

Oct. 5, 1943.

E. K. STANDISH

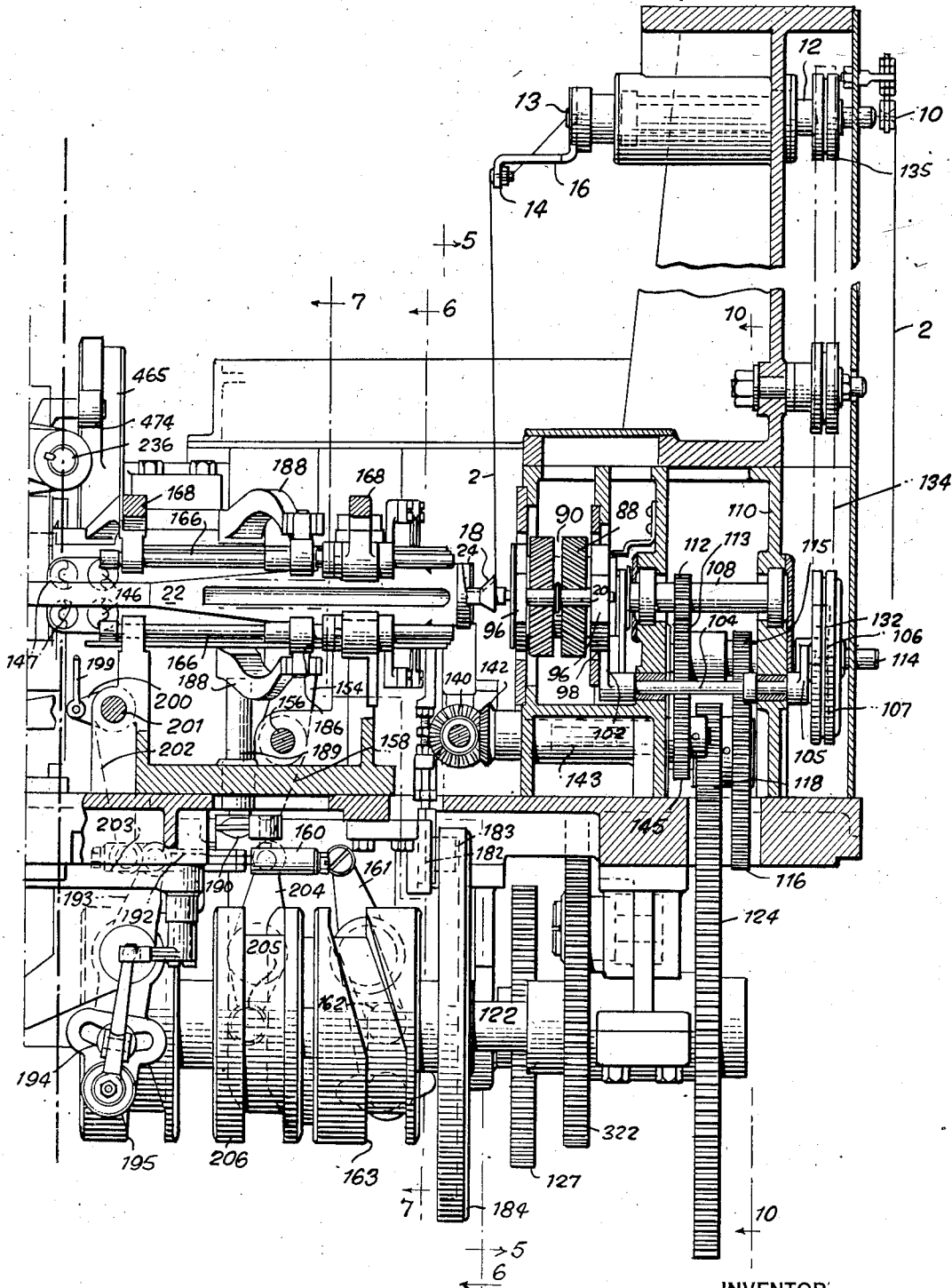
2,331,004

MACHINE FOR WINDING AND PACKAGING SKEINS

Filed Aug. 2, 1940

16 Sheets-Sheet 1

Fig.1.



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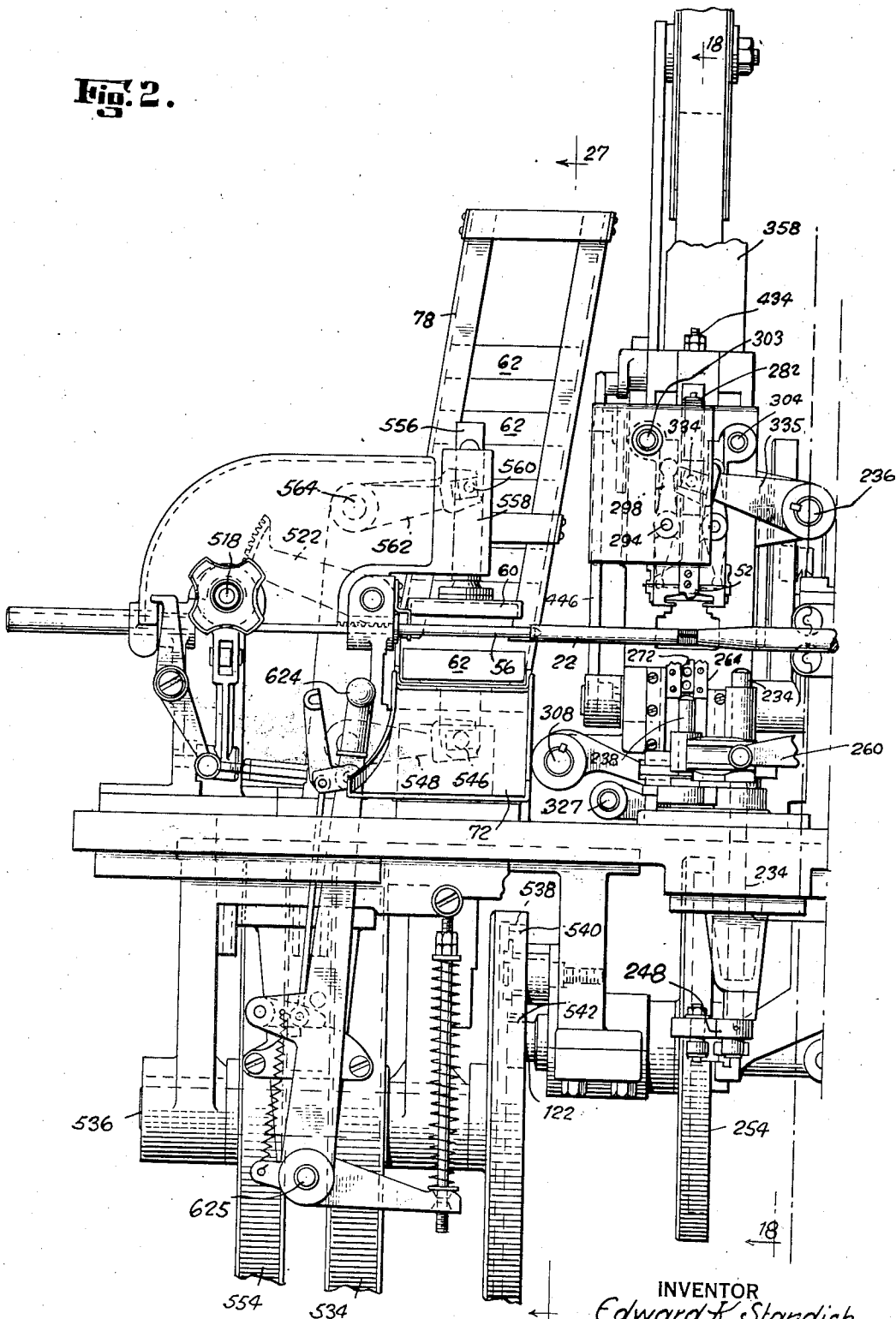
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MACHINE FOR WINDING AND PACKAGING SKEINS

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16 Sheets-Sheet 2

Fig. 2.



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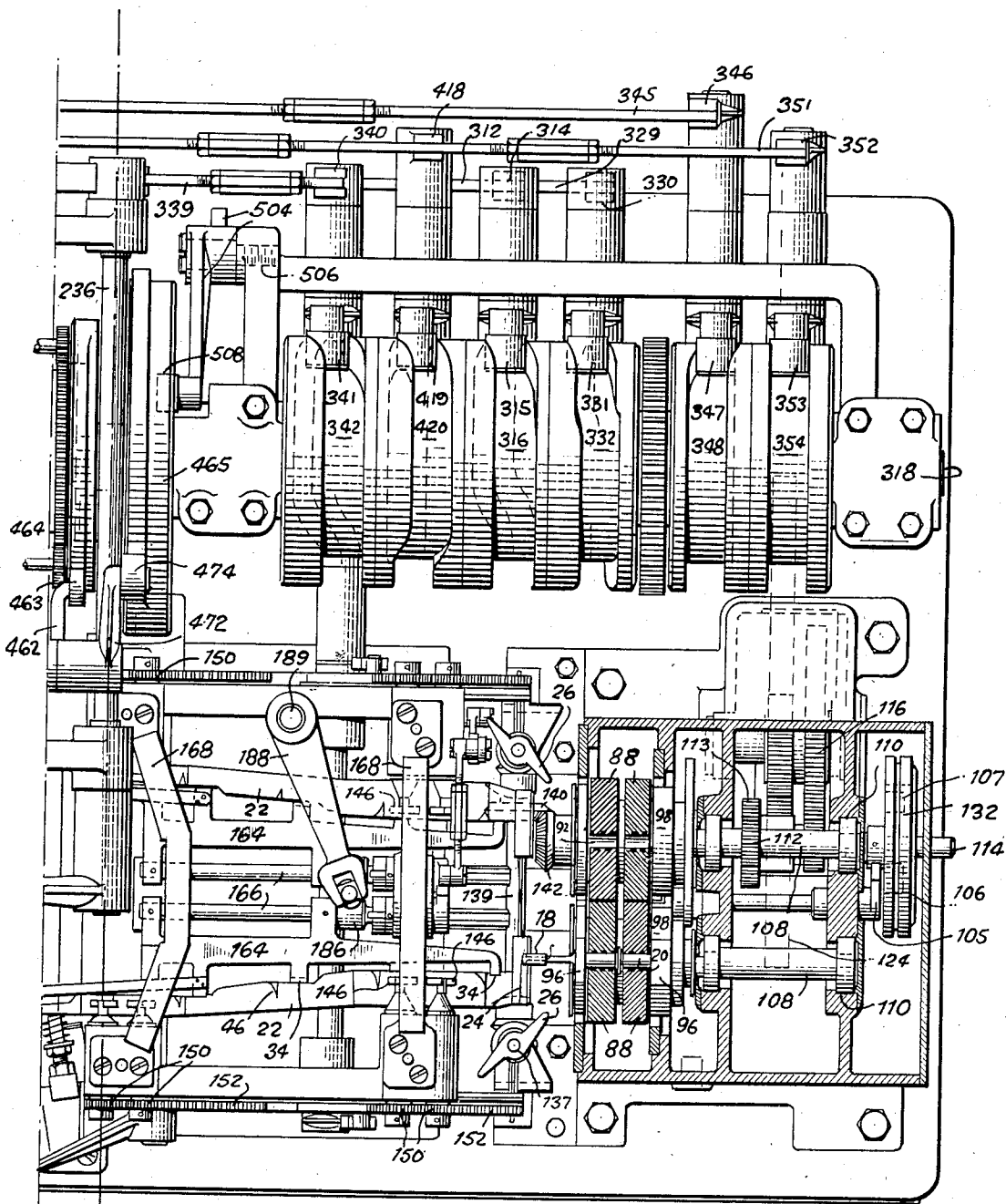
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MACHINE FOR WINDING AND PACKAGING SKEINS

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Fig. 3.



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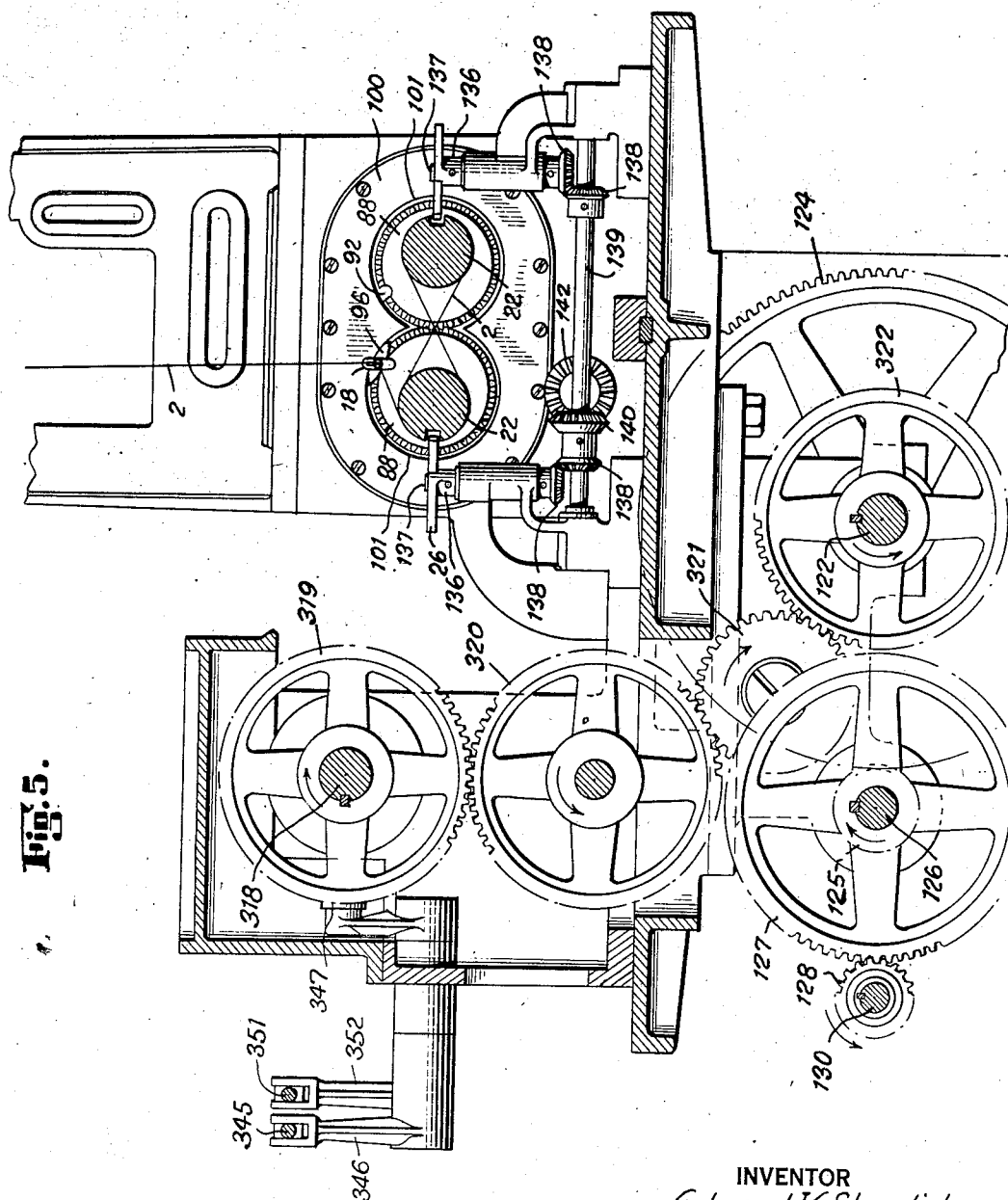


Fig. 5.

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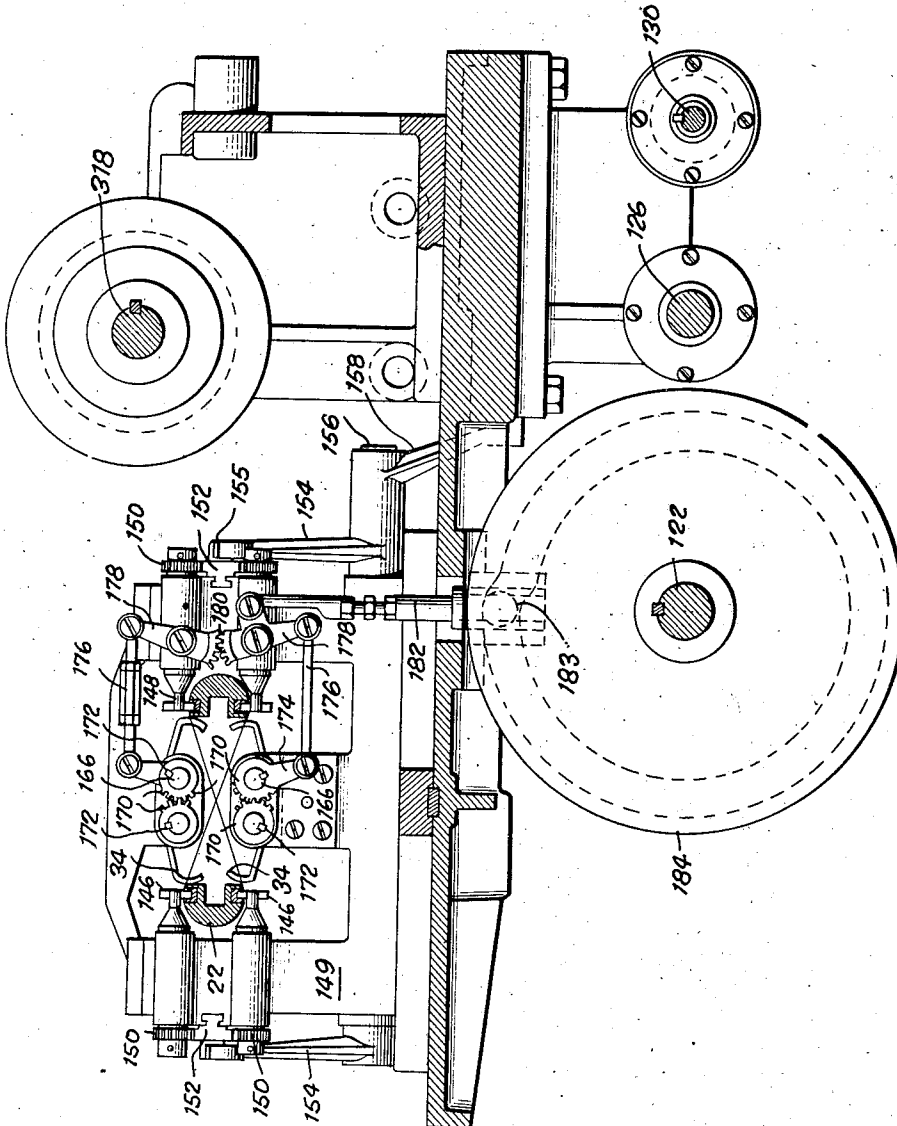
2,331,004

MACHINE FOR WINDING AND PACKAGING SKEINS.

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Fig. 6.



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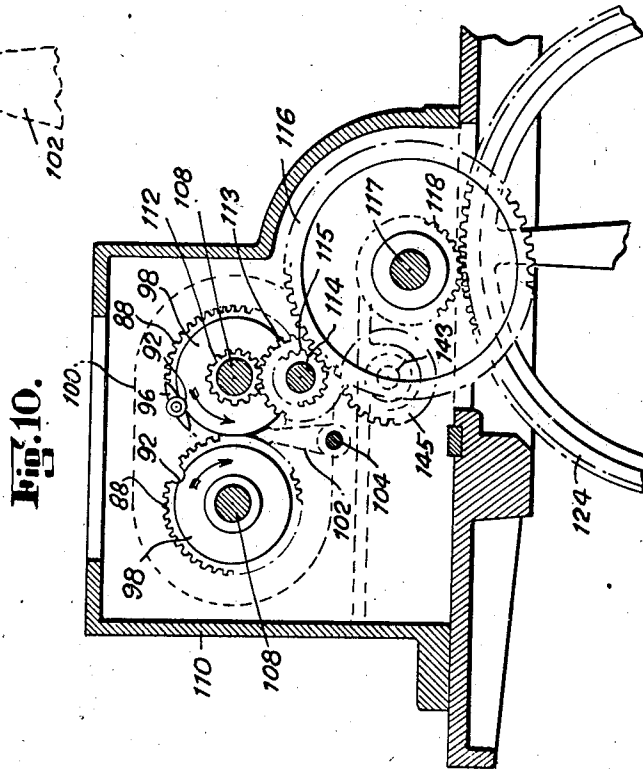
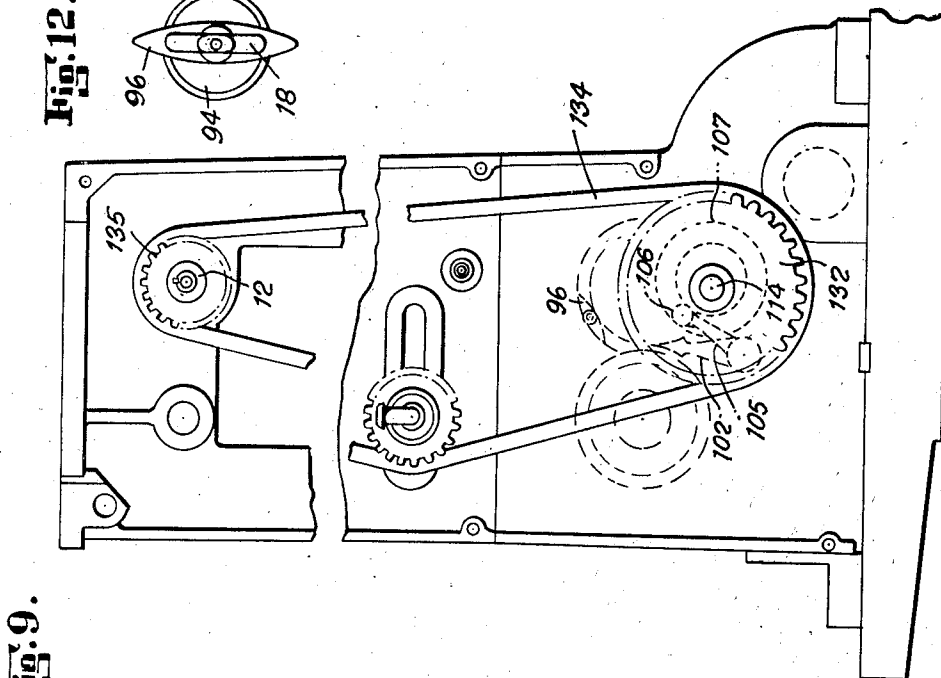
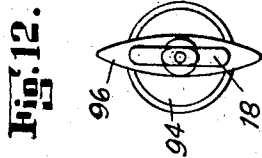
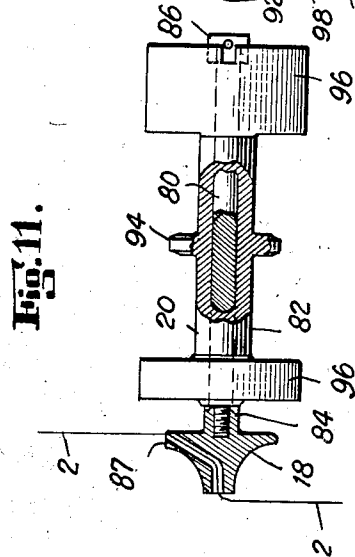
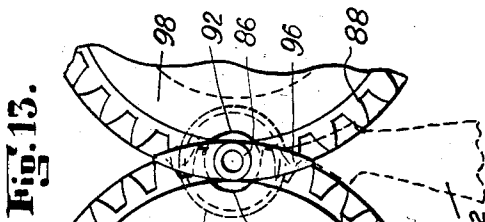
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MACHINE FOR WINDING AND PACKAGING SKEINS

Filed Aug. 2, 1940

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MACHINE FOR WINDING AND PACKAGING SKEINS

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Fig. 15.

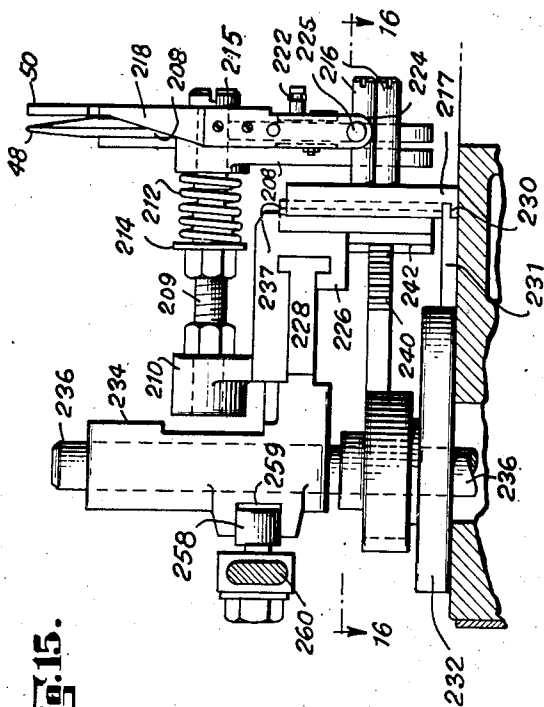


Fig. 17.

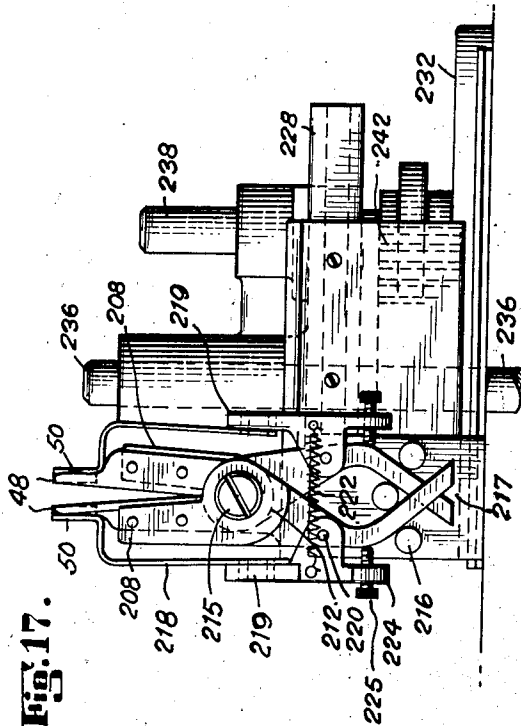


Fig. 14.

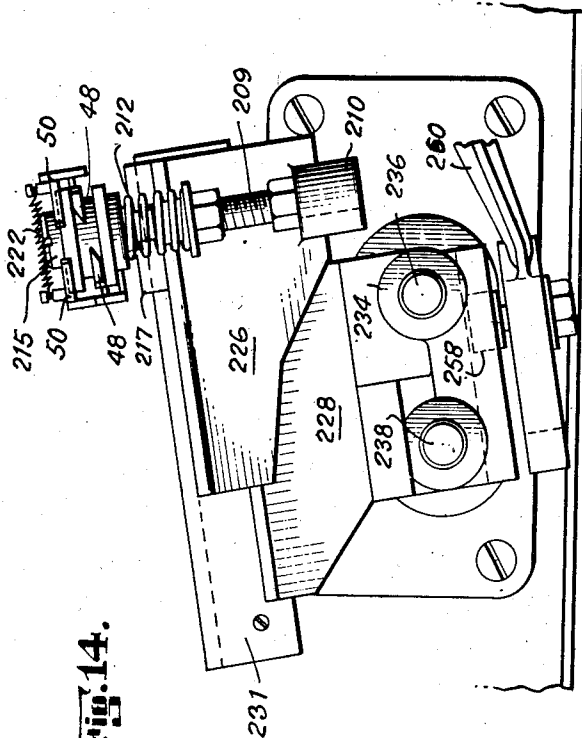
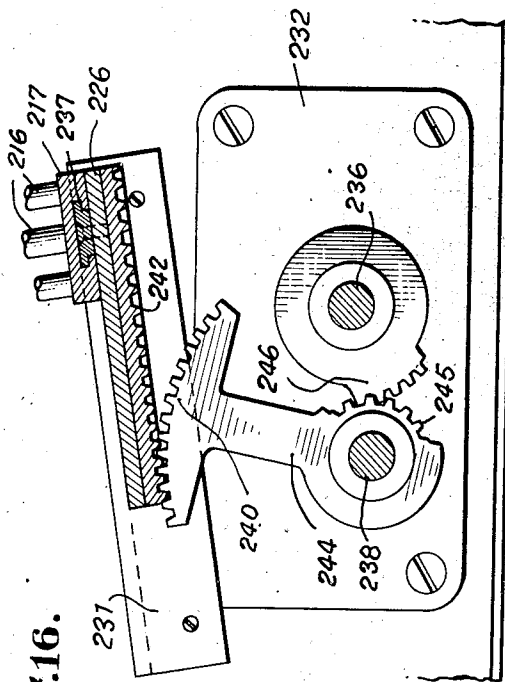


Fig. 16.



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MACHINE FOR WINDING AND PACKAGING SKEINS

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Fig. 18.

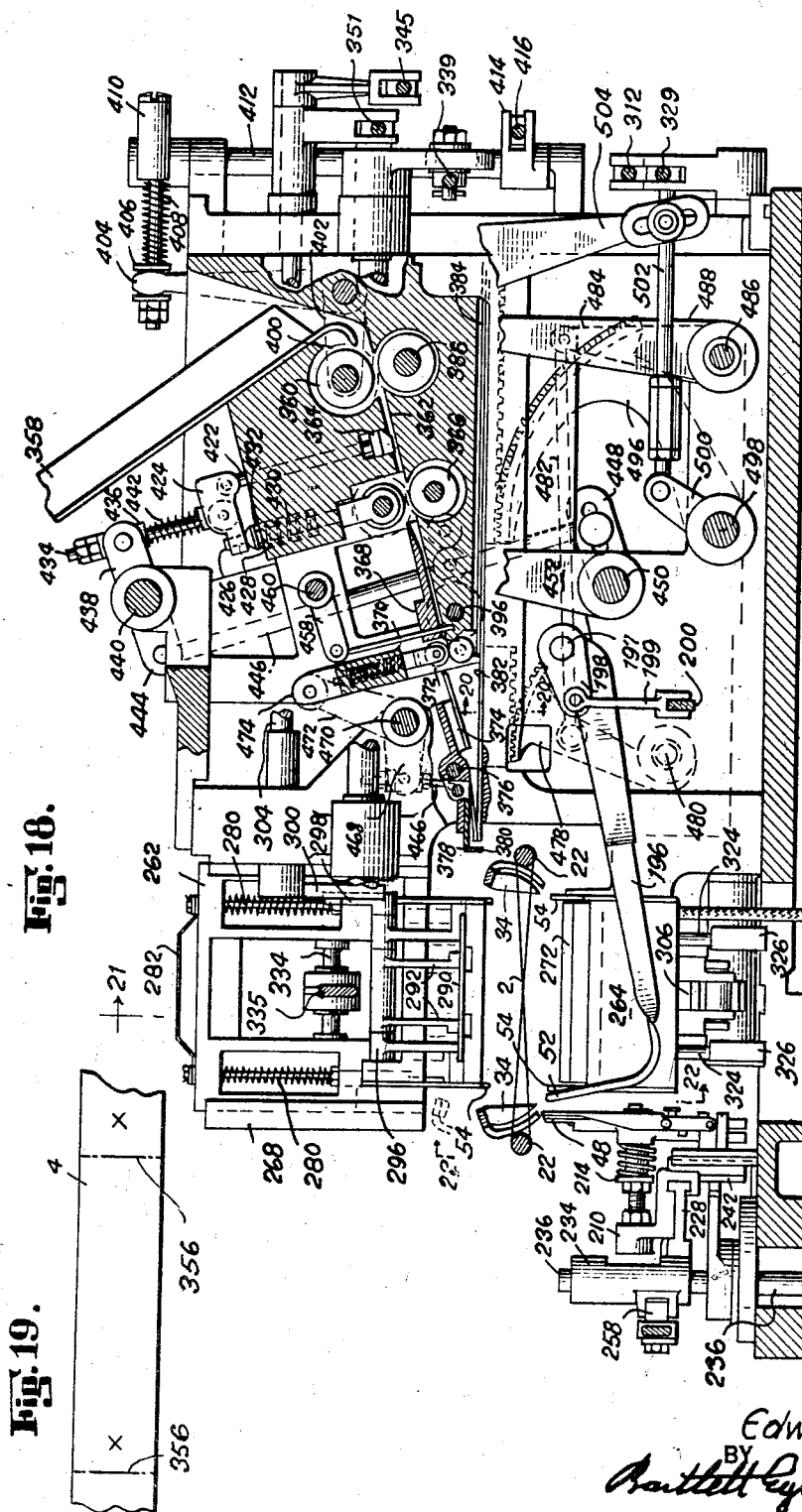
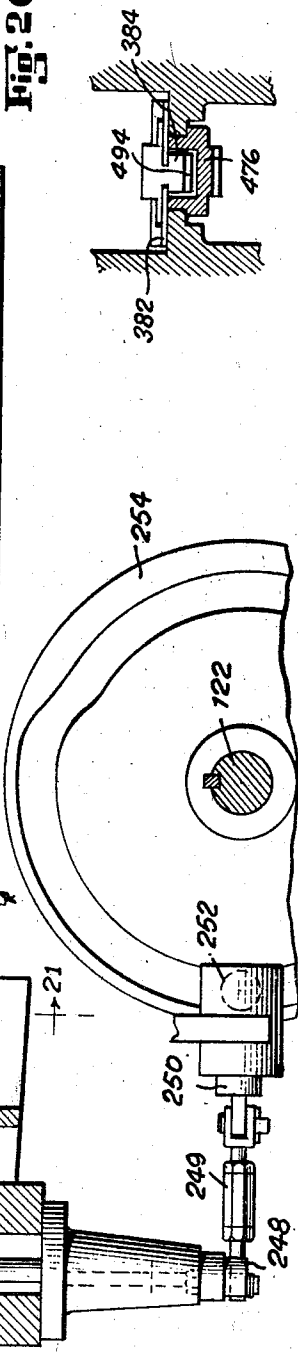


Fig. 20.



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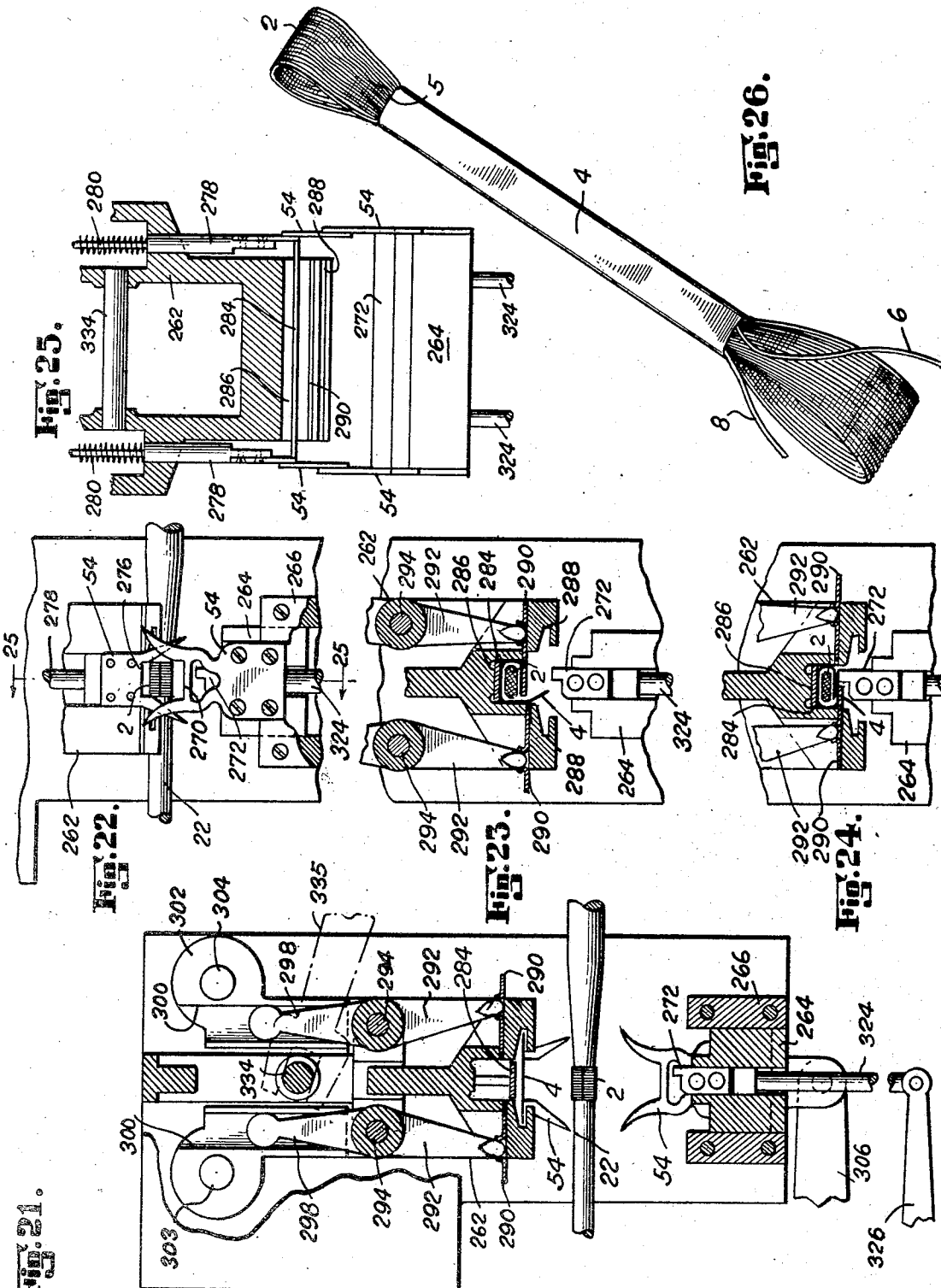
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MACHINE FOR WINDING AND PACKAGING SKEINS

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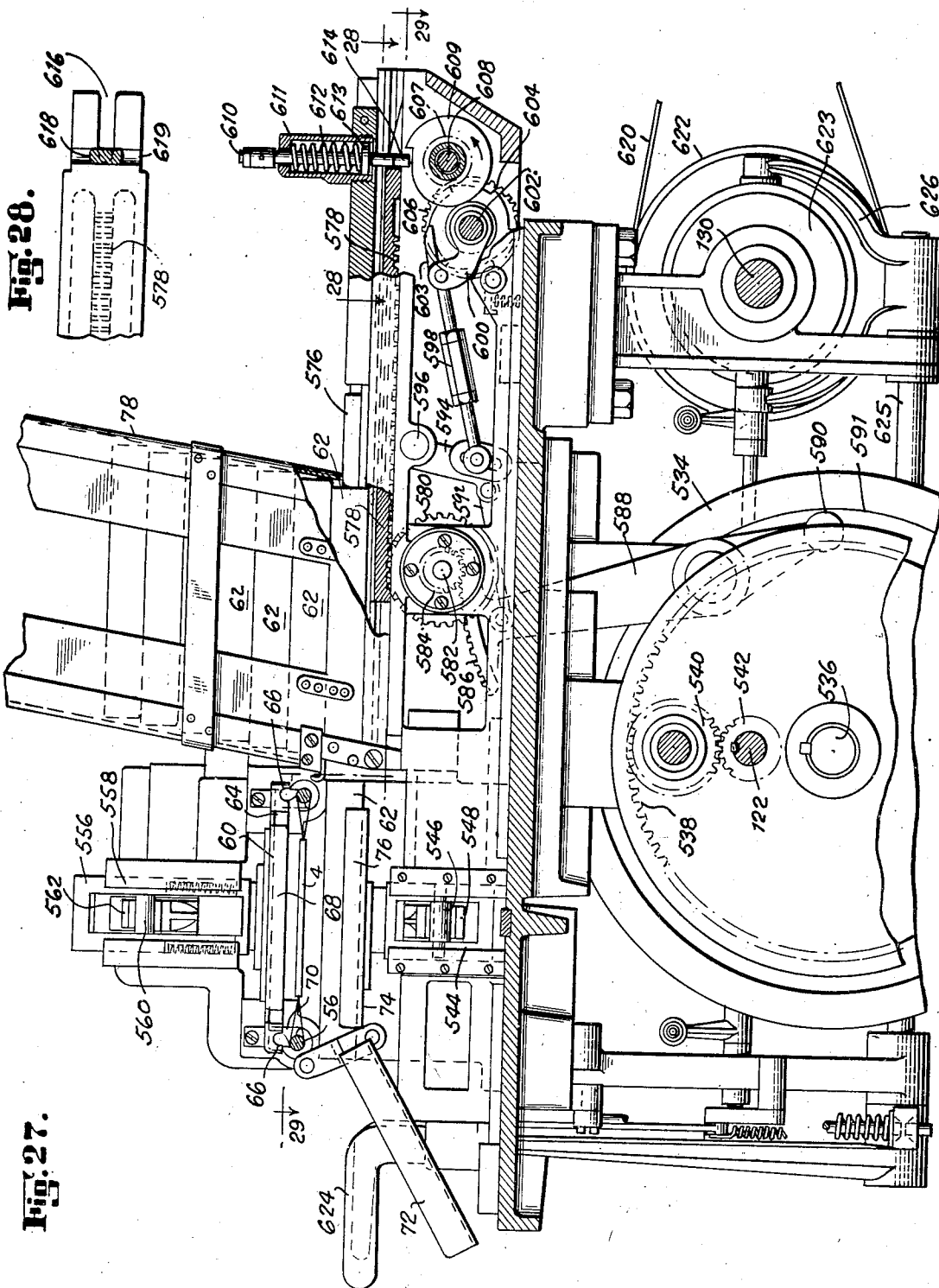
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MACHINE FOR WINDING AND PACKAGING SKEINS

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MACHINE FOR WINDING AND PACKAGING SKEINS

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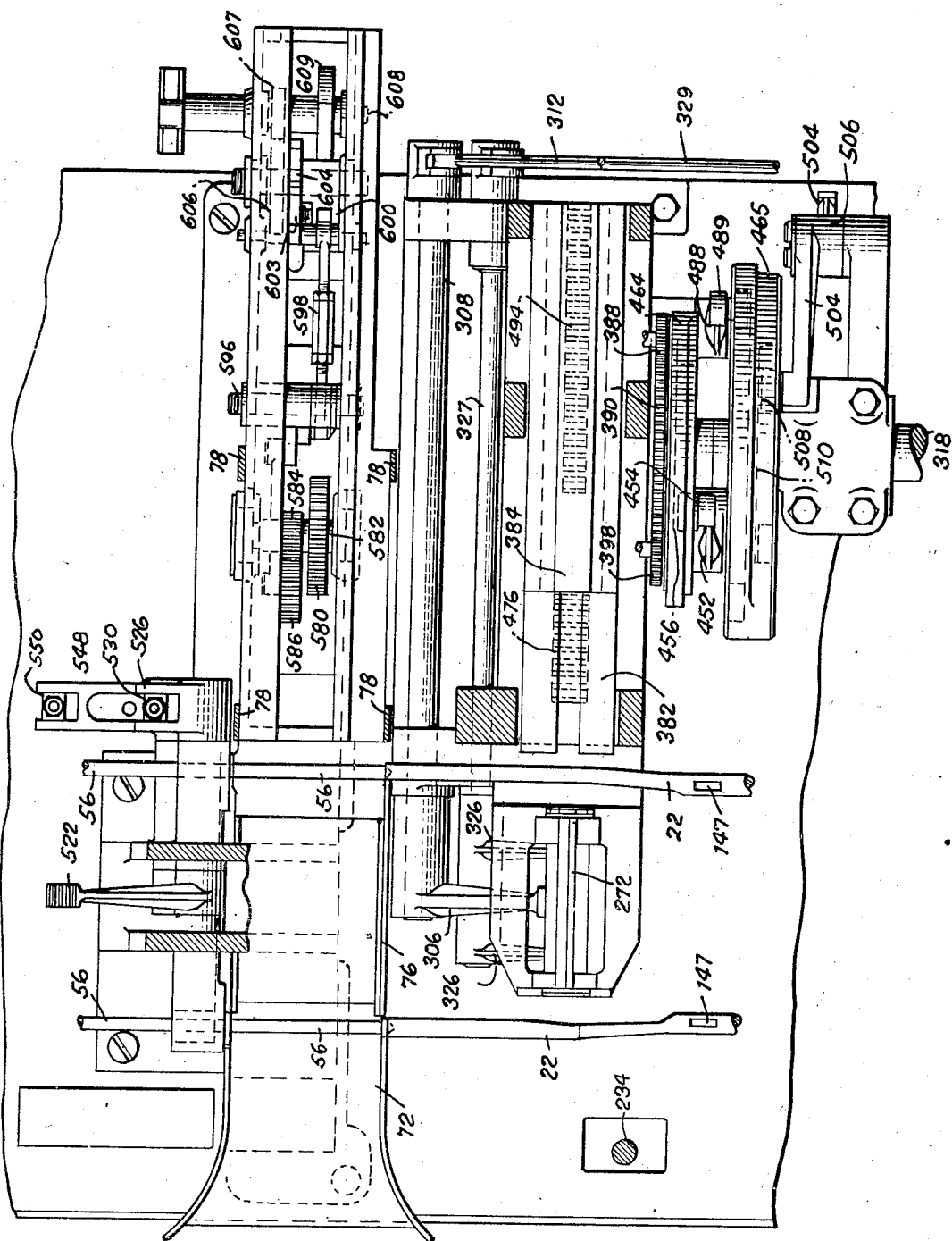


Fig. 29.

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MACHINE FOR WINDING AND PACKAGING SKEINS

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Fig. 30.

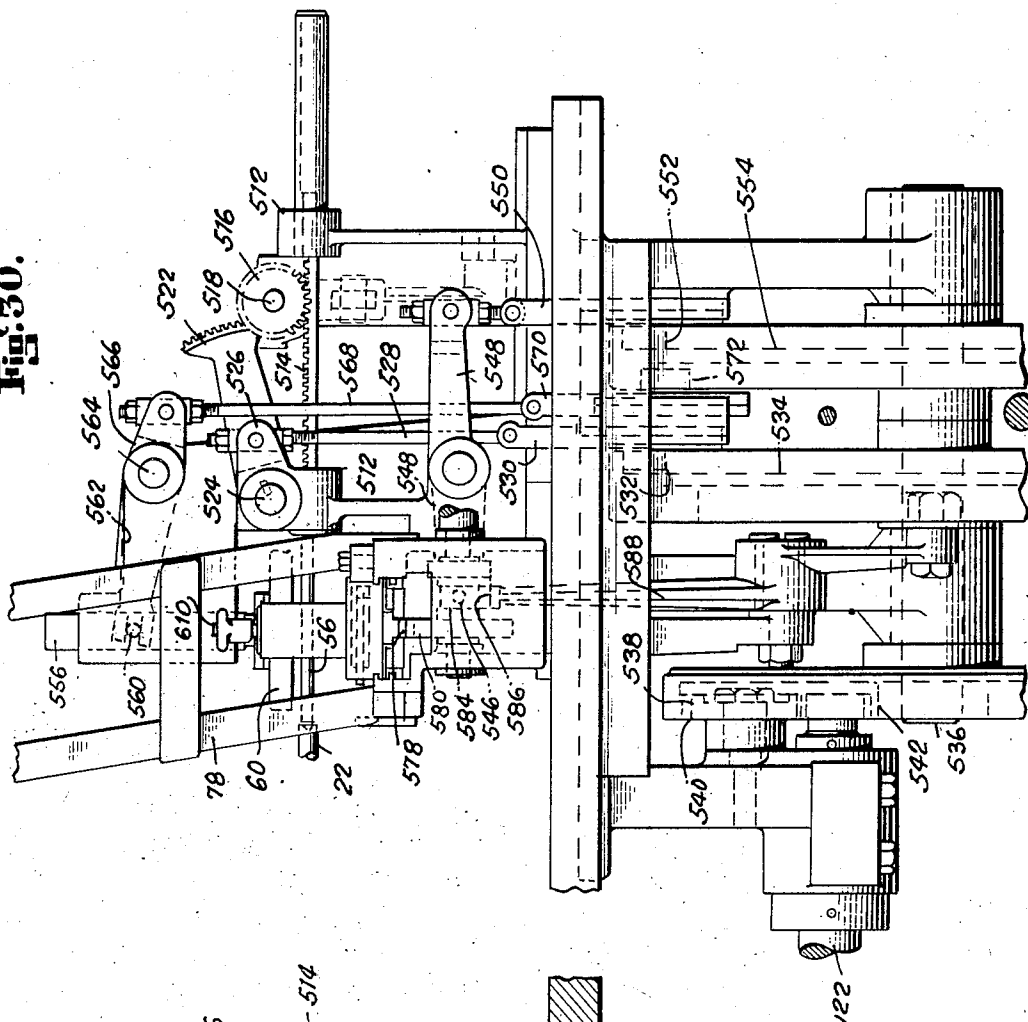
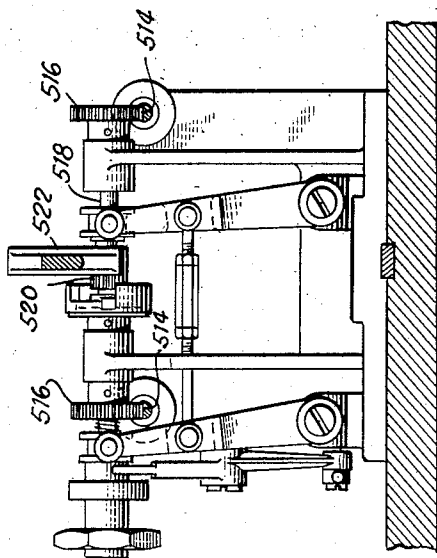


Fig. 31.



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MACHINE FOR WINDING AND PACKAGING SKEINS

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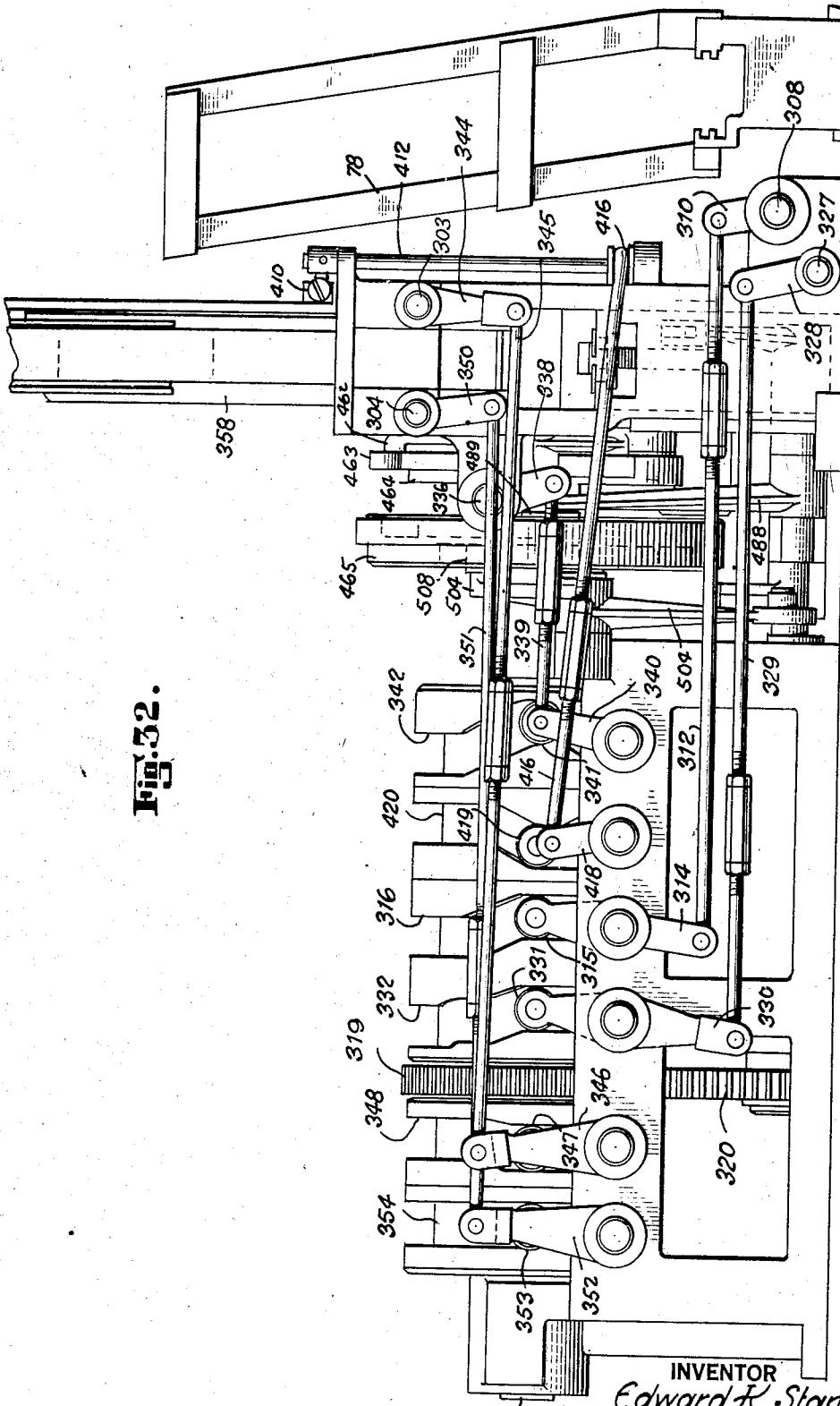


Fig. 32.

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MACHINE FOR WINDING AND PACKAGING SKEINS

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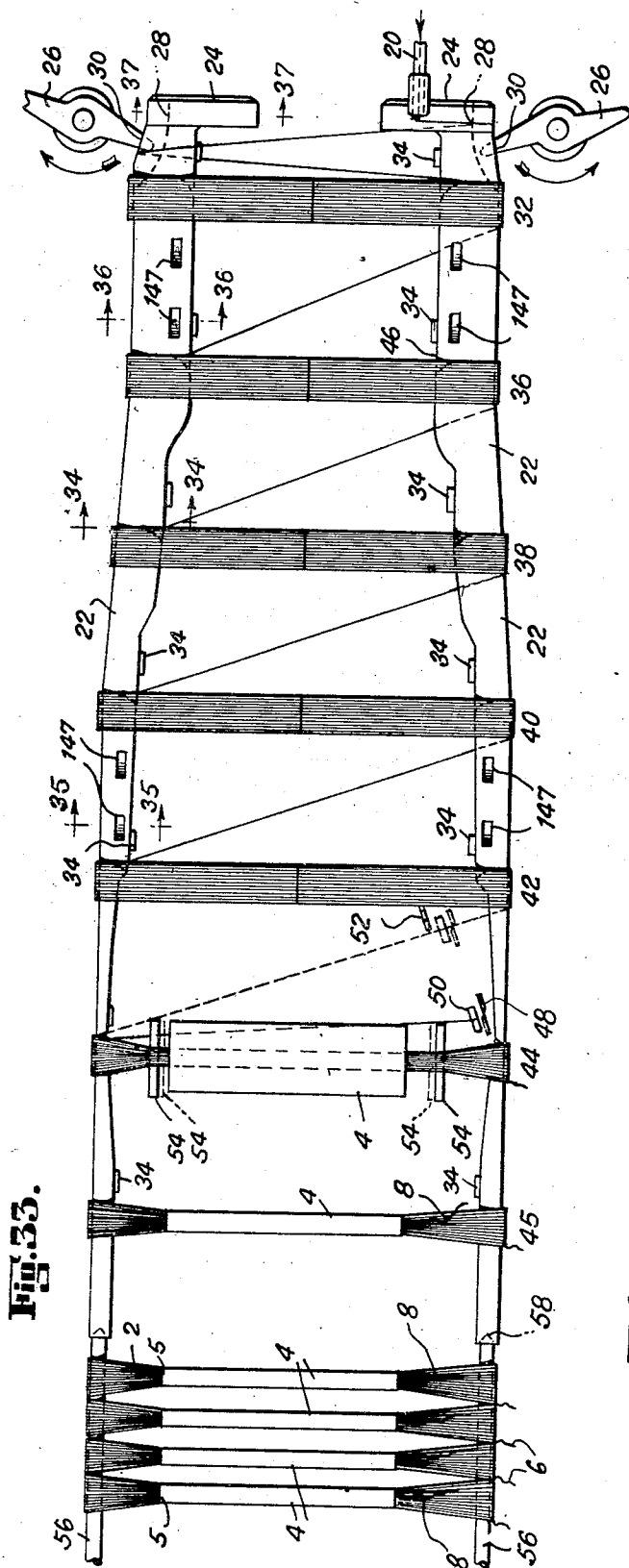


Fig. 33.

Fig. 37.

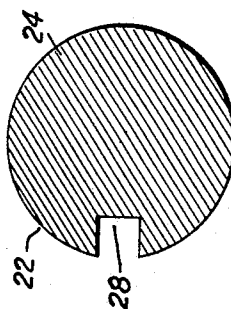


Fig. 36.

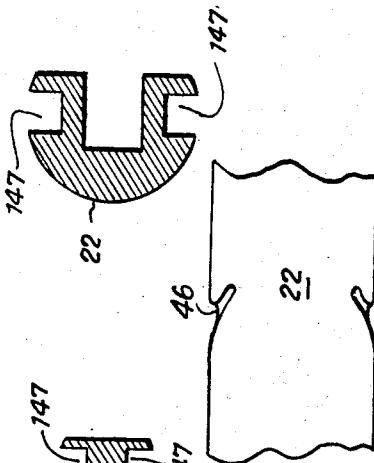


Fig. 35.

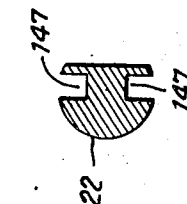


Fig. 38.

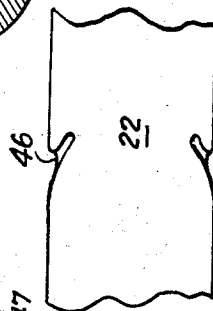
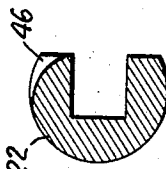


Fig. 34.



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UNITED STATES PATENT OFFICE

2,331,004

MACHINE FOR WINDING AND PACKAGING SKEINS

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Application August 2, 1940, Serial No. 349,947

23 Claims. (Cl. 28—21)

The present invention relates to machines for winding strands, and has special reference to the manufacture and packaging of skeins of yarn or thread.

One of the objects of the invention is to provide a novel and improved machine of the character indicated.

Other objects of the invention are to provide novel and improved winding mechanism, labeling mechanism and packaging mechanism, and to coordinate these mechanisms in such a manner that the resulting machine is simple in construction, efficient in operation, and capable of operating at high speed.

The several features of the invention whereby these and other objects may be attained, will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a front elevation, partly in section, of the right hand portion of the machine;

Fig. 2 is a similar view of the left hand portion;

Fig. 3 is a plan view, partly in section, of the portion of the machine shown in Fig. 1;

Fig. 4 is a similar view of the portion of the machine shown in Fig. 2;

Figs. 5, 6 and 7 are sectional views respectively taken on the lines 5—5, 6—6 and 7—7 of Fig. 1;

Fig. 8 is a side view, partly in section, of a portion of one of the skein holder bars and the supporting means therefor;

Fig. 9 is a right hand end view of the upper portion of the machine with certain parts removed and parts broken away to save space;

Fig. 10 is a section taken on the line 10—10 of Fig. 1;

Fig. 11 is a side view, partly in section, of the skein winding flier;

Figs. 12 and 13 are views of opposite ends of the flier, Fig. 13 showing portions of the operating devices for the flier;

Fig. 14 is a detail plan view of a thread severing and gripping mechanism;

Fig. 15 is a side view, partly in section, of said mechanism;

Fig. 16 is a sectional plan view taken on the line 16—16 of Fig. 15;

Fig. 17 is a rear elevation of the mechanism;

Fig. 18 is a side elevation view, partly in section, taken on the line 18—18 of Fig. 2, showing especially the labeling mechanism of the machine;

Fig. 19 is a plan view of a portion of a strip from which the labels are severed;

Fig. 20 is a detail sectional view taken substantially on the line 20—20 of Fig. 18;

Fig. 21 is a sectional elevation, on an enlarged scale, taken substantially on the line 21—21 of Fig. 18;

Fig. 22 is a detail sectional elevation, taken substantially on the line 22—22 of Fig. 18 but with the parts shown in a different position;

Figs. 23 and 24 are views similar to a portion of Fig. 21, illustrating different steps in the applying of the label to the skein;

Fig. 25 is a sectional view, taken on the line 25—25 of Fig. 22;

Fig. 26 is a view in perspective of a completed skein which may be formed by the machine;

Fig. 27 is a sectional elevation, taken on the line 27—27 of Fig. 2;

Fig. 28 is a detail sectional plan view, taken on the line 28—28 of Fig. 27;

Fig. 29 is a sectional plan view, taken substantially on the line 29—29 of Fig. 27;

Fig. 30 is an elevation of a portion of the opposite side of the machine from that shown in Fig. 2;

Fig. 31 is a sectional elevation, taken substantially on the line 31—31 of Fig. 4;

Fig. 32 is an elevation of a portion of the further side of the machine, viewing Figs. 3 and 4;

Fig. 33 is a diagrammatical plan view illustrating especially various steps in winding and applying labels to the skeins;

Figs. 34, 35, 36 and 37 are detail sectional views, on an enlarged scale, respectively taken on the lines 34—34, 35—35, 36—36 and 37—37 of Fig. 33; and

Fig. 38 is a detail inner side view of a portion of one of the skein holder bars.

The machine illustrated in the drawings, is particularly adapted for use in forming the embroidery skein shown in Fig. 26. This skein comprises a yarn or thread 2 which is wound in the form of a figure 8 with the coils of the thread arranged side by side. A label 4 is secured about the central portion of the skein, the label extending the major portion of the length of the skein. Previously to applying the label, the portions of the coils extending the length of the label are tightly squeezed together both laterally and vertically while maintaining the side by side relation of the coils. The label is tightly applied so as to hold the coils in close contact. One end 5 of the label extends in proximity to the corresponding end of the skein. Both ends 6 and 8 of the thread are arranged at the other end of the skein. The end 6 of the thread projects loose-

ly a distance beyond the end of the skein so that it may be easily grasped by the fingers of the user to pull the coils from the skein. The other end 8 of the thread projects a lesser distance from the end of the label.

With the skein as thus formed, the figure 8 coils are firmly held together by the long label. By extending the end 5 of the label close to the corresponding end of the skein and arranging both ends of the thread at the other end of the skein, the user by pulling on the projecting end of the thread, may easily unwind the coils without danger of the loops at the opposite end of the skein snarling or becoming entangled. In case the end 6 of the thread is cut close to the label while in use, the skein may be unwound by means of the other end 8 of the thread.

Thus the user receives the skein with the coils properly arranged throughout, and the skein may be easily and conveniently unwound as it is used without danger of snarling the thread.

In addition to winding skeins and applying the labels thereto, the machine is adapted to pack the skeins in boxes with a predetermined number of skeins in each box.

The thread 2 from which the skeins are formed is delivered to the machine from a suitable thread supply and passes through a thread guide 10, a tubular shaft 12, a thread guide 13 on the forward or inner end of the shaft, and a thread guide 14 carried by the end of an arm 16 secured on the forward end of said shaft 12 (Fig. 1). From the thread guide 14 the thread passes through a thread guide 18 that is carried by a flier 20.

The flier 20 and the thread guide carried thereby are moved in the path of a figure 8 so as to cause the thread to be wound upon a frame or holder. This holder comprises two rails or bars 22 having cylindrical heads 24 on their front ends (Fig. 33). The flier 20 winds the thread in a form of a figure 8 over these heads 24 and as each coil is wound rotating arms 26 engage the ends of the coil and slide it forwardly on the holder bars, the front portions of the bars and the heads 24 being provided with clearance slots 28 through which the ends of the arms pass.

The portions of the bars 22 adjacent the heads 24 are of smaller diameter than said heads but their outer surfaces are spaced further apart, the rear portions 30 of said surfaces being tapered inwardly flush with the surfaces of the heads.

As each coil is thus slid forwardly on the bars 22 by the arms 26, it engages and slides forwardly the coils previously wound until a predetermined number of coils have been wound about the bars to form a skein. Such formation of the skein takes place at station 32 on the bars. When a skein has thus been wound, fingers 34 engage the upper and lower lengths of the last wound coil and advance the skein along the bars to a station 36. The fingers 34 are arranged in sets spaced along the bars 22 and all moved together longitudinally of the bars.

When the next skein has similarly been wound on the rods, the two skeins are advanced on the bars by the fingers 34, the first skein that is wound being advanced to station 38 and the second skein to station 36. Such advancing of the wound skeins on the bars takes place while the flier 20 continues to wind the thread on the bars, and the skeins are successively advanced on the bars from station 38 to stations 40, 42 and 44.

In order to hold the skeins at the various sta-

tions from working rearwardly, the last wound coils of each skein are laid in notches 46 in the skein-holding bars 22, the notches 46 being properly positioned to receive the coils.

When each skein reaches the station 44, knives 48 sever the thread extending between the skeins at the stations 44 and 42, and grippers 50 grip the end of the thread of the skein near the station 42, the other severed end of the thread being permitted to hang loosely from the skein at station 42.

In order to insure the length of thread extending between the skeins at stations 42 and 44 being in position to be acted upon by the cutters 48 and grippers 50, a locating device 52 which comprises a blade having a pointed or beveled upper end, engages the rear side of the thread and places a portion thereof in proper position to be engaged by the knives and grippers.

The grippers 50 carry the end of the thread held thereby against the rear side of the skein at station 44. When this takes place, devices 54 engage the coils of thread at points spaced from the holder bars, and firmly squeeze the portions of the coils at these points together both laterally and vertically while maintaining the side by side relation of the coils. When this occurs the label 4 is applied tightly about the portion of the skein extending between the two sets of devices 54, and thus serves to hold the portions of the coils enclosed by the label firmly together in side by side relation.

When the label has thus been applied and secured about the skein at station 44, the skein is advanced to station 45. Also, the skein at station 42 is advanced to station 44 and the thread likewise severed and a label applied to the skein.

From the station 45 the completed skeins are successively slid by fingers 34 off the forward ends of the bars, and upon rods 56. These rods are arranged in alinement with the bars and have their ends received in recesses 58 in the ends of the bars.

As each skein slides on to the rods 56, it pushes the previously wound skeins along with it, until a predetermined number of skeins are thus received in side by side relation on said rods. When this occurs a head 60 (Fig. 27) is moved downwardly over the group or layer of skeins on the rods 56, and a box 62 is moved upwardly in proximity to the under sides of the rods. The head 60 comprises a plate that extends over the tops of the skeins. Depending flanges 64 on the ends of the rear edge of the plate have semi-circular clearance notches 66 which, when the head has been moved down, receive the upper portions of the rods 56 at the rear of the skeins. The plate is provided with both front and rear side depending flanges 68.

Adjacent the rear edge of the head 60 are stripping fingers 70 having their lower ends fitted around the inner portions of the rods 56 and arranged adjacent the front side of the foremost coil of the foremost skein.

When the head 60 thus moves down over the layer of skeins on the rods 56 and a box 62 is moved up into proximity to the underside of said rods, the rods are retracted so as to cause the layers of skeins to be stripped from the rods by the stripping fingers 70. During this stripping operation, the head 60 assists in holding the skeins from piling up on one another and maintains them in side by side relation so as to cause them to be deposited in a layer in the box 62.

This operation of assembling the skeins in a

layer on the rods 56 and then depositing them in a box 62, is continued until three or other desired number of layers have thus been deposited in the box one upon the other.

When the desired number of layers have thus been deposited in a box, the box is discharged down a chute 72 and from the machine, and the next box that is to be filled is fed into position beneath the rods 56.

Each box is supported beneath the rods 56 and is moved vertically toward and from the rods 56 by means of a table 74 which has front and rear upstanding flanges 76 for receiving the box between them. The boxes to be filled are arranged in a magazine 78 and are successively delivered to the table 74.

The mechanisms for performing the several operations above referred to will now be described.

The thread guide 18 of the flier 20 is screw-threaded on the reduced end of a pin 80 which is mounted to turn in a carrier sleeve 82 (Figs. 11, 12 and 13). The pin 80 is held from axial movement in the sleeve 82 by a hub 84 on the guide engaging one end of the sleeve, and a collar 86 secured on the rear end of the pin adjacent the other end of the sleeve, the collar 86 extending into a recess or counter-bore in the end of the sleeve.

The thread guide 18 is in the form of a flat plate and its thread guide opening 87, its outlet end centrally located with the axis of the pin 80, and the other end of the opening being normally above said axis.

During the travel of the flier to wind the thread about the skein-holder bars 22, the stretch of thread extending to the thread guide 18 is maintained sufficiently taut to maintain the thread guide substantially vertical (Fig. 12). Such control of the thread is effected by the arm 16 (Fig. 1) which makes two revolutions for each complete figure 8 movement of the flier 20.

The illustrated machine is provided with novel and improved mechanism for traversing the flier 20 as above described. As shown, this mechanism comprises two intermeshing gears 88 which are arranged with their axes in a horizontal plane (Figs. 1, 3, 10 and 13). Each gear is formed with oppositely directed miter or spiral teeth with a peripheral groove 90 arranged between the two sets of teeth. Each gear is also provided with a transverse groove 92 in its periphery, a portion of a tooth being omitted where the groove is located and the center of the groove being spaced from adjacent teeth a distance corresponding to the distance between the centers of adjacent teeth.

The grooves 92 in the gears 88 are so located that the grooves are brought opposite each other or in registry at the completion of each revolution of the gears.

The carrier sleeve 82 for the flier 20 is adapted to be received in each of the grooves 92, with a centrally located annular rib 94 on the sleeve extending into the groove 90 so as to hold the carrier sleeve from axial movement.

The ends of the sleeve 82 are provided with laterally directed wedge shaped guiding members 96 which extend over hubs 98 on the sides of each gear. The hubs of the two gears extend through openings in plates 100 (Fig. 5), the walls 101 of the openings being spaced from the periphery of the hubs so as to provide guideways for the guiding members 96 of said sleeve 82.

During the rotation of the gears 88 the carrier sleeve 82 is carried in the groove 92 of one of

the gears, the sleeve being held in the groove by the guiding members 96 riding in their said guideways. When the grooves 92 reach a position opposite each other, a switching device acts to shift the carrier sleeve into the groove 92 in the other gear.

This switching device comprises an arm 102 which is secured on the end of a rock-shaft 104 and is operated through an arm 105 that carries a cam roll 106 engaging in a cam groove 107 (Figs. 1 and 9). The switch arm 102 has its upper end pointed or beveled as shown.

When the flier 20 carried by one of the gears reaches a position opposite the groove 92 in the other gear, one of the guiding members 96 of the carrier sleeve engages one side of the beveled end of the switch arm 102 and by riding on said beveled end, the carrier is shifted into the groove 92 in the other gear. After this occurs the switch arm 102 is rocked into a position so that when the flier reaches a position opposite the groove 92 in the first gear, said one of the guide members 96 rides on the opposite side of the beveled end of the switch arm 102 to shift the flier into the groove in said first gear.

It will be apparent that with this construction the flier travels at a constant speed in the path of a figure 8, the flier being alternately carried by first one gear and then the other. The flier is capable of high speed operation smoothly and uniformly, and with a minimum amount of wear on the parts.

Each of the gears 88 is secured on a shaft 108 which is journaled in bearings in a gear casing 110 (Figs. 1, 3 and 10). The drive for the gears 88, comprises a pinion 112 secured on one of the shafts 108 which is engaged by a gear 113 on a shaft 114, which shaft also carries a pinion 115 that is engaged by a gear 116 secured on a shaft 117. A pinion 118 on the latter shaft is engaged by a gear 124 that is carried by the main cam shaft 122 of the machine. This cam shaft is driven through the gear 124 (Fig. 5) which is engaged by a pinion 125 on a shaft 126 that carries a gear 127 driven by a pinion 128 on the main drive shaft 130 of the machine.

The shaft 114 (Fig. 1) carries a sprocket wheel 132 in the side of which the cam groove 107 for operating the switch arm 102 is formed. The sprocket wheel 132 (Figs. 1 and 9) through a sprocket chain 134 drives a sprocket wheel 135 on the end of the tubular shaft 12 that carries the yarn compensating or equalizing arm 16.

Each of the pair of thread positioning arms 26 (Figs. 3 and 5) projects from a collar 136 which is secured on the upper end of a vertical shaft 137. The two shafts 137 are driven to rotate the arms as above described, through miter gears 138 which connect the lower ends of the shafts with a shaft 139. The shaft 139 carries a bevel gear 140 which is operatively engaged by a gear 142 on one end of a short shaft 143 (Figs. 1 and 10). The shaft 143 is driven through a gear 145 on the other end thereof that is engaged by the gear 113 on the shaft 114.

Inasmuch as the skeins pass the full length of the bars 22 (Figs. 1, 3 and 5), means must be provided for supporting those bars in such a way as not to interfere with the passage of the skeins.

As shown, each bar is supported by two spaced sets of semi-circular disks 146 which are adapted to fit into curved slots 147 in the top and bottom surfaces of each bar (Figs. 3, 6, 7, 8 and 33). Each set of disks 146 comprises two pairs of disks, Fig. 8, the disks of each pair being adapt-

ed to respectively engage in upper and lower slots 147 in the bar. The disks of the several sets are so operated that when one pair is in engagement in the slots 147, the disks of the other pair of the set are out of engagement with the slots, the corresponding pairs of disks of the two bars being moved simultaneously into and out of engagement with the slots. The disks 146 are moved into and out of engagement with the slots in the bars by rotation thereof in opposite directions 180 degrees.

The operation of the disks 146 is so timed with the skein feeding fingers 34 that as a skein approaches the front pairs of disks of corresponding sets, these disks are turned (viewing Fig. 8), so as to move them out of engagement with the slots and away from the rods to permit the skein to pass beneath the disks. Simultaneously with this movement of the front pairs of disks, the rear pairs of disks are moved into engagement with their associated slots. Thus as a skein approaches the front pairs of disks, the skein is permitted to pass by said disks, and as the skein approaches the rear pairs of disks, those disks are swung away from the bars so as to permit the skeins to pass by them, the bars then being supported by the front pairs of disks.

The disks 146 are carried by the inner ends of shafts 148 which are journaled in bearings in supporting brackets 149. The outer ends of the shafts 148 carry pinions 150 which are engaged by teeth on the top and bottom sides of racks 152, each rack operating all of the disks 146 associated with each skein holder bar 22.

The two racks 152 are reciprocated to operate the disks 146 as above described by means of arms 154, the upper ends of which are bifurcated to operatively engage pins 155 on the racks. The arms 154 are secured on a shaft 156 so as to cause them to move together. The hub on one of the arms 154 (Figs. 6 and 7) is provided with an arm 158 which is connected by a link 160 (Figs. 1 and 7) with a lever 161 that carries a cam roll 162 engaging in a groove in a cam 163 on the main cam shaft 122.

The fingers 34 for advancing the skeins along the skein holder bars 22 are formed on arms 164. There are four arms 164, the series of upper fingers 34 associated with a bar 22 being formed on one of the arms and the series of lower fingers associated with a bar is formed on another arm. Each of the arms 164 is secured on a rock shaft 166 that is mounted to turn and slide longitudinally in bearings in horizontal transverse frame members 168 (Fig. 3).

The four rock shafts 166 are adapted to be turned to move the fingers into and out of position adjacent the rear sides of the skeins, by means of segmental pinions 170 (Fig. 6) which are connected with the shafts by keys 172 that cause the shafts to turn with the pinions but permit the shafts to be moved longitudinally through the pinions.

The pinions 170 associated with the upper shafts 166 are in intermeshing engagement, and the pinions 170 associated with the lower shafts 166 are also in intermeshing engagement and means is provided for oscillating one of the pinions of each pair to move the lower and upper fingers 34.

The pinions are thus operated by an arm 174 projecting from one of the pinions of each pair of upper and lower pinions which is connected by a link 176 with an arm 178. The two arms 178 have intermeshing gear segments 180 on their

inner ends, and the lower arm 178 is pivotally connected to the upper end of a rod 182 which is mounted to slide vertically. This rod 182 carries a cam roll 183 that engages a groove in the side of a cam disk 184 carried by the main cam shaft 122.

The fingers 34 are moved longitudinally in opposite directions, as above described, by means of a block or cross-bar 186 (Figs. 3 and 7) secured to each pair of shafts 166 and operated through a pin and slot connection with the end of an arm 188, the two arms 188 being secured on a vertical rock shaft 189. The lower end of the rock shaft 189 carries an arm 190 which is connected by a link 192 with the end of an arm 193 that carries a cam roll 194 engaging a groove in a cam 195 on the main cam shaft 122.

The thread positioning device 52 for positioning the thread in the path of the thread cutting and gripping devices 48 and 50, is formed on the end of an arm 196 secured on a shaft 197 mounted in bearings in the machine frame (Figs. 18 and 33). The shaft 197 is actuated to raise and lower the device 52 by means of an arm 198 secured thereon which is connected by a link 199 with an arm 200 secured on a shaft 201 (Fig. 1). The shaft is actuated through an arm 202 secured thereon which is connected through a link 203 with a lever 204 that carries a cam roll 205 engaging in a cam groove in a cam 206 on the main cam shaft 122 (Fig. 1).

The thread severing knives 48 are secured on the ends of the upper arms of levers 208 that are pivoted on a pin 209 which is secured in a bracket 210 (Figs. 14 to 17). The two arms are pressed toward each other by means of a spring 212 coiled about the pin 209 and interposed between the hub of one of the knives and a washer and nut 214 screw-threaded on the pin 209, the knives being held on the pin 209 by the head 215 on the end of the pin. The lower arms of the levers 208 are inclined so as to cross each other and extend between studs or pins 216 on a plate 217.

The thread grippers 50 are formed on the upper ends of spring arms 218, the lower ends of which are secured to arms 219 which are pivotally mounted at 220 on the lower arms of the knife levers 208. The grippers are pressed toward each other by means of a coiled spring 222 connecting the arms 219, the inward movement of the grippers being limited by the engagement of the upper end portions thereof with the outer sides of the knives.

The arms 219 are provided with depending lugs 224 carrying adjusting screws 225 that bear against the outer sides of the lower arms of the knife-carrying levers 208.

The bracket member 210 which carries the knives 48 and the grippers 50, is formed on a block 226 which is mounted to slide horizontally on a bracket arm 228. The bracket plate 217 is mounted to slide horizontally with the block 226 in a guideway 230 in a fixed plate 231.

The bracket arm 228 is formed on a casting 234 which is mounted to slide vertically, carrying the block 226 therewith on a vertical shaft 236 and a pin 238, the latter being secured to the base plate 232, and the block 226 being connected with the plate 217 through a guide-way 237 which permits the block to move vertically with relation to the plate 217.

With this construction it will be apparent that by sliding the block 226 on the bracket arm 228, the knives 48 and gripper 50 may be moved longitudinally of the skein holder bars 22. Also, by sliding the casting 234 vertically on the rod 236

and pin 238, the cutters and grippers may be moved vertically.

During the latter part of the upward movement of the knives and grippers 48 and 50, the lower inclined arms of the levers 208 by engagement with the studs or pins 216 close the knives and grippers to sever and grip the thread, and at the start of the downward movement of the cutters and grippers they are swung outwardly to release the thread.

The thread cutters and grippers are thus reciprocated longitudinally of the skein holder bars 22, by means of a gear segment 240 which engages teeth on a rack 242 on the underside of the block 226. The gear segment 240 is formed on an arm 244 which is mounted to turn on the pin 238. The hub of the arm 244 is provided with a gear segment 245 which meshes with a gear segment 246 secured on the vertical shaft 236. The shaft 236 is oscillated to actuate the gear segment 246 by means of an arm 248 that is connected by a link 249 with a slide 250 which carries a cam roll 252 which engages a groove in the side of a cam 254 secured on shaft 122 (Figs. 2, 4 and 18).

The casting 234 is raised and lowered to move the thread cutters and grippers 48 and 50 vertically, by means of a roller 258 that engages in a groove 259 in the side of the casting 234. The roller 258 is mounted on the end of an arm 260 (Figs. 1 and 2) which is secured on the rock shaft 201 which, as heretofore described, actuates the thread positioner arm 196.

Owing to the greater length of the arm 196 (Fig. 18) the thread positioner 52 engages and positions the thread previously to the engagement of the cutters and grippers.

The mechanism for applying the labels to the skeins comprises a block 262 arranged above the level of the holder bars 22, and a block 264 normally arranged below the level of said bars (Figs. 2, 18, 21-25, 27). The two blocks are adapted to be moved vertically toward and from each other.

The lower block 264 is guided in a guideway formed in a frame member 266. The upper block 262 is guided in a frame 268.

On the sides of the blocks 264 are secured the lower members of the devices 54 which squeeze the coils of the skein together at points spaced in proximity to the skein holder bars 22. These lower members each comprises a plate having a U-shaped upper end, the bottom 270 of the U being substantially straight and horizontal, and the sides of the U being curved upwardly and outwardly.

Mounted to slide in the block 264 is a heating member 272 for heat-sealing each label after it is applied to the skein, the labels supplied to the machine being provided with a heat-sealing adhesive.

The upper block 262 carries the upper members of the coil squeezing devices 54. These members, like the lower members, are formed with a U-shaped coil engaging end, the bottom 276 of the U being substantially straight and the sides of the U inclining downwardly and outwardly. The upper members of devices 54 are secured on the sides of plunger rods 278 which are urged downwardly by springs 280 coiled about the rods, the downward movement of the rods being limited by a handle or bail 282 secured to the upper ends of the rods and engaging the block 262. Also, carried by the spring-pressed plungers 278 is a bar 284 which extends through

a longitudinal groove 286 in the underside of the upper block.

The groove 286 is enlarged at its lower portion, and the longitudinal walls thereof are provided with guideways 288 for receiving the labels 4 which are successively fed into said groove.

Above the guideways 288 are horizontal sliding folder blades 290 which are adapted to be moved toward and away from each other into and out of the groove 286. Each blade is thus moved by a pair of arms 292 having their lower ends entering flanged apertures in the blades. The two pairs of arms are secured on shafts 294 journaled in bracket bearings 296.

The shafts 294 are rocked to actuate the plates 290, by arms 298 secured on the rear ends of the shafts 294 and having their upper ends engaging in grooves 300 in levers 302 respectively pivoted on shafts 303 and 304 journaled in bearings in the machine frame.

With this construction, when a skein has reached station 44 (Fig. 33) and the thread has been severed and the severed end laid against the coils of the skein, a label has been positioned in the guideways 288, and the two blocks are moved toward the top and bottom sides of the skein. When the skein squeezing devices 54 first engage the skein, their outwardly projecting arms bring the coils of the skein tightly together, and at the completion of the movements of the blocks 262 and 264, the horizontal walls 270 and 276 of the devices firmly squeeze the top and bottom lengths of the coils together. Also, this movement of the blocks 262 and 264 causes the skein to engage the label and force it against the spring pressed plate or bar 284, the projecting portions of the horizontal sides of the label being bent downwardly. When this occurs, the right hand folding blade 290 is moved inwardly to fold one side of the label against the under side of the skein, and then the other blade 290 is moved inwardly to fold the other side of the label over the margin of the first folded side.

When the sides of the label are thus folded over the heating element 272 is moved upwardly into engagement with the margin of the outer fold to heat-seal the overlapping margins of the label together, the adhesive being applied to the inner margin of the outer fold.

When the label is thus sealed, the heating element 272 and the blocks 262 and 264 are retracted, whereupon the completed skein is ready to be advanced to the next station 45 on the parallel bars.

The lower block 264 is raised and lowered as above described through an arm 306 having one end pivotally connected with the bottom of the block and its other end secured on one end of a shaft 308 which is actuated by an arm 310 secured thereon (Fig. 32). This arm 310 is connected by a link 312 with a cam lever 314 that carries a cam roll 315 which engages in a groove in a cam 316 carried by a cam shaft 318. This cam shaft 318 is driven from the main cam shaft 122 through gears 319, 320, 321 and 322, the latter gear being secured on the cam shaft 122 (Fig. 5).

The heating element 272 (Fig. 21) is actuated as above described, by two rods 324 which are pivotally connected with arms 326 that are secured on a shaft 327 (Figs. 4 and 32). The shaft 327 is actuated through an arm 328, link 329 and a cam lever 330 which carries a cam roll 331 that engages in a groove in a cam 332 on the cam shaft

318.

The upper block 262 is operated through a pin 334 thereon, which is engaged by the bifurcated end of an arm 335 (Fig. 2) secured on a shaft 236 which carries an arm 338 (Fig. 32) that is connected by a link 339 with a lever 340 which carries a cam roll 341 engaging in a groove in a cam 342 carried by the cam shaft 318.

The folder arm 302 carried by the shaft 303 is operated by an arm 344 secured on said shaft which is connected through a link 345 with a cam lever 346 which carries a cam roll 347 engaging a groove in a cam 348 carried by said cam shaft 318.

The shaft 304 that carries the other folding blade operating arm 302 is actuated through an arm 350 secured thereon which is connected by a link 351 to a cam lever 352 which carries a cam roll 353 engaging in a groove in a cam 354 carried by the cam shaft 318.

The labels are severed from a strip (Fig. 19) which is supplied to the machine with transverse lines of perforations 356, the perforations being spaced apart the length of the labels.

This strip slides down an inclined chute 358 between feed rollers 360, through a guideway 362 beneath a gripping block 364, between feeding or stripping rollers 366 beneath a guide plate 368, and against a stop plate 370 (Fig. 18). In front of the stop plate 370, there are small feed rolls 372, and a guide plate 374 which is pivoted on a shaft 376 and has an extension 378 having a depending stop flange 380 in its forward edge.

When the advancing end of the label strip reaches a position against the stop plate 370, the upper roll of the pair of feed rolls 360 is raised to discontinue the feeding of the strip. When a label is to be severed from the strip and delivered to its guideway in the block 262, the stop plate 370 is raised and the gripping block 364 moves down to hold the label. The stripping rolls 366 are then brought together to cause a label to be torn on the line of perforation between the rollers 366 and the gripping block 364, whereupon the rolls 366 feed the severed label forwardly between the feed rolls 372, beneath the guide plate 374, and against the stop flange 380. The guide plate 374 guides the label over a longitudinally extending plate 382 on which the label rests.

The plate 382 is then advanced to position the advancing end of the label against the entrance end of the guideway on the block 262. When this occurs a plate 384 that is mounted to slide on the plate 382 advances and engages the rear edge of the label and slides it into position in the guideways 288 in the upper block 262.

During the feeding of the severed label into the guideways 288, the label strip again is fed by the feed rolls 360 into position against the stop plate 370 which again is moved down across the guideway for the label strip.

The lower one of the feed rolls 360 is secured on a shaft 386 which is driven by a pinion 388 on one end thereof (Fig. 4), that is engaged by a large driving gear 390 on the cam shaft 318. The lower one of the feed rolls 366 is driven by a gear 391 secured on the shaft thereof which through idlers 392 is driven by a pinion 394 on a shaft 396 which carries a pinion 398 that is engaged by the large gear 390. The lower one of the small feed rolls 372 is driven by a pinion on the shaft thereof which engages said pinion 394, the two feed rolls 372 being geared together.

The upper feed roll 360 (Fig. 18) is driven by a gear 400 secured on the shaft thereof which meshes with a corresponding gear on the shaft

386 of the lower gear. The upper feed roll 360 is raised into and out of feeding engagement with the label while still maintaining the teeth of the gear 400 in mesh with the teeth of the lower gear, by means of an arm 402 of a bell-crank 404, the shaft 386 of the upper roll 360 being journaled in the arm 402. The other arm of the bell-crank is bifurcated to engage between washers 406 on a rod 408 which is secured in the tubular end 410 of an arm secured to a shaft 412. Between the inner washer 406 and the tubular end 410, a spring is coiled about the rod 408 so as to tend to press the upper roll 360 downwardly and to permit it to yield upwardly.

The shaft 412 (Fig. 32) is actuated through an arm 414 secured thereon which is connected by a link 416 with a lever 418 that carries a cam roll 419 engaging in a groove in a cam 420 on the cam shaft 318.

The gripping block 364 (Fig. 18) is mounted to slide vertically and is secured to the lower end of a rod 422 which has its upper end pivotally connected with a block 424. The upper one of the stripping rolls 366 is mounted in the lower end of a plunger 426 which slides through a guiding aperture 428 and its upper end extends through an aperture in the block 424. A spring 430 is coiled about the rod and interposed between a washer 432 and the bottom of aperture 428.

The block 424 is pivotally mounted on the lower end of a rod 434 which is mounted to slide through an aperture in a block 436 pivotally mounted on the bifurcated end of an arm 438 secured to a shaft 440 (Figs. 4 and 18). A spring 442 is coiled about the rod 434 and interposed between a shoulder on the rod and the block 436.

Upon actuating the shaft 440 to swing the arm 438 downwardly, the block 436 acts through the spring 442 to move the head 424 downwardly and thus cause the gripping block 364 to grip the label, and the upper roll 366 to be moved into stripping engagement with the label, the relatively light spring 430 insuring that the gripping block 364 engages the label before the upper roll 366 makes contact. The shaft 440 is actuated by an arm 444 secured thereon which is connected by a link 446 with an arm 448 secured on a shaft 450. This shaft 450 has an arm 452 (Fig. 29) secured thereon which carries a cam roll 454 that engages in a cam groove 456 in a side of a disk secured on the cam shaft 318.

The stop plate 370 (Fig. 18) is raised and lowered as above described through pivotal connection with an arm 458 that is secured on a shaft 460 on which is secured an arm 462 (Figs. 4 and 32) which carries a cam roll 463 engaging a peripheral cam surface 464 on a cam carried by the cam shaft 318.

The member comprising the guide plate 374 and the stop flange 380 is actuated through a link 466 and an arm 468 secured on a shaft 470. This shaft is actuated through an arm 472 which carries a cam roll 474 that engages a cam surface on a cam disk 465 secured on the main cam shaft 318 (Figs. 3, 18 and 29).

The label feeding plate 382 (Fig. 20) is made in two longitudinal sections that are spaced apart, and is actuated by a rack 476 (Figs. 18, 29) secured to the under side of said sections and engaged by a gear segment 478 pivoted on a shaft 480. The segment is actuated through a link 482 and an arm 484 secured on a rock-shaft 486. This shaft 486 is actuated by an arm 488 which carries a cam roll 489 that engages a cam groove in the cam disk 465 on the cam shaft 318.

The upper label feeding plate 384 is actuated, as above described, by means of a rack 494 (Fig. 20) on the under side thereof which is engaged by a gear segment 496 (Fig. 18) secured on a shaft 498 that is actuated through an arm 500 secured thereon. The arm 500 is connected by a link 502 with the lower arm of a bell-crank 504 pivoted on a stud shaft 506 (Figs. 7 and 29). The other end of the bell-crank carries a cam roll 508 that engages in a groove in said cam 465.

The rods 56 which receive the group or layer of completed skeins from the skein holder bars 22 are mounted to slide in bearings 512 on the machine frame (Figs. 2, 4, 30 and 31). The rods 56 are advanced and retracted by means of rack teeth 514 on the rear portions thereof that are engaged by pinions 516 secured on a shaft 518. The shaft 518 is driven by a pinion 520 on the central portion thereof that is engaged by a gear segment 522 secured on a shaft 524. The shaft 524 is actuated by an arm 526 secured thereon which is connected by a link or rod 528 with a slide 530 that carries a roller 532 which engages in a cam groove in a cam 534 carried by a shaft 536.

The shaft 536 is driven through an internal gear 538 that is engaged by a pinion 540 which meshes with pinion 542 on the main cam shaft 122 (Figs. 27 and 30).

The flanged table 74 for successively receiving the boxes from the hopper 78 is mounted to slide in a guideway 544, and is raised and lowered by means of a pin 546 thereon which is engaged by the bifurcated end of one arm of a lever 548. The other arm of said lever is connected with a slide 550 that carries a cam roll 552 engaging a cam groove in a cam 554 carried by the shaft 536 (Figs. 2, 27 and 30).

The flanged head or plate 60 is carried by a slide 556 mounted in a guideway 558. This slide is actuated to raise and lower the plate 60 by means of a pin 560 carried thereby and engaged by the bifurcated end of an arm 562 secured on a shaft 564. This shaft is actuated by an arm 566 thereon which is connected by a link or rod 568 with a vertical slide 570. This slide carries a cam roll 572 which engages a cam groove in a side of said cam 554.

The boxes 62 are stacked one upon the other in the hopper 78 and are successively fed from the bottom of the stack by means of a slide 576 which extends into an opening in the lower end of the side wall of the hopper. The hopper 78 is slanted in two directions to prevent the boxes from telescoping together.

The mechanism for operating the slide 576 comprises a rack 578 mounted to slide beneath the plate 576. This rack is engaged by a gear 580 secured on a shaft 582 which carries a pinion 584 that is engaged by a gear segment 586 on one arm of a lever 588. The other arm of this lever carries a cam roll 590 which engages in a cam groove 591 in the cam 534 on the shaft 536.

The connections between the box ejector slide 576 and the rack 578 is such that the slide is advanced and retracted once for every three advancing and retracting movements of the rack 578. These connections comprise a link 592 having one end connected with the gear segment arm of the lever 588 and its other end pivotally connected with an arm 594 pivoted on a pin 596. The arm 594 is connected by a link 598 with an arm 600 pivotally mounted on a shaft 602. A pawl 603 is pivotally mounted on the arm 600 and

engages a ratchet wheel 604 secured on the shaft 602. Also, secured on this shaft 602 is a gear 606 which engages a pinion 607 secured on a shaft 608. This shaft has secured thereon a surface cam 609. Engaging this cam 609 is the lower end of a rod 610 which is mounted to slide in a hollow boss 611 on the rear end of the box ejector slide 576. The rod 610 is urged downwardly by a spring 612 coiled about the rod and interposed between the upper end of the hollow boss 611 and a collar 613 on the rod.

The rod has a reduced lower end portion 614 that enters a clearance slot 616 in the rear end of the rack 578. Above this reduced end is a rectangular portion 618 which is adapted to be received in a transverse slot 619 in the rear end of the rack 578.

At every third forward advancing stroke of the rack 578, the cam 609 permits the rectangular portion 618 of the spring pressed rod 610 to enter the slot 619, whereupon the rack acts through the rod to carry the slide 576 therewith to eject a box from the hopper, and on the return movement of the rack the slide is retracted therewith. At the completion of this return movement of the slide the cam 609 raises the spring-pressed rod 610 so as to disengage the rectangular portion 618 thereof from the transverse slot 619.

The main drive shaft 130 (Fig. 27) of the machine may be driven through a belt 620 which passes over a pulley 622. This pulley is adapted to be clutched to the shaft 130 through any conventional clutch 623 that may be thrown into and out of operation by a hand lever 624 secured on a shaft 625 which is connected with the clutch through a clutch yoke 626 secured thereon.

While the features described above are well adapted for use in the type of machine illustrated in the drawings, it is to be understood that except as defined in the claims certain features of the invention are not limited to use in a machine embodying any or all of the other features.

What I claim is:

1. In a winding machine of the class described, the combination of a flier comprising a thread guide and a carrier for the thread guide, means for traversing the flier in a path of the form of a figure 8 comprising two members mounted for rotation in opposite directions, each of said members having a peripheral recess for receiving said carrier, said recesses being so located as to arrive at a position of alinement as the members reach a predetermined point in their rotation, means for causing the carrier to pass from the recess in one of said members to the recess in the other member as said members leave said predetermined position, and means for retaining the carrier in each recess in which it is received until the carrier passes into the other recess.

2. In a winding machine of the class described, the combination of a flier comprising a thread guide and a carrier for the thread guide, the thread guide being arranged adjacent to one end of the carrier, means for traversing the flier in a path of the form of a figure 8 comprising two members mounted for rotation in opposite directions, each of said members having a peripheral recess for receiving said carrier, said recesses being so located as to arrive at a position of alinement as the members arrive at a predetermined point in their rotation, a switching device arranged in the path of said carrier and acting to cause the carrier to pass from the recess in one

of said members to the recess in the other member as said members leave said predetermined position, and means for guiding the ends of the carrier to retain the carrier in each recess in which it is received until the carrier passes to the other recess.

3. In a winding machine of the class described, the combination of a flier comprising a thread guide, means for traversing the flier in a path of the form of a figure 8 comprising two members mounted for rotation in opposite directions, means associated with each of said members for retaining said flier in a predetermined position thereon when the flier is presented thereto, and means for alternately shifting the flier from one rotary member to the other at the completion of each revolution of said members.

4. In a winding machine of the class described, a flier comprising a thread guide, and a carrier on one end of which the thread guide is mounted for turning movement, and means for traversing the flier comprising two members mounted for rotation in opposite directions, and means for causing the flier to be carried 360 degrees first by one member and then the other.

5. In a winding machine of the class described, the combination of a flier comprising a thread guide, a carrier on one end of which the thread guide is mounted for pivotal movement, means for traversing the flier in a path of the form of a figure 8 comprising two members mounted for rotation in opposite directions each of said members having a transverse recess in the periphery thereof adapted to receive said carrier, said recesses being so located so as to arrive at a position of registry at the completion of each revolution of said members, means for causing the carrier to pass from one recess to the other when said recess has reached said position of registry, and means for guiding the ends of the carrier to maintain the carrier in each recess until the recess reaches said position of registry.

6. A structure according to claim 5 in which the means for guiding the ends of the carrier comprises hubs on said members and guides arranged about said hubs forming guideways for the ends of the carrier.

7. A structure according to claim 5 in which said members have centrally located peripheral grooves and said carrier has a radially projecting annular rib adapted to be received in said grooves to hold the carrier from axial movement.

8. A structure according to claim 5 in which means for guiding the ends of the carrier comprises guideways for receiving the ends of the carrier, each end of the carrier having laterally projecting wedge-shaped members forming a shoe adapted to ride in the guideways.

9. In a winding machine of the class described, a flier comprising a thread supply, a thread guide having a thread guiding opening through which the thread from the thread supply passes, a carrier on one end of which the thread guide is mounted to turn about a substantially horizontal axis, said thread guide having its guiding opening arranged in an arc with its outer end arranged in proximity to the axis of the thread guide and its inner end directed upwardly, means for traversing the flier in a path of the form of a figure 8, and means for maintaining the length of thread extending to the thread guide sufficiently taut to maintain the inner end of the thread guide opening directed upwardly during the travel of the flier in said path.

10. A structure according to claim 9 in which the means for maintaining the length of thread extending to the thread guide taut comprises a compensating arm engaging said length of thread and rotating in timed relation to the travel of the flier.

11. In a winding machine of the class described, the combination of a skein holder, means for winding thread about the holder to form skeins successively, each skein consisting of a predetermined number of coils, means for advancing the skeins predetermined distances along the holder at the completion of the winding of each skein, means for severing the length of thread extending between the two foremost skeins when the foremost skein reaches a predetermined station on the holder, means for placing a label about the central portion of each skein while the skein is at said station and after the thread has been severed, and means for successively feeding the labeled skeins from said station and positioning them in a group or layer consisting of a predetermined number of skeins arranged side by side, and means for removing said layer of skeins from said holder while maintaining the skeins in said side by side relation.

12. In a winding machine of the class described, the combination of a skein holder comprising two bars arranged side by side and spaced apart, means for winding a thread about the bars to successively form skeins, each skein consisting of a predetermined number of coils with the coils arranged side by side, means for advancing the skeins predetermined distances along the bars at the completion of the winding of each skein, devices acting automatically when a skein reaches a predetermined station along the bars to sever the length of thread extending between said skein and the next subsequently wound skein and for gripping the severed end of the thread extending to the skein at said station and positioning said severed length adjacent to the side of the coils of the skein, and means for applying a label about each skein while at said station.

13. In a winding machine of the class described, the combination of a skein holder comprising two bars arranged side by side and spaced apart, each bar being made in two sections that are arranged in alinement, the rear sections being movable longitudinally into and out of engagement with the ends of the forward sections, means for winding a thread about the front end portions of the forward sections to successively form skeins, means for advancing the skeins predetermined distances along the forward section at the completion of the winding of each skein, means for severing the length of thread extending between the two foremost skeins when the foremost skein reaches a predetermined station on the forward sections, means for securing a label about each skein when the skein is at said station and the thread has been severed, means for sliding each skein after its label has been applied thereto from the rear end of the forward sections of the bars on to the rear sections of the bars, means acting automatically when a predetermined number of skeins have thus been applied to the rear bar sections to retract said sections from the forward sections, and devices for stripping the skeins from the rear sections as they are being retracted to cause said skeins to be removed in a group or layer.

14. In a winding machine of the class described, the combination of a skein holder, means for winding thread on the holder to successively

form skeins, means for severing the thread between the skeins, means for applying a label about each skein, means for successively arranging the labeled skeins on the holder in groups or layers with the skeins in each layer arranged side by side with a predetermined number of skeins to the layer, means for positioning a box beneath the holder, and means for successively removing the layers of skeins from the holder and depositing them one upon the other in said box.

15. In a winding machine of the class described, the combination of a skein holder, means for winding thread on the holder to successively form skeins, means for severing the thread between the skeins, means for applying a label about each skein, means for successively arranging the labeled skeins on the holder in groups or layers, the skeins in each layer being arranged side by side with a predetermined number of skeins to the layer, means for successively removing the layers of skeins from the holder, and means for successively feeding boxes into position to receive a predetermined number of layers of skeins as the skeins are removed from the holder, the layers of the skeins being positioned one above the other in the boxes.

16. A structure according to claim 13 in which means is provided for successively feeding boxes to a position beneath said forward sections of the skein holding bars, and means for guiding each layer of skeins as the layer is removed from the forward sections to cause it to be deposited in a box, there being a predetermined number of layers deposited one upon the other in each box.

17. In a winding machine of the class described, the combination of a skein holder comprising two bars arranged side by side and spaced apart each bar being made in two sections that are arranged in alinement, the rear sections being movable longitudinally into and out of engagement with the ends of the forward sections, means for feeding skeins along the forward sections and on to the rear sections, means acting automatically each time a predetermined number of skeins have been arranged on the rear sections to retract the rear sections from the forward sections, devices for stripping the skeins from the rear sections as the rear sections are being retracted to cause said skeins to be removed in a group from the rear sections; a support for a box positioned beneath the rear sections when the rear sections are in engagement with the forward sections, guiding devices positioned above the rear sections and in alinement with the box support, and means for moving the box support upwardly and said guiding devices downwardly over the skein supported on the rear sections whereby said guiding device serves to guide and hold the skeins in side by side relation as the rear sections are retracted so as to cause the skeins to be laid in a layer in the box.

18. A structure according to claim 17 in which means is provided for successively feeding the boxes on to said support, whereby a predetermined number of layers or skeins are deposited in each box.

19. In a winding machine of the class described, the combination of a skein holder comprising two bars arranged side by side and spaced apart, means for winding thread about the bars to form skeins successively, each skein consisting of a predetermined number of coils, means for

advancing the skeins predetermined distances along the bars upon completion of the winding of each skein, means for severing the length of thread extending between the two foremost skeins when the foremost skein reaches a predetermined station on the holder, means at said station for positioning a label over the central portion of each skein when the skein is at said station with the longitudinal edges of the label projecting a distance beyond the sides of the skein, means for successively folding the longitudinal edges of the label over the underside of the skein in overlapping relation, and means for sealing said overlapping edges of the label together.

20. In a winding machine of the class described, the combination of a skein holder comprising two bars arranged side by side and spaced apart, means for intermittently feeding skeins along the bars to a definite station, each skein being wound on the bars with the coils arranged side by side, devices for engaging the coils of each skein when it reaches said station at points arranged in proximity to the inner sides of the bars to press the coils together while maintaining them in side by side relation, a head at said station comprising a support for a label arranged above the bars, means for moving the head downwardly to position the label supported thereby over the portion of the coils extending between said devices with the longitudinal edges of the label projecting beyond the sides of the skein, and devices for folding the projecting edges of the labels over the underside of the coils in overlapping relation, and means for securing the overlapping edges together.

21. A structure according to claim 20 in which means is provided for successively supplying labels to said support whereby a label is applied to each skein arriving at said station.

22. In a winding machine of the class described, the combination of a skein holder, means for winding thread about one end portion of the holder to form a skein, means for feeding the skein along the holder, devices for supporting the holder at spaced points, and means for moving said devices into and out of supporting engagement with the holder whereby when a skein approaches any one of said devices, said device is retracted from the holder to permit the skein to pass thereby, the holder being supported while the skein passes said device by other of said devices.

23. In a winding machine of the class described, the combination of a skein holder comprising two bars arranged side by side and spaced apart, means for winding a thread over corresponding ends of the bars to form a skein, means for feeding the skein along the bars, a plurality of sets of devices for supporting each bar, each set of devices comprising two members adapted to be moved into and out of supporting engagement with opposite sides of the associated bar, and means for moving each set of devices out of engagement with its associated bar as the skein approaches said set of devices and for moving said set of devices into engagement with the bar after the skein passes said set, said bar being supported by the other sets of devices associated therewith while one set of devices is out of engagement with the bar.

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