrapper chain, a lever 435 (Fig. 6) presses against rod 433 this causing the pocket walls to open and clamping fingers 398 and lifter plate 404 deliver the cigar between the clamping lugs 429. As soon as the cigar is inserted lever 435 releases rod 433 causing the clamping lugs or walls 429 to close and hold the cigar. The clamping fingers 398 and lifter plate 404 of the transfer mechanism then retreat to their lowermost position. The cam piece 383 engages with roller 384 and presses bell crank lever 393 downward and out of the way of extending ends 217 of U shaped fingers 213. The supporting lugs 411 are also equipped with a top guide plate 436 (Fig. 33) mounted on rods 437 slidably supported in sleeves 431. Rods 437 at their upper end are connected by a bar 438. Lifter plate 436 is in its lowermost position when the pocket formed by walls 429 are empty. As the cigar is entered between the latter, the lifter plate 436 rests on top of the cigar and goes up with the same. In order to keep the wrapper chain firm and level while the cigar passes through the different wrapping processes, supporting lugs 411 are equipped with guide shoes 439 engaging in grooves 440 (Fig. 36) of guide bars 417. The lever 435 (Fig. 6) is mounted on a shaft 441 supported by bearing brackets 442 attached to guide bars 417. To the shaft 441 is secured a lever 443 connected through a rod 444 to a cam lever 445 (Fig. 6) engaging with a roller 446 (Fig. 33) in a cam track 447, on shaft 243.

#### *The wrapping material feed*

The sheet material wherein the cigar is to be wrapped is fed from a reel R (Fig. 24), on a shaft 448 supported by a bracket 449 attached to cover 450 mounted on upper frame 418. The web "W" which in the embodiment illustrated is of transparent cellulosic material such as that known by the trade name of "Cellophane", is guided over a friction roller 451 and a guide roller 452 and over a floating roller 453 and another guide roller 454 into the cutting and clamping mechanism. The cellophane is fed in such a manner that the web W is pulled from a slidable clamping mechanism through the cutting mechanism, then cut in the required length and the cut blank "A" is then moved by a slidable transfer mechanism between the banded cigar C in the first conveyor chain 132 and the corresponding pocket of the wrapper chain. The entire wrapper feed mechanism is driven by a gear 455 mounted on shaft 223 carrying a bevel gear 456 meshing with bevel gear 457 (Fig. 23) on shaft 243. The gear 455 drives, through an intermediate gear 458 on shaft 459, the gear 460 on the wrapper feed main drive shaft 461 which is supported in a bracket 462 attached to the rear side frame 100.

The web cutting mechanism is actuated by cam lever 463 (Figs. 24 and 25) engaging with a roller 464 in a cam track 465 of a double cam 466

mounted on the main wrapper feed drive shaft 461. The cam lever 463 is pivoted on shaft 467 and has another lever 468 connected through a rod 469 to a lever 470 mounted on knife shaft 471 which is supported by bearings of the knife supporting bracket 472. This bracket is adjustably held by two stationary guide bars 473 attached to feed supporting brackets 462. On the shaft 471 are mounted the double levers 474, at one end connected through links 475 to a knife supporting plate 476 carrying the upper knife 477. The other end of double lever 474 is connected through links 478 to the lower knife frame 479 slidably mounted in knife supporting bracket 472. The lower knife frame 479 carries the lower knife 480.

Due to the rocking motion imposed on shaft 471 by rod 469 and lever 470, the double lever 474 moves the upper knife plate 476 downward and the lower knife frame 479 upward, producing shearing action between knives 477 and 480, which overlap each other at one end (Fig. 25). The upper knife supporting plate 476 is also equipped with a pair of guide rollers 481 which assure an easier sliding of plate 476 against frame 479 which are held under tension by spring 482.

Curing the cutting operation the wrapper web "W" is clamped between a stationary top plate 483 and a swingable bottom plate 484. The top clamping plate 483 is mounted on a pair of vertical rods 485 loosely mounted in bracket 472. The upper parts of rods 485 are connected by means of a cross bar 486. The rods 485 and clamp plate 483 are held stationary by tension springs 487. The bottom clamp plate 484 is mounted on a shaft 488 (Fig. 26) actuated by a lever 489 having a roller 490 which engages with a rocking bar 491. In order to assure proper pressure of the roller 490 on the rocking bar 491 a spring 492 is provided. A rocking bar 491 is pivoted on a link 493 (Fig. 24) mounted on shaft 494 and in a bell crank lever 495 which is pivoted on stud 496 (Fig. 26). To link lever 493 is attached another lever 497 (Fig. 24) which is connected to bell crank lever 495 by rod 498. Lever 497 through another rod 499 receives rocking motion from a double lever 500 engaging on one end with a roller 501 in a cam track 502 of gear 458. The double lever 500 is pivoted on a stud 503 supported by feed supporting bracket 462.

The required length of wrapping material is pulled through the cutting mechanism by a slidable clamping device which consists of a stationary top clamp plate 504 mounted on a clamping bracket 505 supported by a sliding plate 506 slidably mounted in grooves of guide bars 473. To sliding plate 506 is mounted a gear rack 507 operated by a gear 508 pivoted on a stud 509 (Fig. 25) supported by a feed bracket 462. To the gear 508 is attached another gear 510 receiving oscillating motion from a gear sector 511 loosely mounted on shaft 467 supported by a bearing bracket 512 on bracket 462. To the gear sector 511 is secured a guide track 513 to which engages a roller 514 adjustably mounted on lever 515 fastened to shaft 516 which also receives oscillating motion from a gear sector 517 actuated from a gear sector 518 equipped with a cam lever 519 engaging with roller 520 in track 521 of double cam 466. The gear sector 518 is pivoted on shaft 467. The clamping bracket 505 carries a shaft 522 which is actuated by a lever 523 engaging with a roller 524 on the top surface of rocking bar 491. To the shaft 522 is secured the lower

clamping finger 525 provided with a tension spring 526.

In order to start feeding the cellophane "W" the latter is threaded between knives 477 and 480 between the interlocking fingers 483 and 484, and 504 and 525. By a slight downward motion of the rocking bar 491 actuated by lever 497, finger 484 will open and finger 525 will close, clamping the web W between top clamp plate 504 and finger 525. The closing of finger 525 is caused by the roller 524 following the rocking bar 491 downward due to the action of spring 526. As soon as the web W is clamped between plate 504 and finger 525, gear rack 507 is actuated by the gear 508, causing the plate 506 to which bracket 505, plate 504 and finger 525 are attached, to slide forward a distance which is equal to the length of wrapping material necessary to wrap a cigar. Then the web W is cut by knives 477 and 480 as above described.

In order to prevent a jerk on reel R which would cause breaking the web when it is pulled, continuously rotating friction web feeding rollers 451 and 452 and a floating loop forming roller 453 are provided. The latter roller pulls a loop of wrapping material from the reel R before it is needed by the wrapping mechanism. The loop is then formed to full size again when fingers 504 and 525 are pulling the web W through the cutting mechanism.

The friction web feeding roller 451 is mounted on a shaft 527 supported by a bearing bracket 528 mounted on bars 473. The shaft 527 carries a friction disc 529 driven by friction from an adjustably mounted roller 530 on shaft 531 which is supported by bearing brackets 532. The shaft 531 carries on its lower end a bevel gear 533 continuously driven by bevel gear 534 mounted on shaft 461. To shaft 527 is fastened a gear 535 meshing with a gear 536 mounted on shaft 537 which is also supported by bracket 528 and which supports idler roller 452. The floating roller 453 is equipped with studs 538 slidably supported in grooves of guide frame 539 (Fig. 24) attached to bracket 528. Guide roller 454 is pivoted in stud 540 held by bracket 528 (Fig. 24).

The weight of floating roller 453 which rests in a loop of web W causes the web W to pull taut the friction roller 451 which is continuously rotating, and roller 451 pulls cellophane from the reel R, and only as long, as the web W lies tight on the roller. As soon as floating roller 453 reaches its lowest position and rests in the frame 539, the loop is released from the weight of roller 453 and the web W is slackened and does not make enough contact on rotary friction roller 451 to be pulled off from the reel R, until fingers 525 and 504 pull on the web again.

After a blank "A" is cut from the web W a sliding sheet transfer device (Figs. 24, 28, and 29) will move the blank "A" into the wrapping machine where the blank is applied to the cigar C.

The sliding transfer device consists of a pair of slide shoes 541 (Fig. 28) slidably supported by guide rails 542 mounted on a stationary cross bar 543 and on a transfer supporting bracket 544. To slide shoes 541 are pivoted a pair of clamping fingers 545 acted on by springs 546. The two slide shoes 541 are connected at one end to a bridge 547 attached to a guide shoe 548 slidably supported by a guide bar 549 mounted on a cross bar 543 and a bracket 544. The slide shoes 541 are equipped with paper guides 572 to assure the correct position of the cellophane blank "A" when it is clamped and transferred.

Guide shoe 548 is reciprocated by a rod 550 operated by a lever 551 pivoted on shaft 467.

The lever 551 is equipped with a track 552 (Fig. 25) in which engages a roller 553 pivoted to lever 554 which is mounted on the oscillating shaft 516. On the guide bar 473 (Figs. 24 and 28) is mounted a bearing bracket 555 supporting a shaft 556 on which is mounted a trip lever 557 equipped with a roller 558. The shaft 556 is actuated by a lever 559 connected through a rod 560 to a lever 561 mounted on a shaft 494 which is actuated by a lever 497. On a supporting bracket 544 is mounted another tripping mechanism consisting of a trip lever 562 equipped with rollers 563. Trip lever 562 is pivoted by means of studs 564 on a bearing bracket 565 adjustably mounted on bracket 544. The bracket 565 carries a shaft 566 on which is mounted a crank 567 held in contact with trip lever 562 by means of spring 568. Shaft 566 is actuated by a lever 569 connected through a rod 570 to lever 571 (Fig. 24) mounted on shaft 494.

#### *The wrapping mechanism*

The blank "A" immediately after being cut, is held between plate 504 and fingers 525. The fingers 545 on slide shoes 541 advance towards the paper and when passing underneath rollers 558 on lever 557 these fingers 545 are opened and slide in on the cellophane blank "A" which is still held by plate 504 and fingers 525. At the same time, blank "A" enters the paper guides 572 centralizing the blank. As the rocking bar 491 moves upward to release the blank "A" from clamping finger 525, trip lever 557 lifts the rollers 558 thereby releasing fingers 545 causing them to close due to springs 546 and clamp the blank "A". While plate 504 and finger 525 slide backward again to meet the web W at the knives 477 and 480, fingers 545 and slide shoes 541 actuated through guide shoes 548 and rod 550 take the blank "A" to a position above the cigar C to be transferred from the bander chain into the wrapper chain. Before the cigar to be transferred reaches the blank "A", rollers 563 actuated through trough tripper 562 and crank 567, trip clamping fingers 545, this causing them to open.

As the cigar C reaches the blank "A", the latter is clamped between the cigar C and the top guide plate 436 and is then taken lengthwise with the cigar into the pocket of the wrapper chain formed by clamping lugs or walls 469 which fold the cellophane smoothly over the sides of the cigar at station I of the wrapper chain. The cigar C is taken by the wrapper chain to an idler station II and then to station III where the bottom or longitudinal lock seam is made by a lock seam fold mechanism (Figs. 44 to 52).

The lock seaming mechanism includes a bracket 573 supported by the main frames 100 of the machine. The bracket 573 carries a pair of studs 574 to which are pivoted gear wheels 575 which receive oscillating motion from gear segments 576 attached to swingable bridge bracket 577 loosely mounted on shaft 578.

The bridge bracket 577 is equipped with a lever 579 actuated through a rod 580 from a cam lever 581 (Fig. 6) engaging with a roller 582 in a cam track of double cam 583 on shaft 381. The bridge bracket 577 carries a bridge 584 designed to press and guide the lock seam onto plate 593 as the cigar moves in the next station.

To shaft 578 is also pivoted a tuck lever 585 having another lever 586 actuated through a rod 587 from a cam lever 588 (Fig. 6) engaging with

a roller 589 in the other cam track of double cam 583. Tuck lever 585 carries a lock seam folding plate 590 corresponding to the groove of folding plate 591 mounted on lugs 592 attached to gear wheels 575.

As the cigar arrives at station III, the cigar has partly moved over folding plate 591 (Fig. 48) then by a swing of lever 585 the folding plate 590 tucks the hanging edges of the blank "A" into the groove of folding plate 591 (Fig. 49) and then retreats again (Fig. 50), thereby forming from the blank "A", an envelope or tubular wrapping "E", the ends of which project beyond the end of the cigar. Then folding plate 591 makes one half of a revolution produced by gear wheel 575 actuated by segment 576 causing the lock seam to project in the opposite direction and interlocking the tucked ends.

The clamping pocket walls or plates 429 then take the cigar to station IV. In order to prevent the lock seam from opening and to cover the gap between a stationary supporting plate 593, the bridge 584 swings in this space. As the cigar is pushed upon the same, the lock seam of envelope E is ironed smooth. For this purpose the bridge extends substantially the entire distance between plates 591 and 593. When the cigar reaches supporting plate 593, bridge 584 will swing backward and folding plate 591 returns to its original position. Plate 593 is fastened to a bracket 594 (Fig. 6) mounted on bracket 573 and holds the lock seam while at the following stations IV, V, and VI, where the end folds of the envelope E are made.

As envelope E is now a tube open and projecting beyond the cigar at both ends, end folding mechanisms are provided on each side of the machine (Fig. 23) to fold these projecting end portions. The folding mechanisms on each side are driven by a shaft 595 carrying a sprocket 596 driven through a chain 597 from a sprocket 598 (Figs. 6 and 23) mounted on shaft 245. The folding mechanisms on each side are mounted in housings 599 slidably supported by brackets 600 fastened to the frames 100. The folding mechanisms in each housing (Fig. 53) are actuated through gear 601 mounted on shaft 595. The gear 601 meshes with gear 602 on shaft 603.

The entire end fold mechanism (Fig. 53) consists of a bellows folding or tucking and flattening mechanism at station IV, a guiding or fold retaining mechanism between station IV and station V, a creasing mechanism at station V, and a crimping mechanism for crinkling or corrugating the creased end operating at station VI.

The bellows folding mechanism (Figs. 54 and 55), at station IV, consists of a pair of narrow tuck fingers 604 and a pair of wide folding and flattening fingers 605, all pivoted on individual studs 606 equipped with springs 607. The studs 606 are mounted on a head piece 608 attached to a sleeve 609 slidably mounted in guide bracket 610 attached to housing 599. To the sleeve 609 is clamped an adjustable lug 611 connected through a link 612 to a lever 613 pivoted on shaft 614 supported by bearings 615 of housing 599. Lever 613 is equipped with a cam lever 616 engaging with a roller 617 in a cam track 618 of cam 619 mounted on shaft 603. Tuck fingers 604 and folding fingers 605 are equipped with lugs 620 (Fig. 53) through which the former are operated by a head pin 621 slidably mounted in sleeve 609, in which is also mounted a tension spring 622 acting on head pin 621, which controls the opening and closing of tuck fingers 604 and folding finger 605, while sleeve 609 moves the

same towards or away from the envelope. Head pin 621 is operated by a lever 623 which has an adjusting screw 624 and is pivoted to shaft 614. Lever 623 is equipped with a cam lever 625 engaging with a roller 626 in a cam track 627 of cam 628, mounted on shaft 603. The above construction is such that the both sets of fingers are held open by positive cam means but are closed on the cigar when permitted by light springs thus preventing injury if an extra large cigar is acted on.

The folding operations (Figs. 62 to 67) are performed in such a manner that tuck fingers 604 and 605 are opened by head pin 621 and moved forward to the cigar C in axial direction over and clearing the ends of envelope E (Figs. 62 and 63). Then fingers 604 and 605 closing in on the envelope end until they exert light spring pressure on the cigar at the base of the taper. The fingers then move backward again (Figs. 64 and 65). The narrow tuck fingers 604 tuck and iron in the sides of the envelope E (Fig. 65), while the wide folding fingers 605 trailing the tuck fingers a little flatten or press together top and bottom folds of the envelope. Both sets of fingers ride on the cigar under light spring pressure.

In order to hold the end fold until it reaches station V, a pair of swingable guide fingers 629 come down on the fold (Fig. 67) and prevent the same from opening up again, which is, because of the resilient nature of the wrapping material, likely to occur. On its way to station V, where the end fold is to be creased, the folded end passes furthermore through a pair of stationary guide fingers 630 (Figs. 68 to 70), so that the fold is guarded and held until it reaches the creasing mechanism at station V. It will be seen that the bellows fold is positively held flat by the several guiding, creasing and crimping mechanisms until finally crimped.

The swingable guide fingers 629 of the guide mechanism (Figs. 56 and 57), are pivoted on studs 631, and are connected with each other for equal and opposite movement by means of gear segments 632. Studs 631 are mounted in a head piece 633 which also carries the adjustably mounted stationary guide fingers 630. Head piece 633 is attached to a stationary stud 634 held by a guide bracket 610. The upper swingable guide finger 629 is connected through a link 635 to lever 636 pivoted on shaft 614. Lever 636 is equipped with a cam lever 637 actuated by a roller 638 engaging in track 639 of cam 640 mounted on shaft 603.

The creasing mechanism (Figs. 58 and 59), consists of a pair of creaser dies 641 mounted on a pair of supporting lugs 642 pivoted to studs 643 held by a head piece 644 which is attached to a stationary supporting stud 645 fastened to guide bracket 610. The lugs 642 are in engagement with each other by means of gear segments 646. The upper lug 642 is operated through link 647 and is connected to lever 648 pivoted on shaft 614. Lever 648 is equipped with a cam lever 649 having roller 650 in a track 651 of cam 652 mounted on shaft 603. The head piece 644 carries a stud 653 to which is pivoted a finger 654 for folding back the creased material on itself, actuated through a link 655 from lever 656 pivoted on shaft 614. Lever 656 is equipped with a cam lever 657 engaging with a roller 658 in a track 659 of cam 660 mounted on shaft 603.

As soon as the folded ends of the enveloped cigar arrive between the open creaser dies 641

(Fig. 71), the latter close and crease the folded ends of the envelope together (Fig. 72) along a transverse crease or fold line. Then the creaser dies 641 open again and folding finger 654 swings forward to fold the overhanging end of the creased fold smoothly back on the lower part of the envelope E (Fig. 73). The folding finger 654 remains in this position, acting as a guide while the enveloped cigar is moved towards station VI, by the wrapper chain. As soon as the enveloped cigar reaches guide plate 661 of the crimper for holding the doubled back portion in position (Figs. 60 and 61), folding finger 654 returns to its original position.

The crimping mechanism (Figs. 60 and 61), consists of a pair of corrugated or crinkly surfaced crimper jaws 662 mounted on a pair of clamping lugs 663 which are pivoted to stud 664, held by supporting head 665 attached to stud 666 supported in bracket 610. Lugs 663 are equipped with lever 667 which are pivoted by means of links 668 to a double crank 669 mounted on shaft 670 which is supported by head piece 665. The double crank and links serve to form a double toggle for providing considerable pressure from opposite directions. Shaft 670 carries a lever 671 actuated through a link 672 from a lever 673 pivoted on shaft 614. Lever 673 is equipped with a cam lever 674 engaging with roller 675 in a track 676 of cam 677 mounted on shaft 603. Guide plate 661 is mounted stationarily to pivots 664 on head piece 665.

The corrugations of the jaws 662 are of V cross section. This crimp, particularly across a crease is effective in locking the fold and in overcoming the resilience of the material, at the extreme tip and where, with an accordion plait, the crimp joins the taper of the package end.

In order to prevent breakage of parts or excess pressure on the wrapper, stud 666 is spring mounted by means of spring 678 and plate 679. Parallel to stud 666 in bracket 610 and plate 679 is mounted a safety stud 680. When crimper jaws 662 which are actuated from double crank 669 and lever 671 close to crimp the under folded and creased end fold of the envelope E (Fig. 75), the double crank 669 touches, when jaws 662 are entirely closed, the safety stud 680, which by further advance motion of lever 671 acts as a pivot on double crank 669 and due to the spring mounting of stud 666 the entire crimper mechanism moves slightly towards the cigar, thereby preventing a break of the cellophane and an injury to the working parts of the mechanism, and permitting the use of wrapping material of various thicknesses.

After the crimper jaws 662 open up again, the finished banded and enveloped cigar P is taken to station VII, where it is transferred from the pockets of the wrapper chain into the grippers of a conveyor chain 681. This transfer mechanism (Fig. 32), is of the same type and construction as the one described and used for transferring the cigar C from the bander chain 132 into the pockets of the wrapper chain.

The two transfer mechanisms are identical in most respects the transferring action being merely reversed. The transfer head 374 in this second transfer carries a cam piece 682 instead of a cam piece 383 in the first transfer. The transfer head 374 in the second transfer is actuated through a link 683 and the cam shaped sliding shaft 401 is operated by a link 684 from different cams from the first transfer. Link 683 is connected to a lever 685 (Fig. 6) pivoted to stud

686 supported by bearing bracket 370. Lever 685 through a link 687 is connected to a cam lever 688 engaging with a roller 689 (Fig. 23) in a track of double cam 690 mounted on shaft 243. Cam lever 688 is pivoted on stud 691 (Fig. 6) to which is pivoted another cam lever 692 engaging with roller 693 (Fig. 23) in the other track of double cam 690. Cam lever 692 through a link 694 actuates a lever 695 to which is pivoted link 684 operating the cam shaped slide shaft 401 of the second transfer. The conveyor chain 681 is driven by a sprocket 696 mounted on shaft 427 and guided over an idler sprocket 697 (Figs. 80 and 82) mounted on shaft 698 supported by side frames 100. Conveyor chains 681 are of identical same construction with the first conveyor chains 132 and carry the same yokes 211 and U shaped fingers 213 and 214 as chain 132. The gripper fingers are opened and closed in the same manner. The extending ends 217 of the fingers are actuated by bell crank levers 699 pivoted on studs 700 mounted in lugs of the side frames 100. The bell crank levers 699 are operated through a rod 701 by a fork 702 carrying a roller 703 actuated by cam piece 682. The fork 702 is supported by a stud 704 slidably mounted in a guide bearing 705 pivoted on stud 706 (Fig. 6) held by lugs 707 of side frames 100. A spring 708 always presses the roller 703 into the path of cam piece 682.

When the enveloped cigar P arrives at station VII, a lever 709 mounted on shaft 441 and actuated by lever 443, presses against stud 433 which caused clamping lugs 429 to open. In the meantime the lifter plate 404 has come up to meet the enveloped cigar (Fig. 41). At the same time, clamping fingers 398 are in open position directly underneath the open clamping lugs 429. The enveloped cigar P held between top guide plate 436 and lifter plate 404 is then guided in between the two clamping fingers 398 which immediately close and together with lifter plate 404 (Fig. 42), transfer the enveloped cigar into the open grippers of the second conveyor chain 681. As soon as the enveloped cigar P is placed in the gripper fingers 213 and 214, bell crank lever 699 releases extending end 217 and fingers 213 and 214 close, due to spring 216. At the same time, clamping fingers 398 open again and together with lifter plate 404 go downward to their lowermost position.

The enveloped cigar P is then conveyed by chain 681 towards the delivery end of the machine. The top guide plate 436, when guiding the enveloped cigar downward at station VII in the just described manner, is then actuated by a roller 710 pivoted to a lever 711 loosely mounted on shaft 441 (Fig. 33). The lever 711 is equipped with another lever 712 which through a connecting rod 713 is operated by a cam lever 714 engaging with a roller 715 (Fig. 23) in a track of cam 716 mounted on shaft 243 (Figs. 6 and 23). Lever 711 through roller 710, which engages with the cross bar 438 holding rods 437, pushes the top guide plate 436 downward in synchronism with the movement of lifter plate 404. In order that the enveloped cigar P may be held firmly between guide plate 436 and lifter plate 404, a tension spring 717 is attached to rod 713. This arrangement assures proper guidance of the cigar in case of variations in the size of the enveloped cigar P.

If it is desired to apply the band B after the cigar is enveloped, the machine is constructed in such a way that the banding mechanism can be

attached above the second conveyor chain 681 as indicated in dot and dash lines in Fig. 6 in exactly the relation to the chain as previously described in connection with the first conveyor chain, by inserting bolts 254a in holes 254b.

In starting the machine, it is desirable to hold back the wrapping material to prevent clogging, until a cigar C arrives at the wrapper applying station I. This is accomplished by tripping the web W out of the reach of clamping fingers 504 and 525. By moving a hand lever 718 (Fig. 24) mounted on shaft 719, a cam piece 720 also mounted on shaft 719 presses downwardly across bar 486 which causes rods 485 to which top clamp plate 483 is attached to move downward, thereby moving the web W which is held between top clamp plate 483 and swingable bottom clamp plate 484 downward and out of the way of clamping fingers 504 and 525. The shaft 719 is supported by lugs on knife supporting bracket 472. As soon as a cigar arrives at the wrapper station I, hand lever 718 is moved again, causing the release of cam piece 720 from cross bar 486. Due to the springs 487, cross bar 486 moves up again bringing clamp plates 483 and 484 back to their original position and web W is again gripped by fingers 504 and 525 thereby resuming the feeding of the material to the cigars.

#### *Cigar delivery and delivery transfer*

Referring to Figs. 6 and 23, the cam lever 721 mounted on the shaft 372, carries a cam roller 722 engaging in a track of a double cam 723. This lever 721 rocks the shaft 372, thereby actuating a lever 724 which operates a rod 725 on the lever 724. A bell crank lever 726 loosely mounted on the shaft 372 carries a cam roller 727 engaging in a track, in the opposite face, of the double cam 723. The lever 726 thus actuated operates a rod 728 connected to the lever.

Referring now to Figs. 80 to 83, the end of the rod 725 is fastened to a block 729. The block 729 carries ejector rods 730, which are slidably mounted in a bearing 731 attached to the shaft 698. The other ends of the rods 730 are fastened in a shank 732 of the ejector or lifter plunger 733. A U-shaped cigar supporting plate 734 has a slot in its base corresponding to the contour of the shank 732. The plate held against the shoulder of the ejector plunger 733 by compression springs 735 are mounted on studs 736 carried by the plunger 733.

The end of rod 728 carries a fork 737 connected to an arm 738, fastened on a shaft 739 supported by the bracket 740, carried by the side frames 100. The bracket 730 has a pad supporting a bracket 741, having a bearing 742 in which are slidably mounted rods 743. The ends of rods 743 are fastened to a shank 744 of a pressure plate 745. A U shaped plate 746 for engaging the upper side of the cigar has a slot in its base corresponding to the contour of the shank 744. The plate 746 is held against the shoulder of the pressure plate 745 by springs 747 carried by studs 748 attached to the plate 745.

Rotation of shaft 739 actuates an arm 749, which carries a link 750 connecting to arm 751, pivotally mounted on a stud 752, attached in a bearing 753 fastened to the bracket 741. The arm 751 also carries a stud 754, which supports a strap 755 connecting to arms 756. The arms 756 are swingably mounted on a rod 757 supported in bearings 758 carried by the delivery table 759. The angular ends of arms 756 carry a top tension plate 760 which through the above means alternately

rests on the cigars and lifts to free them for forward movement.

The crosswise extending bracket 740 has lugs 761 carrying studs 762 on which are mounted the bridge 763. The enveloped cigar packages pass over the aforesaid bridge 763 and are propelled onto the delivery table 759. The table 759 being supported by angle irons 764 is attached to the end frames 765 carried by the frames 100.

The operation of the delivery mechanism is as follows. The enveloped cigar packages "P" which are lodged in the grippers of the intermittently driven chain 681, are carried towards the ejecting station "Z" (Figs. 80 and 82). The package P arriving at the ejecting station, enters between the U shaped plates 733 and 746. The prongs 766 and 767 of the aforesaid fingers are shaped to suit the path of the oncoming packages P.

After entering the clamping chamber formed by the opposed spring pressed plates 733 and 746, the drive of the conveyor chain is momentarily idle, and the package P is ejected. The package P while in this position, is still clamped by the fingers 213 and 214 which form the pockets of the conveyor chains. The package is also held by the prongs 766 and 767, the latter prongs 767 being arranged in such a manner that they press against and retain the freshly sealed cigar band "B". The cam actuated rod 725 then ascends, thus bringing the ejector plunger 733 against the package P, and in this manner the springs 735 of the plate 734 are compressed. The continued upward motion of the package P, presses the spring tensioned plate 746, thus raising it and bringing the package against the pressure plate 745.

The package P thus ascending and at all times firmly gripped, is finally released from the pockets of the conveyor chain 681, and comes to rest when the extending ends 768 of finger 734 come into alignment with the top of bridge 763 (see Fig. 81). The raising of pressure plate 745 compresses tension springs 769 mounted on the rods 743. The bridge 763 has slots into which fit the extending ends 768 of the U plate 734 so that there is no laterally extending crack over which the packed cigars must be pushed.

The cam actuated rod 728 now descends and forces the arm 738 downward, thus rotating the shaft 739. The rotation of shaft 739 brings a set of fingers 770 against the rear side of the package P. The continued rotation of the shaft 739 permits the fingers 770 to expel the package P (shown in dotted lines), from the clamping chamber in which it was arrested, and deposits the package P onto the bridge 763 leading to the delivery table 759. In the interim, the rotation of shaft 739 actuates the arm 749, which through its linkage raises the arms 756 and releases the pressure on the packages P. In this manner, the package just discharged from the clamping chamber propels the preceding packages forward the width of one cigar.

The package having been discharged from the clamping chamber, permits the springs 769 to return the rods 743 to their former position. The rods 743 carry adjustable stop collars 771 which rest against the top of bearing 742, when the pressure plate is returned to its receiving position. The rod 728 then ascends and returns the fingers 770 to their former position. The rod 728 through its linkage, also returns the top tension plate 760 to its position of rest on the cigar bands "B". A spring 772 on rod 757 applies pressure to the arms 756, retaining the cigar bands "B"

against any tendency to spring open. The rod 725 then descends and returns the ejector plunger 733 to its original position.

The package P when delivered onto the bridge 763, enters between side guides 773 and 774 and passes onto the delivery table 759. The guide 773 extends but part way along the length of delivery table 759, for accessibility while the guide 774 extends the full length of the table. The packages also pass under top tension belts 775 and 776 designed to prevent rolling of the cigars, to which weights 777 are attached at spaced intervals. The end of the belts are looped around a rod 778 attached to the guide 773. In this manner, the packages P are kept in alignment, and the bottom seam of the packages, and the band and the band seal are held intact.

The packages P advancing on the table 759 arrive above a platform 779 (Figs. 80 and 83), supported by a bracket 780, adjustably carried by straps 781. The straps 781 being attached to the frame 765, the frames 765 are made rigid by the tie bars 782. The operator then places a cigar box or similar container on the platform 779, resting against a stop 783. The packages P which have accumulated in solid formation at the delivery point, are then slid over the table by the operator and packed in the box.

#### Operation

While the operation of the parts of this machine has in general been described in detail in connection with the description of these parts the operation of the machine as a whole will now be briefly reviewed below.

The cigars in packed row formation as shown in Fig. 1 are pushed by the belts 189 and 194 into position for engagement by the laterally spaced guide or stop fingers 160, which move against the leading cigar and act to straighten it if it is askew. The fingers then retreat as the cigars are pushed by the belts 189 and 194, locating the leading cigar against the transfer or elevator fingers 174. The fingers 160 continue to retreat a little. The clamps 147 and the fingers 174 then clamp the leading and succeeding cigar, and the fingers 174 then move away from the succeeding cigar a little to prevent friction between the cigar surfaces during the transfer.

The cigar is then lifted into the grippers 175, 176 and swung by them 90° to be ejected bottom inward into the gripper fingers on the endless intermittently travelling chain 132. During the ejecting movement reciprocating fingers 207 provide a light pressure against the ejector which serves to prevent displacement of the cigar till securely gripped by the chain gripper fingers.

The chain 132 then carries the cigar to one banding position (shown in Fig. 6) where the banding operations are carried on while the cigar is securely held towards either end by the laterally spaced gripper fingers. The suction band turret 275 is given a bodily movement up against the bands in a magazine and then downwardly to withdraw a band and also to bring a band on the diametrically opposite turret arm into position on top of the cigar. A pair of inflexible but pivoted and spring pressed fingers 309 come down along the radially extending turret arm, spaced apart more than the width of the cigar to pass the corners thereof. Then the fingers come together and lightly press toward the center of the cigar while continuing to move downwardly to fold the band. This results in a frictional sliding contact with the band and pulls the band tightly

over the top and corners of the cigar, holding the band tightly folded over three sides of the cigar while the downwardly extending band ends are laid one over the other.

The band ends are folded against the bottom of the cigar by two fingers 325 and 348 one of which is split and moves first across the bottom of the cigar to lay one end and the other of which moves between the split portions to lay the other end while the split portions securely hold down the first end. This second finger travels with the cigar when it is indexed to the plate 366 to hold the band closed till engaged by the plate, acting as a bridge between banding position and the edge of the plate.

As already described the banding mechanism is secured together in a single unit which can be readily detached and moved to a prepared base where it will band after instead of before wrapping.

The cigar is then transferred from the chain to the pockets of a wrapping chain, the cigar during the transfer being pushed into a sheet of wrapping material previously fed between the cigar and the pocket as shown in Fig. 24. Since the thin transparent cellulose materials used curl readily and are difficult to guide by the edges or push, the feeding means provided maintains a positive grip on the forward edge of the web for feeding and positioning purposes. Interfingering grippers are provided for transferring the web end from one gripper to another without releasing the web end.

The cigar and wrapper sheet are then pushed into opened pockets on the wrapper chain while the cigar is lightly but continuously gripped between opposite surfaces to prevent displacement of the cigar at the high speeds at which this machine is designed to operate. The pocket walls close on the cigar before the cigar completes its upward movement to pull the wrapper down tightly on the top and corners of the cigar. The depending edges of the wrapper are then lapped and lock seamed as previously described to form a tube projecting at either end beyond the cigar.

The tube ends are then plicated or bellows folded by tuckers followed by flattening fingers (Figs. 62 to 76) both of which are lightly spring pressed to ride down the taper of the cigar to closely fit and iron the folded wrapping or envelop against the cigar ends of variable shape without danger of breaking the cigar. This ironing and flattening has a stretching action on the lock seam which prevents gapping. Since cellulosic material most used with this machine is quite resilient guides 629 and the inner surfaces of the flatteners and crimpers employed cooperate to continuously hold the previously made folds till the final crimp is made.

The bellows fold is then crimped to transversely crease it and the end portion beyond the crimp folded back and in order to maintain this position of the material a series of sharp crinkles or corrugations of V cross-section are crimped into the material transversely of the crease or fold line. This has the effect of locking the folds and the sharp angles and apparently the stretching of the material at the apexes takes the resilience out of the material where crimped.

The sharp grooves form accordion pleats having a spear point formation which serve to neatly merge the crimped portion into the chisel shaped package end, and to prevent the crimped point from opening up at this point, the spear shaped points apparently taking the resilience out of the

material at this location. By the foregoing, the heat sealing commonly employed is rendered unnecessary. Since heat sealed packages of the transparent cellulose materials often open up at the seam and ends unless enough heat is used as to hurt the appearance of the material and endanger the cigar, the method of closure just described and the resulting package have substantial advantages.

The completely banded and wrapped cigar is next transferred to a second gripper chain under the wrapper chain for movement to the cigar delivery mechanism. At the delivery point the cigar package after it has travelled part way around the chain sprocket, is elevated in a radial direction by an elevator transfer 746 gripping the package between the chain grippers from above and below, to a position in line with the curved lip of the delivery table. The package is then swept on to the table by swinging fingers 770 into contact with the row of cigars already there ready for packing.

From the foregoing it will be noted that from feed to delivery the cigars are so securely gripped during movement thereof that the several movements and operations on the cigar can be made at higher rates of speed without displacement or loss of control of the cigar than would be possible otherwise.

What is claimed is:

1. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for transporting the same into and out of the range of action of said mechanism, and a cigar bander operating to band the cigars while held by said grippers.

2. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for transporting the same into and out of the range of action of said mechanism, a cigar bander operating to band the cigars while held by said grippers, said cigar wrapping mechanism including means for wrapping a sheet of material about the article with the ends projecting beyond the end of the article, means for flattening and folding back a portion of the projecting material, and means for grooving the material across the fold line formed by folding back said portion.

3. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for transporting the same into and out of the range of action of said mechanism, a cigar bander operating to band the cigars while held by said grippers, said grippers being arranged in cooperating pairs spaced along the length of the cigar and said bander operating on the portion of said cigars between the grippers.

4. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for conveying the same into and out of the range of action of said mechanism, a cigar bander operating to band the cigars while held by said grippers, said conveying means comprising a plurality of endless chains, one on either side of the wrapping mechanism, and means for performing a wrapping operation intermediate said chains.

5. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for conveying the same into and out of the range of action of said mechanism, and a cigar bander operating to band the cigars while held by said grippers, said conveying means including endless chains and said grippers being

arranged in coacting pairs for gripping a cigar between them, means pivotally mounting said grippers on the chains, and means for operating said grippers to receive and close on a cigar, said means including inter-connections between grippers for producing equal movement of the opposed grippers of a pair to hold the cigars regardless of size with their longitudinal axis in definite predetermined relationship to the chain.

6. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for conveying the same into and out of the range of action of said mechanism, and a cigar bander operating to band the cigars while held by said grippers, said conveying means including a plurality of endless chains, wrapping means spaced from said chains, means for transferring cigars from one of said chains to said wrapping means and a second transferring means for transferring the cigars from said wrapping means to the second of said chains.

7. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for conveying the same into and out of the range of action of said mechanism, a cigar bander operating to band the cigars while held by said grippers, said bander comprising means overlying the conveying means for partially wrapping a band about said cigars, and mechanism underneath the cigars on the conveyor for completing the wrapping of said cigars.

8. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for transporting the same into and out of the range of action of said mechanism, and a cigar bander operating to band the cigars while held by said grippers, and means for selectively mounting said bander to operate on cigars in said grippers before or after wrapping.

9. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for transporting the same into and out of the range of action of said mechanism, and a cigar bander operating to band the cigars while held by said grippers, said bander comprising a band magazine, band applying devices, a rotating band retaining unit, and means for operating said unit to withdraw a band from said magazine and carry it into position to be applied by said devices to a cigar in said grippers.

10. The combination with mechanism for wrapping cigars, of means including grippers acting on the cigars for transporting the same into and out of the range of action of said mechanism, and a cigar bander operating to band the cigars while held by said grippers, said wrapping mechanism including an endless chain having cigar receiving pockets opposite said grippers, means for feeding wrapping material between said grippers and said pockets, and means for pushing the cigars from said grippers into the wrapping material and thence into the pockets.

11. The combination with a source of supply of cigars in face to face row formation, of upper and lower endless conveyor systems provided with cigar grippers, of means for transferring the cigars from the lower to the upper system, means spaced along said systems for wrapping and banding the cigars while held by said conveyor system.

12. The combination with a source of supply of cigars in face to face row formation, of upper and lower endless conveyor systems provided with cigar grippers, of means for transferring the cigars from the lower to the upper system, means spaced along said systems for wrapping and band-

ing the cigars while held by said conveyor system, said lower conveyor system comprising a plurality of separate endless chains, and said transferring means operating to transfer cigars from one of said chains to the upper system and mechanism for transferring the cigars from said upper system to another of said chains.

13. The combination with a source of supply of cigars in face to face row formation, of upper and lower endless conveyor systems provided with cigar grippers, of means for transferring the cigars from the lower to the upper system, means spaced along said systems for wrapping and banding the cigars while held by said conveyor system, and mechanism for partially wrapping the cigar during said transfer.

14. In a machine for wrapping cigars and similar articles, the combination with wrapping devices, of conveying mechanism for carrying articles to and from said wrapping devices, a banding unit and means for selectively supporting said banding unit in position to operate on the article in said conveyor mechanism before or after wrapping.

15. In a cigar wrapping and banding machine, the combination with a source of supply of cigars in face to face formation, of cigar banding mechanism, cigar wrapping mechanism, and means including cigar grippers feeding cigars one by one from said row, successively subjecting them to the action of said mechanisms and carrying them away from said mechanisms while continuously maintaining a grip on the cigars.

16. The combination with a cigar wrapper, of a cigar bander, a cigar feed for feeding cigars one by one from face to face row formation, a cigar delivery for receiving cigars one by one and delivering them into face to face row formation and conveying means for receiving cigars from said feed, carrying them into the range of action of said bander and wrapper and thence to said delivery.

17. In a cigar banding and wrapping machine, the combination with a conveyor system for forwarding cigars in a generally horizontal direction, of means cooperating with said conveyor system to wrap a sheet of wrapping material circumferentially about the cigar with the wrapper extending beyond the ends of the cigars, a series of mechanisms arranged along the line of movement of the cigars for tucking in the sides of the tubular wrapper extensions into bellows formation, folding back the tucked wrapper on itself and crimping the folded material to retain the same in place, banding mechanism operative to cooperate with said conveyor system to band cigars carried thereby, and means for supporting said banding means at a plurality of positions along said systems to selectively operate on the cigars before or after wrapping.

18. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold.

19. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism

for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said means including lock seaming mechanism uniting the longitudinal edges of said sheet.

20. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said instrumentalities including tuckers engaging opposite sides of the tube to tuck same into bellows formation.

21. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said mechanism having its parts arranged to cause the crinkles to run transversely of the fold line.

22. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said mechanism including a pair of coating crimpers having interengaging teeth of V cross-section.

23. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said flattening mechanism including a pair of elements on either side of the cigar, and means for giving said elements an ironing movement along the taper of the cigar.

24. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said devices including a crimper for putting a crease transverse to the cigar axis in the projecting portion of the tucked tube.

25. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said

devices including a crimper having opposed jaws arranged to act on the projecting portion of the tube, a single operating element for the crimper and toggle connections from said operating element to each of said jaws.

26. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said means including lock seaming mechanism forming a lock seam projecting across the side of the cigars in one direction, and means for swinging the lock seam to a position in which it projects in the opposite direction.

27. In a wrapping machine, the combination with means for wrapping and lock seaming a sheet of material about a cigar or similar article with the ends projecting in tubular formation beyond the ends of the cigar, of instrumentalities for tucking in the projecting ends, mechanism for flattening the tucked ends, devices for folding the flattened ends back on themselves, and mechanism for crinkling said ends at the fold, said means including an endless chain having a series of pockets thereon, means for feeding wrapping material across the open sides of said pockets and means for pushing the article into said material and said pocket.

28. In a cigar wrapping machine, the combination with an endless chain having a series of cigar grippers thereon for carrying the cigars along a right line, of means for inserting a cigar with a wrapper about the same in said grippers, said wrapper extending beyond the ends of the cigars, a series of mechanisms arranged along the line of movement of said cigars for successively tucking in the sides of the wrapper extension into bellows formation, folding back the tucked wrapper and crimping the same to retain the folded material in place.

29. In a cigar wrapping machine, the combination with an endless chain having a series of cigar grippers thereon for carrying the cigars along a right line, of means for inserting a cigar with a wrapper about the same in said grippers, said wrapper extending beyond the ends of the cigars, a series of mechanisms arranged along the line of movement of said cigars for successively tucking in the sides of the wrapper extension into bellows formation, folding back the tucked wrapper and crimping the same to retain the folded material in place, and stationary guides between mechanisms to hold the partially folded material in place against the natural resilience of the material.

30. In a cigar wrapping machine, the combination with a conveyor chain having a series of spring pressed cigar grippers thereon for resiliently gripping a cigar, of a second oppositely disposed conveyor chain also having spring pressed cigar grippers, means for feeding wrapping material between said chains and mechanism for elevating a cigar from the lower chain into the wrapping material and between the grippers of the upper chain.

31. The combination with travelling means for supporting an elongated article with a sheet of wrapping material surrounding three sides thereof, of mechanism for folding longitudinal edges of said sheet together in a lock seam, a plate

positioned along the path of said travelling means beyond the lock seaming position to exert pressure on said seam, a movable bridge for guiding the lock seam from lock seaming position to said plate, and means for moving said bridge away from guiding position to provide fair way for wrapping or lock seaming operations.

32. In a cigar wrapping machine, the combination with means for wrapping sheet material circumferentially about a cigar with the material projecting beyond the end of the cigar, tuckers for tucking in opposite sides of the projecting material to form a bellows fold and flattening elements for flattening the tucked material, and means for operating said tuckers and said flattening elements to cause them to iron the material along the taper of the cigar towards the tip.

33. Means for feeding cigars from row formation one by one into a series of spaced pairs of gripper fingers comprising means for urging forward the row of articles, means for clamping the article next to the leading article, means for first moving the leading article forwardly away from said next article and then above said row, and mechanism receiving the article from said elevating means and delivering it between the grippers of one of said pairs.

34. Means for feeding cigars from row formation one by one into a series of spaced pairs of gripper fingers comprising means for urging forward the row of articles, means for clamping the article next to the leading article, means for first moving the leading article forwardly away from said next article and then above said row, and mechanism receiving the article from said elevating means and delivering it between the grippers of one of said pairs, said mechanism including operating parts acting to deliver the article to the grippers with the side which was down in the row nearest the base of the gripper fingers.

35. Means for feeding cigars from row formation one by one into a series of spaced pairs of gripper fingers comprising means for urging forward the row of articles, means for clamping the article next to the leading article, means for first moving the leading article forwardly away from said next article and then above said row, mechanism receiving the article from said elevating means and delivering it between the grippers of one of said pairs, cigar aligning means, and means for giving said aligning means a movement against the forward side of the leading cigar to align the same prior to the operation of said elevating means.

36. In a cigar handling device, for feeding cigars from row formation, a sprocket, an endless conveyor chain passing around said sprocket, cigar grippers on the chain projecting outwardly therefrom, means for separating the leading cigar from said row, and means for rotating the cigar and inserting in the grippers as they pass around said sprocket with the face of the cigar which was bottom down in the row, nearest the chain.

37. Means for delivering cigars from a row to a conveyor having chains, sprockets carrying the chains, and grippers on the chains, which comprises means for segregating the foremost cigar of the row, and means for turning it approximately 90° and inserting it in the grippers at said position as they pass around a sprocket.

38. In a transfer for cigars and similar articles, the combination with reciprocating plunger having an article supporting surface for lifting or lowering an article, of gripper fingers with respect to which the plunger is relatively movable

during part of its reciprocation, said grippers travelling with the plunger during the remainder of its reciprocation, and means operating said grippers from the plunger as a result of said relative movement.

39. In a transfer for cigars and similar articles, the combination with reciprocating plunger having an article supporting surface for lifting or lowering an article, of gripper fingers with respect to which the plunger is relatively movable during part of its reciprocation, said grippers travelling with the plunger during the remainder of its reciprocation, and means operating said grippers from the plunger as a result of said relative movement, said means including a cam surface on the plunger.

40. In a cigar wrapping and/or banding machine, the combination with a plurality of endless series of travelling grippers, of cigar wrapping means overlying said grippers, means for elevating said cigar into said wrapping means, and grippers having movement in the direction of movement of the elevator for maintaining a grip on the cigars during elevation thereof.

41. The combination with a first series of travelling grippers, of article wrapping means overlying the grippers, said wrapping means including a second series of grippers spaced from the first series, reciprocating means for transferring said articles from the first series of grippers to said second series and means acting on the articles during said transfer for maintaining positive grip on the articles at all times during the transfer when the article is not fully gripped by the grippers of said first and second series.

42. The combination with a first series of travelling grippers, of article wrapping means overlying the grippers, said wrapping means including a second series of grippers spaced from the first series, reciprocating means for transferring said articles from the first series of grippers to said second series and means acting on the articles during said transfer for maintaining positive grip on the articles at all times during the transfer when the article is not fully gripped by the grippers of said first and second series, said means including tension plates cooperating with the transfer to exert yielding pressure on the opposite side of the article during part of the movement of the transfer.

43. The combination with a first series of travelling grippers, of article wrapping means overlying the grippers, said wrapping means including a second series of grippers spaced from the first series, reciprocating means for transferring said articles from the first series of grippers to said second series and means acting on the articles during said transfer for maintaining positive grip on the articles at all times during the transfer when the article is not fully gripped by the grippers of said first and second series, said means including a pair of opposed reciprocating grippers travelling with the transfer during a part of the movement thereof, and means for opening and closing said grippers in timed relation to the operation of said transfer.

44. The combination with sets of spaced article grippers, of a reciprocating transfer for supporting and transferring an article from one set to the other and a third set of grippers cooperating with the transfer to grip the article and prevent displacement thereof relative to the transfer during the operation thereof.

45. The combination with sets of spaced arti-

cle grippers, of a reciprocating transfer for supporting and transferring an article from one set to the other and a third set of grippers cooperating with the transfer to grip the article and prevent displacement thereof relative to the transfer during the operation thereof, and means for giving said third set of grippers movement independent of the transfer in the direction of movement of said transfer.

46. Means for delivering a cigar from an endless series of grippers to a delivery table comprising a reciprocating elevator, a tension plate overlying said elevator coacting with the elevator to grip the cigar during the elevating operation, a delivery table level with the upper position of the elevator, and means for pushing the cigar out from between the elevator and tension plate onto said table.

47. The combination with an endless series of cigar grippers, of chains carrying said grippers, sprockets around which said chains travel, a reciprocating elevator arranged to act on the cigars between vertical and 90° position as they pass around said sprocket and a delivery having a lip in line with the surface of the elevator at the upper position of the elevator and having a curved portion adjacent the lip for guiding the cigars into horizontal row formation.

48. In a cigar machine, the combination with means for supporting a sheet of wrapping material of greater length than the cigar, of cigar feeding and transferring mechanism including means for pushing a cigar into said wrapping material to drape the material around three sides thereof with the longitudinal edge portions of the wrapper outstanding beyond the fourth side of the cigar, lock seaming means for interfolding said edge portions, and means for plicating to bellows formation, flattening and folding back the tubular portion of said wrapper extending beyond the end of the cigar, said lock seaming means including a grooved element on one side of said edge portions, a blade on the other side thereof, mechanism for giving relative movement to said element and said blade to cause the blade to push a doubled portion of said edge portions into said groove.

49. In a cigar machine, the combination with means for supporting a sheet of wrapping material of greater length than the cigar, of cigar feeding and transferring mechanism including means for pushing a cigar into said wrapping material to drape the material around three sides thereof with the longitudinal edge portions of the wrapper outstanding beyond the fourth side of the cigar, lock seaming means for interfolding said edge portions, means for plicating to bellows formation, flattening and folding back the tubular portion of said wrapper extending beyond the end of the cigar, said lock seaming means including a grooved element on one side of said edge portions, a blade on the other side thereof, mechanism for giving relative movement to said element and said blade to cause the blade to push a doubled portion of said edge portions into said groove, and means for swinging the grooved element and the doubled edge portion of the wrapper within the groove about a hinge line adjacent the cigar to change the relative position of the lock seam and the remainder of the wrapper.

50. In a cigar machine, the combination with means for supporting a sheet of wrapping material of greater length than the cigar, of cigar feeding and transferring mechanism including means for pushing a cigar into said wrapping

material to drape the material around three sides thereof with the longitudinal edge portions of the wrapper outstanding beyond the fourth side of the cigar, lock seaming means for interfolding said edge portions, means for plicating to bellows formation, flattening and folding back the tubular portion of said wrapper extending beyond the end of the cigar, a pair of grippers positioned to receive the cigar operated on by said pushing means, said grippers being arranged to lay the material along the sides of said cigar.

51. In a cigar wrapping machine, the combination with a pair of cigar receiving jaws, of means for supporting a sheet of wrapping material of greater length than the cigar adjacent said jaws, means for pushing a cigar into said material and thence into the jaws to fold the material around three sides of the cigar, a grooved element, a tongue element, means relatively moving said elements to cause the tongue element to double the outstanding edge portions of said wrapper together to form a lock seam and push the same into said groove with the seam extending in one direction with the wrapper edges exposed, and means for swinging the grooved element to change the direction in which the seam extends and cover said edges, and mechanism for closing the ends of said wrapper.

52. In a cigar wrapping machine, the combination with a pair of cigar receiving jaws, of means for supporting a sheet of wrapping material of greater length than the cigar adjacent said jaws, means for pushing a cigar into said material and thence into the jaws to fold the material around three sides of the cigar, a grooved element, a tongue element, means relatively moving said elements to cause the tongue element to double the outstanding edge portions of said wrapper together to form a lock seam and push the same into said groove with the seam extending in one direction with the wrapper edges exposed, and means for swinging the grooved element to change the direction in which the seam extends and cover said edges, and mechanism for closing the ends of said wrapper, said mechanism including devices for flattening and transversely folding and sealing the tubular portion of the wrapper extending beyond the end of the cigar whereby said lock seam is pulled flat against the cigar.

53. In a machine for wrapping cigars, the combination with a banding unit for banding cigars, of means for wrapping the banded cigars and advancing them with a translatable motion, and mechanism acting to convey the cigars with a translatable motion for transporting them into the range of action of said banding unit and delivering the banded cigars to said means.

54. In a machine for wrapping cigars, the combination with means for wrapping cigars and simultaneously advancing them in a rectilinear course with a translatable motion, of a banding unit for banding wrapped cigars, and mechanism acting to convey the wrapped cigars in a linear course with a translatable motion to transport them to said wrapping means and further into the range of action of said banding unit.

55. In a machine for wrapping cigars, the combination with a banding unit for banding cigars, of means for wrapping cigars, and mechanism for removing cigars one by one from a row and conveying them to said banding unit and wrapping means successively and reassembling the wrapped and banded cigars in the original relative relation in a row.

56. In a machine for wrapping cigars, the combination with means for wrapping cigars, of a banding unit for banding the wrapped cigars, and mechanism for removing cigars one by one from a row of cigars arranged in side by side contacting relation and conveying them to said wrapping means and banding unit successively and reassembling the wrapped and banded cigars in the original relative relation in a solid row.

57. In a machine for wrapping cigars, the combination with means for wrapping cigars, said means being operative to support a wrapper in horizontal position, of a banding unit for banding the wrapped cigars said unit being operative to support a band in horizontal position, and mechanism for conveying the cigars to said wrapping means and banding unit successively and lifting them vertically to enfold in the horizontally supported wrapper and band whereby the margins of the wrapper and band will be lapped on the bottom face of the cigar.

58. In a machine for wrapping cigars, the combination with a banding unit for banding cigars, of means for wrapping cigars, and mechanism for conveying the cigars to said banding unit and wrapping means successively and delivering the wrapped and banded cigars in the same relative position in which they were delivered to the banding unit.

59. In a machine for wrapping cigars, the combination with means for wrapping cigars while advancing them in a rectilinear course with a translatable motion, of mechanism acting to separate cigars from a solid row and convey them with a translatable motion to and from said wrapping means and deliver them vertically in separate relation to said means, said mechanism including traveling grippers.

60. The combination with an endless guide belt, of endless forwarding belts below said guide belt and extending beyond the latter and adapted to forward a row of cigars sidewise in spaced relation underneath the guide belt, means for intermittently driving said guide and forwarding belts in synchronism, a device for pressing the guide belt into engagement with the tops of the cigars therebelow while said guide and forwarding belts are being driven and releasing the guide belt while said belts are idle, a device engaging the leading cigar in said row at a position beyond the guide belt and moving forward therewith but at a speed less than that of the forwarding belt whereby the cigars will accumulate in solid formation beyond the guide belt and rolling of the leading cigar will be prevented, and means for pressing the cigar next to the leading one down upon the forwarding belts while the latter are idle.

61. The combination with an endless guide belt, of endless forwarding belts below said guide belt and extending beyond the latter and adapted to forward a row of cigars sidewise in spaced relation underneath the guide belt, means for intermittently driving said guide belt and forwarding belts in synchronism, a device for pressing the guide belt against the tops of cigars therebetween while said guide and forwarding belts are being driven and releasing the guide belt while said belts are idle, a device engaging the leading cigar in said row at a position beyond the guide belt and moving forward therewith but at a speed less than that of the forwarding belt, whereby the cigars will accumulate in solid formation beyond the guide belt and rolling of the leading cigar will be prevented.

62. The combination with an endless guide belt, of endless forwarding belts below said guide belt and adapted to forward a row of cigars sidewise underneath the guide belt, means for intermit- 5  
tently driving said guide belt and forwarding belts in synchronism, a device for pressing the guide belt against the tops of the cigars therebelow while the guide belt and forwarding belts are being driven and releasing the guide belt while 10  
said belts are idle and mechanism for removing the leading cigar from said row while said guide and forwarding belts are idle and the guide belt has been released.

63. The combination with opposed endless traveling forwarding members between which cigars 15  
are gripped and forwarded in a row, means periodically separating said belts to relieve the forwarding pressure on the cigars, and mechanism for removing the leading cigar from said row 20  
while the members are separated.

64. A combined cigar wrapping and banding machine comprising means for wrapping and

banding cigars individually while advancing them in a rectilinear course with a translatory motion, and mechanism for removing cigars individually from a solid row wherein they are arranged in side by side contacting relation and delivering 5  
them to said means with the same edgewise disposition and the same face up as they had in said row.

65. A combined cigar wrapping and banding machine comprising means for wrapping and 10  
banding cigars individually while advancing them in a rectilinear course with a translatory motion, mechanism for removing cigars individually from a solid row wherein they are arranged in side by side contacting relation and delivering them to 15  
said means with the same edgewise disposition and the same face up as they had in said row, and a device for removing the wrapped and banded cigars from said means and reassembling them in a solid row with the same edgewise disposition 20  
and the same face up.

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