June 16, 1931. W. W. TRINKS ET AL 1,810,690

WINDING MACHINE

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Fig. 8

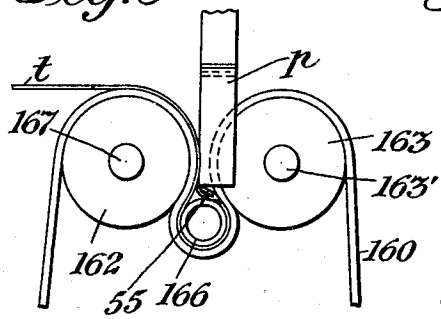



Fig. 1




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WINDING MACHINE

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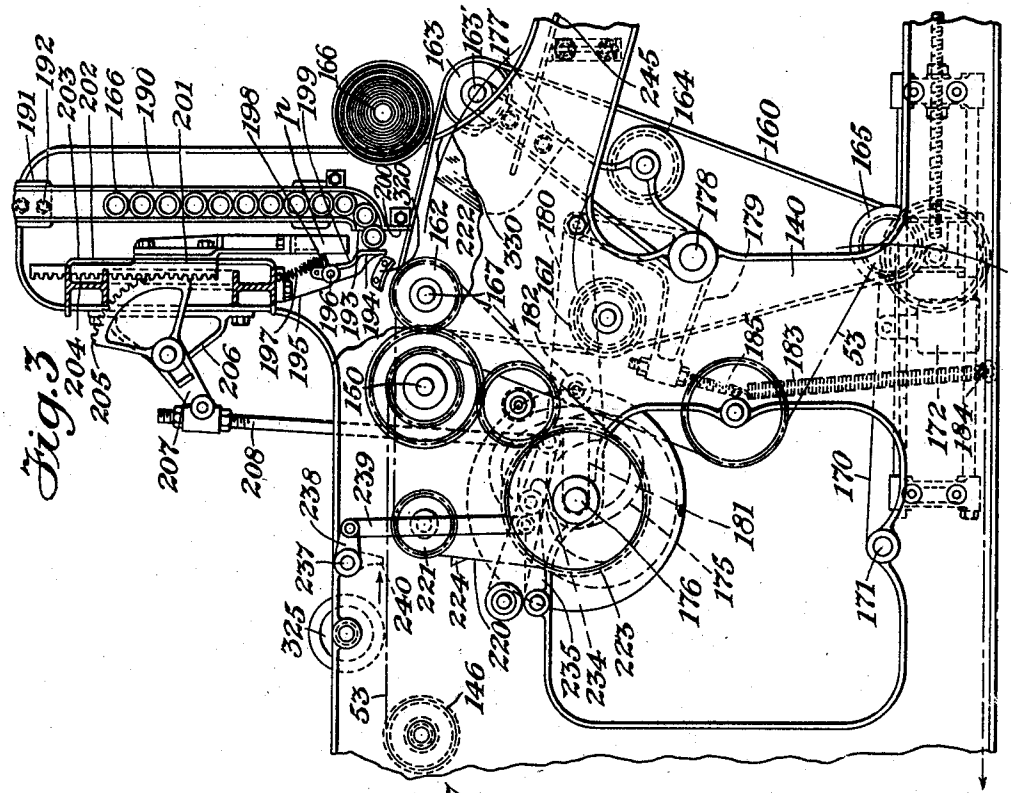


Fig. 3

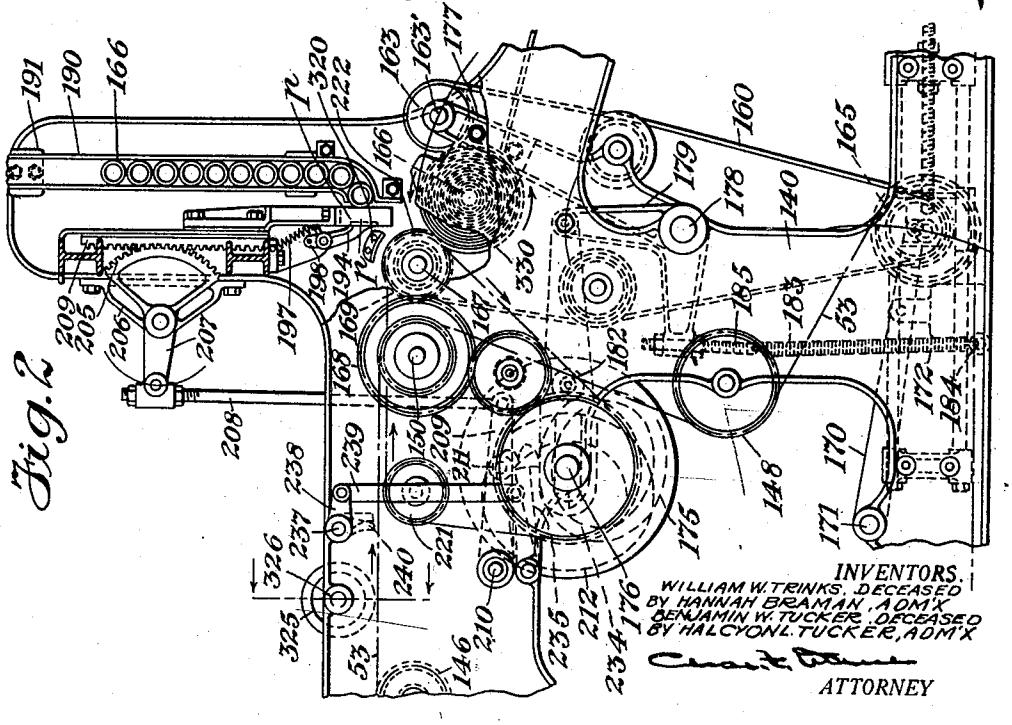


Fig. 2

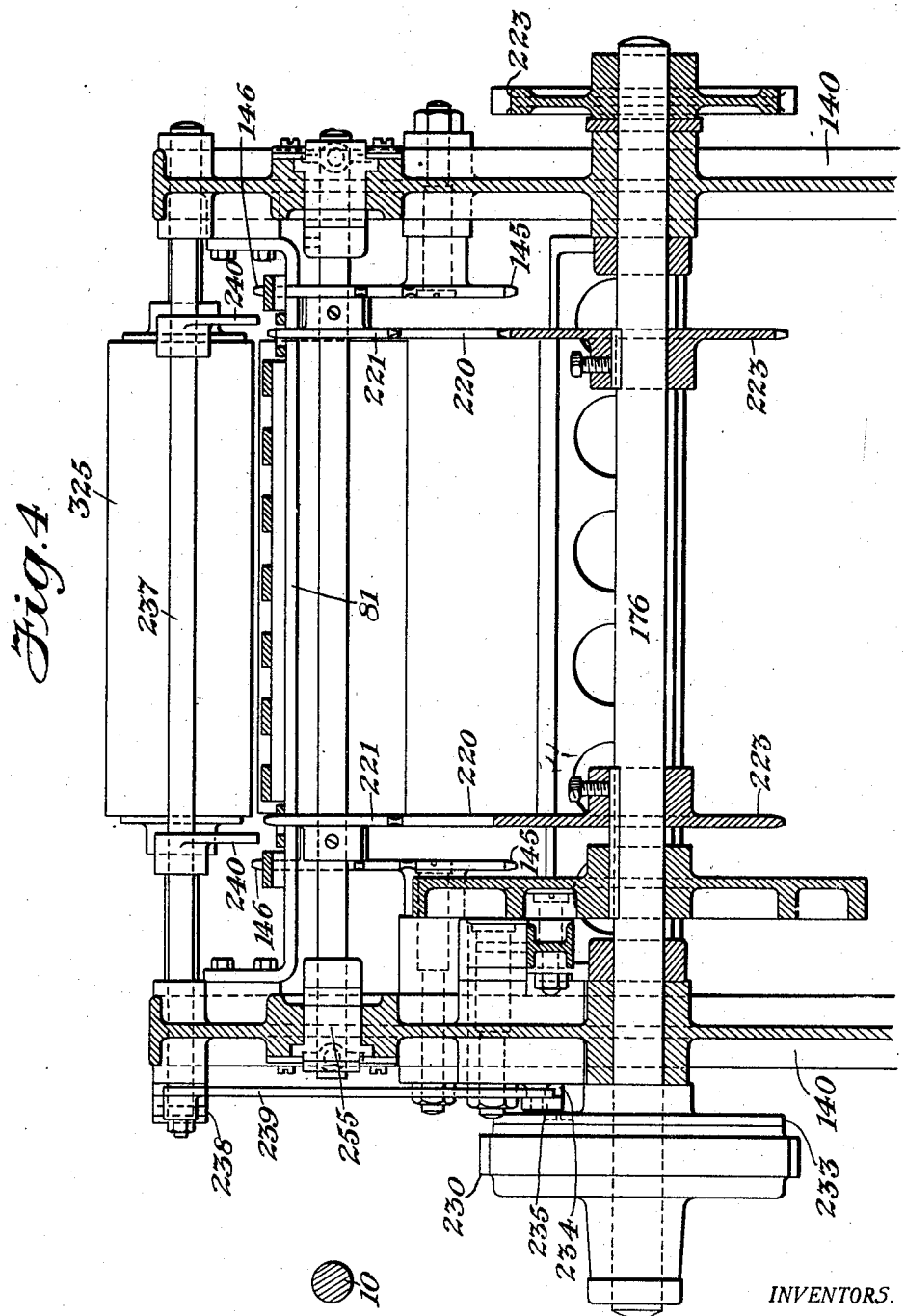
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WINDING MACHINE

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Fig. 4




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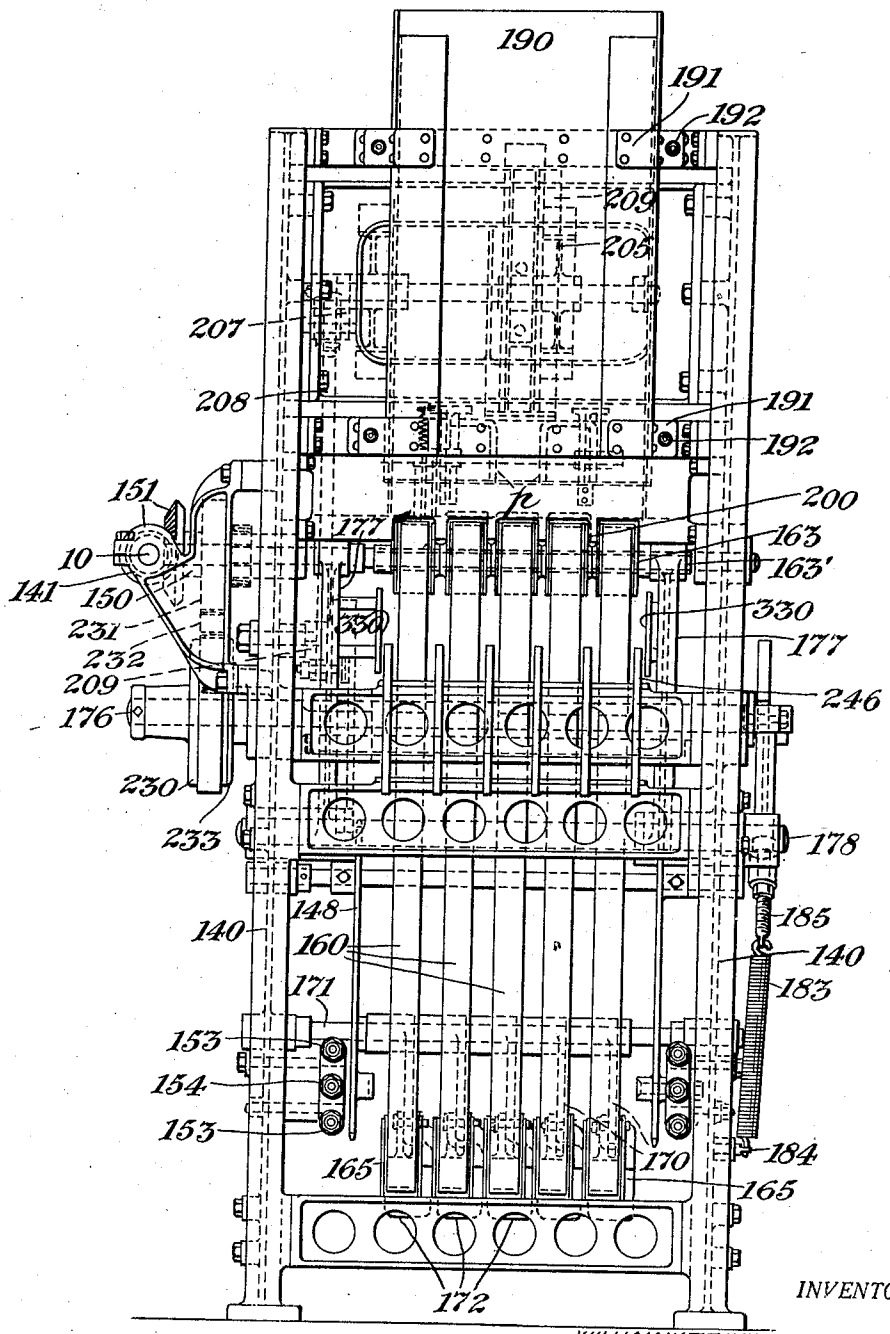
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WINDING MACHINE

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*Fig. 5*




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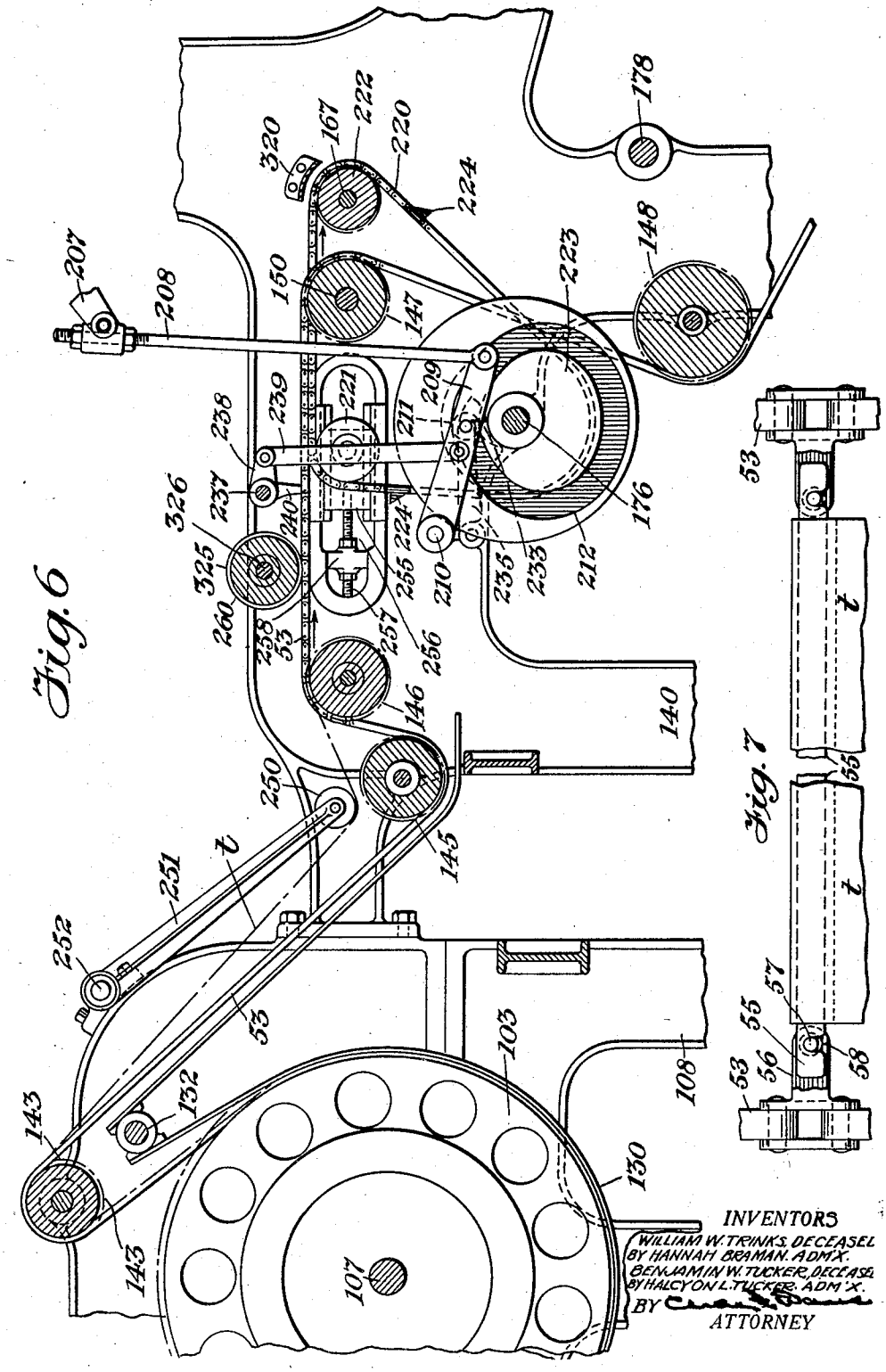
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WINDING MACHINE

Original Filed Nov. 21, 1921 5 Sheets-Sheet 5



Patented June 16, 1931 1,810,690

# UNITED STATES PATENT OFFICE

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## WINDING MACHINE

Original application filed November 21, 1921, Serial No. 516,806. Patent No. 1,778,777, dated October 21, 1930. Divided and this application filed August 1, 1930. Serial No. 472,426.

This invention relates to a winding machine adapted generally for winding up lengths of material into roll form, but more particularly adapted for use in connection with towel laundering machines to receive laundered towels from the latter, automatically wind up the same, preferably on a mandrel, and thereafter discharge the rolls of cleaned towelling ready for immediate distribution and use. Such special use of the winding machine in connection with, or as a part of, a laundering machine, is illustrated and described in detail in pending application Serial No. 516,806 now Patent No. 1,778,777, granted October 21, 1930, of which this application is a division.

The invention has for its main object the provision of a simple and effective winding machine operative in the way referred to, and it comprises the novel construction and combinations of parts as hereinafter described and claimed and as illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation, partly in section, of a winding machine embodying the present invention.

Figs. 2 and 3 are similar views, but showing the changed positions of the parts at different times in the operation of the machine.

Fig. 4 is an enlarged sectional detail on the line 4—4 of Fig. 1.

Fig. 5 is an end elevation of the machine looking from the right in Fig. 1.

Fig. 6 is an enlarged detail, in side elevation and section, showing the rear end of a laundering machine, and the means for releasing the leading end of a towel from the feed chains, which have carried the towel through the laundering machine, and delivering it to the winding machine.

Fig. 7 is a detail showing sections of the feed chains in engagement with the bar which passes through a loop in the end of the towel for detachably connecting the latter with said chains.

Fig. 8 is a detail showing the relation of certain parts of the winding mechanism.

Similar reference characters indicate like parts in the several figures of the drawings.

As hereinbefore referred to, the machine of the present invention is disclosed in pending application Serial No. 516,806 as part of a towel laundering machine for receiving the leading ends of long lengths of towels as they come from the laundering devices and rewinding them in roll form upon mandrels and thereafter discharging the rolls of cleaned towelling ready for immediate distribution and use. In view of the fact that the present application is filed as a division of the aforesaid pending application, the machine will be herein described as a towel rewinding machine although it will be understood that it may be utilized for winding up into roll form strips of material of any kind and for any purpose.

As a convenient means for feeding or carrying the towels through the laundering devices and from thence to the rewinding mechanism a pair of sprocket chains or belts are provided, indicated at 53, 53, which are spaced apart a distance slightly greater than the width of the towel and mounted on a series of suitably supported sprocket wheels arranged to direct the towel in its proper path through the machine. These chains may be driven from any suitable source of power, the same in the present case serving only as a means for feeding or delivering the towels to the winding machine.

As a convenient means for effecting detachable connection of the towel, indicated at *t*, with the feeding chains, said towel is provided with a loop, as shown in Fig. 7, through which is passed a bar 55 with its ends projecting slightly beyond the opposite edges of the towel for connection with the feed chains, these latter being provided at predetermined points in their lengths with inwardly projecting arms 56 having pins 57 for engaging the ends of the towel bar within notches 58 therein, as shown.

In Fig. 6 is shown a mangle drum 103 carried by a shaft 107 journalled in a frame 108, this drum constituting the last element of the laundering machine about which the towel is passed by the feed chains prior to its delivery to the rewinding mechanism carried by the frame 140. Secured on one side of this

latter frame is a bearing bracket 141 in which is journalled the rear end of the main drive shaft 10, only a part of which latter is here shown and which may be operated from any suitable source of power.

The feed chains 53, 53, after carrying the towel about the drum 103, next pass about a pair of guide sprocket wheels 143 on the mangle drum, and from thence about several pairs of sprocket wheels on the rewinder frame 140, indicated at 145, 146, 147, 148 and 149, the latter being adjacent the lower part of the frame and from which the chains pass back on their return movement towards the front of the machine. Of these several sprocket wheels on the rewinder frame, all are guides with the exception of those indicated at 147. These latter are mounted on a shaft 150 which is driven from the shaft 10 through bevel gearing 151. As a means for keeping the chains under proper tension, the lower guide wheels 149 are each mounted on a block 152 which is slidably mounted on fixed rods 153—153 carried by the frame 140, and connected with one end of an adjusting rod 154, which is threaded into a fixed plate 155. By turning these adjusting rods to shift the wheel supporting blocks 152 either backward or forward, the operator is thereby enabled to control the slack in the chains and keep the latter under proper working tension.

The towel rewinder as here shown comprises a plurality of endless belts 160 which are mounted on a series of pulleys, such as indicated at 161, 162, 163, 164 and 165, certain of which are adjustable relatively to the others to permit of the upper run of belt between the pulleys 162 and 163 being placed in loop form whereby to provide a pocket to receive and hold a hollow tube or mandrel 166 about which the towel is to be wound, the winding operation being performed by the running of the belts which act through frictional engagement with the tube or mandrel to revolve the same and thereby effect a winding of the towel thereon as the leading end of the towel is fed to said tube in the loop of the winding belts. The winding belts are operated to run continuously, the same being driven from the pulleys 162 which are fixed to a shaft 167 driven from the shaft 150 through gears 168 and 169.

The tube holding loop or pocket in the upper run of the belts is formed at a predetermined time in the operation of the machine, to wit, just prior to the leading end of the towel reaching the belts, by the action of a plunger $p$ which releases a tube from its containing magazine 190 to permit it to drop onto the upper run of belts, and then, by a continued downward movement against the tube, depresses both said tube and the upper run of belts downwardly between the adjacent sets of pulleys 162 and 163, as shown in Figs. 1 and 8. When the tube is thus pressed downward by the plunger $p$ against the upper run of belts to form a loop therein, the pulley 163 is at the same time moved forward towards the adjacent pulley 162, as from the position shown in Fig. 3 to that shown in Fig. 1, in order to cause the belts to closely embrace the tube and thereby more effectively assure the winding of the towel thereon. As the winding operation proceeds following the entry of the leading end of the towel into the winding loop and about the tube therein, the diameter of the rolled towel of course gradually increases, as shown in Fig. 2, thereby making it necessary that the size of the winding loop should correspondingly increase. To provide for such increase in the size of the winding loop by automatically acting means, the shaft of the pulley 165 is mounted on a plurality of lever arms 170 which are pivoted to the frame at 171 and provided with attached weights 172. Such movable support for the pulley 165 automatically permits of any necessary variation in the length of the belt loop while at the same time it maintains the belt under constant tension.

During the winding operation and until the completion of the same, the rollers 163 and plunger $p$ maintain the positions shown in Fig. 1, that is, the rollers 163 remain in their forward position adjacent the rollers 162 to close the mouth of the winding loop and the plunger remains in its lowered position opposite said mouth of the loop; in this way serving to hold the towel in the winding loop of the belts during the winding operation. After the winding operation has been completed the rollers 163 are automatically thrown back and the plunger raised, through the positions shown in Fig. 2 to those shown in Fig. 3, to release the rolled up towel and permit its discharge from the machine. Such operations of the rollers 163 and plunger $p$ are automatically controlled from an intermittently operated clutch controlled shaft 176 in a manner to be presently described.

The lower or tube-engaging end of the plunger $p$ is composed of a plurality of fingers, as shown by dotted lines in Fig. 5, which are so spaced as to permit of their entry between the several rollers 163 on the shaft 163′ when the parts are in the position shown in Fig. 1. One of the functions of the plunger $p$ when in this lowered position, is to assure the towel bar 55 taking one complete turn about the tube in the winding belt at the commencement of the towel winding operation; this being accomplished by the engagement of the plunger with the leading edge of the towel bar when the latter reaches the mouth of the belt loop during its first turn about the tube, as shown in Fig. 8, and thereby holding the bar against the tube at such time

and until it has passed beneath the second wrap of the towel about the tube and is held thereby. Without this holding of the bar against the tube at such time, it would have a tendency to move up into the mouth of the winding belt loop and so prevent or interfere with the proper winding of the towel.

The shifting of the pulleys 163 towards and from the pulleys 162 in the manner and for the purpose described is controlled from a cam 175 on the shaft 176 through the following means: the shaft 163′ carrying the pulleys 163 is mounted in a pair of arms 177—177 fixed to a rock shaft 178 journalled in the frame 140. Secured to this rock-shaft 178 is a bell-crank lever 179, to the vertical arm of which is connected one end of a link 180, which latter at its opposite end has a sliding support on the shaft 176, this being effected by the provision of an elongated slot 181 in the link through which the shaft 176 extends. A roller 182 mounted on this link is held in operative engagement with the peripheral working face of the cam 175 by means of a spring 183 connecting the horizontal arm of the bell-crank 179 with a fixed part, such as the eye-piece 184 on the frame. With this arrangement and combination of parts, a rotating movement of the cam 175 will act, through the link 180 and connected rocking parts 179, 178 and 177, to positively move the pulleys 163 from their inner or closed position shown in Fig. 1, towards their outer or open position, as shown in Figs. 2 and 3, and thereafter control their return movement under the action of the spring 183. For the purpose of keeping the spring 183 under proper tension, its connection with the bell-crank is made through an adjusting screw 185 as shown.

The hollow tubes 166 about which the towels are wound are contained in a vertically arranged magazine 190 secured to the supporting frame 140 by suitable fastening means, such as the attaching brackets 191 and fastening screws 192. This magazine is provided at its lower end with a lateral opening 193 through which the tubes automatically discharge by gravity in a position directly above the upper run of the winding belts, as shown. A retainer 194 is provided for normally holding the lowermost tube in a position partially projecting from the discharge opening 193 and in the path of the plunger $p$, as shown in Fig. 3. This retainer as here shown is pivoted to a fixed supporting bracket 195 at 196 and is yieldingly held in its said normal tube retaining position by a spring 197 connecting at one end with a pin 198 on the retainer and at its opposite end with a fixed part of the frame. The plunger $p$, when operated on its down stroke from the position shown in Fig. 3, first engages an inclined or cam surface 199 on the retainer and forces the latter laterally from its tube retaining position to thereby release the engaged tube and permit the same to drop on to the winding belts, the released tube being held on the inclined belts beneath the plunger by downwardly projecting fingers 200 at the lower end of the rear wall of the magazine. After the plunger has thus shifted the retainer to release the tube, it follows the tube and forces the same downward to depress the belts and form a winding loop therein as hereinbefore described. While the plunger is in its lowered position it closes the discharge opening in the magazine, as shown in Figs. 1 and 2, but when it passes said opening on its return upward movement, it will release the retainer and thereby permit the latter to move to its normal retaining position under the action of the spring 197.

The plunger $p$ may be operated by any suitable means. As here shown it is attached to the rear side of a plate or block 201 suitably mounted for vertical movement in a slot or way 202 in a fixed plate 203 carried by the machine frame. Attached to the front side of this plate or block 201 is a rack-bar 204 which is engaged by an operating segment gear 205 pivoted to a supporting bracket 206 and having a rear arm 207 connecting through a link 208 with the free end of a lever 209, which latter is pivoted to the frame at 210 and provided with an attached roll 211 engaged by a grooved cam 212 on the intermittently operated shaft 176. Rotation of this grooved cam, acting through the connections 209 and 208, serves to oscillate the segment gear 205 about its axis on the supporting bracket 206 and so impart a vertical movement to the rack-bar 204 and connected plunger $p$. The timing of the action of this plunger in releasing a tube from the magazine and depressing the upper run of belts to form a winding loop therein, and also the timing of the forward and backward movement of the belt rolls 163 in the closing and opening of said winding loop, all as controlled from the shaft 176, will be hereinafter more particularly referred to.

After the leading end of the towel has been brought to the rewinding mechanism by the carrier or feed chains, the towel bar is adapted to be released from said chains and delivered into the loop of the winding belts to be wound about the tube therein. This is effected by a pair of endless sprocket chains 220—220 mounted on pairs of sprocket wheels 221, 222, and 223, the first two pairs being merely guide wheels and the last pair, those indicated at 223, being driving wheels and mounted on the intermittently operated shaft 176, as most clearly shown in Figs. 4 and 6. These releasing chains, which are operated to move at a greater speed than that of the feed chains, are provided with projections 224 which are moved in paths to engage the ends of the towel bar 55 adjacent the rear

end of the upper runs of the feed chains and disengage said bar from the latter and deliver it into the loop of the winding belts. Such delivery of the towel bar into the loop of the winding belts is effected by loosely mounting the rear guide wheels 222 on the shaft 167 which carries the belt pulleys 162, whereby the towel bar engaging projections 224 on the releasing chains will carry the towel bar into the belt loop formed at the rear side of said pulleys 162, and there drop or release the same upon their movement in a reverse direction towards the driving wheels 223, as will be clear by reference to Figs. 1, 2 and 6. A pair of fixed guides 320 attached to the opposite side frames in position to overhang the ends of the towel bar at the point where the latter is carried downwardly at the rear side of the guide wheels 222, serve to prevent disengagement of the towel bar from the lugs 224 of the releasing chains at such point.

As it is only necessary to operate certain parts of the rewinding mechanism when the leading end of the towel is brought adjacent thereto, viz: the plunger *p*, the swinging support 177 for the rear winding belt pulleys 163, and the towel-bar releasing and delivery chains 220, the shaft 176 for operating such parts is connected with its driver through a clutch which is adapted to be automatically controlled from the towel feeding chains 53. The driver for the shaft 176 is here shown as a gear wheel 230 loosely mounted on the end of said shaft and being continuously driven from the shaft 150 through gearing 231 and 232. Any usual or suitable form of clutch may be employed for connecting the shaft with this driver. The clutch here employed (not shown) is controlled from a disk 233 loosely mounted on the shaft and carrying a projection 234 which is normally engaged by a pivoted latch 235 to maintain the clutch in unclutched relation to the driver. Upon releasing the latch 235 from the projection 234, the disk 233 will be free to throw in the clutch and automatically connect the shaft to the driver in the usual manner. To effect such throwing in of the clutch at the proper predetermined time in the operation of the machine, that is, when the leading end of the towel has been brought by the carrier or feed chains to a point adjacent the rewinding mechanism, we mount a shaft 237 on the frame in a position just above the feed chains and provide the same at one end with a horizontal arm 238 having connection with the latch 235 through a link 239, and also provide the same with two depending trip fingers 240—240 arranged with their lower ends projecting into the path of movement of the towel-bar 55 (see Fig. 4) to be engaged thereby and operated to rock the shaft 237 and so effect a lifting of the latch from engagement with the clutch controlling disk, as indicated by dotted lines in Fig. 2. When the disk is thus released from the latch and the clutch thrown into driving engagement, the shaft 176 with its attached operating parts are thrown into operation to actuate the rewinding mechanism in the manner hereinbefore referred to. This, briefly stated, is as follows: the plunger *p*, through the action of the cam 212 and intermediate driving connections, operates to effect a release of one of the tubes 166 from its containing magazine and to then force such tube downwardly upon the upper run of winding belts and form a winding loop therein, as shown in Fig. 1. At the same time the swinging support 177 for the rear winding belt pulleys 163, through the action of the cam 175 and spring 183, is operated to move the pulleys 163 forward from the position shown in Fig. 3 to that shown in Fig. 1 to partially close the upper end or mouth of the winding loop and cooperate with the front pulleys 162 and plunger *p* in retaining the tube within said loop. While the loop is thus being formed in the winding belts and a tube placed therein, the releasing chains 220 have also been brought into operation by the shaft 176 and caused to release the towel-bar from its feed chains and deliver the same into the loop of the winding belts. The winding of the towel now begins and this operation continues until the towel has been completely wound about the tube, at which time or shortly thereafter the bar in the end of the succeeding towel is brought to a position to engage and actuate the clutch trip 240, whereupon the shaft 176 is again brought into action to operate the several parts of the winder mechanism through the positions shown in Figs. 2 and 3 and back again to those shown in Fig. 1, that is, the rear belt rollers 163 are thrown back to release the rolled up towel and cause its discharge from the winding loop and then brought forward again, the plunger *p* is raised to permit of the discharge of another tube from its containing magazine and then lowered to force the discharged tube downward onto the upper run of the belts and press the latter into loop form between the adjacent sets of pulleys 162 and 163, and the releasing chains 220 are operated to release the bar in the leading end of the succeeding towel from the feed chains and deliver the same into the loop of the winding belts. When the wound towel is discharged from the loop of the winding belts by the straightening out of said loop to present a rearwardly sloping inclined run of belt as shown in Fig. 3, it drops onto a set of guide fingers or plates 245 which extend to the rear of the machine where they are provided with upturned retaining ends 246 as shown in Fig. 1.

Following the raising of the latch 235 by the trip fingers 240 to effect a throwing in of the clutch mechanism, said latch drops back

to latching position to be operative to throw out the clutch after one complete rotation of the shaft 176.

As hereinbefore referred to, the towel-bar releasing or transfer chains 220 are geared to operate at a greater speed than that of the feed chains in order to release the towel-bar 55 from the latter by a movement in the direction of movement of the feed chains. To do this, it obviously requires a certain amount of slack in the towel adjacent the point where it is taken by the releasing chains from the feed chains. Such slack is provided by deflecting the feed chains downwardly beneath the guide rolls 145 in their passage from the guide wheels 143 to the guide wheels 146, as shown in Fig. 6. To control such slack in the towel and maintain the same under proper tension, we provide a roll 250 for engaging the towel at such point, which is movably supported in order to yield and give off slack when the towel-bar is advanced from its connection with the feed chains by the engagement therewith of the more rapidly moving releasing chains, as hereinbefore described. This slack controlling roll 250 is here shown as carried by a pivoted frame 251 attached to the supporting frame at 252.

As a means for maintaining the releasing chains 220 under proper tension, the shaft carrying the supporting and guide rolls 221 is journalled in bearing blocks 255 which are slidably mounted in elongated slots 256 in the frame 140 and engaged by threaded adjusting rods 257 carried in fixed brackets 258, as most clearly shown in Fig. 6.

As a means for obtaining an even winding of the towels, we provide a pair of gage-plates 330—330 for engaging the ends of the towel-bar 55 during the towel winding operation and preventing endwise movement of the same and thereby the associated tube 166 on which the towel is being wound, in the loop of the winding belts. These gage-plates 330 may be supported in any suitable way, the same as here shown being attached to the swinging arms 177 which carry the rear belt pulleys 163.

What is claimed is:

1. In a machine of the class described, the combination of a winding belt, means for feeding a mandrel to said belt and forming a loop in the latter to retain the mandrel, means for feeding a strip of material to said mandrel in the belt loop, and means for operating the belt to wind the strip around said mandrel.

2. In a machine of the class described, the combination of a winding belt, means for feeding a mandrel to said belt and forming a loop in the latter to retain the mandrel, means for feeding a strip of material to said mandrel in the belt loop, means for operating the belt to wind the strip around said mandrel, and means permitting of a variation in the size of the belt loop as the strip winding operation proceeds.

3. In a machine of the class described, the combination of a winding belt, means for feeding a mandrel to said belt and forming a loop in the latter to retain the mandrel, means for feeding a strip of material to said mandrel in the belt loop, means for operating the belt to wind the strip around said mandrel, means permitting of a variation in the size of the belt loop as the strip winding operation proceeds, and means maintaining the belt under constant tension during the strip winding operation.

4. In a machine of the class described, the combination of a winding belt, supporting means for the belt comprising two adjacent members one of which is movable relatively to the other, means for feeding a mandrel to said belt at a point between its said adjacent supporting members and forming a loop therein to retain the mandrel, means for feeding a strip of material to said mandrel in the belt loop, and means for operating the belt to wind the strip around said mandrel.

5. In a machine of the class described, the combination of a winding belt, supporting means for the belt comprising two adjacent members one of which is movable relatively to the other, means for feeding a mandrel to said belt at a point between its said adjacent supporting members and forming a loop therein to retain the mandrel, means for feeding a strip of material to said mandrel in the belt loop, means for operating the belt to wind the strip around said mandrel, and means yieldingly holding the movable belt-supporting member towards the other member to retain the mandrel and strip in the belt loop during the winding operation.

6. In a machine of the class described, the combination of a winding belt, supporting means for the belt comprising two adjacent members one of which is movable relatively to the other, means for feeding a mandrel to said belt at a point between its said adjacent supporting members and forming a loop therein to receive the mandrel, means for feeding a strip of material to said mandrel in the belt loop, means for operating the belt to wind the strip around said mandrel, and means operative to shift the movable belt-supporting member to closed mandrel holding position adjacent the other member prior to the strip winding operation and to thereafter shift said movable member to open position when the strip winding operation has been completed.

7. In a machine of the class described, the combination of a winding belt, supporting means for the belt comprising two adjacent members one of which is movable relatively to the other, means for feeding a mandrel to said belt at a point between its said adjacent supporting members and forming a loop

therein to receive the mandrel, means for feeding a strip of material to said mandrel in the belt loop, means for operating the belt to wind the strip around said mandrel, and cam controlled means operative to shift the movable belt-supporting member to closed mandrel holding position adjacent the other member prior to the strip winding operation and to thereafter shift said movable member to open position when the strip winding operation has been completed.

8. In a machine of the class described, the combination of a winding belt, supporting means for the belt comprising two members arranged to present an inclined run of belt therebetween and one being movable towards and from the other, means for feeding a mandrel to said inclined run of belt and forming a loop therein to receive and hold the mandrel, means for feeding a strip of material to said mandrel in the belt loop, means operative to shift the movable belt-supporting member to closed mandrel holding position adjacent the other member prior to the strip winding operation, means for operating the belt to wind the strip around the mandrel held in the belt loop, and means operative to shift said movable belt-supporting member to its open position when the strip winding operation has been completed and thereby bring the supporting run of belt to its normal inclined position to automatically discharge the rolled up strip.

9. In a machine of the class described, the combination of means for winding up a strip of material, a continuously moving carrier for carrying the strip to a point adjacent said winding means, and means movable at a greater speed than that of the carrier operative to release the strip therefrom and deliver it to said winding means.

10. In a machine of the class described, the combination of means for winding up a strip of material, a carrier for carrying the strip to a point adjacent said winding means, means for releasing the strip from said carrier and delivering it to the winding means, a clutch-controlled drive for said releasing means, and clutch controlling means actuated from said carrier to effect operation of said drive at predetermined times.

11. In a machine of the class described, the combination of means for winding up a strip of material, means for feeding a mandrel to said winding means, a carrier for carrying the strip to a point adjacent said winding means, means for releasing the strip from said carrier and delivering it to the winding means and mandrel, a clutch-controlled drive for said releasing means and mandrel feeding means, and clutch-controlling means actuated from said carrier to effect operation of said drive at predetermined times.

12. In a machine of the class described, the combination of means comprising a continuously moving belt for winding up a strip of material, means for feeding a mandrel to said winding belt, a continuously moving carrier for carrying the strip to a point adjacent said winding means, means for releasing the strip from said carrier and delivering it to the winding belt and mandrel and a normally inactive clutch-controlled drive for said releasing means and mandrel feeding means, and clutch controlling means actuated from said carrier to effect operation of said drive at predetermined times.

13. In a machine of the class described, the combination of a winding belt, means comprising a reciprocatory plunger for feeding a mandrel to said belt and forming a loop in the latter to receive and hold the mandrel, means for feeding a strip of material to said mandrel in the belt loop, and means for operating the belt to wind the strip around said mandrel.

14. In a machine of the class described, the combination of a winding belt for winding up a strip of material, means yieldingly maintaining said belt under tension, means comprising a reciprocatory plunger for feeding a mandrel to said belt and forming a loop therein to receive the mandrel, a carrier for feeding a strip to said mandrel in the belt loop, means for operating the belt to wind the strip around said mandrel, a normally inactive clutch-controlled drive for said plunger, and clutch-controlling means actuated from the strip carrier to effect operation of said plunger drive preliminary to each strip winding operation.

15. In a machine of the class described, the combination of a winding belt for winding up a strip of material, means yieldingly maintaining said belt under tension, means comprising a reciprocatory plunger for feeding a mandrel to said belt and forming a loop therein to receive the mandrel, a carrier for feeding a strip to said mandrel in the belt loop, means for operating the belt to wind the strip around said mandrel, means moving at a greater speed than that of the carrier for releasing the strip therefrom and delivering it to the mandrel in the winding belt, a clutch-controlled drive for said releasing means and mandrel feeding plunger, and clutch controlling means actuated from the strip carrier preliminary to each strip winding operation to effect operation of said drive.

16. In a machine of the class described, the combination of winding means for winding up a strip of material, a continuously moving carrier for feeding the strip to a point adjacent said winding means, releasing means moving at a greater speed than that of the carrier operative to release the strip therefrom and deliver it to the winding means, and means operative to produce slack

in the strip in advance of its engagement by said releasing means.

17. In a machine of the class described, the combination of winding means for winding up a strip of material, a continuously moving carrier for feeding the strip to a point adjacent said winding means, releasing means moving at a greater speed than that of the carrier operative to release the strip therefrom and deliver it to the winding means, and means operative to normally produce slack in the strip in advance of its engagement by the releasing means and automatically give up slack to said releasing means when the latter takes the strip from its carrier.

In witness whereof we affix our signatures.

HALCYON L. TUCKER,
*Administratrix of the Estate of Benjamin W. Tucker, Deceased.*

HANNAH BRAMAN,
*Administratrix of the Estate of William W. Trinks, Deceased.*