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(54) **Traverse guide with detectors.**

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US-A- 3 257 087
US-A- 3 498 567
US-A- 3 997 128
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Description

This invention relates to textile yarn winding apparatus and in particular to the reciprocal traverse guide used in such apparatus for laying yarn in a precise position on to a bobbin.

Our British Patent No. 2127860 describes and claims a textile yarn winding apparatus comprising a yarn traverse mechanism including a yarn guide which is caused to reciprocate along the length of a flanged bobbin to be wound, to lay the yarn on the bobbin wherein the yarn guide is formed of two parts or fingers between which, in use, the yarn is located for movement along the length of the bobbin body, the relatively trailing part or finger in any particular stroke of the guide acting to cause the yarn to be moved fully up to the flange of the bobbin, the two parts of the guide each being movable independently from its normal position to a position clear of the flange of the bobbin, means being provided to displace the relatively leading guide part or finger in any particular stroke at or prior to the said leading part reaching the flange of the bobbin so that the said trailing part may move to a position closely adjacent the flange.

The winder described in Patent Specification No. 2127860 has on the inner face of each guide finger, a displaceably mounted detector member carrying a pulley. The arrangement is such that a respective pulley contacts the inside face of the corresponding flange of the bobbin at the end of each stroke. The pulley is rotated by the rotating flange to reduce friction and at the same time, the pressure on the pulley causes the detector to displace to its mount to send a signal to reverse the direction of the traverse movement of the yarn guide.

Such a winder will hereafter be referred to as "a yarn winder of the type described".

It was necessary for the pulleys carried by the detectors of "a yarn winder of the type described" to be offset to either side of the vertical diametral line of the bobbin, so as to avoid contact with each other. This arrangement, however, causes a problem due to the fact that, depending on which side of the diametral line the pulley makes contact with the rotating bobbin flange, that pulley is subjected to a force tending to either lift it from, or to press it down on to, the surface of the package being wound on the bobbin. These phenomena cause unwanted variations in the winding at both ends of the packet particularly when a fine filament is being wound.

The general object of this invention is to minimise or eliminate these variations.

A winder of the type described in accordance with the invention has the detector member of at least one of the guide fingers mounted on a carrying plate which is movably mounted on the respective finger, the carrying plate being normally held in an inoperative position in which the pulley of the associated detector member of at least one of the fingers is mounted on a carrying plate which is pivotally mounted on the respective finger at an intermediate position along its length, the carrying plate being normally held in an inoperative position in which a feeler of its associated detector member is located at, or sufficiently apart from, the inner face of the finger for that feeler not to obstruct the feeler of the detector member carried on the other finger when said other detector member is in its normal position for detecting a bobbin flange, means being provided to displace the carrying plate and hence the detector member pivotally associated therewith from its inoperative position to an operative position in which the feeler of the said associated detector member is in a position to engage the respective flange of the bobbin, when, and only when, the said other finger is displaced from its normal winding position, the carrying plate being pivotted to return the detector member to its normal inoperative position when the said other finger is returned to its normal winding position.

The invention will now be further described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a yarn winder of the type described as illustrated in our British Patent Specification No. 2 127 860,

Figure 2 is a sketch illustrating the problem which may arise with yarn winding apparatus of the type described and as generally shown in Figure 1,

Figure 3 is a plan view of the yarn guide members of one embodiment of a winding apparatus in accordance with the present invention,

Figure 4 is a view corresponding to Figure 3 showing the position of the guide members when at one end flange of a bobbin, and

Figure 5 is a view corresponding to Figure 4 showing the position of the guide members when the other flange of the bobbin is to be engaged.

Referring to Figure 1, the yarn laying mechanism of the winder comprises a traverse guide generally indicated at 2 which is caused to reciprocate along a screwed and rotating guide bar 4 by a nut 8 in a traverse box.

The guide 2 rests on a package being wound on a bobbin 10 provided with flanges 12 and as can be seen in Figure 1 the guide is formed with two flat fingers 14 and 16 each pivoted separately at 17 on the traverse nut 8. The fingers 14 and 16 can thus each hinge upwardly to accommodate the growth of the package. Each flat finger has a Tungsten carbide strip 18 to help to withstand abrasion of the filament being wound.

In practice filament or yarn is fed between the two parts or fingers 14, 16 of the guide so as to be reciprocated by the guide along the length of the bobbin between the flanges. As the guide is moved in the direction of the arrow A in Figure 1 towards the right hand flange 12 depending on the position of the yarn let-off guide (not shown), the trailing leg 14 of the guide acts to push the yarn along the bobbin over at least the last part of the traverse. In order to prevent the leading yarn finger 16 from fouling the flange 12, the leading finger 16 is lifted by engagement of the finger with a cam 20. The cam is formed so that finger 16 is lifted through a sufficient distance to clear the flange 12 (as can be seen in Figure 1) enabling the trailing finger 14 of the guide

to lay the yarn very closely adjacent the right hand flange. The leg 16, although raised clear of the flange, still extends beyond the yarn line so that when the traverse is reversed it can, if required, immediately influence the movement of the yarn in the opposite direction.

A similar cam 20 is provided adjacent the left hand flange 12 of the bobbin so that the then leading guide finger 14 will itself be lifted as the guide approaches the other flange. The guide finger 16 will then act to push yarn against the said other flange.

In order to made sure that the length of each traverse stroke of the yarn guide is such as to lay the yarn closely adjacent each bobbin flange, a detector member 21 (21') carrying a pulley 22 (22') is pivotally mounted on the inner face of each guide member 14, 16 so as to engage the inside face of each flange 12 at the end of each stroke respectively. The pulley then acts to reduce friction when engaging the flange.

When member 21 (21') engages a flange, through pulley 22 (22'), the member pivots on its guide member and an electrical signal is transmitted by means of a circuit indicated by dash lines 24 to a connecting box 26 and from thence to a fluid cylinder 28, the piston 30 of which is connected to a pivoted member 32 carrying two drive wheels 34, 36.

When the piston 30 is in the position illustrated in Figure 1, the drive wheel 36 extends between and connects a main driven wheel 38 and a driven wheel 40 attached at the end of the spindle 4 so as to rotate the spindle in one direction.

When a signal from a detector pulley is received the piston 30 is drawn into the cylinder 28 causing the arm 32 to pivot and the drive wheel 36 driven by wheel 34, to come into contact with the driven wheel 40 causing the wheel 40 to be driven in the opposite direction, the traverse nut 8 and guide means 2 being then caused to move in the opposite direction along the bobbin 10.

In this way, the length of each traverse stroke is determined by the detectors on the guides thus ensuring that the yarn is laid up to the respective flanges. This also obviates the problem which could arise were the bobbin diameter to increase by build-up of yarn thereon, causing increased pressure on the flanges which could even cause distortion thereof.

With the device illustrated in Figure 1 it is necessary for the pulleys 22, 22' to be offset on either side of the vertical diametral line of the bobbin so as to avoid contact with each other as can be seen with reference to Figure 2. This arrangement, however, causes a problem as, depending upon which side of the vertical diametral line 42 the pulleys make contact with the rotating bobbin flange 12, the pulley is subjected to a force tending either to lift it from the package surface or to press it down on to the package surface.

This causes uneven winding adjacent the bobbin flanges and is overcome by the construction of the fingers in accordance with the invention, as will now be described with reference to Figures 3 to 5.

Figure 3 shows the two guide fingers 14 and 16 lying side by side in their normal position for winding. The detector member 21' of the finger 14 is pivotably mounted at 44 not to the finger itself as is the case with the detector member 21 of the finger 16 but rather to a carrying plate 46 which is itself pivoted at 48 to the finger 14. The micro switch device 50' to transmit the signal to the mechanism for reversing the traverse movement is also carried on the plate 46 which is biased by means of a spring 52 to the position shown in Figure 3 in which it is pivoted in a clockwise direction about the pivot 48 to move the detector pulley 22' to an inoperative position away from the inner edge 54 of the finger 14. It can thus be positioned opposite to the corresponding pulley 22 of the finger 16 which is not carried on a plate 46 but is rather pivoted about a pivot 56 directed to the finger 16.

Both the detector members 21 and 21' are biased by means of a spring member 58, 58' to a position in which they are held by stop screws 60, 60' with their switch contact adjustment screws 62, 62' held apart from the corresponding actuators 63, 63' on switch units 50, 50'. In this position, therefore, both the pulleys can be located on the diametral line 42 (see Figure 2).

When the finger 14 approaches the corresponding flange 12 of the bobbin at the end of one stroke it is lifted by a cam device as described with reference to Figure 1 to a position as illustrated in the lefthand side of Figure 4 in which it can clear the flange. The pulley 22 then engages the flange and is moved against the bias of a spring 58 in an anti-clockwise direction about its pivot 56 until the contacts 62', 63 close and a signal is transmitted to reverse the traverse movement.

When the yarn guide unit reaches the other flange 12 of the bobbin the finger 16 is lifted as illustrated in the lefthand side of Figure 5 so as to be able to clear the corresponding flange 12 of the bobbin.

In so doing a deflecting surface 64 provided adjacent the inner end of the finger 16 engages a stud 66 connected to the inner end of the carrying plate 46 of the finger 14. This stud and hence the plate 46 is moved to the left as shown in Figure 5 as the surface 64 rises, causing the carrying plate 46 to pivot about its pivot 48 to bring the detector pulley 22' into the operative position as seen in Figure 5 overlapping the inner edge 54 of the finger 14 so that it can engage the adjacent flange 12 on the diametral line 42.

On contact with the flange the deflector member 21' is pivoted about its pivot 44 against the bias of the spring 58' in a clockwise direction so that the screw 62' and actuator 63' engage. This causes the traverse drive to reverse. As the fingers move away from the flange 12 the finger 16 is again lowered to the position shown in Figure 3 with the result that the carrying plate 46 is pivoted in a clockwise direction about the pivot 48 by the bias provided by the spring 52 with the stud 66 sliding back over the deflecting surface 64 until the position in Figure 3 is again reached.

It will be appreciated that the winder could be employed to wind two bobbins simultaneously positioned along the length of the winder. As seen in Fig-

ure 1, the screw thread in this case would extend entirely along the length of the spindle 4 and a second traverse nut 8 and a yarn guide 2 would be incorporated.

Claims

1. A textile yarn winding apparatus comprising a yarn traverse mechanism including a yarn guide which is caused to reciprocate along the length of a flanged bobbin to be wound, to lay the yarn on the bobbin wherein the yarn guide is formed of two fingers between which, in use, the yarn is located for movement along the length of the bobbin body, the relatively trailing finger in any particular stroke of the guide acting to cause the yarn to be moved fully up to the flange of the bobbin, each of said fingers being displaceable from its normal winding position to a position clear of the flange of the bobbin and means for displacing the relatively leading finger in any particular stroke at or prior to the said leading finger reaching the flange of the bobbin so that the said trailing finger may move to a position closely adjacent the flange, each of said fingers having a respective detector member to sense the bobbin flange at the end of the respective stroke and to then transmit a signal to cause the drive for the traverse mechanism to be reversed, each respective detector member being positioned on the inner edge of the respective finger so as to contact a bobbin flange when the respective finger is the trailing finger and pivot relative thereto to transmit an appropriate signal to a control means (26), characterized in that the detector member (21, 21') of at least one of the fingers (14, 16) is mounted on a carrying plate (46) which is pivotally mounted on the respective finger at an intermediate position along its length, the carrying plate being normally held in an inoperative position in which a feeler (22') of its associated detector member is located at, or sufficiently apart from, the inner face of the finger for that feeler not to obstruct the feeler of the detector member carried on the other finger when said other detector member is in its normal position for detecting a bobbin flange, means (20; 64, 66) being provided to displace the carrying plate and hence the detector member pivotally associated therewith from its inoperative position to an operative position in which the feeler of the said associated detector member is in a position to engage the respective flange of the bobbin, when, and only when, the said other finger is displaced from its normal winding position, the carrying plate being pivotted to return the detector member to its normal inoperative position when the said other finger is returned to its normal winding position.

2. A winder according to Claim 1 wherein each said feeler (22, 22') is mounted at one end of a respective elongate detector member (21, 21') and which is pivotally mounted thereon at an intermediate position along its length and which co-operates with switch means (50, 50') at its other end, each said elongate detector member being rotatably biased with respect to its mount (44, 56) in a direction so as to enable the respective feeler (22, 22') to engage the respective flange (12) of the bobbin (10).

3. A winder according to Claim 2 wherein said carrying plate (46) extends along a portion of the respective guide finger (14), being rotatably biased to said inoperative position, and in which the respective switch means (50') is mounted on said carrying plate.

4. A winder according to any preceding claim wherein said finger (14) is displaceable in an upward direction and said carrying plate (46) incorporates an abutment member (66) which co-operates with a surface (64) on the other finger (16) which is inclined to the vertical plane such that when one or other of the fingers is lifted, the carrying plate is pivoted by or against its bias (52, 58').

5. A winder according to any preceding claim in which the means for displacing the finger (14) comprises a cam (20) positioned on the winder adjacent the or each flange (12) of the bobbin and which is engaged by the relatively leading finger (14, 16) and which acts to pivot the said leading finger upwardly at a position close to the flange so that the said leading finger may pass over the top of the flange.

6. A winder according to any preceding claim in which the feeler (22, 22') is a pulley.

Patentansprüche

1. Textilgarnaufspulgerät umfassend einen Garntraversiermechanismus mit einer Garnführung, die zum Legen des Garns auf die Spule entlang der Länge einer zu spulenden Flanschenspule hin- und hergeht, bei dem die Garnführung aus zwei Fingern gebildet wird, zwischen denen sich, im Einsatz, das Garn befindet, so daß es sich entlang der Länge des Spulenkörpers bewegen kann, wobei das Garn durch den jeweils hinteren Finger bei einem Hub der Führung ganz hin zum Spulenflansch bewegt wird und jeder dieser Finger aus seiner normalen Spulstellung in eine vom Spulenflansch entfernte Stellung verschoben werden kann und einer Vorrichtung zum Verschieben des jeweils vorderen Fingers bei einem Hub zu dem Zeitpunkt, an dem jener vordere Finger den Spulenflansch erreicht oder davor, so daß jener hintere Finger ganz nahe an den Flansch heranrücken kann, wobei jeder dieser Finger jeweils über ein Detektorglied verfügt, das den Spulenflansch am Ende des jeweiligen Hubes erfaßt und dann ein Signal überträgt, durch das der Antrieb des Traversiermechanismus umgekehrt wird, wobei jedes Detektorglied jeweils so an der Innenkante des jeweiligen Fingers liegt, daß es, wenn es sich beim jeweiligen Finger um den hinteren Finger handelt, einen Spulenflansch berührt und zur Übertragung eines entsprechenden Signals zur Steuereinrichtung zu diesem verschwenkt, dadurch gekennzeichnet, daß das Detektorglied (21, 21') mindestens eines der Finger (14, 16) auf einer Tragplatte (46) montiert ist, die auf dem jeweiligen Finger in einer Mittelstellung entlang dessen Länge schwenkbar montiert ist, wobei die Tragplatte normalerweise in einer Ruhestellung gehalten wird, in der ein Fühler (22') ihres zugeordneten Detektorglieds sich an oder genügend weit entfernt von der Innenfläche

des Fingers befindet, so daß dieser Fühler nicht den Fühler des Detektorglieds auf dem anderen Finger behindert wenn sich dieses andere Detektorglied in seiner normalen Stellung zur Erfassung eines Spulenflansches befindet, wobei eine Vorrichtung (20; 64, 66) zum Verschieben der Tragplatte und deshalb des dieser schwenkbar zugeordneten Detektorgliedes von ihrer Ruhestellung in eine Betriebsstellung vorgesehen ist, in der der Fühler jenes zugeordneten Detektorglieds mit dem jeweiligen Spulenflansch in Eingriff kommen kann und zwar einzig und allein wenn jener andere Finger aus seiner normalen Spulstellung verschoben ist, wobei die Tragplatte zur Rückkehr des Detektorglieds in seine normale Ruhestellung verschwenkt wird, wenn jener andere Finger in seine normale Spulstellung zurückkehrt.

2. Aufspulgerät nach Anspruch 1, bei dem jeder jener Fühler (22, 22') an einem Ende eines jeweiligen länglichen Detektorgliedes (21, 21') montiert ist, das in einer Mittelstellung entlang seiner Länge schwenkbar montiert ist und mit einer Schaltvorrichtung (50, 50') an seinem anderen Ende zusammenwirkt, wobei jedes jener Detektorglieder bezüglich seiner Halterung (44, 56) in einer solchen Richtung drehbar vorgespannt ist, daß der jeweilige Fühler (22, 22') mit dem jeweiligen Flansch (12) der Spule (10) in Eingriff kommen kann.

3. Aufspulgerät nach Anspruch 2, bei dem sich jene Tragplatte (46) entlang eines Teils des jeweiligen Führungsfingers (14) erstreckt und drehbar in jene Ruhestellung vorgespannt ist und bei dem die jeweilige Schaltvorrichtung (50') auf jener Tragplatte montiert ist.

4. Aufspulgerät nach einem der vorhergehenden Ansprüche, bei dem jener Finger (14) nach oben verschiebbar ist und jene Tragplatte (46) ein Anschlagglied (66) aufweist, das mit einer Fläche (64) am anderen Finger (16) zusammenwirkt, die bezüglich der Vertikalen so geneigt ist, daß die Tragplatte, wenn einer der Finger angehoben wird, durch oder gegen ihre Vorspannung (52, 58') geschwenkt wird.

5. Aufspulgerät nach einem der vorhergehenden Ansprüche, bei dem die Vorrichtung zum Verschieben des Fingers (14) einen Nocken (20) umfaßt, der sich an dem Aufspulgerät neben dem oder jedem Flansch (12) der Spule befindet, mit dem der jeweils vordere Finger (14, 16) in Eingriff kommt und der jenen vorderen Finger nahe dem Flansch so nach oben schwenkt, daß jener vordere Finger über den Flansch hinweggehen kann.

6. Aufspulgerät nach einem der vorhergehenden Ansprüche, bei dem der Fühler (22, 22') eine Riemenscheibe ist.

Revendications

1. Un dispositif de bobinage de fils textiles comprenant un mécanisme transversal du fil comportant un guide-fil qui est destiné à se déplacer suivant un mouvement de va-et-vient sur toute la longueur d'une bobine à enrouler munie de joues, pour étendre le fil sur la bobine, dans lequel le guide-fil est formé de deux doigts entre lesquels, en cours d'utilisation, le fil est logé pour se déplacer sur toute la longueur du corps de la bobine, le doigt relativement en arrière, dans n'importe quelle course particulière du guide, agissant pour faire en sorte que le fil soit déplacé complètement jusqu'à la joue de la bobine, chacun desdits doigts pouvant être déplacé de sa position normale d'enroulement vers une position dégagée de la joue de la bobine et un moyen pour déplacer le doigt relativement en avant, dans n'importe quelle course particulière, au moment où, ou avant que, ledit doigt avant n'atteigne la joue de la bobine de telle sorte que ledit doigt arrière puisse se déplacer vers une position très proche de la joue, chacun desdits doigts ayant un élément détecteur respectif pour palper la joue de la bobine à la fin de la course respective et pour transmettre ensuite un signal pour faire en sorte que la commande d'entraînement du mécanisme transversal soit inversée, chaque élément détecteur respectif étant disposé sur le bord interne du doigt respectif afin de venir en contact avec une joue de la bobine lorsque le doigt respectif est le doigt arrière et de pivoter par rapport à celui-ci pour transmettre un signal approprié à un moyen de commande, caractérisé en ce que l'élément détecteur (21, 21') d'au-moins un des doigts (14, 16) est monté sur une plaque support (46) qui est montée de façon pivotante sur le doigt respectif, en une position intermédiaire de sa longueur, la plaque support étant normalement maintenue dans une position de repos dans laquelle un palpeur (22') de son élément détecteur associé est disposé au niveau de, ou suffisamment espacé de, la face interne du doigt pour que ce palpeur n'obstrue pas le palpeur de l'élément détecteur supporté par l'autre doigt, quand ledit autre élément detecteur est dans sa position normale pour détecter une joue de bobine, des moyens (20, 64, 66) étant prévus pour déplacer la plaque support et par suite l'élément détecteur associe de façon pivotante avec celle-ci de sa position de repos vers une position active dans laquelle le palpeur dudit élément détecteur associé est dans une position de contact avec la joue respective de la bobine lorsque, et seulement lorsque, ledit autre doigt est déplacé de sa position normale d'enroulement, la plaque support pivotant pour faire revenir l'élément détecteur vers sa position normale de repos lorsque ledit autre doigt revient à sa position normale d'enroulement.

2. Un bobinoir selon la revendication 1 dans lequel chacun desdits palpeurs (22, 22') est monté à une extrémité d'un élément détecteur allongé respectif (21, 21') et qui est monté de façon pivotante, en une position intermédiaire de sa longueur sur celui-ci, et qui coopère avec des commutateurs (50, 50') à son autre extrémité, chacun desdits éléments détecteurs allongés étant forcé par ressort à tourner par rapport à son support (44, 56) dans une direction de manière à permettre au palpeur respectif (22, 22') de venir en contact avec la joue respective (12) de la bobine (10).

3. Un bobinoir selon la revendication 2 dans lequel ladite plaque support (46) s'étend le long d'une partie du doigt de guidage respectif (14) en étant forcé par ressort à tourner vers ladite position de

repos et dans lequel le commutateur respectif (50') est monté sur ladite plaque support.

4. Un bobinoir selon l'une quelconque des revendications précédentes dans lequel ledit doigt (14) peut être déplacé vers le haut et ladite plaque support (46) présente un élément de butée (66) qui coopère avec une surface (64) sur l'autre doigt (16) qui est inclinée par rapport au plan vertical de telle sorte que lorsque l'un ou l'autre des doigts est soulevé, la plaque support pivote par ou à l'encontre de son ressort (58, 58').

5. Un bobinoir selon l'une quelconque des revendications précédentes dans lequel le moyen pour déplacer le doigt (14) comporte une came (20) disposée sur le bobinoir près de la ou de chaque joue (12) de la bobine et qui est engagée par le doigt relativement en avant (14, 16) et qui agit pour faire pivoter ledit doigt avant vers le haut en une position près de la joue, de telle sorte que ledit doigt avant puisse passer au-dessus de la joue.

6. Un bobinoir selon l'une quelconque des revendications précédentes dans lequel le palpeur (22, 22') est une poulie.

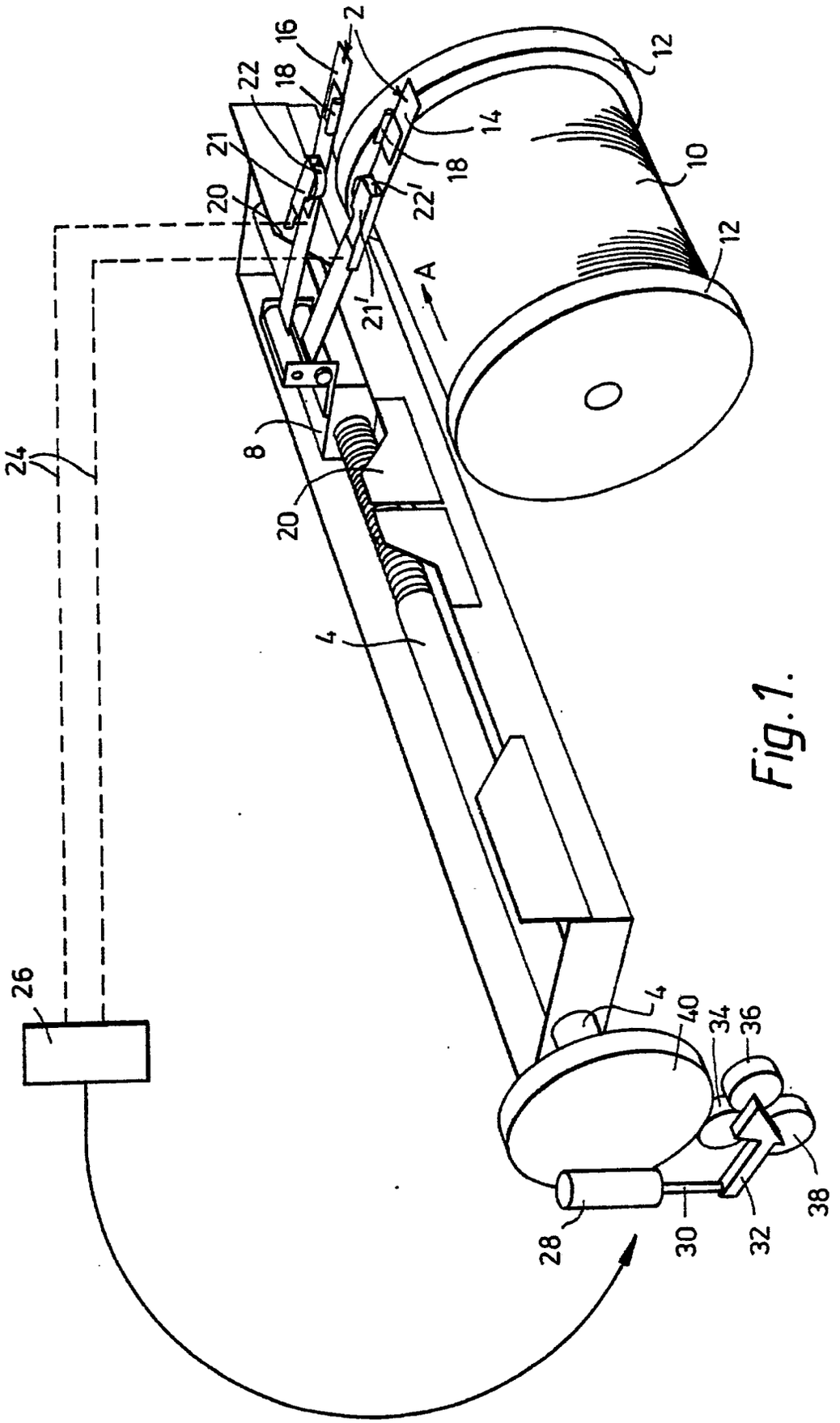
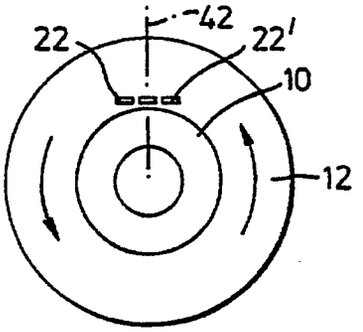


Fig. 1.

Fig.2.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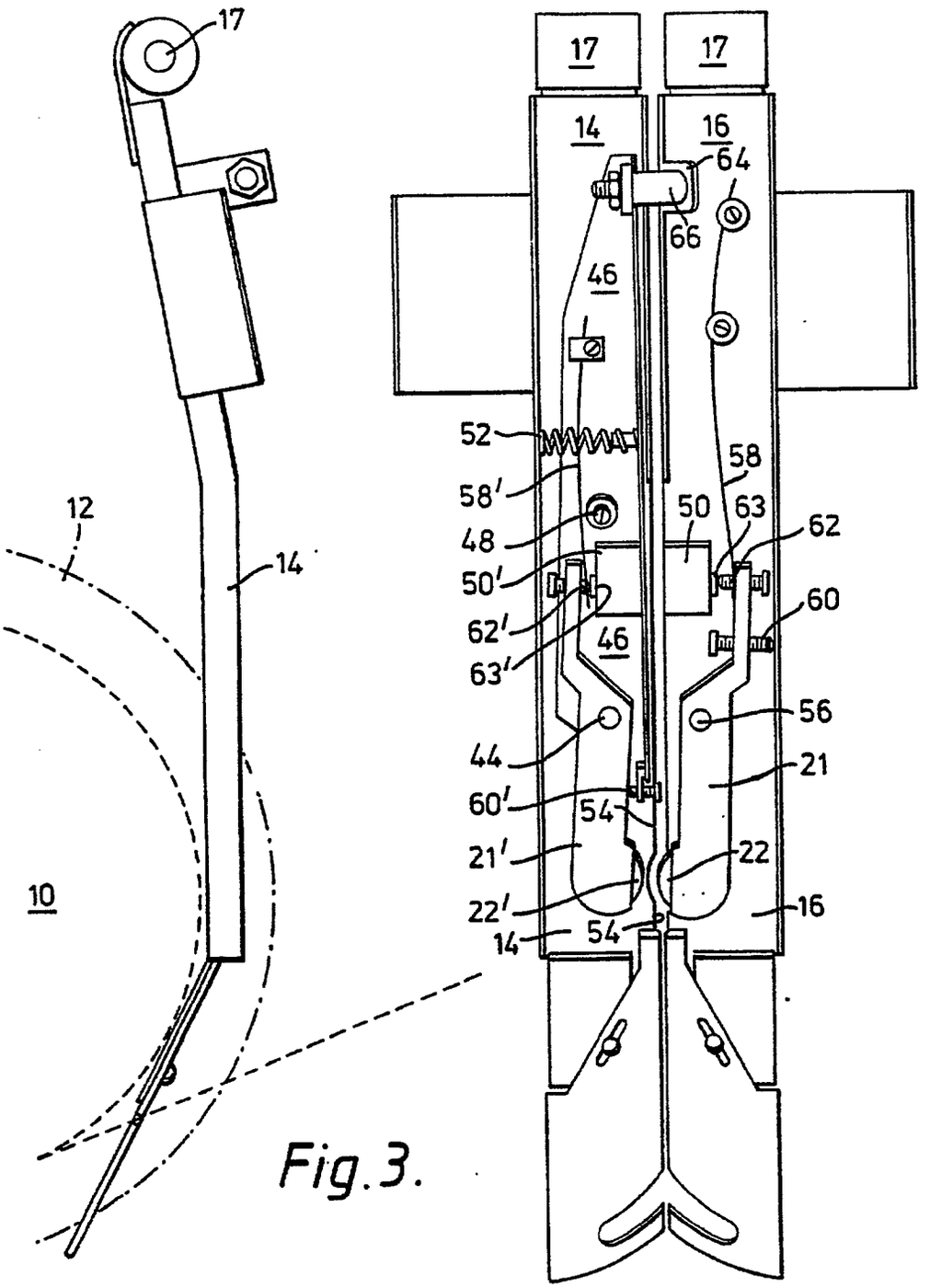
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Fig.3.

Fig.4.

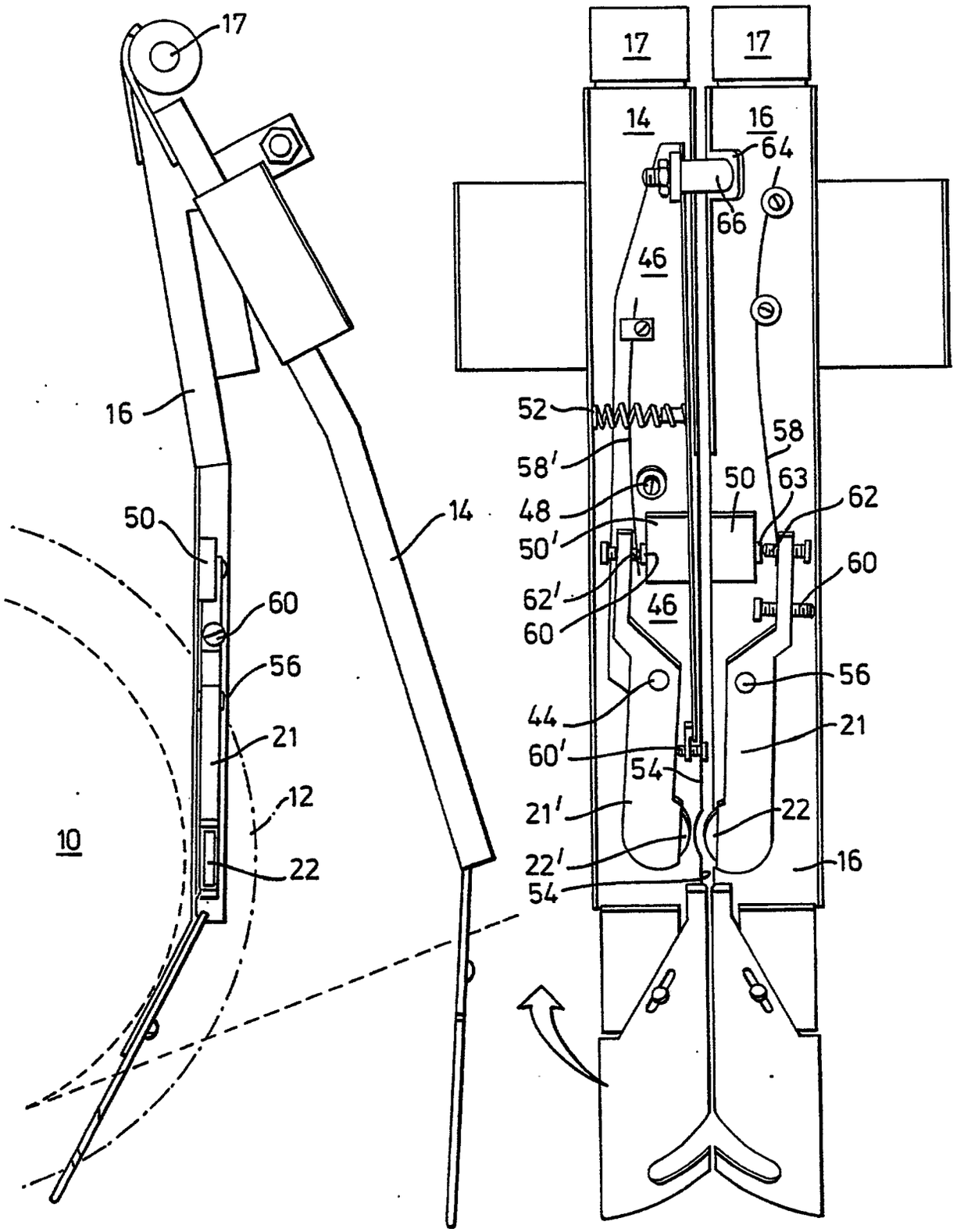
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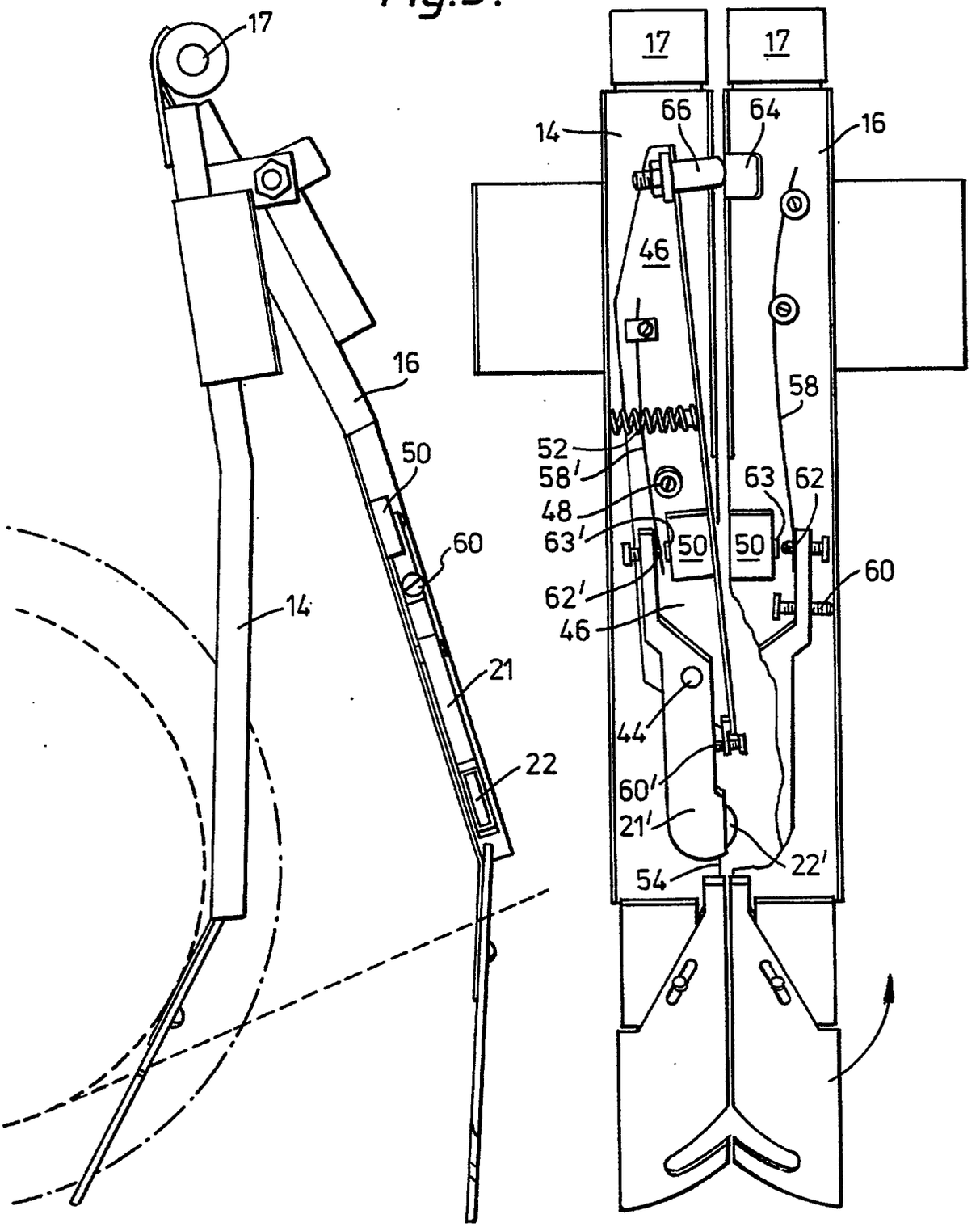
Fig.5.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