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(54) **Tailing tool for yarn winding and method of using same.**

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Description

The present invention relates to a winding yarn, and in particular to the reliable formation of a tail at the start of winding up a fresh package.

It is known to provide a tail of yarn when starting to wind up yarn on a new support, upon completion of a preceding package. However, the tail has in the past been susceptible to unravelling from the support core during storage and subsequent handling of the full package.

It is an object of the present invention to provide a simple hand-held tool which facilitates the formation of a "trapped" tail without the need for an automatic reserve builder at each winding station of a multi-position yarn winder.

DE—A—2705392 (Luwa AG) discloses a hand-held tool for forming a tail on a rotating yarn support core, comprising: means for positioning the tool in an operative position relative to a rotatable yarn supporting core; and means for holding a run of a yarn against the support core for effecting traverse in a first direction. Upon completion of the reserve, the tool is moved away to allow the further wound yarn to commence the first layer of package build-up. The tail, the yarn reserve, and the first layer of the package are in this reference all formed by a traverse in a single direction along the support core. In accordance with one aspect of the present invention such a tool is characterised in that the yarn run holding means includes a rotatable yarn guide having a yarn-locating portion mounted to orbit around the axis of rotation of the yarn guide to effect a traverse of said run in a second direction opposite to said first direction during formation of a yarn tail on the core; and operable so as to release the yarn at or near completion of said traverse; in that a manually operable control is provided to hold said yarn guide in a position in which to effect said traverse in the second direction and is operable to rotate the yarn guide to allow release of the yarn, after said traverse in the second direction, for starting a main traverse to begin build-up of a yarn package on the support core; in that said yarn-locating portion is the bight of a U-shaped end portion of the yarn guide, said bight joining both side limbs of the U, and the axis of symmetry of the U being perpendicular to the axis of rotation of the yarn guide; and in that the axis of rotation of the yarn guide lies in the plane of the U and intersects each side limb of the U at a location spaced from those two ends of the side limbs of the U which are joined to the bight of the U, whereby the yarn is located at or near the bight of the U and the run of yarn from the locating portion to the rotating yarn core is caused to traverse in said second direction during rotation of the yarn guide through a quarter of a revolution during operation of said manual control.

GB—A—1471472 (Socitex) discloses an automatic yarn reserve builder which is actuated in response to a change of bobbins, and in Figures 5 and 6 there is disclosure of a system which will automatically build the reserve during a prelimi-

nary partial traverse in a direction opposed to the direction of traverse common to the transfer tail attachment traverse and the first main traverse of the yarn guide during winding of the main package. This forms a so-called "trapped" or "protected" tail in which the tail end is under the reserve.

This prior art thus discloses a method of forming a tail on a rotating yarn support core during yarn winding comprising: holding a run of the yarn against the support core for effecting traverse in a first direction; winding the yarn onto the end of the core, starting from the end of the tail, in said first direction of traverse; forming a reserve by winding the yarn in a second direction of traverse opposite to said first direction; and releasing the yarn to start winding of a yarn package in the first direction of traverse. According to a second aspect of this invention such a method is characterised by placing a hand-held tool in position alongside the rotatable yarn support core ready for operation, the tool including means for holding the run of the yarn in contact with said tool when so positioned; manually operating movable means of the yarn run holding means by use of a manually operable control of the tool for guiding that run of a yarn for traverse in the second direction during formation of the yarn reserve on the core and for then allowing release of the yarn when winding of the yarn package is started by a traverse in the first direction.

In order that the present invention may more readily be understood the following description is given, merely by way of example, with reference to the accompanying drawings, in which:—

FIGURE 1 is an end elevational view of a yarn support core at the start-up of yarn winding, and showing the use of a "tailing" tool in accordance with the present invention;

FIGURE 2 is a view of the same end of the yarn support core, and of the "tailing" tool when viewed from the lefthand side of Figure 1; and

FIGURE 3 is a view corresponding to Figure 2, but showing the winding operation during a subsequent stage of the build-up of the tail.

As shown in Figure 1, the yarn support core 1 has at its end yarn pick-up slots 3 intended to pick up the yarn to define the end of the tail.

The yarn support core 1 is caused to rotate, in the anticlockwise direction as viewed in Figure 1, by frictional contact with the take-up roll 4 alongside it. In order to interrupt drive to the yarn support core 1, it is mounted on a swinging package arm 5 allowing it to be moved towards and away from the take-up roll 4. This same swinging action of the package arm 5 also allows the yarn support core 1 to move further away from the axis of rotation of the take-up roll 4 as the yarn package (not shown) builds up on the cylindrical surface of the core 1.

Yarn 6 is initially threaded up with the aid of a "tailing" tool 7 having a handle 8, a main hook 9, and a secondary hook 10, the latter being threadable and controlled by a lever 11 fixed to it.

Figure 2 also shows a yarn traverse guide 12 which oscillates to-and-fro in a direction parallel to the axis of the yarn support core 1 so as to cause the yarn package to build up on the core 1 in a controlled manner with the appropriate overall profile of the package (usually requiring the first layers of the package to extend closer to the ends of the yarn support core 1 than the later layers so that the package has a stable, tapered profile).

In Figure 2, the yarn pick-up slot 3 is the one visible on the lefthand side of Figure 1 and it will be clear that during rotation of the yarn support core 1 that slot 3 will eventually (after a quarter of a revolution) come into register with the run of yarn 6 guided between the main and secondary hooks of the "tailing" tool 7.

For ease of explanation, the yarn 6 can be considered as three separate runs 6a, 6b and 6c, along which any point on the continuous yarn will travel. The run 6a is from the delivery to the secondary hook 10, the run 6b is from the secondary hook 10 to a guide bar 9a of the main hook 9, and the run 6c extends from the main hook 9 to a waste suction tube (not shown).

Upon rotation of the yarn support core 1, the yarn run 6b will initially ride on the end surface of the yarn support core 1 but as soon as one of the two pick-up slots 3 comes into register with it it will be entrained by that slot 3 and rapidly severed somewhere between that point of catching in the slot 3 and the waste suction tube (probably along the run 6c).

As shown in Figure 2, the yarn support core 1 includes chamfers 3a around the pick-up slot 3, so as to guide the loose severed end of the yarn into the slot 3 where the end will be held to prevent flaying during winding.

Reference to Figure 1 will show that in the position depicted by Figures 1 and 2 the U-shaped yarn locating portion 10a at the end of the secondary hook 10 is holding the yarn (at the junction between the runs 6a and 6b) at a point which is further away from the viewer in Figure 2 than is the axis of rotation of the secondary hook 10. Thus as the secondary hook 10 is rotated in the clockwise direction as viewed from above the point of holding the yarn (near the bight of the U) moves rightwardly from registration with the line 13 in Figure 2 representing what we shall refer to as the "initial tail line". This gives rise to a subsequent tail line 14 (Figure 3) which is displaced rightwardly to arrive at the righthand end of the tail build-up on the yarn support core 1. The movement of the secondary hook 10 and its actuating lever 11 to arrive at this situation can be appreciated by comparing Figures 2 and 3.

Whereas in the Figure 2 position the horizontally extending upper limb of the U-shaped yarn locating end portion 10a of the secondary hook 10 provides a barrier to prevent the yarn from moving axially along the yarn support core 1 away from its end, this constraint is removed by the time the Figure 3 position has been adopted. The axis of rotation 10c of the secondary hook 10 lies in the plane of the U of the yarn locating portion

10a and intersects the limbs of the U at locations spaced from their ends adjacent the bight of the U so, as the secondary hook 10 rotates, the bight and preferably at least an adjacent part of each limb will orbit the hook axis of rotation to traverse the tail yarn rightwardly and then allow the yarn run 6a to release itself automatically from the secondary hook 10 and to move across to be entrained by the traversing guide 12 (Figure 2).

The advantage of forming a tail using the "tailing" tool 7 illustrated is that the tail 15 is initially formed by a tail run 15a which extends from the pick-up slot 3 as far as the initial line (13 in Figure 2) and subsequently the build-up of the tail 15 traverses back over the top of this run 15a and helps to lock the run 15a in place. Consequently, use of the "tailing" tool in accordance with the present invention allows the tail to have its first convolution or convolutions trapped by the subsequently formed convolutions wound thereon, leaving the finished tail stable. The resulting package is therefore more easily handled and requires less care to be taken during storage.

The main hook 9 of the tool has an end 9b which co-operates with the bracket 5 to locate the tool in the correct position (a) axially of the yarn support core 1 so as to maintain the geometry illustrated in Figure 1, and (b) radially of the yarn support core axis so as to maintain the geometry of the Figure 2 position.

The important characteristic of the "tailing" tool 7 is that it should incorporate means for shifting the tailing line axially of the yarn support core 1, during tail formation in a direction to trap the initial yarn tail convolution or convolutions.

Claims

1. A hand-held tool for forming a tail on a rotating yarn support core (1), comprising: means (9b) for positioning the tool (7) in an operative position relative to a rotatable yarn supporting core; and means (9a, 10) for holding a run (6b) of a yarn against the support core for effecting traverse in a first direction; characterised in that the yarn run holding means includes a rotatable yarn guide (10) having a yarn-locating portion (10b) mounted to orbit around the axis of rotation (10c) of the yarn guide to effect a traverse of said run in a second direction opposite to said first direction during formation of a yarn tail (15) on the core, and operable so as to release the yarn at or near completion of said traverse; in that a manually operable control (11) is provided to hold said yarn guide in a position in which to effect said traverse in the second direction and is operable to rotate the yarn guide (10) to allow release of the yarn, after said traverse in the second direction, for starting a main traverse to begin build-up of a yarn package on the support core; in that said yarn-locating portion is the bight (10b) of a U-shaped end portion (10a) of the yarn guide, said bight joining both side limbs of the U, and the axis of symmetry of the U being perpen-

dicular to the axis of rotation (10c) of the yarn guide; and in that the axis of rotation of the yarn guide lies in the plane of the U and intersects each side limb of the U at a location spaced from these two ends of the side limbs of the U which are joined to the bight (10b) of the U, whereby the yarn is located at or near the bight of the U and the run (6b) of yarn from the locating portion to the rotating yarn core is caused to traverse in said second direction during rotation of the yarn guide through a quarter of a revolution during operation of said manual control (11).

2. A tool according to Claim 1, characterised in that said positioning means comprise part (9b) of a hook (9) arranged to co-operate with supporting means (5) for the rotatable yarn support core (1), to enable the tool to be held adjacent one end of the yarn support core for stringing up the yarn on the support core.

3. A tool according to claim 1 or 2, characterised in that said means for holding the run (6b) of yarn against the support core (1) comprise a stationary guide bar (9a) of said tool, mounted alongside said rotatable yarn guide (10).

4. A tool according to claims 2 and 3 taken together, characterised in that the guide bar (9a) is also a part of the hook (9) of the tool.

5. The combination of a tool according to any one of claims 1 to 4, together with a yarn support core, characterised by the core (1) having a yarn pick-up slot (3) at one end to locate the free end of the tail at the end of the core (1).

6. A method for forming a tail on a rotating yarn support core (1) during yarn winding comprising; holding a run (6b) of the yarn against the support core for effecting traverse in a first direction; winding the yarn onto the end of the core, starting from the end of the tail, in said first direction of traverse; forming a reserve by winding the yarn in a second direction of traverse opposite to said first direction; and releasing the yarn to start winding of a yarn package in the first direction of traverse, characterised by placing a hand-held tool in position alongside the rotatable yarn support core (1) ready for operation, the tool including means (9a, 10) for holding the run (6b) of the yarn in contact with said tool when so positioned; manually operating movable means (10) of the yarn run (6b) holding means by use of a manually operable control (11) of the tool for guiding that run of yarn for traverse in the second direction during formation of the yarn reserve (15) on the core and for then allowing release of the yarn when winding of the yarn package is started by a traverse in the first direction.

Patentansprüche

1. Handgerät zur Bildung einer Garn(Faden)-Reserve auf einem umlaufenden Garnträgkern (1), mit Mitteln (9b), um das Werkzeug (7) in eine Betriebsstellung bezüglich eines drehbar gelagerten Garnträgkernes (1) zu bringen, sowie mit Mitteln (9a, 10), um eine Garnstrecke (6b) zur

Ausführung eines in einer ersten Richtung erfolgreichen Wickelhubes an den Garnträgkern zu halten, dadurch gekennzeichnet, daß die Garnhaltemittel einen drehbaren Garnführer (10) aufweisen, der einen Garnüberführungsteil (10b) enthält, welcher derart gelagert ist, daß er unter Ausführung eines in einer der ersten Richtung entgegengesetzten zweiten Richtung erfolgreichen Wickelhubes während der Bildung der Garnreservewicklung (15) auf dem Kern eine Orbitalbewegung um die Drehachse (10c) des Garnführers ausführen kann und der derart betätigbar ist, daß das Garn bei oder fast bei dem Abschluß des Wickelhubes freigegeben wird; daß eine handbetätigbare Steuereinrichtung (11) vorgesehen ist, durch die der Garnführer in einer Stellung haltbar ist, in der er den Wickelhub in der zweiten Richtung ausführen kann und die derart betätigbar ist, daß der Garnführer (10), zur Ermöglichung der Freigabe des Garnes nach dem Wickelhub in der zweiten Richtung, verdrehbar ist, um einen Hauptwickelhub zum Anfangen des Aufbaus eines Garnkörpers auf dem Garnträgkern zu beginnen; daß der Garnüberführungsteil die Ausbuchtung (10b) eines U-förmigen Endteils (10a) des Garnführers ist, wobei diese Ausbuchtung sich an die beiden seitlichen Schenkel des U anschließt und die Symmetrieachse des U rechtwinklig zu der Drehachse (10c) des Garnführers verläuft; und daß die Drehachse des Garnführers in der Ebene des U liegt und die beiden seitlichen Schenkel des U an einer Stelle schneidet, die im Abstand von dem mit der Ausbuchtung (10b) des U verbundenen beiden Enden der seitlichen Schenkel des U liegt, derart, daß das Garn in oder nahe der Ausbuchtung des U sich befindet und der von dem Garnüberführungsteil zu dem umlaufenden Garnträgkern verlaufenden Garnstrecke (6b) bei der Betätigung der handbetätigbaren Steuereinrichtung (11) durch Verdrehung des Garnführers um eine Viertelumdrehung ein Wickelhub in der zweiten Richtung erteilt wird.

2. Gerät nach Anspruch 1, dadurch gekennzeichnet, daß die Mittel, um das Garn in die Betriebsstellung zu bringen, einen Teil (9b) eines Hakens (9) aufweisen, der derart angeordnet ist, daß er mit Trägermitteln (5) des drehbaren Garnträgkernes (1) zusammenwirken kann, um das Gerät an einem Ende des Garnträgkernes zum Anlegen des Garnes an den Trägkern halten zu können.

3. Gerät nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Mittel, um die Garnstrecke (6) an dem Trägkern (1) zu halten, eine ortsfeste Führungsschiene (9a) des Gerätes aufweisen, die neben dem drehbaren Garnführer (10) angeordnet ist.

4. Gerät nach den Ansprüchen 2 und 3, dadurch gekennzeichnet, daß die Führungsschiene (9a) ebenfalls ein Teil des Hakens (9) des Gerätes ist.

5. Kombination eines Gerätes nach einem der Ansprüche 1 bis 4 mit einem Garnträgkern, dadurch gekennzeichnet, daß der Kern (1) an einem Ende einen Garnaufnahmeschlitz (3) auf-

weist, der zum Halten des freien Endes der Garnreservewicklung an dem Ende des Kernes (1) dient.

6. Verfahren zum Bilden einer Garnreservewicklung auf einem umlaufenden Garnträgerkern (1) während des Garnaufwicklungsvorgangs, mit den Verfahrensschritten: Eine Strecke (6b) des Garnes wird an den Trägerkern derart angelegt, daß sie einen Wickelhub in einer ersten Richtung ausführt; das Garn wird, beginnend mit dem Ende der Garnreservewicklung, in der ersten Wickelhubrichtung auf das Ende des Kernes aufgewickelt; es wird eine Reserve dadurch gebildet, daß das Garn in einer der ersten Richtung entgegengesetzten zweiten Wickelhubrichtung aufgewickelt wird; und das Garn wird schließlich freigegeben, um das Aufwickeln eines Garnkörpers in der ersten Wickelhubrichtung zu beginnen, gekennzeichnet dadurch, daß ein Handgerät in betriebsbereiter Stellung neben dem drehbaren Garnträgerkern (1) gehalten wird, wobei das Gerät Mittel (9a, 10) aufweist, um in dieser Stellung die Garnstrecke (6b) in Berührung mit dem diese Stellung einnehmenden Gerät zu halten; daß von Hand bewegliche Einrichtungen (10) der Haltemittel für die Garnstrecke (6b) mittels einer handbetätigbaren Steuereinrichtung (11) des Gerätes betätigt werden, um die Garnstrecke derart zu führen, daß sie während der Bildung der Garnreservewicklung (15) auf dem Kern einen Wickelhub in der zweiten Richtung ausführt und sodann das Garn freigegeben wird, wenn mit dem Aufwickeln des Garnkörpers durch einen Wickelhub in der ersten Richtung begonnen wird.

Revendications

1. Outil à main destiné à former un prolongement sur un noyau support de fil rotatif (1) comprenant: des moyens (9b) servant à positionner l'outil (7) dans une position de travail par rapport à un noyau support de fil tournant; et des moyens (9a, 10) servant à maintenir une longueur (6b) d'un fil contre le noyau support pour effectuer un déplacement dans un premier sens, caractérisé en ce que les moyens de maintien de la longueur de fil comprennent un guide-fil tournant (10), qui possède une partie de positionnement du fil (10b) montée pour tourner en orbite autour de l'axe de rotation (10c) du guide-fil afin d'effectuer un déplacement de cette longueur dans un deuxième sens opposé au premier sens pendant la formation d'un prolongement de fil (15) sur le noyau; et que l'on peut mettre en action pour libérer le fil à la fin ou près de la fin de ce déplacement; et en ce qu'une commande (11) pouvant être actionnée manuellement est prévue pour maintenir ledit guide-fil dans une position dans laquelle il peut effectuer ledit déplacement dans la deuxième sens et que cette commande peut être mise en action pour faire tourner le guide-fil (10) de façon à permettre de libérer le fil,

après ledit deuxième déplacement dans le deuxième sens, pour commencer un déplacement principal pour entamer la formation d'une bobine de fil sur le noyau support; en ce que ladite partie de positionnement du fil est l'anse (10b) d'une partie d'extrémité en forme de U (10a) du guide-fil, ladite anse réunissant les deux branches latérales du U et l'axe de symétrie du U étant perpendiculaire à l'axe de rotation (10c) du guide-fil; et en ce que l'axe de rotation du guide-fil se trouve dans le plan du U et coupe chaque branche latérale du U en un point espacé des deux extrémités des branches latérales du U qui sont réunies à l'anse (10b) du U de sorte que le fil est placé à l'anse du U ou à proximité de cette anse et que le brin de fil (6b) allant de la partie de positionnement au noyau de fil tournant est contraint de se déplacer dans ledit deuxième sens pendant la rotation du guide fil sur un quart de tour pendant l'actionnement de ladite commande manuelle (11).

2. Outil selon la revendication 1, caractérisé en ce que lesdits moyens de positionnement comprennent une partie (9b) d'un crochet (9) agencé pour coopérer avec des moyens de supports (5) destinés à supporter le noyau support de fil rotatif (1) pour permettre à l'outil d'être tenu dans la région adjacente à une extrémité du noyau support de fil pour monter le fil sur le noyau support.

3. Outil selon la revendication 1 ou la revendication 2, caractérisé en ce que lesdits moyens servant à tenir la longueur (6b) du fil contre le noyau support (1) comprennent une barre de guidage fixe (9a) dudit outil, montée le long dudit guide-fil tournant (10).

4. Outil selon les revendications 2 et 3, considérées ensembles, caractérisé en ce que la barre de guidage (9a) fait elle aussi partie du crochet (9) de l'outil.

5. Combinaison d'un outil selon l'une quelconque des revendications 1 à 4 avec un noyau support de fil, caractérisé en ce que le noyau (1) présente une fente (3) de saisie de fil à une extrémité, qui sert à fixer la position de l'extrémité libre du prolongement à l'extrémité du noyau (1).

6. Procédé de formation d'un prolongement sur un noyau support de fil tournant (1) pendant le bobinage du fil, consistant à: maintenir une longueur (6b) du fil contre le noyau support pour effectuer le déplacement dans un premier sens; enrouler le fil sur l'extrémité du noyau, en partant de l'extrémité du prolongement, dans ledit premier sens de déplacement; former une réserve en enroulant le fil dans un deuxième sens de déplacement qui est inverse du premier sens; et libérer le fil pour commencer le bobinage d'une bobine de fil dans le premier sens de déplacement, caractérisé en ce qu'on place un outil à main en position le long du noyau support de fil tournant (1) prêt pour la manoeuvre, l'outil comprenant des moyens (9a, 10) servant à maintenir la longueur (6b) du fil en contact avec ledit outil lorsqu'il est ainsi positionné; on actionne manuellement des moyens mobiles (10) apparten-

nant aux moyens de maintien du brin (6b) du fil à l'aide d'une commande (11) de l'outil actionnée manuellement, pour guider cette longueur de fil de façon qu'elle se déplace dans le deuxième

sens pendant la formation de la réserve de fil (15) sur le noyau, et pour permettre ensuite de libérer le fil lorsque le bobinage de la bobine de fil débute par un déplacement dans la premier sens.

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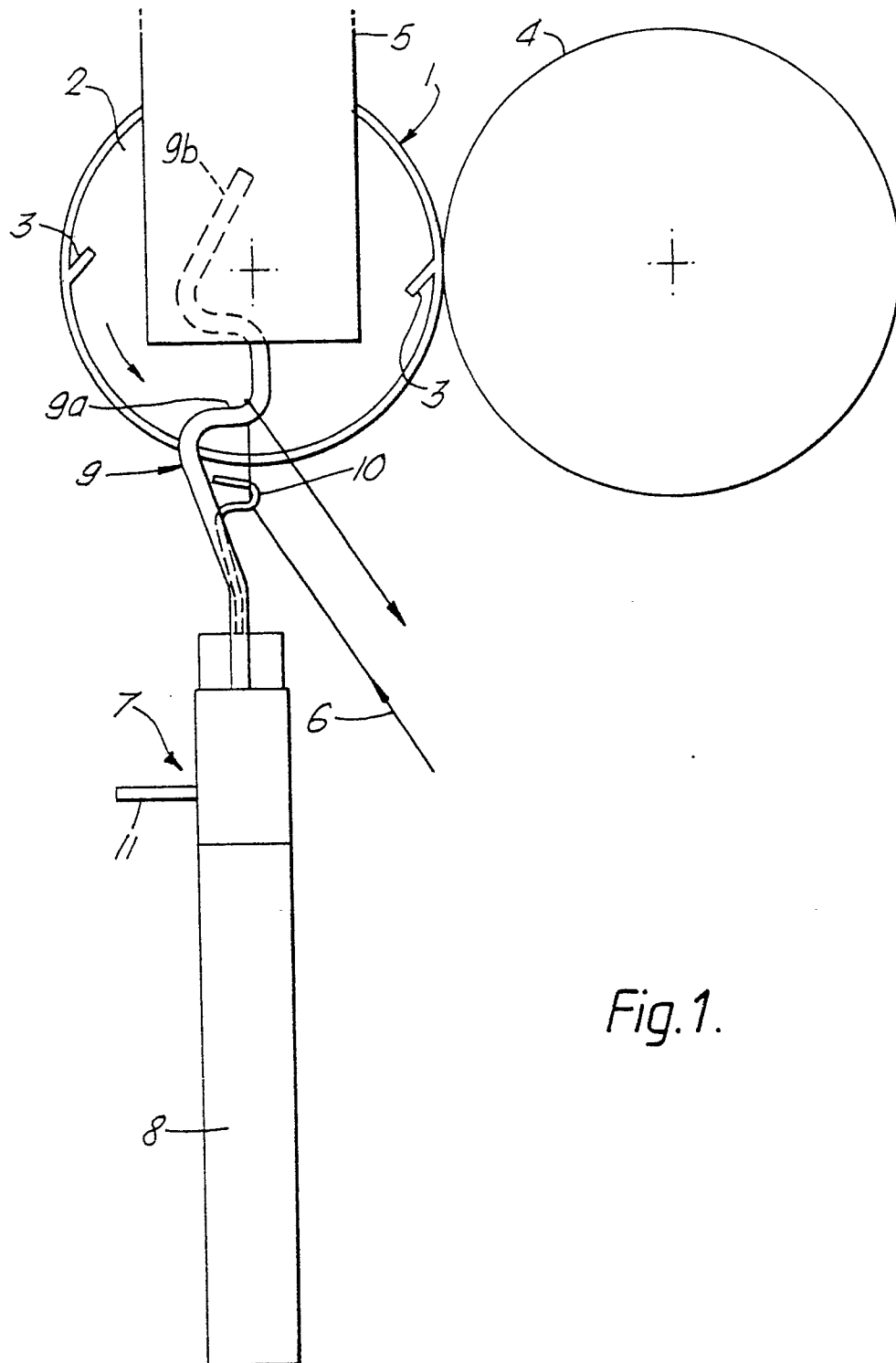


Fig.1.

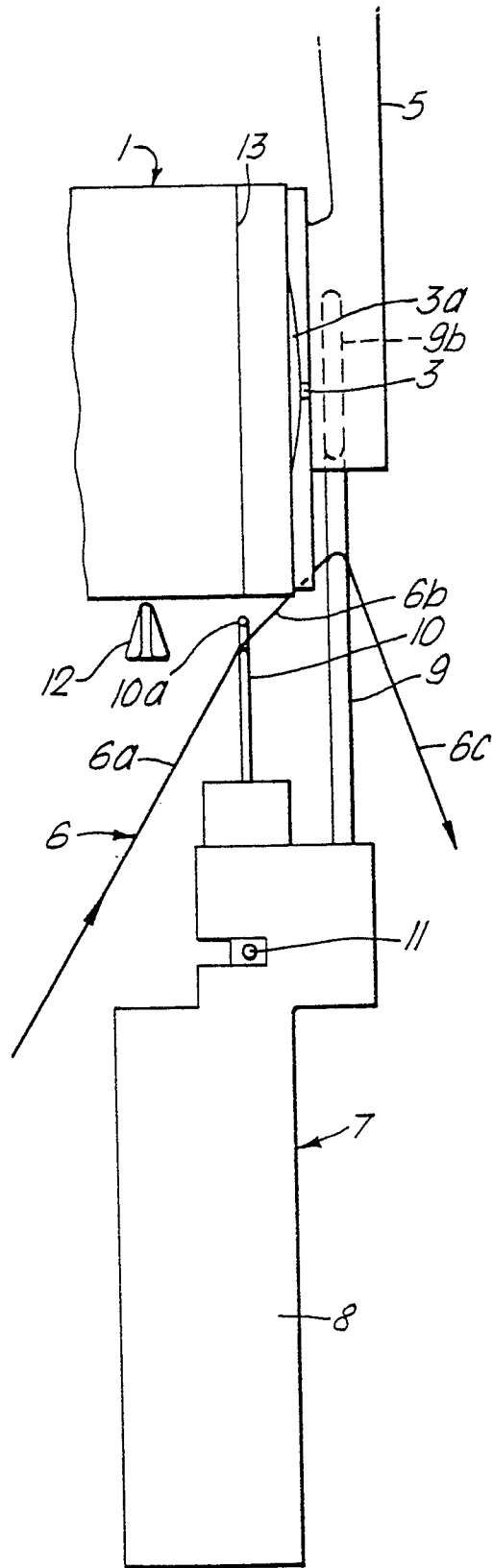


Fig.2.

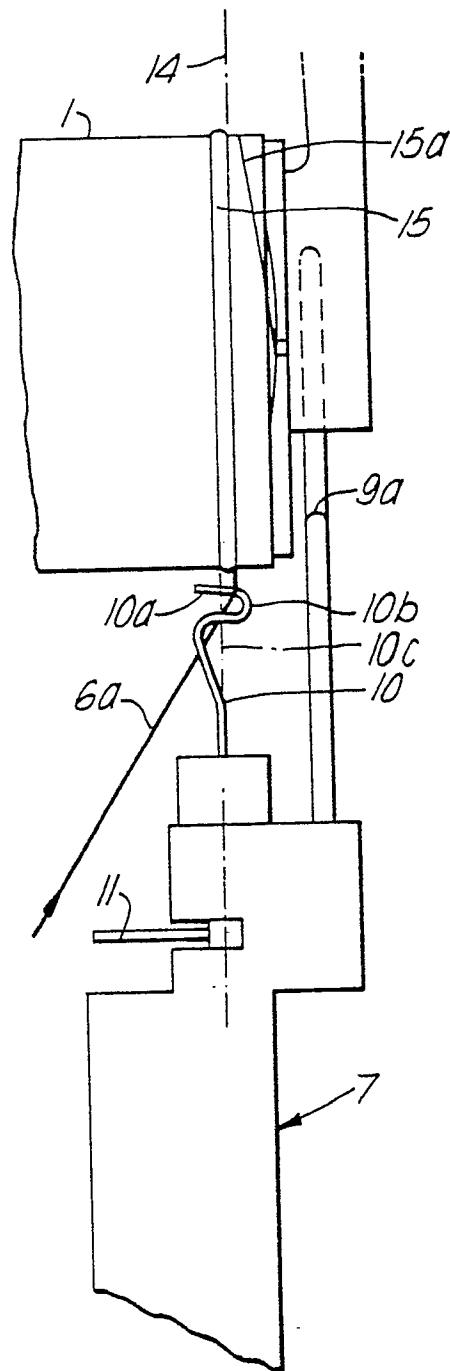


Fig. 3.