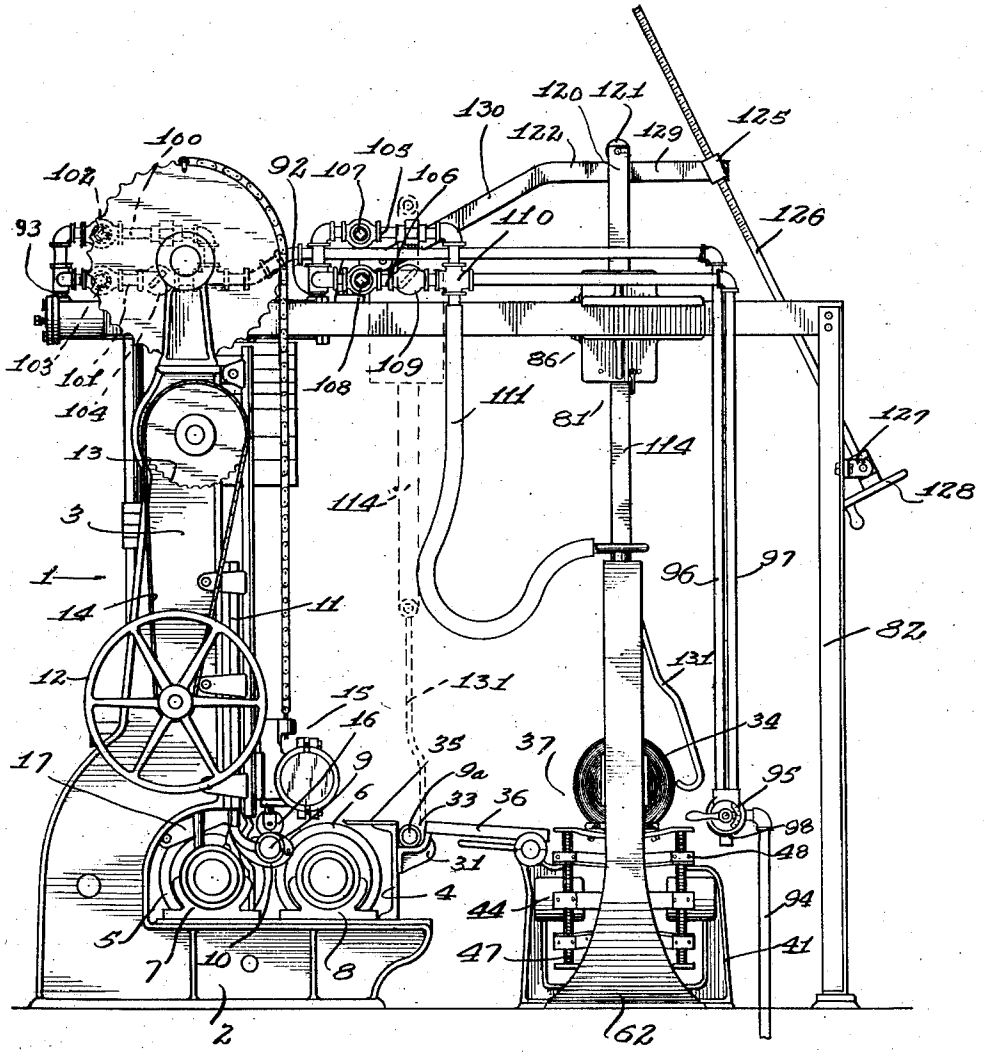
Nov. 6, 1934. E. E. BERRY 1,979,310

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Filed July 22, 1931 6 Sheets-Sheet 1

Fig. 1.



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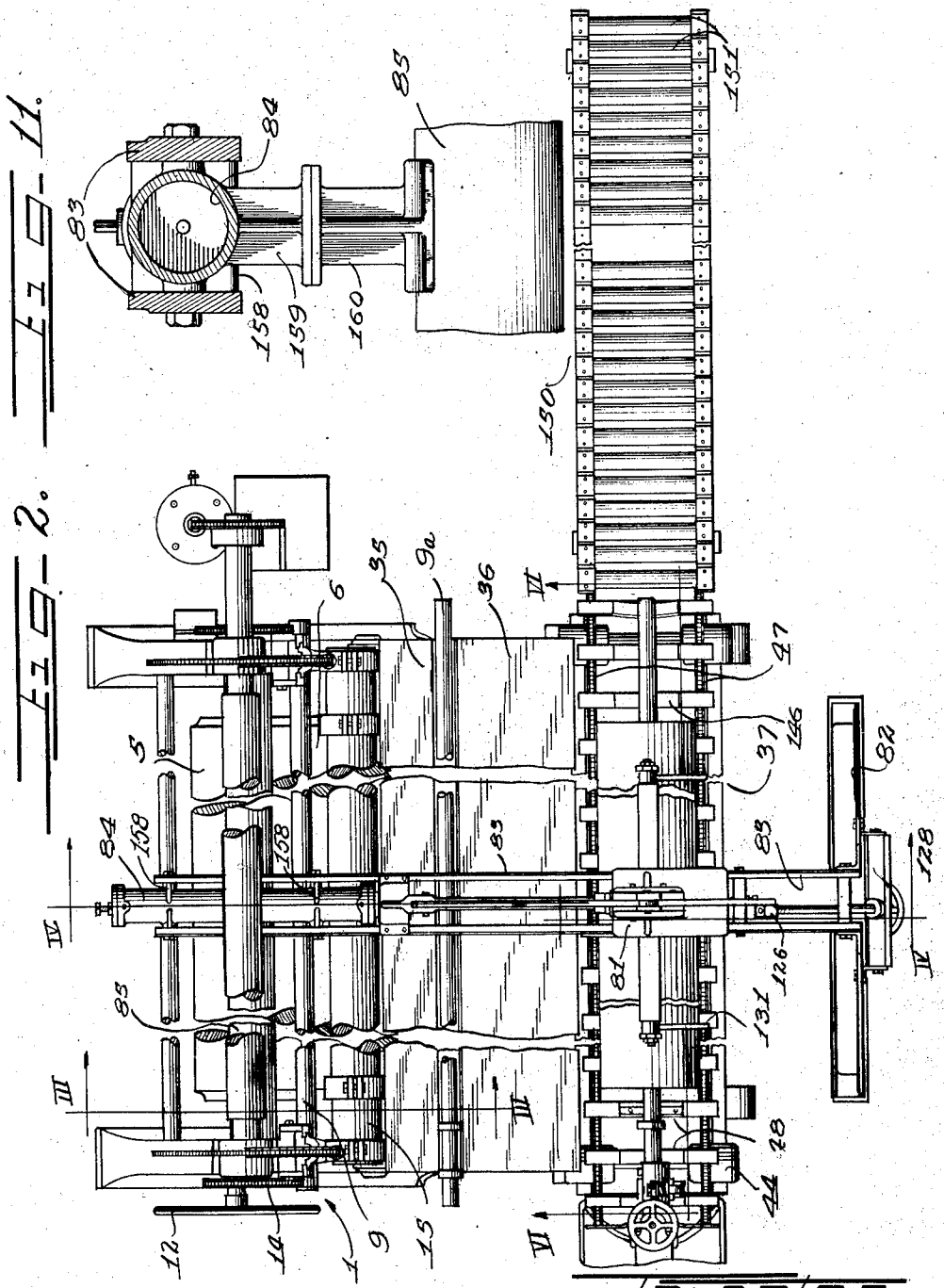
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Fig. 1.

Fig. 2.



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FIG. 3.

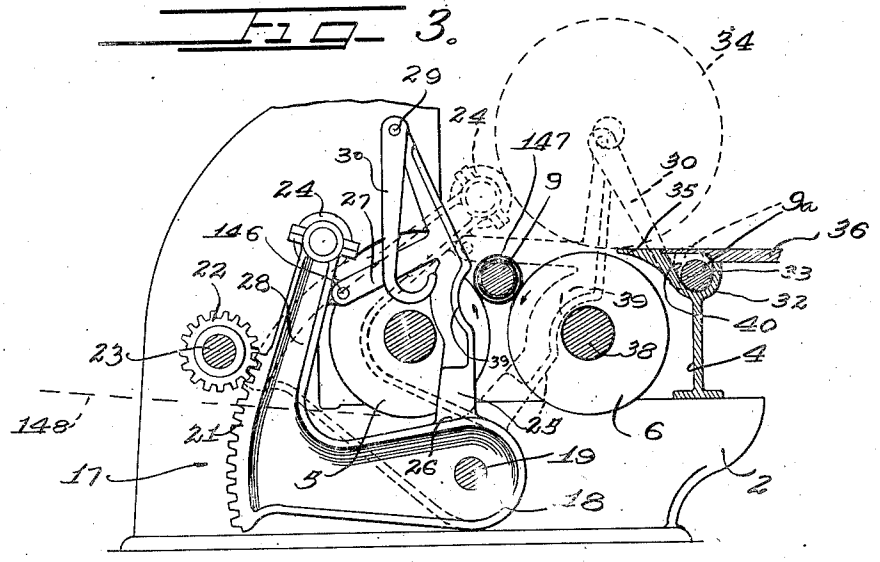
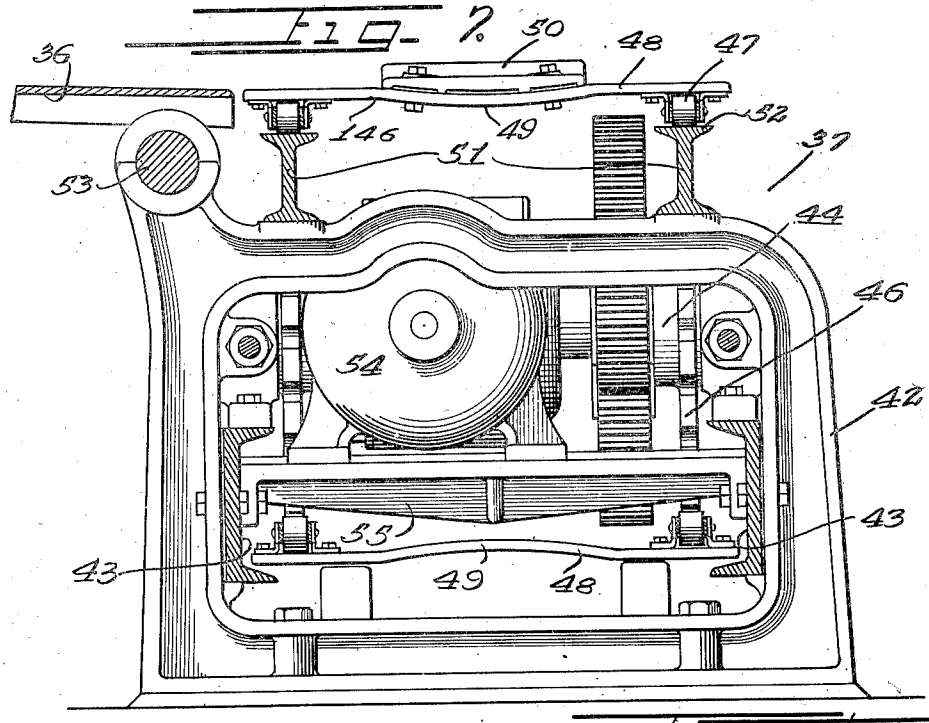


FIG. 2.



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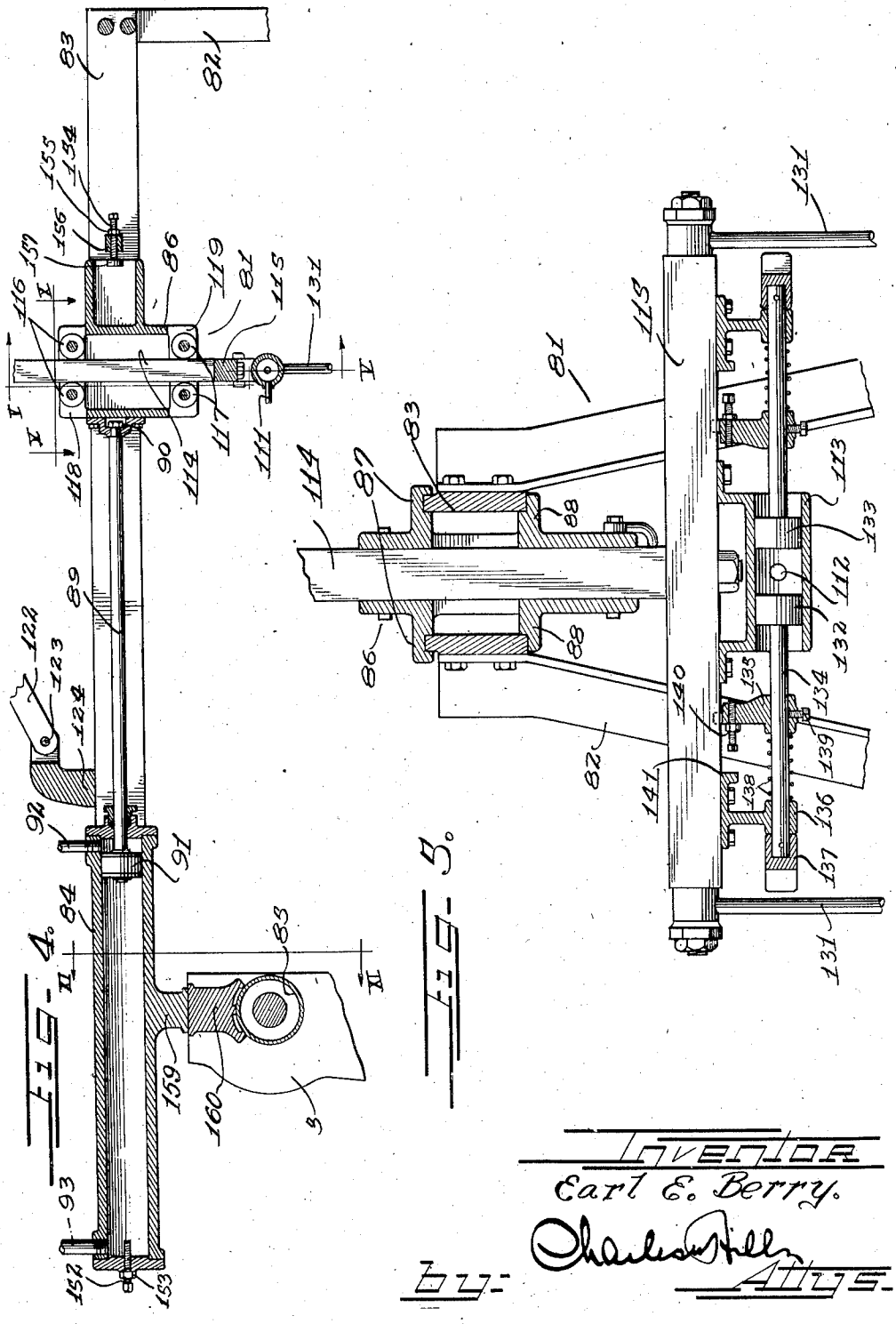


Fig. 4.

Fig. 5.

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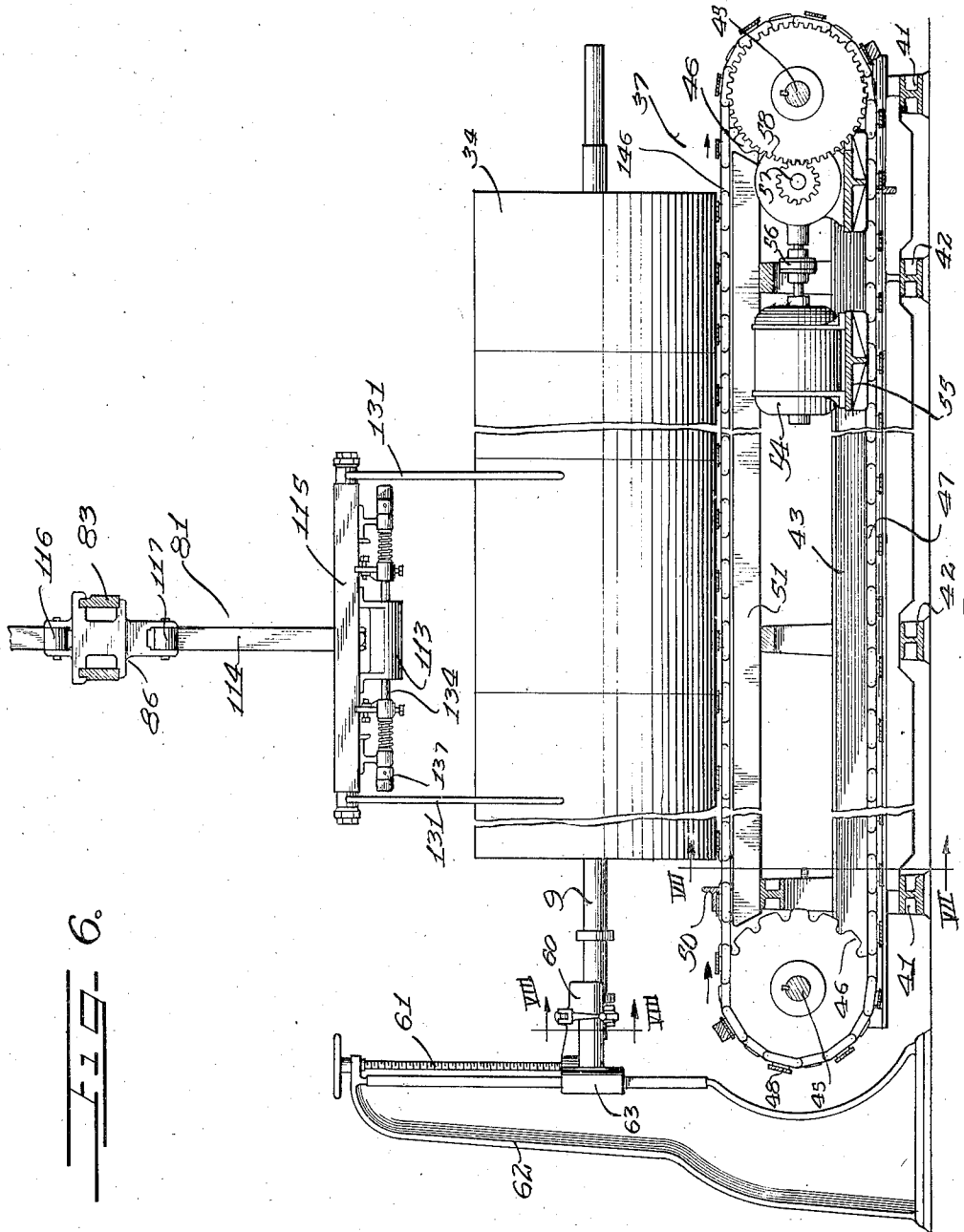


Fig. 6.

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Fig. 8.

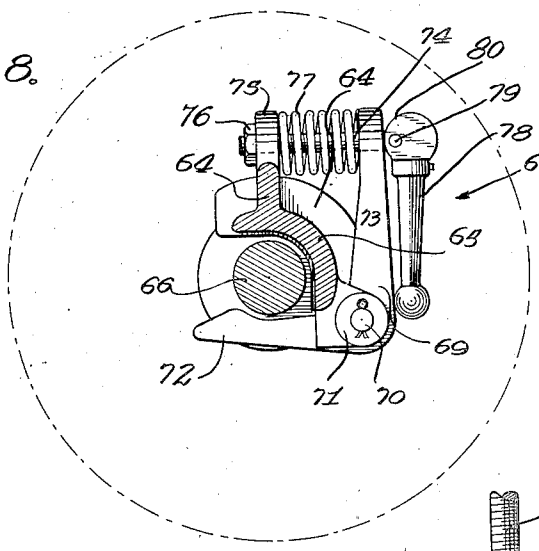


Fig. 9.

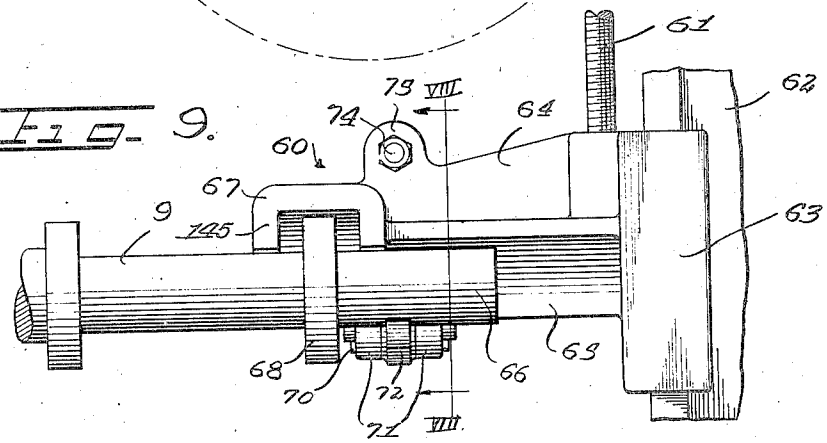
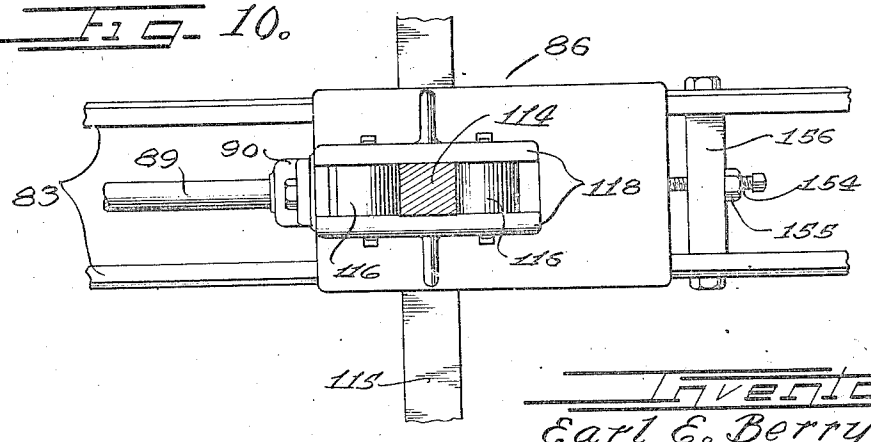


Fig. 10.



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Patented Nov. 6, 1934 1,979,310

UNITED STATES PATENT OFFICE

1,979,310

PAPER WINDER

Earl E. Berry, Beloit, Wis., assignor to Beloit Iron Works, Beloit, Wis., a corporation of Wisconsin

Application July 22, 1931, Serial No. 552,442

25 Claims. (Cl. 242—81)

This invention relates to a paper winder and more particularly to an attachment for paper rewinders for removing the winder shaft from the wound rolls of paper, preferably in combination with roll ejecting and shaft transfer mechanisms.

It has heretofore been proposed, because of the increased size and weight of paper rolls as produced on modern winding equipment, to provide semi-automatic mechanism for ejecting the wound rolls of paper from their winding position on the winder drums into a suitable receiving position. I have already described and claimed various types of suitable roll ejecting mechanisms in my U. S. Patents Nos. 1,870,224 and 1,870,225 granted August 9, 1932, and my copending application, Serial No. 524,439, filed March 23, 1931.

The present invention relates to further improvements in the mechanical handling of the wound rolls and their winder shafts, for use either in conjunction with the roll ejecting mechanisms or for separate use as an attachment to paper rewinders and the like. The combined use with roll ejecting mechanisms of my previous invention of my present invention for mechanically pulling the winder shaft from the wound roll and for semi-automatically returning the winder shaft for reuse greatly simplifies the operation of modern, wide rewinders and reduces the amount of necessary manual labor to an absolute minimum. Such combination of mechanisms also largely reduces the risks and hazards incident to the operation of paper rewinders.

It is therefore an object of this invention to provide a winder shaft pulling mechanism and transfer mechanism for attachment to a paper rewinder in order to facilitate the operation of the machine and reduce the amount of manual labor attendant thereto.

It is a further important object of this invention to provide novel and semi-automatic attachments for a paper rewinder that are simple and rugged in construction and that result in an increased efficiency and ease of operation.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is an end elevational view of a paper rewinder equipped with roll ejecting and shaft pulling and transfer mechanisms of my invention.

Figure 2 is a broken top plan view of the same.

Figure 3 is an enlarged detail sectional view taken substantially on the line III—III of Figure 2, showing the roll ejecting mechanism.

Figure 4 is an enlarged sectional view taken substantially on the line IV—IV of Figure 2, with parts removed.

Figure 5 is an enlarged sectional view taken substantially on the line V—V of Figure 4.

Figure 6 is an enlarged sectional view taken substantially on the line VI—VI of Figure 2.

Figure 7 is an enlarged sectional view taken substantially on the line VII—VII of Figure 6.

Figure 8 is an enlarged sectional view taken substantially on the line VIII—VIII of Figure 6.

Figure 9 is an enlarged, fragmentary elevational view of the end of the winder shaft and shaft engaging mechanism shown in Figure 8.

Figure 10 is an enlarged sectional view taken substantially on the line X—X of Figure 4.

Figure 11 is an enlarged sectional view taken substantially on the line XI—XI of Figure 4.

As shown on the drawings:

The reference numeral 1 indicates as a whole a paper rewinder of essentially the same construction as that shown in my pending application entitled "Paper rewinder", U. S. Serial No. 524,439, filed March 23, 1931. It will be understood that many of the details of construction of the rewinder itself constitute merely standard construction and form no part of the present invention. Therefore, only so much of the construction of the rewinder as is necessary to an understanding of the present invention will be here described.

Said rewinder 1 (Figures 1, 2 and 3) comprises a pair of end supporting bases 2 having upstanding portions 3 extending therefrom and secured together in spaced relation by suitable means, including a tubular cross member 85 and a transversely extending channel beam 4.

A pair of spaced under drums 5 and 6 are suitably journaled at their respective ends in bearing housings 7 and 8, which, in turn, are mounted upon the base portions 2. Said under drums 5 and 6 are suitably driven in the same direction to wind a web of paper, indicated by a dotted line at 148, upon a winder shaft 9 that is rotated by surface contact between the

web of paper and the surfaces of the driven under drums.

Said winder shaft 9, when in operative position, is held at its ends in releasable clamping members 10. Said clamping members 10 form elements of members 11 that are suitably mounted for vertical sliding movement in guideways carried by the upstanding frame portions 3. As the diameter of the paper roll being wound upon the winding shaft 9 increases, the mechanism just described permits the winding shaft to move vertically upwardly to compensate for the increasing diameter of the roll. The usual mechanism for raising the clamping members 10, including the hand wheels 12, sprocket wheels 13 and chains 14, is provided.

A slitting mechanism indicated as a whole by the reference numeral 15, and including rotary slitters 16, is provided for slitting the web of paper into the desired widths as it comes from the paper machine. The paper is slit while it is being wound upon cores 147 of corresponding lengths. The cores 147 are mounted on the solid winding shaft 9 in the usual manner, but when a collapsible winder shaft is employed, no cores are used.

Up to this point, merely old or standard rewinder construction has been described. According to my present invention, a roll ejecting mechanism, indicated as a whole by the reference numeral 17 and best shown in Figure 3, is associated with the under drums 5 and 6 to eject the wound roll and associated winder shaft from operative position with respect to the under drums. Said roll ejecting mechanism comprises a pair of arcuate shaped arms 18 pivotally mounted upon a cross shaft 19 that extends beneath the under drums 5 and 6 between the base frames 2. Each of said pivotally mounted arms 18 is provided on its rear upstanding portion 28 with ratchet teeth 21 for engagement with a spur gear 22 secured upon a driven cross shaft 23. A roller 24 is journaled at its ends on the free ends of the portions 28. Each of the arms 18 is also provided with a forward upstanding portion 25, rigidly joined to the corresponding arm, as at 26, near the pivotally mounted end of said arm. Each of said upstanding portions 25 is connected by means of a link 27 integral with the portion 25 and pivotally connected to the corresponding rear, upstanding portion 28 as at 146, whereby to brace said upstanding portions 25. At the free end of each of said upstanding portions 25, there is pivoted, as at 29, a dependent hook member 30.

The channel beam 4 positioned in front of the under drum 6 is provided at its ends with brackets 31 (Fig. 1), or with integrally formed recesses 32 (Fig. 3), forming sockets 33 for the reception of the ends of a spare winder shaft 9a.

The roll ejecting mechanism just described not only serves to eject the wound roll of paper but also to replace a spare winder shaft 9a in operative position with respect to the under drums 5 and 6, the operation being as follows:

After the web of paper on the operating winder shaft 9 has reached the desired size, or for some other reason has to be removed, the driving shaft 23 is rotated by some suitable source of power (not shown) and through the intermeshing gears 22 and ratchet teeth 21, the arms 18 are swung upwardly until the roller 24 comes in contact with the roll of paper 34. Continued upward movement of the arms 18, as indicated in dotted lines in Figure 3, causes the roller 24 to push the wound roll of paper 34 and associated winder shaft 9 out from between the under drums 5 and 6 and over the crown of the forward under drum 6, until it rolls onto a receiving platform 35. Said wound roll of paper then rolls over the spare winder drum 9a onto a sloping platform 36 and is delivered onto the shaft pulling mechanism, indicated generally by the reference numeral 37 and more fully described hereinafter.

As the roll ejecting arms 18 move in the manner just described, the hook members 30, dependent from the upstanding portions 25, move forwardly until recessed portions 39 on said upstanding portions 25 abut the shaft 38 of the forward under drum 6. Said hook members 30 may then be manually swung under the spare winder shaft 9a to engage the ends of the same, as indicated in dotted lines in Figure 3. As the roll ejecting arms 18 are moved back into normal position, the hook members 30 drag the spare winder shaft 9a up over the inclined surface 40 of the sockets 32, over the platform 35 and forward over drum 6 into operative position. The new end of the paper web is then started around the fresh winder shaft 9a and the winding operation continued.

The shaft pulling mechanism 37 comprises a plurality of supporting frames, including end frames 41 and intermediate frames 42, positioned in alignment in front of the rewinder 1 and held in spaced relation by longitudinally extending channel beams 43. Each of the end frames 41 supports, by means of suitable brackets extending therefrom, a pair of spaced, aligned bearing housings 44, in each pair of which is journaled a shaft 45 carrying a pair of sprocket gears 46. A pair of roller type sprocket chains 47 is trained around the corresponding sprocket gears 46 to run lengthwise of the shaft pulling mechanism 37. A plurality of transversely extending cross members 48 are connected to the sprocket chains 47 to provide a roll conveyor 146. Said cross members 48 are provided with concave roll receiving portions 49 (Fig. 7) and certain of said cross members 48 are provided with upstanding cleats or shoes 50 that serve to engage an end of the paper roll 34 in a manner later to be described.

A pair of I-beams 51 extends in parallel spaced relation along the top of the respective frame members 41 and 42, to which they are suitably secured. The upper surfaces of these I-beams 51 provide trackways 52 over which the rollers of the sprocket chains 47 run. The platform 36 is pivotally supported from the frame members 42, as at 53, at the proper height to deliver the wound roll 34 onto the traveling conveyor comprising the sprocket chains 47 and transverse members 48. While on said conveyor 146, the roll rests in the depressions 49 formed in the cross members,

Means for driving the conveyor 146 comprise a motor 54 supported on a platform 55 from the channel beams 43. Said motor 54 is connected through a clutch member 56 (Fig. 6) and suitable reducing gears 57 and 58 to one of the shafts 45 on which the sprocket gears 46 are keyed or otherwise secured. Thus, when the motor 54 is energized, it serves to drive the conveyor 146 in a direction indicated by arrows in Figure 6 until one of the cleats 50 engages an end of the roll 34.

In order that continued movement of the con-

veyor may serve to remove the roll 34 from its accompanying winder shaft 9, one end of said winder shaft 9 is adapted to be engaged by a clamping mechanism 60 adjustably mounted by means of a screw mechanism 61 from a stand 62.

Said clamping mechanism 60 is best shown in Figures 8 and 9 and comprises a guide engaging portion 63 and a bracket 64 preferably cast integral therewith. Said bracket 64 is provided with a segmental cylindrical portion 65 that partially houses one end 66 of the winder shaft 9. A flanged segmental cylindrical socket portion 67 integrally formed on the free end of the bracket 64 serves to partially house a collar 68 such as is usually affixed on a winder shaft end. The flanges 145 of said socket portion 67 prevent more than limited axial movement of the winder shaft 9 when its end 66 is engaged by the clamping mechanism.

The clamping mechanism proper comprises a pawl or dog 69 that is pivoted at its apex about a pin 70 extending through spaced lugs 71 formed on the bracket casting 64. One end 72 of said dog 69 passes under the end 66 of the winder shaft 9. The other end, 73, of said dog 69 is apertured to receive a pin 74 that extends through an upstanding lug 75 on said bracket 64 and is secured in said lug by means of a nut 76. A spring 77 is mounted under compresssion on the pin 74 between said lug 75 and the dog end 73. A handle 78 pivotally secured to the extended free end of the pin 74, as at 79, provides a cam face 80 that permits the spring 77 to cause the release of the dog 72 when the handle 78 is raised. The winder shaft end 66 can then be moved out from between the dog 72 and the segmental cylindrical portions 65 and 67 of the bracket 64.

The reference numeral 81 (Fig. 5) indicates, as a whole, a mechanism for returning the winder shaft 9 to its waiting position in the sockets 33. Said mechanism 81 includes end frame supporting member 82, parallel track members 83 supported at one of their ends therefrom and at the other of their ends connected by yokes 158 to a cylinder 84 (Figs. 2 and 11). Said cylinder 84 is supported from the cross tube 85 extending between the rewinder frame portions 3 by means of an integral lug 159 on said cylinder and a saddle block 160 upon which said lug 159 rests (Figs. 4 and 11). A carriage, indicated generally by the reference numeral 86, is mounted for sliding movement on the tracks 83 and for this purpose is provided with shoes or flanges 87 and 88 (Fig. 5) that engage the upper and lower faces, respectively, of said track members 83. A piston rod 89 is connected at one end, as at 90 (Fig. 4), to the carriage 86 and at its other end to a piston 91 slidable within the cylinder 84. Said cylinder 84 is provided with compressed fluid pipes 92 and 93, which, as best shown in Figure 1, are controlled through suitable piping.

Said piping includes a pipe 94 (Fig. 1) leading from a source of a fluid, such as air, under pressure and connected through a multiple port valve 95 to separate pipes 96 and 97. Said valve 95 is of any suitable construction that will permit the air to be passed from the pipe 94 to either pipe 96 or 97 or to a discharge nipple 98 to permit the discharge of air from either pipe 96 or 97 when the other pipe is in connection with the pipe 94. Pipe 96 is connected to branch piping 100 and 101, which, in turn, are connected by means of suitable fittings to the nipple 93. Air cocks 102 and 103 are provided in the branch piping 100 and 101, respectively, and the branch pipe 101 includes a check valve 104, for a purpose later to be described.

Pipe 97 is similarly connected to the nipple 92 through branch piping 105 and 106, also similarly provided with a cock 107 and with a cock 108 and check valve 109, respectively. Said pipe 97 is also connected through a cross fitting 110 to a flexible tube 111.

Said flexible tube 111 is connected as at 112 to an open ended cylinder 113 (Fig. 5) mounted on the lower end of a vertically adjustable rod 114 from a cross rod 115. Said vertically adjustable rod 114 extends between two pairs of rollers 116 and 117 (Fig. 4) that are mounted in bifurcated portions 118 and 119, respectively, of the carriage casting 86. The rod 114 is provided with an upper bifurcated end 120 carrying a roller 121. A rod 122 passes through said bifurcated end 120 and serves as a trackway for the roller 121. Said rod 122 is pivoted as at 123 (Fig. 4) to a bracket 124 secured to the tracks 83. At its other end, the rod 122 is provided with a pivotally mounted, internally threaded collar 125 through which is threaded a rod 126 (Fig. 1). Said rod 126 is rotatably supported at its lower end from a bracket 127 and is provided with a hand wheel 128 by means of which the rod 122 may be raised or lowered about the pivot point 123.

Said rod 122 comprises a normally substantially horizontal portion 129 lying above the shaft pulling mechanism 37, and an inclined portion 130 that slopes downwardly to the pivot point 123. Said pivot point 123 is substantially directly above the waiting position of the winder shaft 9*a*.

The cross bar 115 carries at each end a swinging hook 131 adapted in operating position to engage the winder shaft 9 of the wound roll of paper 34. As will later be explained, it is necessary at one point in the operation of the shaft pulling mechanism to hold the hooks 131 against swinging movement and this is accomplished by means of air operated mechanism including the cylinder 113. A pair of opposed pistons 132 and 133 (Fig. 5) are mounted in said cylinder 113 on opposite sides of the air connection 112. Piston rods 134 connected to the pistons 132 and 133 extend through a pair of spaced bearing brackets 136 and carry at their outer ends bifurcated members 137 that are adapted to engage the hooks 131 to hold them against swinging movement. A spring 138 is held under compression between a collar 135 secured to each piston rod 134 by means of the set screw 139 and the stationary bearing bracket 136.

Accordingly, when there is no air pressure within the cylinder 113 to force the pistons 132 and 133 outwardly, the compression forces of the springs 138 draw the bifurcated ends 137 out of engagement with the hooks 131. On the other hand, when air is introduced into the cylinder 113 under pressure, the pistons 132 and 133 are forced outwardly to cause the bifurcated ends 137 to engage the hooks 131. Each of the collars 135 is provided with an adjusting bolt 140 for coaction with a flange 141 on a bearing bracket 136 to serve as a stop for limiting the outward movement of the piston rods 134.

The operation of the shaft pulling and shaft transfer mechanisms is as follows. After the

roll 34 of paper has reached the desired size on the winder drums 5 and 6, the roll ejecting mechanism 17 is operated, as previously described, to eject the roll 34 from operative relation to the under drums and deliver it onto the conveyor 146 of the shaft pulling mechanism 37. As the roll 34 rolls unto the shaft pulling mechanism, it pushes the hooks 131 ahead of it out of the way, as indicated in Figure 1. The end 66 of the winder shaft 9 moves into the cylindrical socket 65 and the handle 78 is lowered to permit the dog end 72 to come up into engagement with the under surface of the winder shaft end 66. Said winder shaft 9 is then held against axial movement by engagement of the collar 68 with the flange 146 of the socket 67 of the clamping mechanism 60. The motor 54 is then started up to operate the conveyor 146 of the shaft pulling mechanism. Movement of the conveyor brings a cleat 50 into engagement with the end of the wound roll 34, which is thereupon carried along on the conveyor and finally discharged onto a platform 150 made up of a plurality of rollers 151.

If the paper has been wound upon cores 147 on the winder shaft 9, as is customary, the individual rolls of paper with their associated cores merely slip off the end of the winder shaft 9 onto the roller platform 150. If a collapsible winder shaft is being used, there are no cores, but the shaft is simply collapsed and the rolls of paper removed in the same manner. The vertical adjustment of the clamping mechanism 60 provided by the threaded rod 61 permits the clamping mechanism to be placed at the correct height for the particular diameter of the roll 34 that is being handled.

It will be noted that at the start of the shaft pulling operation, the hooks 131 are displaced to one side by the roll of paper 34 (Fig. 1), but as the roll 34 is moved axially along the winder shaft 9, first one hook 131 and then the other is allowed to swing down into engagement with the winder shaft 9. By turning the hand wheel 128 one way or the other, the horizontal portion 129 of the trackway 122 can be brought to the proper level such that the hooks 131 engage the shaft 9. The clamping mechanism 60 is then released by raising the handle 78, causing the dog end 72 to drop out of engagement with the end 66 of the winder shaft 9. Said winder shaft 9 is now entirely supported by the hooks 131.

The valve 95 is then adjusted to a position such that compressed air is admitted through the piping 97, branch piping 105 and 106, and nipple 92 to the stuffing box end of the cylinder 84. The plug cocks 107 and 108 are partially closed to cause a throttling effect on the air as it goes into the stuffing box end of the cylinder 84. Consequently, the air first passes unrestrictedly into the flexible tube 111 and through the opening 112 into the cylinder 113. The pistons 132 and 133 in said cylinder 113 are accordingly forced outwardly to bring the bifurcated ends 137 into engagement with the shafts of the hooks 131. Said hooks 131 are thus held against swinging movement to prevent them from being swung backwardly due to inertia and possibly releasing the winder shaft 9 when the carriage 86 starts to move.

The compressed air entering the nipple 92 at the stuffing box end of the cylinder 84 forces the piston 91 toward the outer end of the cylinder, thus moving the carriage 86 and associated hooks 131 toward the spare winder shaft position in the sockets 33. In the course of its travel, the vertical rod 114 associated with the carriage 86 is permitted to drop down as the roller 121 passes onto the inclined portion 130 of the trackway 122. The winder shaft 9 is thus lowered at the end of the travel of the carriage 86 into the spare winder shaft position in the socket 33. When in this position, the lower ends of the hooks 131 are dropped out of engagement with the winder shaft. At some time during the travel of the carriage 86, fresh cores are threaded onto the winder shaft unless it is of the collapsible type. This can easily be done by manually raising one end of the shaft.

As the compressed air is entering the stuffing box end of the cylinder 84, the piston is forcing out ahead of it the air already in said cylinder and this air passes out through the nipple 93 and piping 100 into the pipe 96. The check valve 104 prevents flow of air through the branch 101. The cock 102 is also slightly closed to cause a throttling effect to thereby prevent a sudden bump as the piston 91 reaches the end of its travel. A bolt 152, provided with an adjusting nut 153, extends through the head end of the cylinder 84 to limit the extreme movement of the piston 91.

Travel of the carriage 86 in the opposite direction is limited by means of a bolt 154 having an adjusting nut 155. Said bolt 154 is threaded through a cross piece 156 that extends between the track members 83 and is adapted to abut a transverse web or lug 157 on the carriage casting when the carriage 86 reaches its extreme point of travel toward the shaft pulling mechanism.

After the winder shaft has been deposited in the spare winder shaft sockets 33, the valve 95 is properly adjusted to admit air under pressure to the head end of the cylinder 84. The compressed air passes through the pipe 96 and the branch piping 100 and 101 and enters the cylinder 84 through the nipple 93. As the piston 91 is displaced toward the stuffing box end of the cylinder 84, the air is released from said cylinder 84 through the nipple 92, branch 105, pipe 97 and discharge nipple 98. The cock 107 being partially closed, there is a throttling effect similar to that previously described that prevents the piston 91 from bumping at the end of its travel toward the stuffing box end of the cylinder 84. The check valve 109 prevents air from going through the branch piping 106, so that the adjustment of the cocks 107 and 108 can be different, if desired, to get just as quick or as slow speed of travel of the carriage 86 in either direction as is wanted.

The air pressure within the cylinder 113 is also at the same time released through the opening 112 and flexible tube 111 into the pipe 96. Thereupon, the force of the springs 138 acting against the collars 135 serve to retract the bifurcated ends 137 and release the hooks 131.

As the carriage 86 moves back over the track 83 toward the shaft pulling mechanism, the roller 121 travels up over the inclined portion 130 of the trackway 122 onto the horizontal portion 129. The rod 114 is accordingly raised to bring the hooks 131 again into position above the conveyor 146 of the shaft pulling mechanism. The various mechanisms are then again in place for a repetition of the operation.

While I have described my invention in connection with a particular construction of rewinder and of roll ejecting mechanism, it will be

understood that the shaft pulling mechanism of my invention has a separate field of usefulness, or can be used with other types of rewinders and roll ejecting mechanism. For instance, I have described and claimed in my copending application Serial No. 524,435, filed March 23, 1931, a slightly modified form of roll ejecting device and mechanism for transferring the winder shaft from waiting to winding position that might be employed in place of the corresponding device and mechanism here shown.

The shaft pulling mechanism is particularly useful in connection with the handling of very large rolls of paper or other web material with which relatively heavy winder shafts are used. The use of my semi-automatic mechanisms reduces manual labor to a minimum and also greatly lessens the hazards incident to the manual handling of heavy rolls of paper and heavy winder shafts.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. In a web winding apparatus, means for supporting a roll of web material wound on a shaft having two free ends, means for releasably engaging a free end of the shaft to hold said shaft from axial movement and means for moving said roll supporting means to separate said roll from said shaft.

2. A device for removing a shaft with two free ends from a roll of web material wound thereon, comprising means for supporting the roll, means releasably engaging a free end of said shaft and driven means engaging said roll and movable axially of said shaft to move said roll off of said shaft.

3. A device for removing a shaft having two free ends from a roll of web material wound thereon, comprising means for supporting the roll, means releasably engaging a free end of said shaft, driven means engaging said roll and movable axially of said shaft to move said roll off of said shaft and means for engaging and supporting said shaft while the roll is being removed.

4. A device for removing a shaft from a roll of web material comprising an endless movable means for temporarily supporting and engaging said roll, means for fixedly engaging a free end of the shaft and means for driving said movable means to move said roll axially of said shaft to separate said roll and shaft.

5. A device for removing a shaft from a roll of web material comprising an endless movable means for temporarily supporting and engaging said roll, means for fixedly engaging a free end of the shaft, means for driving said movable means to move said roll axially of said shaft to separate said roll and shaft and gravity operating means for engaging and supporting said winder shaft upon separation of said roll.

6. A device for removing a shaft from a roll of paper wound thereon, comprising a conveyer for temporarily supporting said roll lengthwise thereof and having spaced members thereon for engaging the end of said roll, vertically adjustable means for engaging a free end of said shaft and means for driving said conveyer to separate said roll from said shaft.

7. In a device of the class described for removing a shaft from a roll of paper wound thereon, relatively movable members for engaging the roll and shaft respectively, means for driving one of said members to separate the roll from said shaft, movable means for engaging and supporting the separated shaft and an adjustable trackway over which said movable means travels to return said separated shaft for reuse.

8. In a device of the class described for removing a shaft from a roll of paper wound thereon, a driven endless conveyer for temporarily supporting said roll lengthwise in the direction of movement thereof, spaced members on said conveyer for engaging an end of said roll, means for driving said conveyer to move said roll axially and means adjustable for varying diameters of rolls for fixedly engaging a free end of said shaft to hold said shaft stationary while said roll is removed therefrom.

9. In combination, a pair of winder drums, a winder shaft for receiving and winding web material thereon into a roll by cooperation with said drums, means for ejecting a roll from winding position with respect to said drums, conveying means for temporarily receiving said wound roll, means for fixedly engaging a free end of said shaft and means for operating said conveying means to separate said roll from said shaft.

10. In combination, a pair of winder drums, a winder shaft for receiving and winding web material thereon into a roll by cooperation with said drums, means for ejecting a roll from winding position with respect to said drums, conveying means for temporarily receiving said wound roll, means for fixedly engaging a free end of said shaft, means for operating said conveying means to separate said roll from said shaft, means for engaging and supporting the separated winder shaft and a trackway over which said last mentioned means is movable to return said winder shaft to a position adjacent said winder drums.

11. In combination, a pair of winder drums, a winder shaft for receiving and winding web material thereon into a roll by cooperation with said drums, means for ejecting a roll from winding position with respect to said drums, conveying means for temporarily receiving said wound roll, means for fixedly engaging a free end of said shaft, means for operating said conveying means to separate said roll from said shaft, means for engaging and supporting the separated winder shaft, a trackway over which said last mentioned means is movable to return said winder shaft to a position adjacent said winder drums and means actuated by said ejecting means to automatically bring said winder shaft into cooperative winding relation with said under drums.

12. In a paper rewinder, the combination of a pair of driven under drums, a winder shaft on which the paper web is wound by surface contact with said under drums to form a roll, means for ejecting said roll and associated winder shaft, a conveyor for receiving said discharged roll, clamping means for releasably engaging one end of the winder shaft, means for driving said conveyer to move said roll off of said shaft, and fluid pressure operated means including a carriage for supporting said separated winder shaft upon the release of said clamping means and returning said winder

shaft to a waiting position adjacent said under drums.

13. In a shaft pulling mechanism, a conveyer for receiving a wound roll of paper and associated winder shaft, spaced cleats on said conveyer for engaging an end of said roll, vertically adjustable clamping means for engaging and holding stationary one end of said winder shaft and means for driving said conveyer to move said roll off of said winder shaft.

14. In a shaft pulling mechanism, a conveyer for receiving a wound roll of paper and associated winder shaft, spaced cleats on said conveyer for engaging an end of said roll, vertically adjustable clamping means for engaging and holding stationary one end of said winder shaft, means for driving said conveyer to move said roll off of said winder shaft and a roller platform for receiving the removed roll.

15. In a shaft pulling mechanism, a conveyer for receiving a wound roll of paper and associated winder shaft, spaced cleats on said conveyer for engaging an end of said roll, vertically adjustable clamping means for engaging and holding stationary one end of said winder shaft, means for driving said conveyer to move said roll off of said winder shaft, an overhead trackway, a carriage movable along said trackway, a dependent hook mechanism movable with said carriage, a cam track guiding said hook mechanism and vertically adjustable to permit said hook mechanism to be brought into supporting engagement with said winder shaft after removal of said roll and the release of said clamping means and pneumatic means for moving said carriage to transfer said winder shaft.

16. In a shaft pulling mechanism, a support for a roll having a shaft associated therewith, means for releasably engaging an end of said shaft, means for moving said roll relative to said shaft to separate the shaft therefrom and pneumatically operated means including an overhead trackway, a carriage movable thereon and a shaft supporting mechanism operable upon release of said shaft engaging means to support and to transfer said shaft.

17. In a shaft pulling mechanism, a conveyer for supporting a roll having a shaft associated therewith, clamping means for releasably engaging an end of said shaft to hold said shaft stationary, means for driving said conveyer to move said roll off of said shaft, an overhead trackway, a carriage movable thereon, a hook mechanism movable with said carriage, a cam track from which said hook mechanism is freely suspended and pneumatically operated means for moving said carriage into position for said hook mechanism to engage and support said shaft upon the release of said clamping means and for moving said carriage to transfer said shaft.

18. A shaft supporting and transfer mechanism, comprising a trackway, a carriage movable thereon, a cam track, a hook mechanism movable with said carriage and suspended from said cam track including shaft engaging hooks and pneumatically operated means for moving said carriage to transfer said shaft.

19. A hook mechanism comprising a vertically suspended rod, a cross member on the lower end thereof, a plurality of spaced pivotally suspended hooks carried by said cross member and pneumatically operated means for releasably engaging said hooks to hold them against swinging movement.

20. A device for removing a shaft from a roll of web material wound thereon, comprising means for supporting a roll having a shaft having two free ends associated therewith, means for releasably engaging a free end of said shaft, driven means engaging said roll and movable axially of said shaft to move said roll off from said shaft and means for transferring the shaft which has been removed from the roll back to the winding position.

21. A device of the class described comprising in combination means for supporting a roll having a shaft associated therewith, means for engaging a free end of said shaft, driven means engaging said roll and movable axially of said shaft relative to said shaft engaging means to separate said roll from said shaft and pneumatically operated means for subsequently transferring said shaft into a position for the winding thereon of another roll.

22. A device of the class described comprising in combination with web winding means having a winder shaft for supporting web material in the form of a roll, means for ejecting and transferring said roll and associated winder shaft from said web winding means, means for receiving said ejected roll and engaging said roll, means for releasably engaging one end of said winder shaft, means for driving said roll receiving and engaging means to move said roll axially of said shaft relative to said shaft engaging means and means for transferring the shaft after said roll has been removed therefrom back to its winding position.

23. In combination with a web winding apparatus, a winder shaft for receiving the web material being wound into a roll, supporting means for receiving said roll and shaft from said winding apparatus, vertically adjustable means for releasably engaging one end of said winder shaft, means for laterally moving said supporting means to separate said roll and shaft, hook means for engaging said shaft as the roll is removed therefrom, and adjustable carriage means for said hook means to return said shaft while suspended from said hook means to said winding apparatus.

24. In combination with a web winding apparatus for winding web material into a roll around a winder shaft, means for separating said roll and winder shaft, and hook means to return said winder shaft to said winding apparatus.

25. The combination with an apparatus for removing a winder shaft from a roll of web material, of hook means for engaging said winder shaft as said roll is removed therefrom, a vertically adjustable support for said hook means, pneumatically operated carriage means for moving said hook means along said support, and track means supporting said carriage means.

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