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(54) **Machine for automatically loading empty bobbins or support tubes, in particular for tape or filament of synthetic material of polypropylene, polyethylene or similar type for industrial use, into automatic winding units.**

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Description

This invention relates to a machine for automatically loading support tubes, in particular for tape or filament of synthetic material of polypropylene, polyethylene or similar type for industrial use, into automatic winding units in spinning plants, and from these latter unloading bobbins already wound with said tape or filament and arranged on rotating spindles according to the preamble of the attached main claim.

Automatic winding units of the aforesaid type enable fibres, such as synthetic fibres in continuos filament form for industrial use, for example for forming the underside of carpets or for forming bags, to be wound onto a plurality of bobbins. As is well known, these winding units are arranged in positions corresponding with usual synthetic fibre production machines and comprise a series of spindles arranged in superposed parallel planes.

When a bobbin has been wound with a suitable mass of filament, the bobbin is unloaded from its respective spindle and replaced by an empty bobbin or support tube.

This is generally done manually, with the obvious drawbacks connected with this manner of working and its cost.

EP-A-26471 representing the closest prior art discloses a machine of the same genus for automatically loading bobbins or support tubes into automatic winding units, and for unloading wound bobins from said units. The known machines comprises two separate carriages driven along the same rails. One carriage has movable means for mounting empty bobbins or tubes on the spindles of the winding unit, and means for gripping and cutting the filament when the bobbin is wound. The second carriage has means for transferring wound bobbins received from the textile unit by way of pusher means pertaining to the latter to a supporting rack structure. The known machine is quite complicated, is specifically conceived for winding machines: a) incorporating as a wound-bobbin removing means for each spindle, and b) having all spindles arranged in a same plane.

An object of the present invention is to provide a machine for cutting and sucking-in the filament, removing the wound bobbin, automatically loading empty tubes or bobbins onto the spindles of the winding unit and automatically restarting the winding of the filament on the empty tube.

A particular object of the invention is to provide a machine which automatically performs the aforesaid operations without any human intervention.

A further object is to provide a machine of the aforesaid type which achieves reliable and exact positioning of the empty bobbins on the spindles.

A further object is to provide a machine of the aforesaid type which is able to remove from a spindle an already wound bobbin and replace it with an empty bobbin independently of the height at which said spindle is located from the floor.

These and further objects which will be apparent to the expert of the art are attained by a machine according to the attached claims.

The present invention will be more apparent from the accompanying drawing, which is provided by way of non-limiting example and in which:

Figure 1 is a schematic side view of a preferred embodiment of the machine according to the invention;

Figure 2 is a front view of the machine of Figure 1;

Figure 3 is a section on the line 3-3 of Figure 2;

Figure 4 is a front view of a detail of the machine of Figure 1 in a different position of use from that shown in Figure 2;

Figure 5 is a front view of a detail of the machine of Figure 1;

Figure 6 is a section on the line 6-6 of Figure 4;

Figure 7 is a section on the line 7-7 of Figure 5; and

Figure 8 is a schematic view of another part of the machine of Figure 1.

With reference to said figures and in particular to Figures 1, 2 and 3, the machine of the invention is indicated overall by 1 and comprises a column 2 with a head or upper part 3 (with respect to said figures) arranged to cooperate with a guide or track 4 (for example in the form of an overhead rail). Along the column 2 there moves a carriage or support member 5 movably carrying a gripping and cutting unit 6 for a filament 7 fed to a bobbin winding unit 8 (of known type), a unit 10 for supporting empty bobbins or tubes 11 (shown by dashed lines in Figure 1) and filament-wound bobbins 12 removed from the winding unit 8, and transfer means 15 arranged to cooperate with the bobbins 12 to be removed from usual spindles 16 of said winding unit and with the empty tubes 11 to be loaded onto said spindles.

The head 3 of the machine 1 supports a first drive member 20 able by known means (for example by a driven toothed wheel 21 cooperating with the guide 4) to move the machine along the fixed guide, and a second drive member 23 driving a toothed wheel 24 to which it is connected and about which a cog belt 25 connected to the carriage 5 passes.

On rotating the wheel 24 the carriage moves vertically along lateral guides 27 provided along the column 2.

The movement of the carriage can be achieved in other known ways, for example by chains, racks or the like.

On the head 3 of the machine 1 there are also provided a usual encoder 30 for verifying the movements of the machine along the guide 4 and members 31 for retaining the machine on said guide.

The carriage 5 supports a plurality of elements 32 (for example grooved wheels as shown in Figure 3) for cooperating with the guides 27 of the column 2. These elements secure the carriage to the guides and enable it to move along them.

In the example, the carriage comprises a bracket 34 to which said belt 25 is connected.

Figures 4 and 6 show the support unit 10. This comprises two arms 35 and 36 carrying at their free ends 35A and 36A spindles 37 for supporting respectively a filament-wound bobbin 12 and an empty bobbin or tube 11. The two arms 35 and 36 are arranged at an angle to each other and are associated with a common arm 39 connected at its free end 39A to a movable shaft 40. This latter rotates within a sleeve 41 provided in a part 5A of the carriage 5, the shaft 40 being associated with said support via usual mechanical decoupling members or bearings 43.

The sleeve is fixed, (eg welded) to said part 5A. The movable shaft carries at its free end 45 a forked member 46 with arms 47 and 48 arranged perpendicular to the axis K of the shaft 40.

These arms cooperate with a pin 49 rotating within eyelets 50 in said arms and secured to the head 51 of the piston 52 of a pneumatic pusher 53. This piston moves within a cylinder 54 secured at a fork-shaped end 55 to a pin 56, about which the cylinder can rotate.

The pin 56 is associated with a plate 57 secured to the part 5A of the carriage 5.

Finally, the arm 35 carries an abutment element 60 arranged to cooperate with fixed members 61 associated with the part 5A of the carriage 5 and acting as a limit stop for the movement (arrow F, Figure 2) of the unit 10 about the axis K of the shaft 40. These fixed members can support proximity sensors (not shown) which sense when the unit 10 has effected its movement of passing from the position shown in Figure 4 to the position shown in Figure 2 (which will be assumed to be the positions in which a bobbin 12 is removed from a corresponding spindle 16 and in which an empty bobbin or tube 11 is mounted thereon).

In a position corresponding with the unit 10 there is provided a pusher or transfer unit defining said means 15.

Said unit 15 (see Figures 5 and 7) comprises an arm 65 with a side surface 66 arranged to cooperate with the bobbins (full or empty) to transfer them from the winding unit 8 to the machine 1 and vice versa.

In the example shown in Figure 5, this arm is associated with a drive unit 68 which withdraws it perpendicularly from the carriage 5 and rotates it about an axis W, along which this withdrawal or movement towards the winding unit 8 takes place.

More specifically, in the example shown in the figures, the drive unit 68 comprises three hollow cylindrical telescopic elements 70, 71 and 72 which are coaxial and move along the common axis W. Two of these cylinders (70 and 71) move longitudinally along the axis W relative to the other cylinder (72), which is fixed longitudinally but can rotate about the axis W.

Figure 7 shows said drive unit 68.

In detail, the bore 73 of the hollow element 70 (to which the arm 65 is fixed) contains two threaded elements or screws 75 and 76, of which one (75) is contained in a bore 77 in the other (76).

The inner screw 75 has its head 75A supported, via bearings 75B, by the wall of the bore 77. The screw 75 cooperates with an element or nut screw 78 inserted in an end cavity 79 of greater diameter than the bore 77 and rests on an annular step 80 of this latter.

The screw 75 is associated with a gearwheel 81 driven by a drive member via usual transmission elements (for example a belt as shown in Figure 5).

The outer screw 76 rests via its head 76A on bearings 76B cooperating with the wall of the bore 73. This screw cooperates with a nut screw 84 inserted into an annular cavity 85 of greater diameter than the remaining part of the bore 73 of the element 70. The nut screw 84 rests on a step 87 present in the bore 73.

The screws 75 and 76 define a differential advancement screw.

The screw 76 cooperates with the element 70 via bearings 88. An elastic element or compression spring 90 is positioned between a fixed ring 91 and the bearing 88.

The elements 70 and 71 and 71 and 72 are keyed together, but in order to allow mutual sliding there are provided annular antifriction elements 92, 93 and 94, 95 arranged respectively in annular recesses 96 and 97 of the element 71 and 98, 99 of the element 7.

Annular seal members 100 and 101 are provided in seats 102 and 103 in the elements 71 and 72 respectively.

On its outer surface 105, the element 72 comprises collars 106, 107, 108, 109 inserted into respective seats in the part 5A of the carriage 5.

Bearings 114 and 115 enable the element 72 to rotate about the axis W.

Finally, a compression spring 116 acts on that end 71A of the element 71 close to a bush 117 into which the end part 118 of the inner screw 75 on

which the gearwheel 81 is keyed penetrates and rotates.

A usual proximity sensor or mechanical encoder 120 senses the rotation of the gearwheel 81 and controls the movements of the telescopic elements 70, 71 and 72. This encoder is connected to the gearwheel 81 for example via said belt 83 or via another transmission element.

As stated, the element 72 can rotate about the axis W rigid with the arm 65. This rotation is achieved by a pneumatic member 125 comprising a piston 126 movable within a sleeve 127 and hinged to a member or connecting rod 128 rigidly fixed to the arm 65.

A limit stop 130 is provided to cooperate with said connecting rod 128, to define the rest position of the arm 65.

Figure 8 shows schematically the gripping and cutting unit 6. In this figure, parts corresponding to those already described are indicated by the same reference numerals.

The gripping and cutting unit comprises a head 150 associated with an arm 151 rotating about a support 152 rigid with a plate 3, which is movable along guides 154 associated with the carriage 5.

More specifically, the head 150 comprises a suction port 155 connected to a duct or tube 156 inserted through the arm 151 (made hollow for this purpose) and a cutting element 157 for the filament 7. This cutting element comprises a cylinder 158 provided with a surface recess 159 to receive the filament and movable within a seat provided in the head 150, into which it can enter and from which it can leave by the action of a drive member, for example a pneumatic piston 160. When the cutting element enters said seat it cuts the filament 7.

The arm 151 penetrates into the support 152, which is formed for example as a hollow cylinder fixed to the plate 153.

The unit 6 also comprises a movable member 162 arranged to cooperate with a usual switch (not shown but provided on the winding unit 8) for halting the rotation of the spindle from which the bobbin already wound with filament 7 is to be removed.

More specifically, the plate 153 is subjected to the action of at least one drive member which in the example consists of a first pneumatic member (or the like) 166 and a second pneumatic member 167 secured to the part 5A of the carriage 5.

The pneumatic member 166 is secured to a piston 168 of the second pneumatic member movable within a sleeve 169 fixed to the carriage 5. The first member 166 comprises a movable piston 170 with which an arm 171 is associated. The movement of the movable piston 170 results in movement of the plate 153, further movement of the member 166 (caused by the movement of the piston 168) resulting in additional movement of said plate.

Usual antifriction elements (such as bushes, not shown) are provided between the arm 151 and the support 152 to allow relative movement of the parts.

A further pneumatic member 175 carried by the plate 153 causes the arm 151 to rotate within the support 152 about its longitudinal axis X.

The pneumatic member 175 comprises a sleeve 178 hinged to a pin 180 secured to the plate 153 and a piston 181 associated with the arm 151.

Likewise, a pneumatic member 182 secured to the plate 153 acts on the movable member 162 for halting the spindle to be unloaded.

The member 162 slides within a sleeve 184 fixed to said plate moved by the member 182.

The movement of said plate, of the arm 152 and of the stop member 162 can be achieved by different methods, for example by electric motors. In particular, the plate 152 can be moved by a single pneumatic member.

It will now be assumed that a wound bobbin is to be removed from a spindle 16 of the winding unit 8.

To achieve this, the machine 1 is moved by the drive member 20 along the guide 4 until it reaches the winding unit of which said bobbin forms part. In this respect it should be noted that generally a large number of winding units 8 are arranged side by side in a production position, the machine 1 being therefore arranged to operate on all said winding units situated in line.

The encoder 30 senses the position of the machine 1 along the guide. It should be noted that every movement of the machine and of each of its parts can be remotely controlled by a microprocessor or similar control member which in accordance with a precise procedure controls the operation of each drive member (mechanical, pneumatic or the like used for effecting the movements of said machine and its parts) present on the machine following a request (manual, automatic or programmed) for removing a bobbin 12 from a winding unit.

During said movement, an arm 300 positioned at the bottom of the machine 1 and comprising a member 301 slidable in a guide 302 associated with the winding unit 8 and parallel to the guide 4 allows improved positioning of the machine 1 in front of the winding unit.

The required position having been reached, the drive member 23 moves the carriage 5 into a vertical position such as to enable the support unit 10 to position one of its spindles 37 (that without a tube 11 for example carried by the arm 36) coaxially to the spindle 16 of the winding unit 8 to be unloaded.

Having done this the gripping and cutting unit is operated to move towards the winding unit.

Specifically, while the suction port 155 sucks the filament 7 (which is fed continuously and continues to reach the winding unit), the movable stop member halts the movement of the spindle 16 by operating a usual switch (not shown) provided on the winding unit 8.

The stop member 162 moves for example until it touches the switch on the winding unit.

During the sucking of the filament 7 the cutting element 157 acts on the filament to cut it. This filament is sucked in by the suction port 155 and is fed pneumatically into a containing chamber (not shown), for example within the carriage 5, through the duct or tube 156.

Alternatively it can be fed to a container lying at the base of the winding unit 8, via the arm 300.

The arm 65 undergoes simultaneous approach movement.

This is achieved for example by rotating the internal screw 75 by means of the gearwheel 81. This causes the nut screw 78 to move along the axis W and press against the step 80, to hence cause the outer screw 76 to move longitudinally. This, by way of the nut screw 84, drives the cylindrical element 70, which emerges from the element 71 to withdraw the arm 65 from the column 2.

When the nut screw 78 bears against the bearing 75B (ie at the end of the screw 75), torsional coupling occurs between the screw 75 and the screw 76. In this manner, the nut screw 84 moves along this latter, pushing the element 71 via the element 70, which has reached its end-of-travel position (ie its maximum extraction). This continues until the nut screw 84 has travelled along the entire screw 76, ie until the maximum extension of the element 71 from the element 72 is achieved.

This drive member has the advantage of being compact and allowing considerable movement of the arm 65 in withdrawing from the column 2. It can however be formed in other known ways, for example by pneumatic members or the like.

The telescopic elements 70 and 71 extend in the aforesaid manner to achieve approach of the arm 65 to the winding unit.

When this has been achieved and verified by the encoder 80, the movement of the screw 75 (and hence of the screw 76) is interrupted and the pneumatic member 125 rotates said arm about the axis W) 8 so that it closes onto the bobbin 12.

By virtue of the control provided by the encoder 80, the position attained by said arm is between said bobbin and the winding unit 8. The arm obviously cooperates with that part of the bobbin not wound by the filament.

At this point, in a manner similar to that described, the telescopic elements 70 and 71 partly return into the element 72. This return brings the arm 65 close to the column 2 so as to drag the bobbin 12 onto the spindle 37 of the support unit 10 which, as stated, lies coaxial to the spindle 16 from which the bobbin 12 is extracted. The arm 65 withdraws from this bobbin by rotating about the axis W.

Usual proximity sensors (not shown) determine when the bobbin 12 has been deposited on the spindle 37. Alternatively, this can be determined indirectly by measuring (by any known method) the effort expended by the drive members which move the arm 65 along the axis W (electric motor or pneumatic member), this effort arising when the arm pushes the bobbin 12 onto the spindle 37 after the bobbin has reached its end-of-travel position (for example in contact with the arm 36).

After this, the pneumatic pusher 53 is operated to rotate the shaft 40 and hence the arm 39 about the axis K.

This results in rotation of the entire unit 10, so that it becomes positioned as shown in Figure 2. In this manner the spindle 37 carried by the arm 35 is brought coaxial to the previously unloaded spindle 16.

At this point the arm 65 is moved, by the movement of the telescopic arms 70 and 71, along the axis W as they enter each other in approaching the column 2. This arm then rotates about the axis W to make contact with the empty tube 11. The elements 70 and 71 then emerge one from the other in the manner heretofore described.

By this movement, the arm 65 withdraws from the column 2, dragging with it the empty tube 11, which passes from the spindle 37 to the spindle 16.

The arm 65 then rotates about the axis W, separates from the tube 11 and withdraws completely towards the column 2.

The movable stop member 162 releases the bobbin stop switch to commence the closure and rotation cycle for the spindle 16.

There is then a combined movement in which the motor 20 causes the machine to advance slightly along the guide 4 and the pneumatic member 175 causes the arm 151 to rotate. The action of the members 166, 167 and said rotation bring the filament 7 into a position corresponding with a notch present on the spindle 16, which hooks it and drags it into rotation.

Simultaneously with this, a usual cutting element on the spindle operates on the filament 7 present in its notch, and cuts it to enable the spindle 16 to wind the filament onto a new bobbin.

The unit 6 then returns to its initial rest position and the machine 1 withdraws from the winding unit 8 to move the bobbin 12 into a region in which it is

unloaded from the spindle 37.

For completion, an overhead line 500 can be provided (see Figure 1) on which usual trolleys run carrying fixed spindles 501 on which to deposit the bobbin 12 removed from the winding unit (and possibly the empty bobbins 11 to be associated with the machine 1).

To achieve this, the carriage 5 of the machine 1 is raised, and in a manner similar to that described for mounting the tube 11 on the winding unit spindle 16 the unit 10 deposits the bobbin 12 on the trolley 501 after withdrawing the empty bobbin to be used for the next cycle. The trolley carries the bobbin to a discharge and storage zone in known manner.

A particular embodiment of the machine 1 has been described, However modifications can be made thereto without leaving the scope of the present document, for example the drive members using electric motors coupled to mechanical members can be replaced by hydraulic or pneumatic elements performing the same function, or vice versa.

Claims

1. A machine for automatically loading empty bobbins or support tubes (1), in particular for tape or filament of synthetic material of polypropylene, polyethylene or similar type for industrial use, into automatic winding units (8) used in spinning plants, and from these latter unloading bobbins (12) already wound with said tape or filament and arranged on rotating spindles (16), said machine comprising means (6) for gripping and cutting the filament or tape (7) travelling towards an already wound bobbin (12), movable means comprising a support unit (10), a first spindle (37) for supporting at least one empty bobbin or tube (11) and a second spindle (37) arranged to receive the wound bobbin (12) after its removal from the winding unit (8), and transfer means (15) rotatable around an axis parallel to the rotation axis of the winding unit spindles (6) and cooperating with the empty bobbin or tube (11) in such a manner as to mount it on said winding unit spindle (6) by displacing it along the rotation axis of said latter spindle (6), characterized in that: the first and second spindle (37) are both mounted on the support unit (10), the transfer means (15) are also arranged to cooperate with the wound bobbin (12) so to extract it from the respective spindle (16), all of the aforesaid means (6; 10; 37; 15) being mounted on the same carriage (5) movable in the vertical and also in the horizontal direction.

2. A machine as claimed in claim 1, characterised in that the support unit (10) comprises a first and a second arm (35,36) forming an angle with each other and connected to a common arm (39) associated at its free end (39A) with a rotating shaft (40), said first and second arm carrying at their free ends (35A, 36A) the two spindles (37).

3. A machine as claimed in claim 2, characterised in that the rotating shaft (40) is associated with a drive member (53) connected to the movable carriage (5), said drive member (53) operating said shaft (40) to rotate the support means (10) about the axis (K) of said shaft to enable both spindles (37) to assume positions coaxial with each spindle (16) of the winding unit (8).

4. A machine as claimed in claim 1, characterised in that the transfer means (15) comprise an arm (65) movable to withdraw from the machine (1) and rotatable about the axis (W) along which this latter movement takes place, said arm (65) cooperating with the wound bobbins (12) to be removed from the winding unit (8) and with those to be mounted on its spindles, (16) said arm (65) being associated with drive means (68) for effecting and controlling said movements.

5. A machine as claimed in claim 4, characterised in that the movable arm (5) is associated with telescopic elements (70,71,72) movable relative to each other and associated with the movable carriage (5) of the machine.

6. A machine as claimed in claim 5, characterised in that the telescopic elements (70,71,72) are associated with at least one screw (75, 76) for their differential advancement.

7. A machine as claimed in claim 5, characterised in that the telescopic elements (70,71,72) are associated with pneumatic members.

8. A machine as claimed in claim 1, characterised by comprising stop means (162) for interrupting the operation of the spindle (16) carrying the already wound bobbin (12) the stop means being a rod-shaped member (162) movable axially relative to the plate (153) of the movable gripping and cutting unit (6).

9. A machine as claimed in claim 1, characterised by comprising a column (2) carrying the tracks (25) for the movement of the movable carriage (5), said column being associated with a part (3) slidable along horizontal guides (4) and

supporting drive means (20) for moving the column (2) and drive means (23) for the movable carriage (5).

10. A machine according to one or more of the preceding claims, characterised in that the gripping and cutting means (6) is mounted in the carriage (5) and comprise a head (150) including a suction part (155) and a cutting member (157), said head (150) being supported by an arm (151) rotatably mounted on a driven plate member (153), said plate member (153) being guidedly movable along guides (154) of the mounting carriage (5) and supporting a drive member for rotating the movable arm (151).

11. A machine as claimed in any of the preceding claims, characterised by comprising an integrated device for supplying empty bobbins (11) and for transporting wound bobbins (12), comprising trolleys (501) slidable along overhead lines (500) and provided with fixed spindles (502) for supporting said bobbins (11,12).

Patentansprüche

1. Vorrichtung zum automatischen Einbringen von leeren Spulen oder Halteröhren (1), insbesondere für Klebeband oder Fäden aus synthetischem Material aus Polypropylen, Polyethylen oder ähnlichem Material für die industrielle Verwendung, in automatische Wickeleinheiten (8), die in Spinnereien eingesetzt werden, und um von letzteren solche Spulen (12) abzunehmen, die bereits mit Klebeband oder Garn bewickelt und auf rotierenden Spindeln (16) angeordnet sind, wobei die Vorrichtung Mittel (6) aufweist, um das Garn oder das Band (7) zu erfassen und zu schneiden, das zu einer bereits bewickelten Spule (12) läuft, mit bewegbaren Einrichtungen, die eine Halteeinheit (10), eine erste Spindel (37) zum Halten von mindestens einer leeren Spule oder Hülse (11) und eine zweite Spindel (37) aufweist, die so angeordnet ist, daß sie die gewickelte Spule (12) nach ihrer Entnahme von der Wickeleinheit (8) aufnimmt, und mit Übertragungsmitteln (15), die um eine Achse drehbar sind, die parallel zur Drehachse der Spindeln (16) der Wickeleinheit verläuft und mit der leeren Spule oder der Hülse (11) in einer Weise zusammenarbeitet, daß sie auf der Spindel (16) der Wikkeleinheit untergebracht wird, indem sie entlang der Drehachse der Spindeln (16) der Wikkeleinheit verschoben wird, **dadurch gekennzeichnet**, daß die erste und zweite Spindel (37) beide auf der Halteeinheit (10) untergebracht sind, daß die Übertragungsmittel (15) ebenfalls angeordnet sind, um mit der gewikkelten Spule (12) zusammenzuwirken und sie von der jeweiligen Spindel (16) abzunehmen, wobei alle zuvor erwähnten Einrichtungen (6; 10; 37; 15) auf demselben Wagen (5) montiert sind und sowohl in vertikaler Richtung, als auch in horizontaler Richtung bewegt werden können.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet**, daß die Halteeinheit (10) einen ersten und einen zweiten Arm (35, 36) aufweist, die miteinander einen Winkel einschließen und die an einen gemeinsamen Arm (39) anschließen, dessen freies Ende (39A) mit einer sich drehenden Welle (40) zusammenwirkt, wobei der erste und zweite Arm an ihren jeweiligen freien Enden (35A, 36A) die beiden Spindeln (37) tragen.

3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet**, daß die sich drehende Welle (40) zu einem Antriebsteil (53) gehört, das an den bewegbaren Wagen (5) angeschlossen ist, wobei das Antriebsteil (53) mit der Welle (40) zusammenwirkt, um das Haltemittel (10) um die Achse (K) der Welle zu drehen, damit beide Spindeln (37) koaxiale Positionen zu jeder Spindel (16) der Wickeleinheit (8) annehmen.

4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet**, daß die Übertragungseinrichtung (15) einen Arm (65) aufweist, der so bewegbar ist, daß er von der Maschine (1) zurückgezogen und um die Achse (W) zusammen mit dieser geschwenkt werden kann, wobei der Arm (65) mit den gewickelten Spulen (12) zusammenwirkt, die von der Wickeleinheit (8) abgenommen und mit denen, die auf die Spindeln (16) aufgesteckt werden sollen, wobei der Arm (65) mit Antriebsmitteln (68) zusammenwirkt, die die Bewegungen bewirken und steuern.

5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet**, daß der bewegbare Arm (65) mit teleskopischen Elementen (70, 71, 72) versehen ist, die in bezug aufeinander verschiebbar sind und die zu dem bewegbaren Wagen (5) der Maschine gehören.

6. Vorrichtung nach Anspruch 5, **dadurch gekennzeichnet**, daß die Teleskopelemente (70, 71, 72) mit mindestens einer Schraube (75, 76) für ihre differentielle Verschiebung versehen sind.

7. Vorrichtung nach Anspruch 5, **dadurch gekennzeichnet**, daß die Teleskopelemente (70, 71, 72) mit Druckluftelementen versehen sind.

8. Vorrichtung nach Anspruch 1, **gekennzeichnet durch** Anschlagmittel (162) zur Unterbrechung des Betriebs der Spindel (16), die die bereits gewickelte Spule (12) trägt, wobei das Anschlagsmittel ein stangenförmiges Teil (162) ist, das in bezug auf die Platte (153) der verschiebbaren Greif- und Schneideinheit (6) axial bewegt werden kann.

9. Vorrichtung nach Anspruch 1, **gekennzeichnet durch** einen Ständer (2), der Führungen (25) für die Bewegung des bewegbaren Schlittens (5) trägt, wobei der Träger einem Teil (3) zugeordnet ist, das entlang von horizontalen Führungen (4) und das Antriebsmittel (20) trägt, die den Träger (2) und das Antriebsmittel (23) für den bewegbaren Schlitten (5) bewegen.

10. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, daß das Greif- und Schneidemittel (6) an dem Schlitten (5) angebracht ist und einen Kopf (150) mit einem Saugteil (155) und einem Schneidteil (157) aufweist, wobei der Kopf (150) von einem Arm (151) getragen wird, der drehbar von einem angetriebenen Plattenteil (153) gehalten ist, wobei das Plattenteil (153) entlang von Führungen (154) des tragenden Schlittens (5) in geführter Weise bewegbar ist und ein Antriebsteil zum Drehen des bewegbaren Arms (151) trägt.

11. Vorrichtung nach einem der vorhergehenden Ansprüche, **gekennzeichnet durch** eine integrierte Einrichtung für die Zufuhr von leeren Spulen (11) und zum Abtransportieren von gewickelten Spulen (12), mit Wagen (501), die entlang von oben angeordneten Leitungen (500) bewegbar und mit feststehenden Spindeln (502) zum Tragen der Spulen (11, 12) versehen sind.

Revendications

1. Machine pour charger automatiquement des bobines vides ou des tubes supports (1), en particulier pour des rubans ou filaments de polypropylène, de polyéthylène ou matériau synthétique similaire d'usage industriel, sur des bobinoirs automatiques (8) utilisés dans des usines de filature, et pour décharger de ceux-ci des bobines (12) sur lesquelles a été enroulé ledit ruban ou filament et qui sont disposées sur des broches rotatives (16), ladite machine comprenant un moyen (6) pour saisir et couper le filament ou ruban (7) se déplaçant en direction d'une bobine déjà pleine (12), un moyen de déplacement comprenant un élément support (10), une première broche (37) pour supporter au moins une bobine vide ou un tube vide (11) et une seconde broche (37) prévue pour recevoir la bobine pleine (12) après son enlèvement du bobinoir (8), et un moyen de transfert (15) susceptible de pivoter autour d'un axe parallèle à l'axe de rotation des broches (6) du bobinoir et coopérant avec la bobine vide ou le tube vide (11) de façon à monter cette bobine ou ce tube sur ladite broche (6) du bobinoir, par un déplacement le long de l'axe de rotation de ladite broche (6), caractérisée en ce que : la première broche et la seconde broche (37) sont toutes deux montées sur l'élément support (10), le moyen de transfert (15) étant également placé de façon à coopérer avec la bobine pleine (12) de façon à pouvoir extraire celle-ci de la broche (16) respective, tous les moyens susdits (6 ; 10 ; 37 ; 15) étant montés sur le même chariot (5) mobile dans le sens vertical et également dans le sens horizontal.

2. Machine selon la revendication 1, caractérisée en ce que l'élément support (10) comprend un premier et un second bras (35, 36) formant un angle entre eux et reliés à un bras commun (39), associé à son extrémité libre (39A) à un arbre pivotant (40), lesdits premier et second bras portant à leurs extrémités libres (35A, 36A) les deux broches (37).

3. Machine selon la revendication 2, caractérisée en ce que l'arbre pivotant (40) est associé à un élément d'entraînement (53) relié au chariot mobile (5), ledit élément d'entraînement (53) coopérant avec ledit arbre (40) pour entraîner en rotation le moyen support (10) autour de l'axe (K) dudit arbre, en permettant ainsi aux deux broches (37) de se positionner dans le même axe que chacune des broches (16) du bobinoir (8).

4. Machine selon la revendication 1, caractérisée en ce que le moyen de transfert (15) comprend un bras (65) susceptible de se déplacer en s'éloignant de la machine (1) et de pivoter autour de l'axe (W) en même temps que le mouvement précédent, ledit bras (65) coopérant avec les bobines pleines (12) à enlever du bobinoir (8) et avec celles qui doivent être montées sur leurs broches (16), ledit bras (65) étant associé à un moyen d'entraînement (68)

permettant d'effectuer et de contrôler lesdits mouvements.

5. Machine selon la revendication 4, caractérisée en ce que le bras mobile (5) est associé à des éléments télescopiques (70, 71, 72) mobiles les uns par rapport aux autres et associés au chariot mobile (5) de la machine.

6. Machine selon la revendication 5, caractérisée en ce que les éléments télescopiques (70, 71, 72) sont associés à au moins une vis (75, 76) permettant de les avancer de façon différentielle.

7. Machine selon la revendication 5, caractérisée en ce que les éléments télescopiques (70, 71, 72) sont associés à des éléments pneumatiques.

8. Machine selon la revendication 1, caractérisée en ce qu'elle comporte un moyen d'arrêt (162) pour interrompre le fonctionnement de la broche (16) portant la bobine déjà pleine (12), le moyen d'arrêt étant un élément en forme de tige (162) mobile dans le sens axial par rapport au plateau (153) du dispositif mobile servant à saisir et à couper (6).

9. Machine selon la revendication 1, caractérisée en ce qu'elle comprend une colonne (2) portant les glissières (25) de déplacement du chariot mobile (5), ladite colonne étant associée à un élément (3) coulissant le long de guides horizontaux (4) et supportant le moyen d'entraînement (20) servant à déplacer la colonne (2) et le moyen d'entraînement (23) du chariot mobile (5).

10. Machine selon l'une ou plusieurs des revendications précédentes, caractérisée en ce que le dispositif servant à saisir et à couper (6) est monté sur le chariot (5) et comprend une tête (150) constituée par un élément de succion (155) et un élément coupant (157), ladite tête (150) étant supportée par un bras (151) monté en rotation sur un plateau entraîné (153), ledit plateau (153) pouvant se déplacer en translation le long de guides (154) du chariot support (5) et supportant un élément d'entraînement pour faire pivoter le bras mobile (151).

11. Machine selon l'une quelconque des revendications précédentes, caractérisée en ce qu'elle comprend un dispositif intégré pour l'alimentation en bobines vides (11) et pour transporter les bobines pleines (12), comprenant des pièces coulissantes (501) se déplaçant le long de rails suspendus (500) et comportant des broches fixes (502) pour supporter lesdites bobines (11, 12).

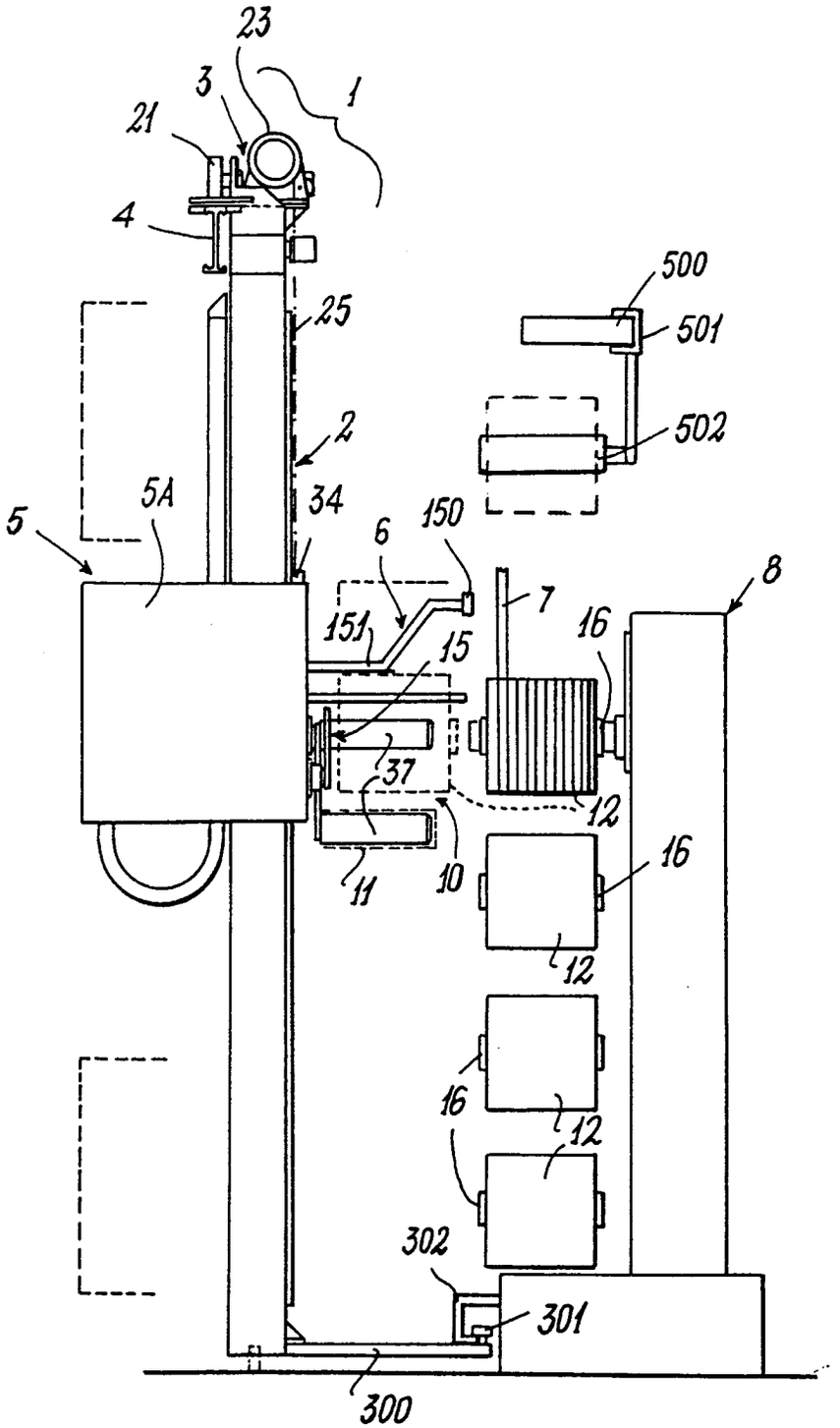

23
3
1
21
4
500
501
25
502
2
5A
34
5
6
150
8
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151
15
16
37
12
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11
16
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16
12
302
301
300

Fig. 1

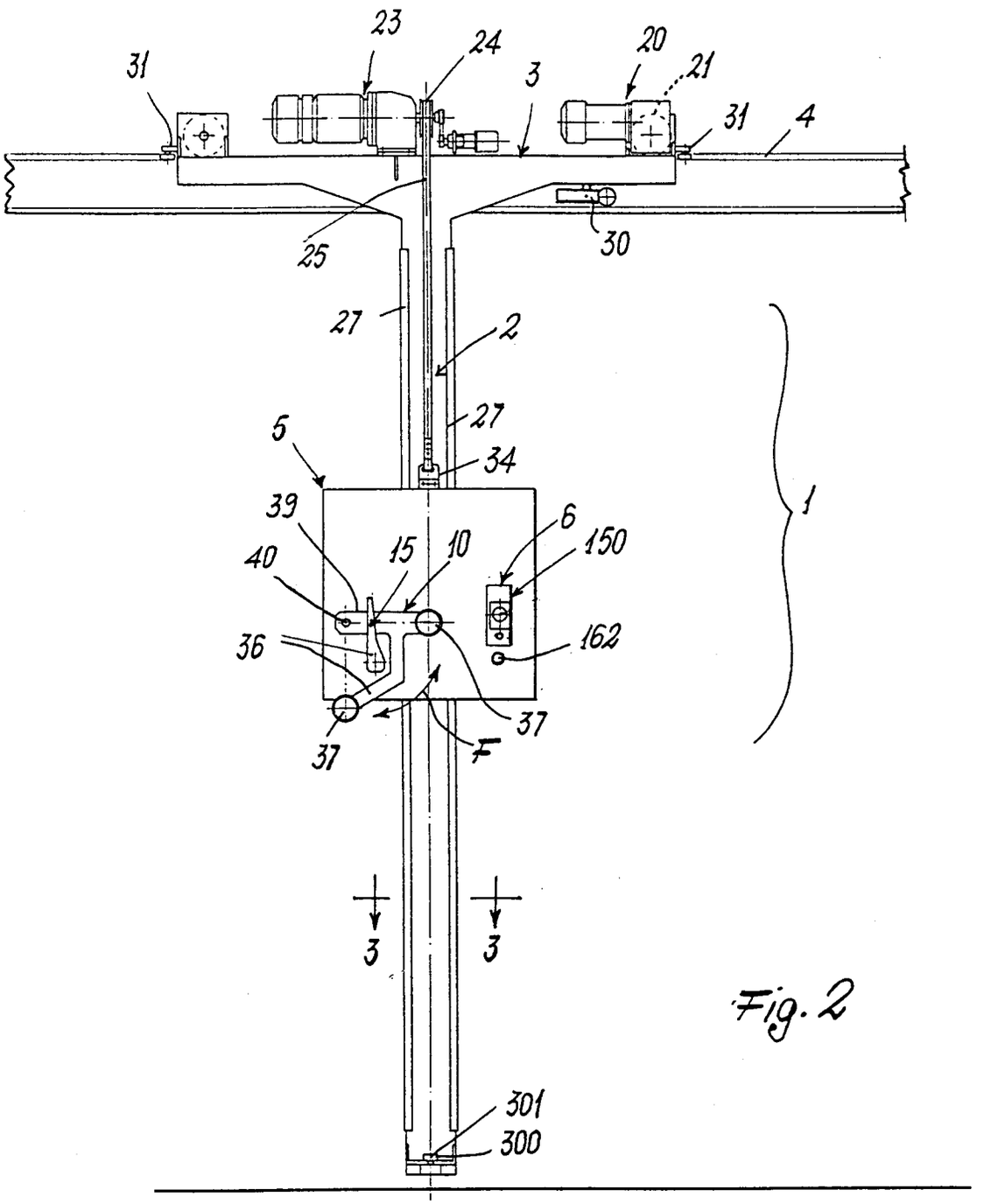

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162
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Fig. 2

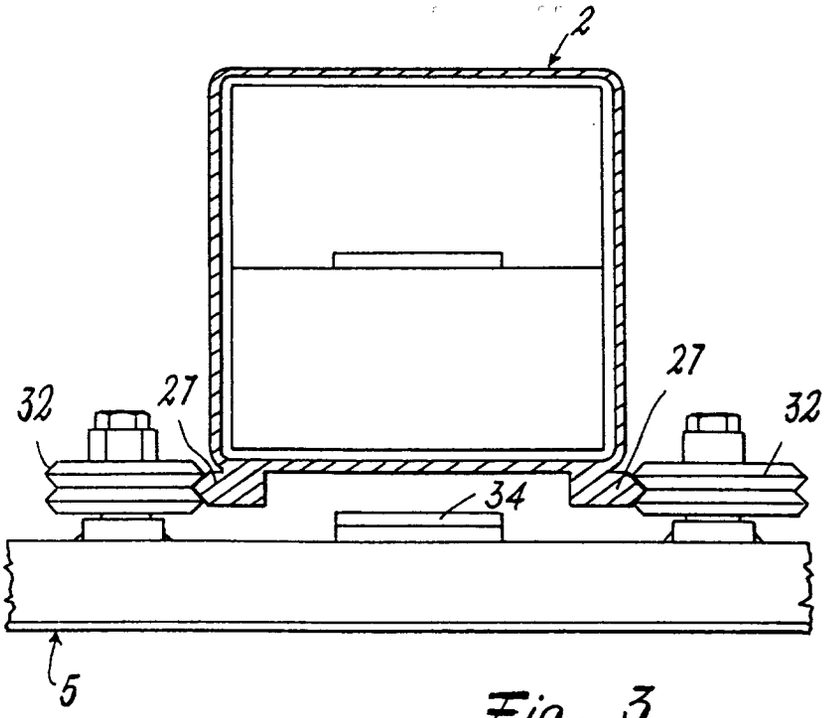

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32
34
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5

Fig. 3

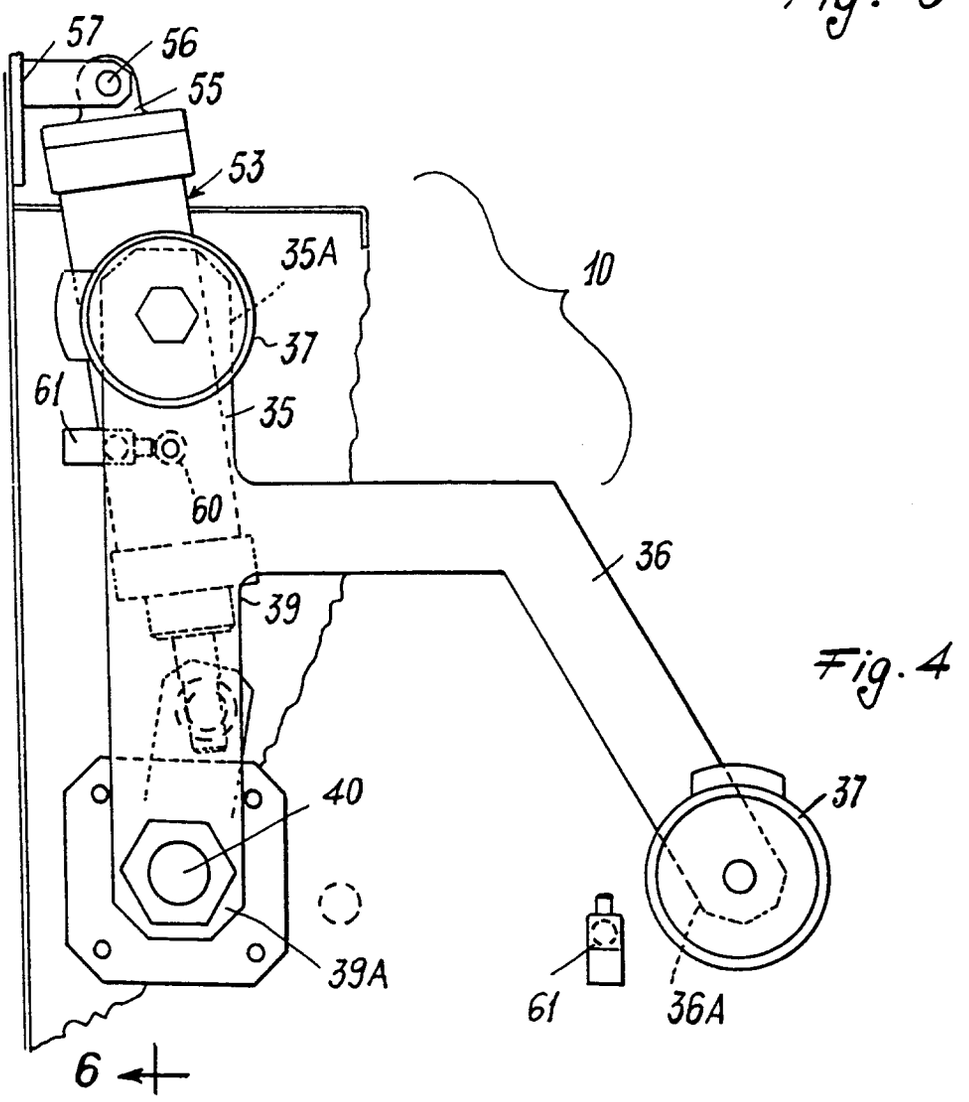

57
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53
35A
37
61
35
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39A
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36A
6

Fig. 4

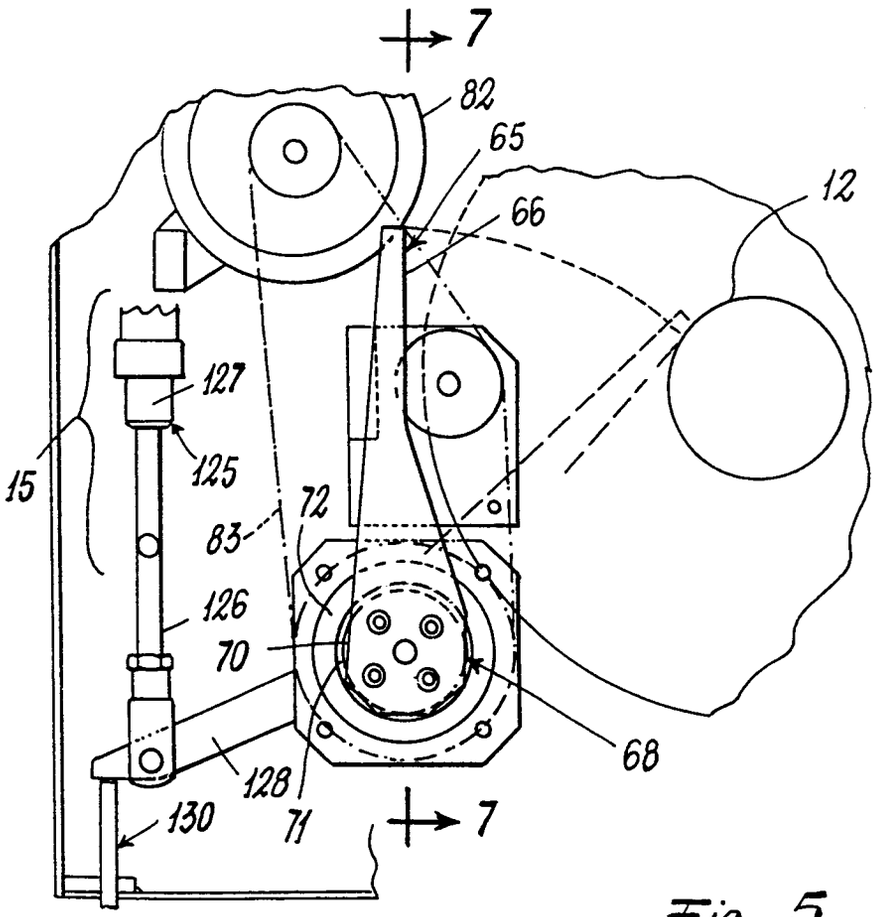

7
82
65
66
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125
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126
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128
71
130
7

Fig. 5

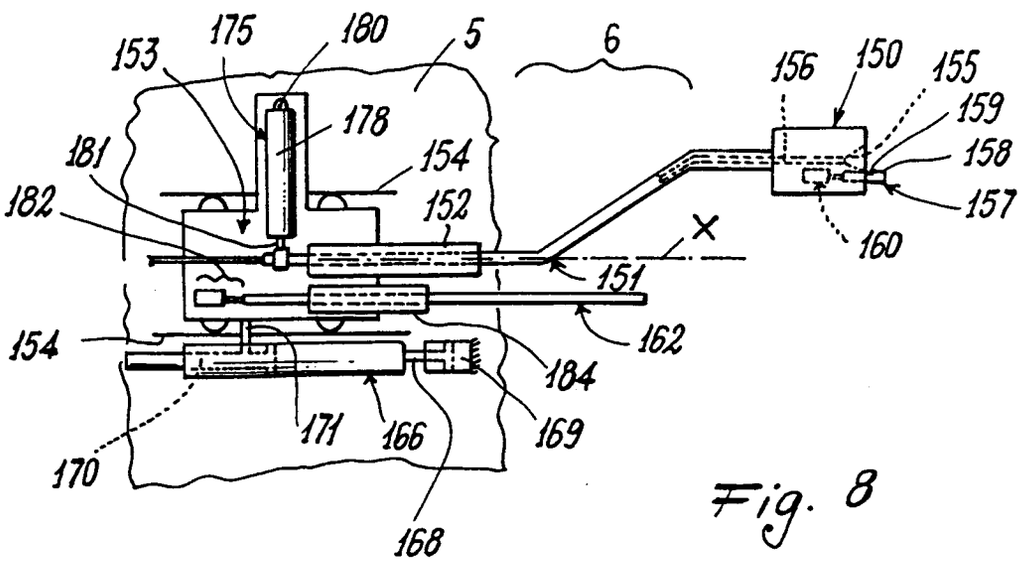

175
180
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Fig. 8

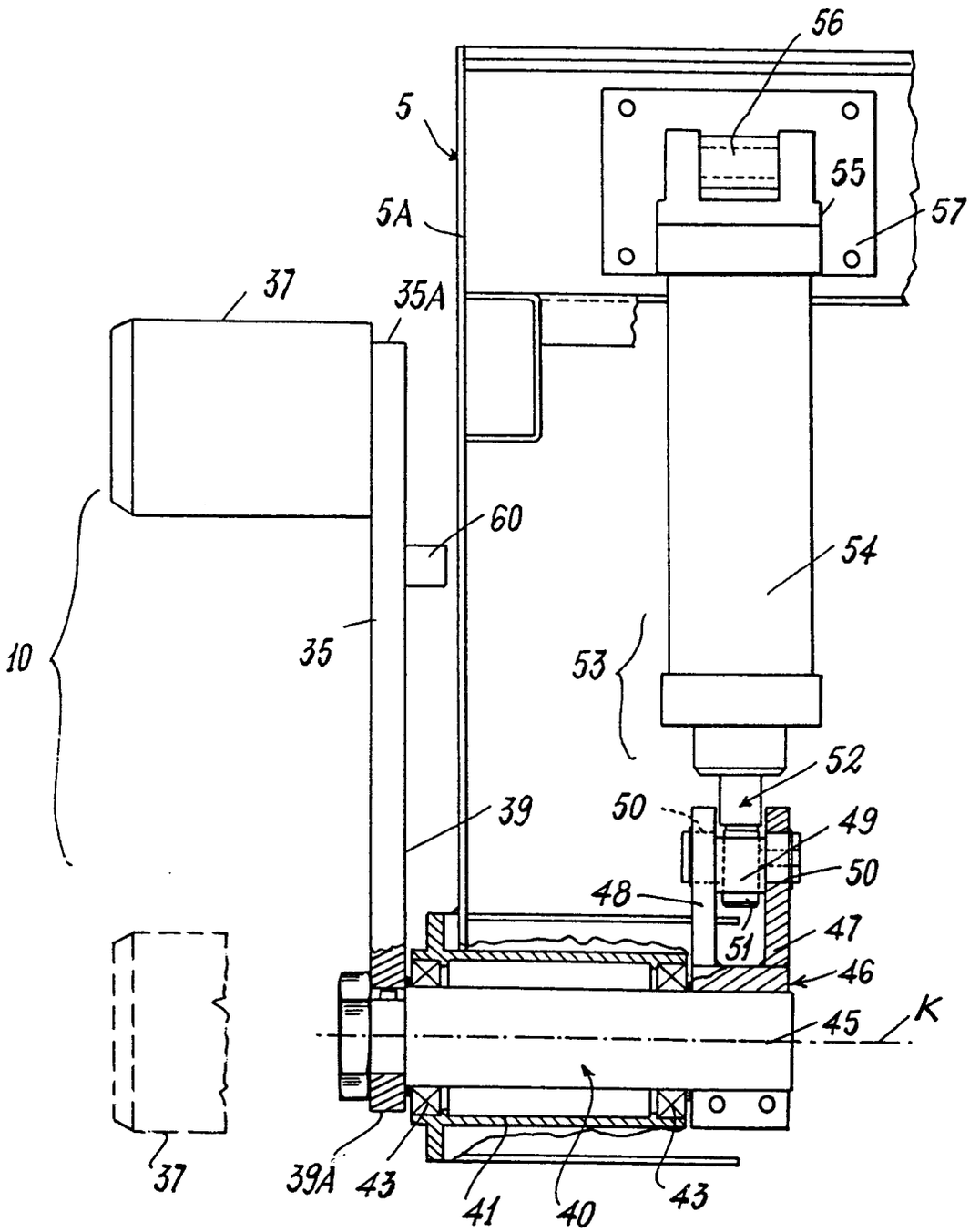

56
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5A
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35A
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46
45
K
37
39A
43
41
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43

Fig. 6

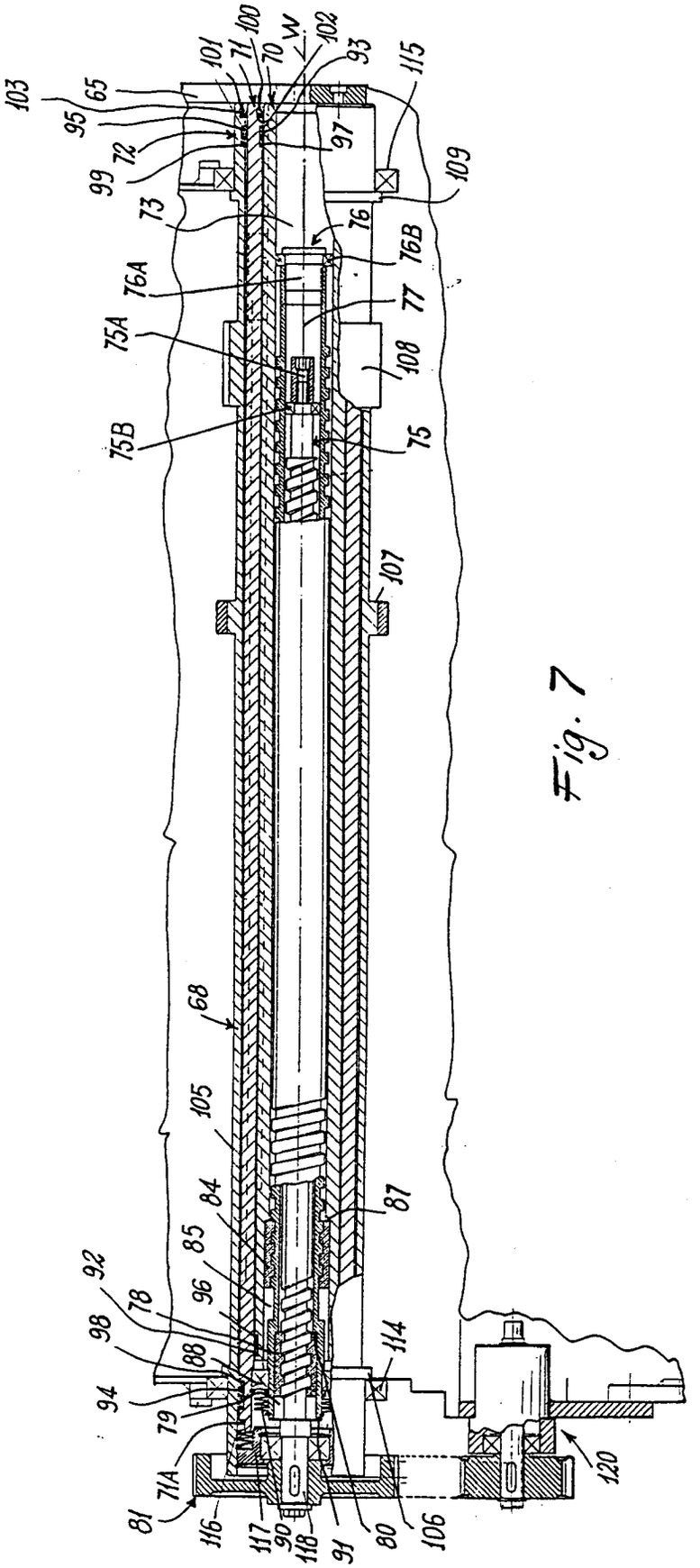

103
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W
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115
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109
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76
76B
76A
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75A
108
75B
75
107
68
105
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114
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71A
120
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Fig. 7