Dec. 18, 1934. J. VAN BUREN 1,984,850

WRAPPING MACHINE

Filed March 27, 1933 6 Sheets-Sheet 1

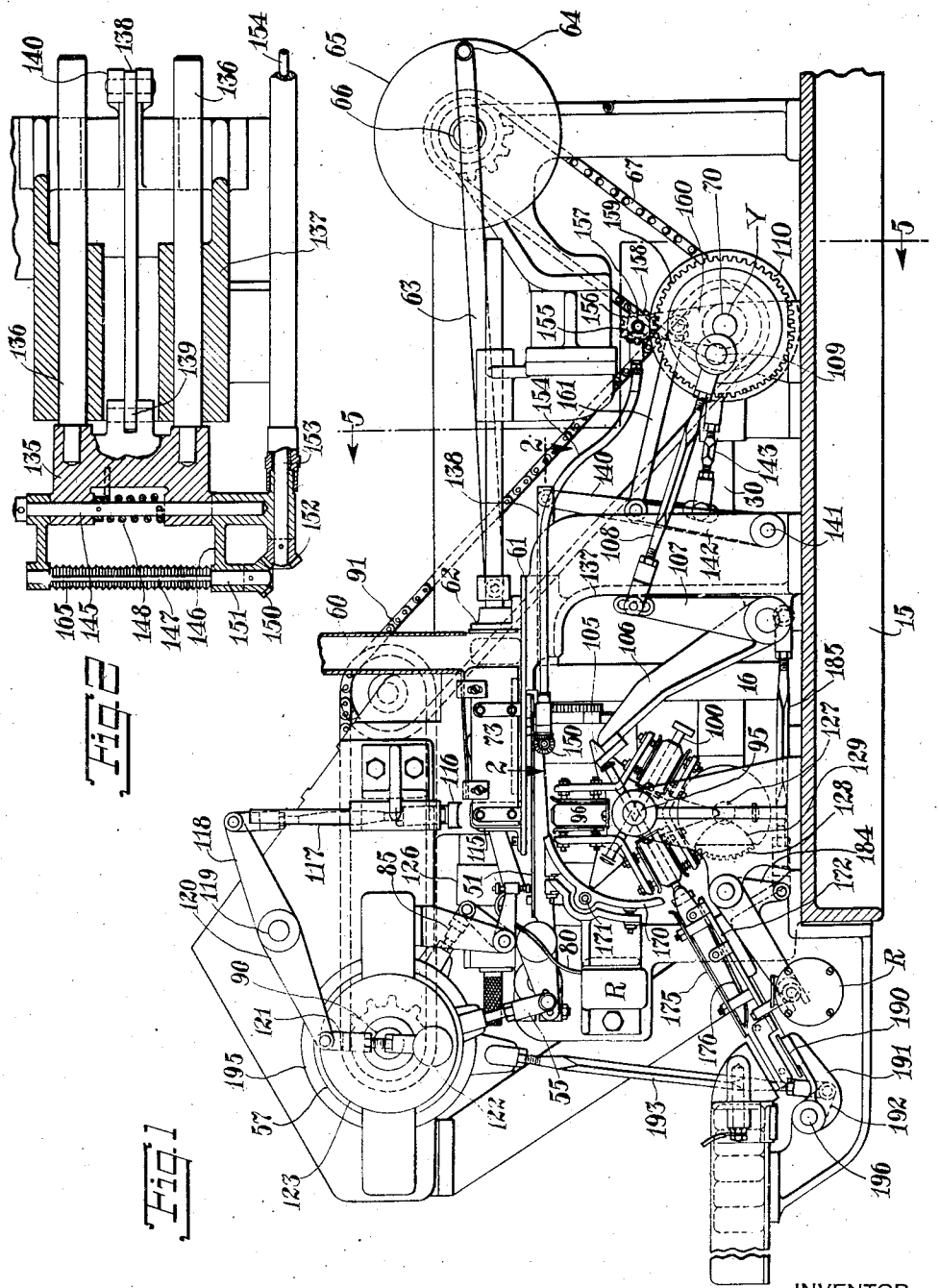

Fig 2

Fig 1

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Filed March 27, 1933 6 Sheets-Sheet 2

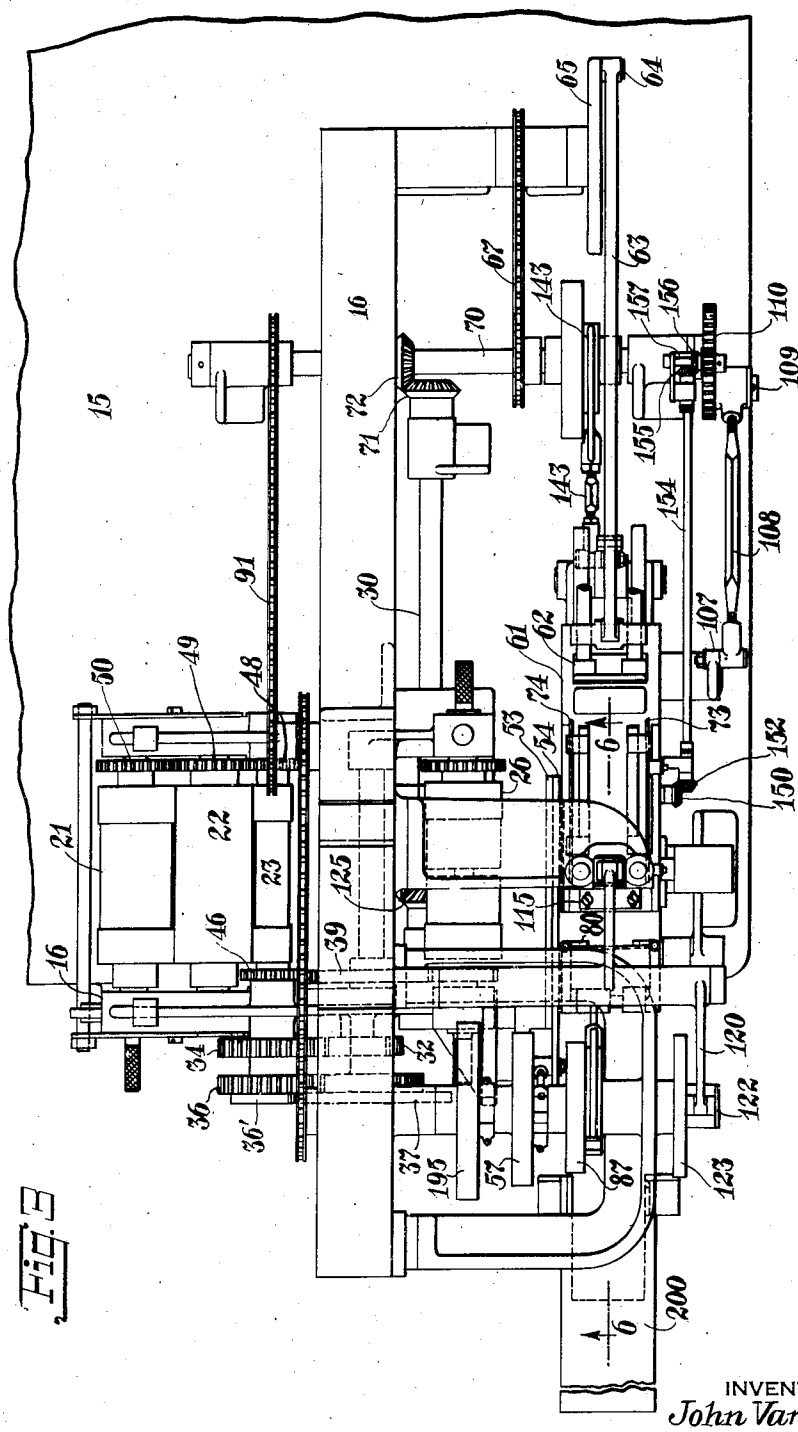

Fig. 3

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Filed March 27, 1933. 6 Sheets-Sheet 3

Fig. 3

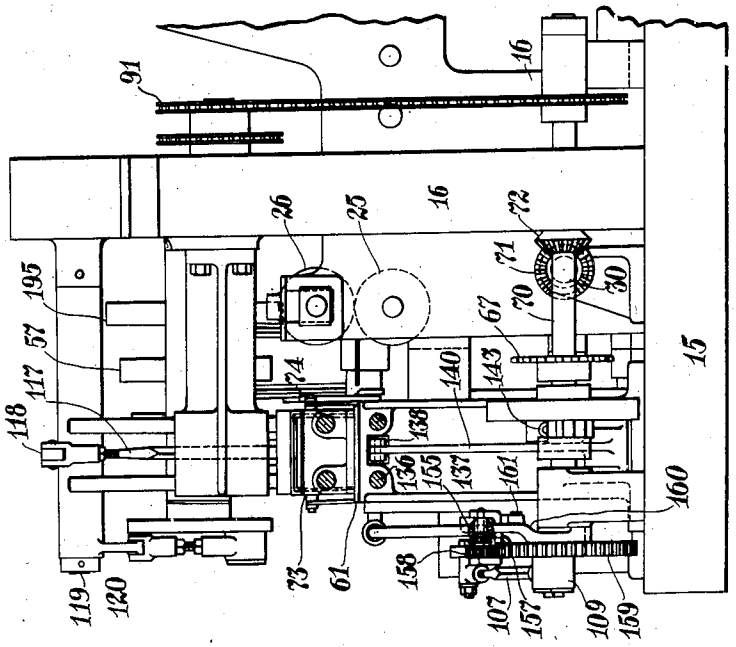
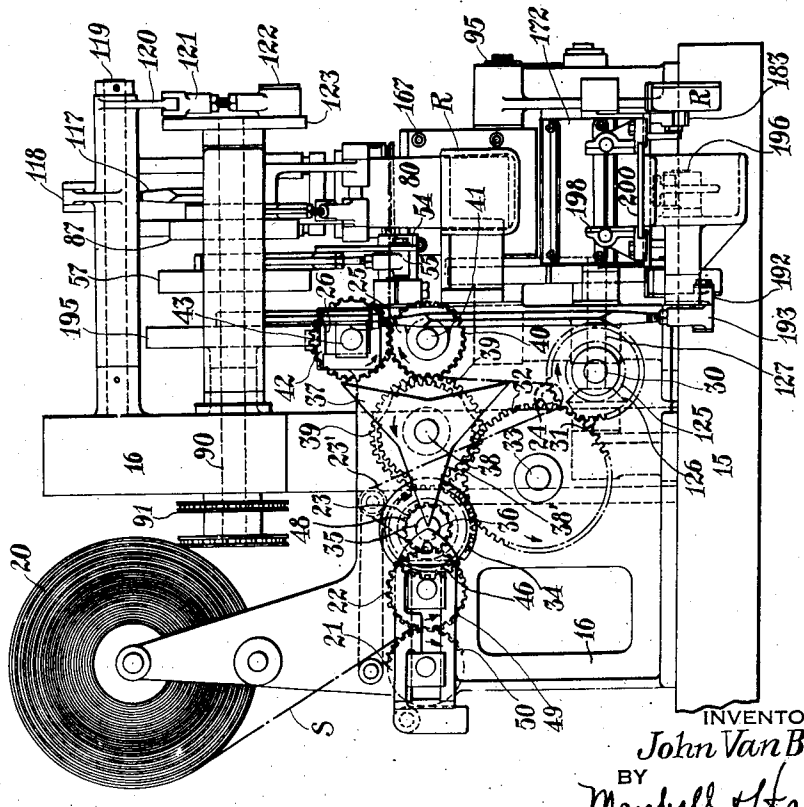


Fig. 4



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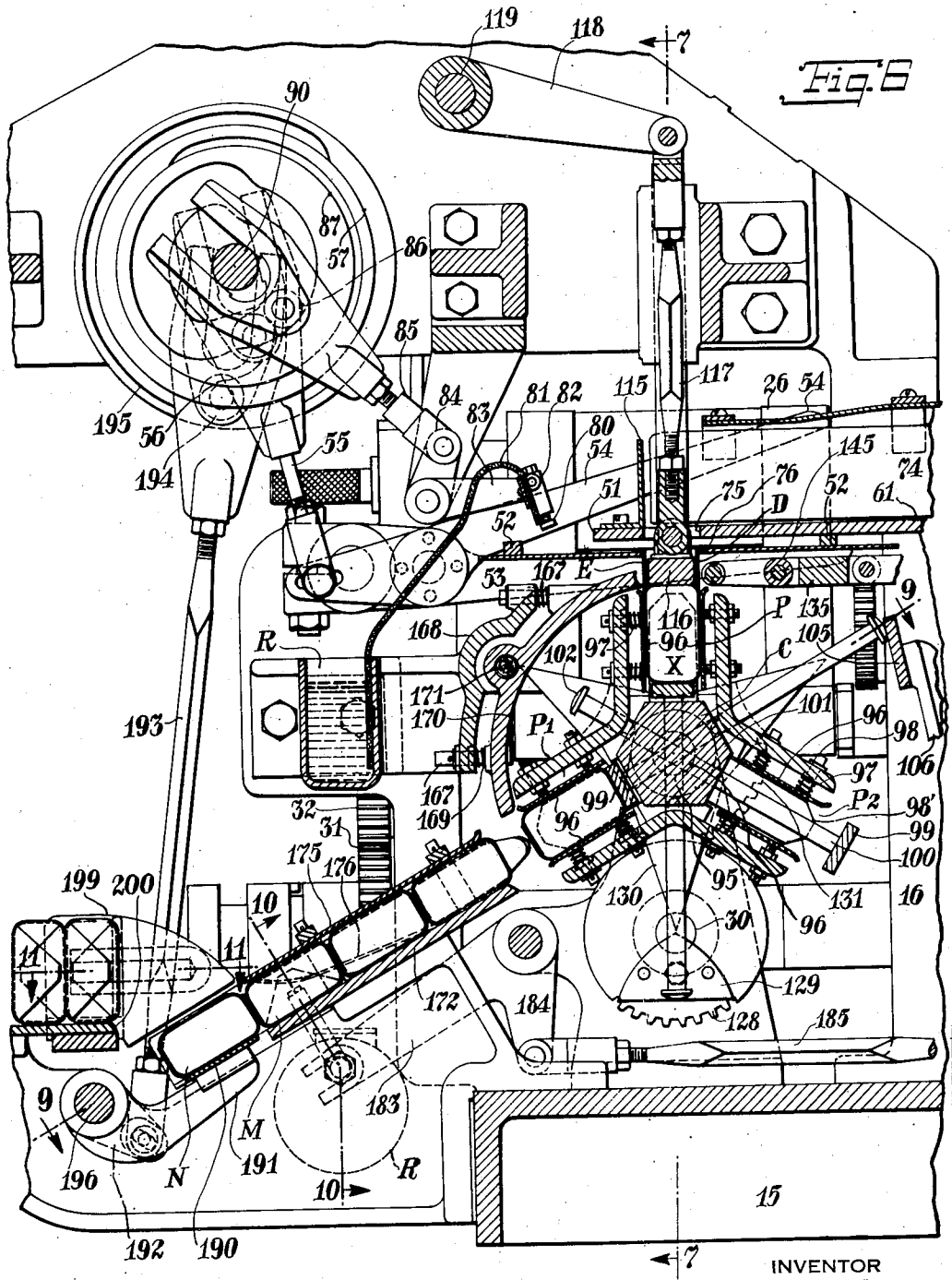
WRAPPING MACHINE

Filed March 27, 1933 6 Sheets-Sheet 4

Fig. 6



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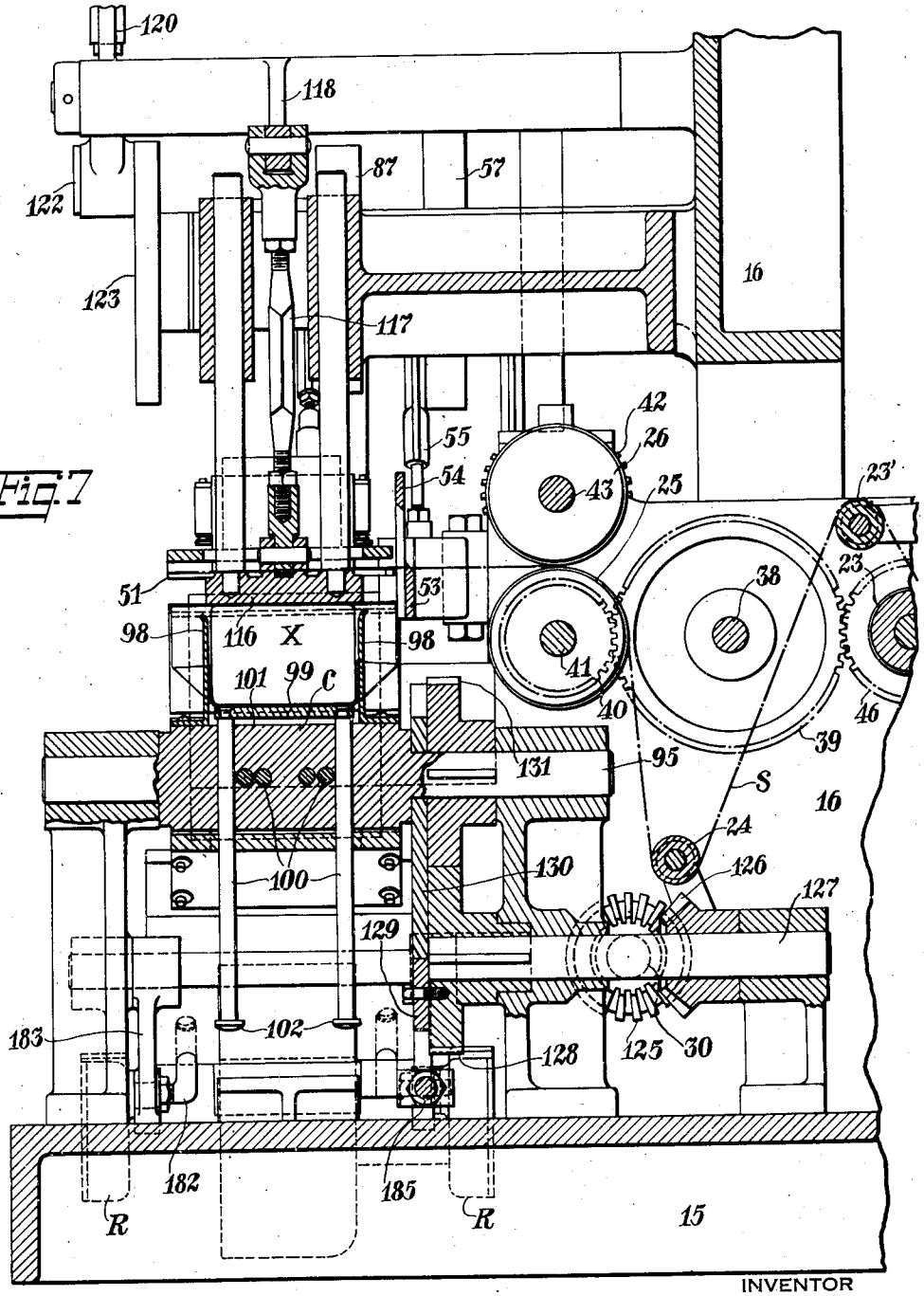
Filed March 27, 1933. 6 Sheets-Sheet 5

Fig. 7



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WRAPPING MACHINE

Filed March 27, 1933 6 Sheets-Sheet 6

Fig. 8

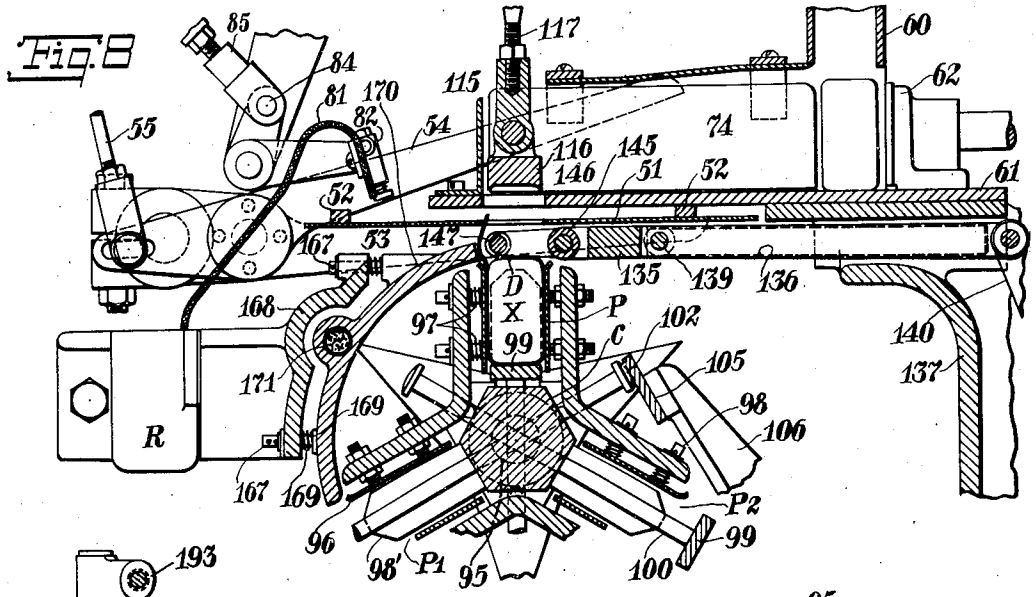


Fig. 9

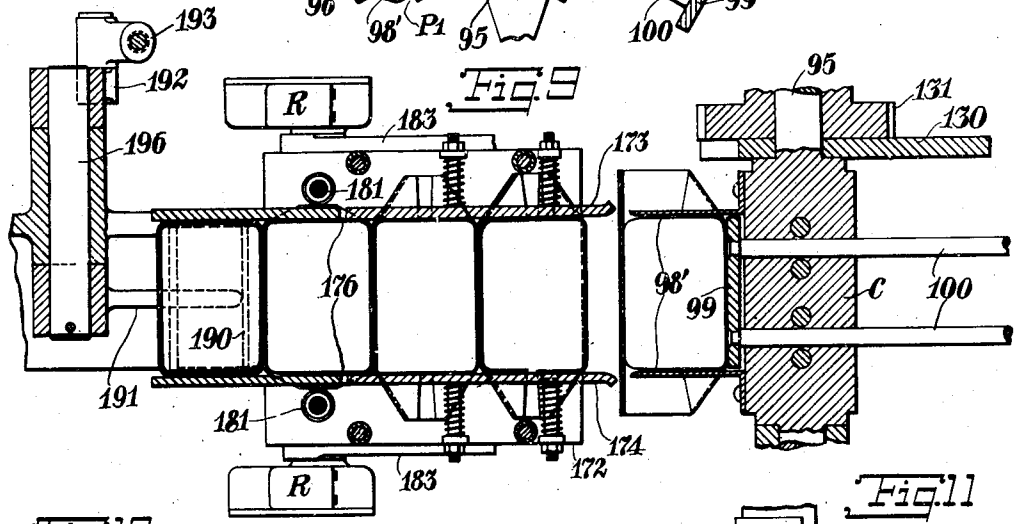


Fig. 10

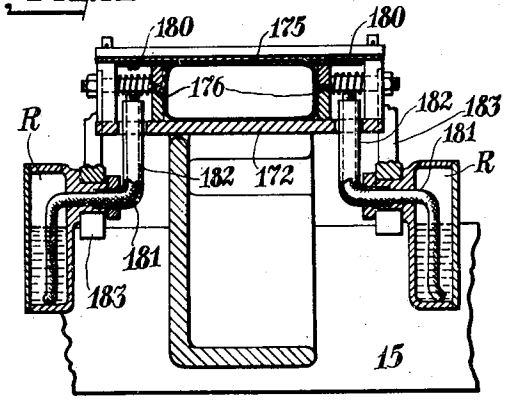
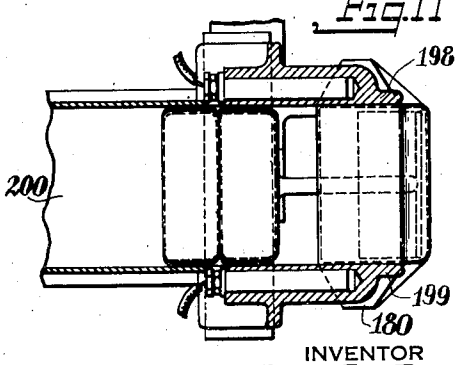


Fig. 11



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Patented Dec. 18, 1934 1,984,850

UNITED STATES PATENT OFFICE

1,984,850

WRAPPING MACHINE

John Van Buren, Brooklyn, N. Y.

Application March 27, 1933, Serial No. 663,077

2 Claims. (Cl. 93—7)

This invention relates to wrapping machines and particularly to a machine for wrapping articles, such as cakes of soap, in wrappers of thin, preferably transparent material, known in the trade as cellophane.

Material such as that mentioned is difficult to handle in wrapping machines since it is thin and tends to slip or unwrap unless it is firmly held in position during the folding operation.

This invention has for its salient object to provide a machine adapted for wrapping articles in relatively thin material, such as cellophane, and so constructed and arranged as to fold and secure the wrapper smoothly and tightly around the article to be wrapped.

Further objects of the invention will appear from the following specification taken in connection with the drawings which form a part of this application, and in which

Fig. 1 is a front elevational view of the machine constructed in accordance with the invention;

Fig. 2 is a sectional elevation on an enlarged scale taken substantially on line 2—2 of Fig. 1 and showing part of the folding mechanism;

Fig. 3 is a top plan view of the machine shown in Fig. 1;

Fig. 4 is an end elevational view of the machine showing the feeding mechanism for the cellophane;

Fig. 5 is a vertical sectional elevation taken substantially on line 5—5 of Fig. 1;

Fig. 6 is a vertical sectional elevation on an enlarged scale taken substantially on line 6—6 of Fig. 3, showing the article feed and folding mechanism;

Fig. 7 is a sectional elevation taken at right angles to Fig. 6 and substantially on line 7—7 of Fig. 6;

Fig. 8 is a detail sectional elevation showing the mechanism for folding the wrapper around the upper edge of the article, one end being folded across the edge and the other end being shown in the position taken just prior to the folding thereof across the first end;

Fig. 9 is a sectional elevation taken substantially on line 9—9 of Fig. 6, showing one article or cake in position to be fed from a pocket to the folding chute;

Fig. 10 is a detail sectional elevation taken substantially on line 10—10 of Fig. 6 and showing particularly the devices for placing the cellophane solvent or softening liquid on the outwardly extending end flaps; and

Fig. 11 is a sectional elevation taken substantially on line 11—11 of Fig. 6 and showing the articles disposed between the heating plates by which the last end folds are made.

The invention briefly described consists of a machine for placing cellophane wrappers around articles, such as cakes of soap, which have preferably previously been wrapped in paper, the paper wrappers, however, not being secured or glued. The cakes are fed from a suitable chute into radially disposed pockets in a rotatable carrier. The cellophane sheets are fed into the path of the cakes and are folded around the wrapped cake as the cake is fed into the pocket. While the cake and cellophane sheet are disposed in the pocket the wrapper is folded around the cake and the ends of the wrapper are folded across the outer edge thereof and also tucks are placed in the ends at the inner edge portions thereof. The carrier is rotated from receiving to discharging position and the cakes and wrapper are discharged into the folding chute in which the other end tucks are formed in the wrapper and one set of end flaps are folded across the ends of the cake. The other end flaps extend outwardly from the ends of the cake and are moistened by a suitable cellophane softener or solvent. The wrapped cakes are then fed upwardly between heating plates and during this movement the remaining end flaps or outer flaps are folded across the inner end flaps and are secured thereto. In addition to rendering the end flaps adhesive one edge of the wrapper is also softened so that when it is folded it will be secured to the inner end.

Further details of the invention will appear from the following description.

In the particular embodiment of the invention illustrated in the drawings the machine comprises a plurality of mechanisms, namely, means for feeding and severing the cellophane sheets, means for feeding the previously wrapped cakes and cellophane wrappers into the radial pockets in the carrier, means for folding the cellophane wrappers around the articles, means for feeding the articles and wrappers into and through the folding mechanism in which the wrapping is completed with the exception of the outer end flaps, and means for discharging the wrapped articles through a guideway between heated plates onto a table or platform.

Cellophane feeding and cutting mechanism

This mechanism is particularly illustrated in Figs. 3 and 4. The machine is mounted on a base 15 and is carried by a suitable frame work 16 which extends upwardly therefrom. Moisture

proof cellophane is preferably utilized and the cellophane sheet S is led from a supply roll 20 between a pair of feed rolls 21 and 22. The sheet after passing between the rolls 21 and 22 is brought around a roll 23 and over a suitably tensioned idler roll 23' and from there passes downwardly (see Fig. 7) around an idler 24 and is led upwardly therefrom between feed rolls 25 and 26.

The feed rollers just described are driven intermittently in the following manner: the main drive shaft of the machine which is driven in any suitable manner is shown at 30 and is provided with a gear 31 which meshes with a gear 32 carried by a shaft 33. The gear 32 meshes with a gear 34 rotatably carried by the shaft 35 on which roll 23 is mounted and this gear has secured thereto a gear 36 having a lug 36' which is adapted to engage a star wheel 37 mounted on a shaft 38. Gear 36 has interrupted gear teeth and as the gear 34 is rotated the lug will intermittently engage the points on the star wheel 37 and the teeth on gear 36 will engage interrupted gear teeth on a gear 38' mounted on the star wheel shaft 38, thus driving the star wheel. The shaft 38 also has secured thereto a gear 39 which meshes with a gear 40 which is secured to the shaft 41 on which the roller 25 is mounted. The gear 40 in turn meshes with a gear 42 on the shaft 43 of the roller 26. Thus, as the star wheel is intermittently rotated the feed rollers 25 and 26 will also be intermittently rotated and will feed the cellophane strip.

The feed rollers 21 and 22 are also intermittently rotated through connections to the star wheel drive in the following manner: The gear 39 on star wheel shaft 38 also meshes with a gear 46 mounted on the shaft 35. The gear 34 is loose on the shaft 35 but the gear 46 is fixed thereto and the shaft, as above stated, has the feed roll 23 secured thereto. The other end of the shaft 35 has secured thereon a gear 48 which meshes with a gear 49 for driving the roll 22 and the gear 49 in turn drives a gear 50 which is connected to the shaft on which the roll 21 is mounted.

From the foregoing description it will be seen that the cellophane feed rolls 21, 22, 23, 25 and 26 will be intermittently operated to feed the strip of cellophane material.

The cellophane strip is fed by the mechanism just described on a table or support 51 (see Fig. 6) between guides 52 and is severed by cutting mechanism comprising a stationary plate 53 and a movable cutter blade 54. The blade 54 is intermittently actuated by a link or pitman 55 which is cam actuated by the coaction of a roller 56 carried by the pitman and a cam 57 by which the roller is controlled and actuated.

Mechanism for feeding cakes and wrapper into folding pockets

The articles, such as cakes of soap, which have been previously enclosed in paper wrappers are disposed in a vertical chute 60 and are fed one at a time along a feed table 61 by a reciprocatable plunger 62. The plunger 62 is driven by a link 63 which is eccentrically pivoted at 64 to a disc 65 carried by a shaft 66. The shaft 66 is driven by a chain and sprocket connection 67 from a shaft 70 which, as shown in Fig. 3, is driven from the main drive shaft 30 by a bevel gear connection 71, 72. The cake with the paper wrapper is fed along the table 61 between side plates 73 and 74 which with the supporting table form a guideway.

The supporting table 51 for the cellophane chute is disposed beneath the table 61 and these tables have alined openings 75 and 76 to permit the cake to be fed downwardly therethrough.

While the cellophane chute is disposed on the table 51 one edge thereof is rendered sticky or adhesive by suitable cellophane modifying or softening liquid, such as ethylene glycol monomethyl ether. This liquid is contained in a tank or receptacle R (see Fig. 6) and is conducted upwardly to an applying strip 80 by means of a wick 81. The strip 80 is mounted in a holder 82 carried by one arm 83 of a bell crank lever, the other arm 84 of the lever being connected to a pitman 85 having a roller 86 disposed in a cam 87. The cams 57 and 87 are both mounted on a cam shaft 90 which may be driven in any suitable manner as, for instance, by a chain and sprocket drive 91 from the shaft 70. The cam 87 is so designed that after the cellophane sheet has been disposed on the table 51 the moistening strip 80 will be depressed, thus softening the edge of the sheet. This takes place prior to the feeding of the article and cellophane wrapper into the folding mechanism which will now be described. The cellophane wrapper is partially folded around the cake in pockets P, P' and P^2 which are radially disposed on a carrier C which is mounted for intermittent rotation on a shaft 95. The side walls of the pockets are formed by resilient plates 96 which are pressed inwardly by springs 97 which surround studs 98 by which the plates are carried. The pockets are also formed with end plates 98' by which the wrapper is tucked adjacent the lower edge of the cake when the cake and wrapper are fed into the pockets. The inner walls of the pockets are formed by plates or bars 99 which are carried by rods 100 which in turn are slidably mounted in a central block 101 of the carrier C. There is sufficient friction between the rods and the block to hold the rods in the various positions to which they are adjusted or in which they are placed. Each of the rods has formed on its outer end a head 102, the heads being intermittently engaged by a plate or bar 105 carried by one arm 106 of a bell crank lever, the other arm 107 of the lever being actuated by a pitman 108 which is connected by a pin 109 to a gear 110 mounted on the shaft 70.

As above stated, the cakes with the paper wrappers are fed along the table 61 by the plunger 62. The ends of the articles are engaged by the walls 73 and 74 which are spring pressed inwardly and extend to a position along the ends of the opening 75 in the table 61. The forward feeding movement of the article is limited by an end stop 115. When the article has reached this position it is fed downwardly into one of the pockets by means of a reciprocatable plunger 116 which is carried by the lower end of a plunger rod 117 which in turn is mounted on the end of an arm 118 carried by a shaft 119. The arm 118 forms a part of a lever, the other end of the lever being formed by an arm 120 which is connected to a pitman 121. The pitman is connected at 122 to a disc 123 mounted on the shaft 90.

From the foregoing description it will be seen that as the plunger 116 is moved downwardly it will engage the upper edge of the wrapped cake and will force the cake downwardly into engagement with the cellophane wrapper and will then force the cellophane wrapper and article into one of the pockets P, P' or P^2. In Fig. 6 the pocket P is disposed in receiving position and

the cake X and the cellophane wrapper are disposed in this pocket with the free ends D and E of the wrapper extending upwardly. As the cake and wrapper are fed into the pocket the bottom edge of the cake will engage the end wall or plate 99 on one set of the rods 100 and the rods and plate will move inwardly through the axis of the carrier C as the article is fed into the pocket. During this movement the ends of the lower edge of the wrapper will be tucked, as shown particularly in Fig. 9.

After the plunger 116 has moved upwardly from the position shown in Fig. 6 the carrier C and the pockets will be rotated in the following manner: The shaft 30 has mounted thereon a bevel gear 125 which meshes with a bevel gear 126 carried by a shaft 127. This shaft has also secured thereto a gear sector 128 and a lug 129. The shaft 95 on which the carrier C is mounted has secured thereto a star wheel 130 and a plurality of gear sectors 131 intermediate the star points. As the shaft 30 is rotated the lug 129 will coact with the star points to rotate the shaft 95 and carrier C and the gear sector 128 will coact with one of the gear sectors 131. These parts are so timed that the carrier C will remain stationary for a sufficient period for one of the parts to receive the article and cellophane wrapper and will thereupon be rotated through 120° to the second position in which the pocket P' is located on Fig. 6. The carrier will then remain stationary for a sufficient period of time for the actuation of the plunger rods 100 by the plate 105 carried by the bell crank lever 106, 107, this operation causing the wrapped article to be discharged from the pocket P' into the folding mechanism hereinafter described.

After the plunger 116 has withdrawn the inner end fold around the upper edge of the cake is made. This is accomplished by the structure particularly illustrated in Figs. 2, 6 and 8. As shown in Fig. 2, a frame or block 135 is carried by rods 136 which are slidably mounted in a stationary frame 137. A link 138 is connected at 139 to the block 135 and at its rear end is connected to a lever 140 which is pivoted at 141 on a fixed pivot. The lever arm 140 is connected to an arm 142 which in turn is connected by a pitman 143 to an eccentric mounted on the shaft 70. As the shaft 70 rotates, therefore, the block 135 will be reciprocated back and forth.

A spindle 145 is mounted in the block 135 and carries a U-shaped frame 146 in the outer end of which is rotatably mounted a circumferentially grooved roller 147. A spring 148 surrounds the spindle 145 and tends to rotate or tilt the U-shaped frame 146 downwardly. A bevel gear 150 is secured to one end of the roller shaft 151 and is driven by a gear 152 carried by a spindle 153 which in turn is driven by a flexible shaft 154. The other end of the flexible shaft has mounted thereon a bevel gear 155 which meshes with a bevel gear 156 carried by a spindle 157 on which is mounted a gear 158 which is driven by a gear 159 carried by the shaft 70. The spindle 157 is carried by an arm 160 which is pivoted on the shaft 70 and is connected by a link 161 to the arm 142.

The roller 147 is thus positively driven and in such a direction as to hold the free end D of the cellophane wrapper tightly against the upper edge of the cake. In order to assist in frictionally engaging the wrapper the roll 147 is provided with one or more longitudinal strips 165. The roller is circumferentially grooved in order to prevent too much of the surface of the roller from engagement with the under moistened surface of the end E of the wrapper when this end is folded downwardly onto the folded end D.

The frame 135 is moved to the left viewing Fig. 8 to the position shown in this figure, thus folding the free end D of the wrapper tightly against the article or inner wrapper which has already been placed thereon. When the parts have reached the position shown in Fig. 8 the carrier C will rotate to 120° to position the pocket P in the location of pocket P', as shown in Fig. 6. During this movement of the carrier the end E of the wrapper will be folded downwardly across the folded end D. The engagement of the rotating roller 147 with the folded end D will hold this end tightly against the article as the end E is folded down against the end D. This last fold is formed by a curved plate 170 which is heated and is curved on an arc having the axis of rotation of the carrier C as its center. The plate 170 may be heated in any suitable manner, as by a heating coil 171 shown in Fig. 8. The plate is carried by rods 167 which are slidably mounted in a frame 168 and are spring actuated toward the carrier by springs 169 which encircle the rods and are disposed between the frame 168 and the plate 170.

When the carrier has been rotated to 120° the ends D and E will be folded across the edge of the cake and the outer end E will be secured to the end D.

The articles and the wrappers therearound are then discharged into a guideway which is provided with means to place the other end tucks in the wrapper, form the end flaps and fold one set of flaps at each end across the end of the cake. This mechanism is illustrated particularly in Figs. 6 and 9. The folding mechanism comprises a bottom 172, side walls 173 and 174 and a top plate 175. The side walls 173 and 174 are provided with longitudinally extending curved slots 176 which receive the bottom end flaps viewing Fig. 6 and fold these flaps across the ends of the cake as the cake moves downwardly to the position of the cake M shown in Fig. 6. As the article enters the folding guideway the ends along the lower edge of the cake are tucked by the side walls 173 and 174. As these tucks are placed in the wrapper it will be obvious that end flaps are formed in alinement with each face or in alinement with the bottom and top surfaces of the cake. The end flaps along the bottom surfaces of the cake are folded by the guideway slots 176 across the ends of the cake and the other end flaps project laterally in alinement with the top surfaces of the cake. When they reach the position of the cake M in Fig. 6 cellophane modifying liquid or softening liquid is placed on the end surfaces of the projecting end flaps. This is accomplished by means of the mechanism shown particularly in Figs. 6 and 10. In this figure the end flaps 180 are shown projecting laterally beneath the top plate 175. A reservoir R of solvent liquid is disposed at each side of the guideway and wicks 181 extend from the reservoir upwardly through tubes 182. The reservoir tubes and wick are carried by arms 183 of bell crank levers, the other arms 184 of the levers being connected to a link 185, the other end of the link being connected to a crank formed on the spindle of the bell crank lever 106, 107.

After the wrapped articles have had their outwardly projecting flaps moistened in the manner just described they move downwardly from

the position shown at M to the position shown at N in Fig. 6 in which latter position they are disposed in engagement with and are supported on a plate 190 which is carried by an arm 191 of a bell crank lever, the other arm 192 of the lever having connected thereto a pitman 193 having a roller 194 which is actuated by a cam 195.

After a wrapped cake has reached the position shown at N it is moved upwardly through an arc about the axis 196 of the bell crank lever 191, 192. During this movement the wrapped articles pass between heated plates 198, 199 and the outer end flaps 180 are folded against the inner end flaps and are secured thereto. The articles are moved between the plates to a position on a supporting platform 200 and as successive articles are deposited on the platforms the articles will move along the platform.

The machine above described operates as follows: The articles or cakes with the paper wrappers thereon are fed along the support 61 to a position above the opening 75 in the support and are thereafter fed downwardly by the reciprocation of the plunger 116. The cellophane sheet is fed from the supply roll 20 by the intermittently operated feed rolls to the supporting table 51 and is severed and cellophane modifying or solvent liquid is applied to one edge thereof by the applying strip 80. The plunger 116 forces the wrapper and article into one of the pockets, such as the pocket P shown in Fig. 6, leaving the ends D and E of the wrapper projecting upwardly. The plunger then withdraws and the end D is folded against the upper edge of the cake or article by the movement of the roller 147 from the position shown in Fig. 6 to the position shown in Fig. 8. Thereupon the carrier will rotate through 120° to the position of the pocket P' in Fig. 6. The wrapper will then be folded around the article and end tucks will be formed at the inner ends thereof. The wrapper and article will then be discharged from the carrier by the movement of the rods 100 into the folding mechanism. The other set of end tucks will first be placed in the wrapper forming end flaps in alinement with the bottom and top surfaces of the cake. The bottom end flaps will be folded across the ends of the cake by the slots 176 and the upper end flaps will project laterally, as shown in Fig. 10. The inner surfaces of these flaps are then moistened and the wrapped cake is positioned, as shown at N in Fig. 6, and is thereafter fed upwardly between the sealing plates 198 and 199 to the discharge platform 200. During the movement of the carrier through 120° from the position of the pocket P to the position of the pocket P' shown in Fig. 6, the edge E will be folded across the folded edge D and the rotation of the roll 147 in engagement with the folded end D will hold this end tightly against the upper edge of the cake.

Although one specific embodiment of the invention has been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. A wrapping machine comprising means for feeding an article to be wrapped, means for feeding a wrapper into the path of movement of the article, a movably mounted pocket for receiving the article and wrapper, reciprocatable, positively rotated means for folding one end of the wrapper across the outer edge of the article when the article is in the pocket, means for moving the pocket after said end has been folded, and relatively stationary means engageable with the outer end of the wrapper for folding said end across the fold end as the pocket and article are moved, said positively rotated means maintaining the wrapper fold tight as the outer fold is made by said stationary means.

2. A wrapping machine comprising means for feeding an article to be wrapped, means for feeding a wrapper into the path of movement of the article, a movably mounted pocket for receiving the article and wrapper, reciprocatable, positively rotated means for folding one end of the wrapper across the outer edge of the article when the article is in the pocket, means for moving the pocket after said end has been folded, and means engageable with the other end of the wrapper for folding said end across the fold end as the pocket and article are moved, said positively rotated means maintaining the wrapper fold tight as the outer fold is made by said stationary means.

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