

(19)



(11)

EP 2 731 900 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

01.02.2017 Bulletin 2017/05

(51) Int Cl.:

B65H 67/048 ^(2006.01)

(21) Application number: **12731289.0**

(86) International application number:

PCT/CH2012/000139

(22) Date of filing: **25.06.2012**

(87) International publication number:

WO 2013/010279 (24.01.2013 Gazette 2013/04)

(54) **ROVING WINDER AND METHOD OF WINDING ROVINGS ON TO BOBBINS**

GARNWICKLER UND VERFAHREN ZUM WICKELN VON GARN AUF SPULEN

DISPOSITIF D'ENROULEMENT DE ROVING ET PROCÉDÉ D'ENROULEMENT DE ROVING SUR
DES BOBINES

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(73) Proprietor: **Maschinenfabrik Rieter AG**

8406 Winterthur (CH)

(30) Priority: **15.07.2011 CZ 20110428**

(72) Inventors:

- **HASKA, Petr**
56002 Ceska Trebova (CZ)
- **STECH, Jiri**
56201 Usti nad Orlici (CZ)

(43) Date of publication of application:

21.05.2014 Bulletin 2014/21

(56) References cited:

EP-A1- 0 367 253 WO-A1-99/12837

EP 2 731 900 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Technical field

[0001] The invention relates to a roving winder, particularly a turret roving winder, comprising at least a pair of rotating bobbins, each provided with a circumferential toothed strip for holding the roving, the bobbins being fitted on a rotary platform which is rotatably fitted in a frame of the equipment, the winder also comprising a roving guide device located longitudinally with respect to the axis of rotation of the bobbin, positioned outside the rotary platform and adjacent to one bobbin, while the other bobbins are brought towards the roving guide device by the rotation of the rotary platform when each fully wound bobbin is exchanged for an empty bobbin.

[0002] The invention also relates to a method of winding rovings on to bobbins, particularly on a turret roving winder, in which the roving is wound with the aid of a roving guide device on to a rotating bobbin, the fully wound bobbin is moved away from the roving guide device after the winding of the full bobbin, and the empty rotating bobbin with a toothed strip for holding the roving is brought towards the roving guide device, while the roving continues to be wound on to the fully wound bobbin.

Prior art

[0003] The high-speed winding of roving, an intermediate product in textile manufacture, gives rise to difficulties, particularly because of the loose nature of the roving which is composed of untwisted and substantially parallel fibres. At low winding speeds, use is made of conventional winding devices in which it is necessary to interrupt the production process and the roving winding when a bobbin is fully wound, replace the full bobbin with an empty one, and then restart the production and roving winding process.

[0004] For high speeds of roving production and winding, there is a known type of special winder comprising a roving guide device adapted to shift the roving during winding according to the height and/or width of the bobbin at high speeds. In order to maintain a high productivity level in roving production and winding, it is preferable for the production and winding of the roving to take place in a substantially continuous way, in other words without any interruption for the replacement of a fully wound bobbin with an empty one. One proposed solution for this problem is the use of what is known as a turret winder. This comprises a rotary platform (or carousel) on which the bobbins are fitted on rotating powered spindles, one of the bobbins being located adjacent to a guide device, while the other bobbins are brought towards the guide device by the rotation of the rotary platform after the winding of a full bobbin.

[0005] Turret winders are known for the most part in the production of man-made fibres, as disclosed for example in EP 0 367 253 A1 and WO 99/12837 A1, in which

the bobbins used have fibre catching devices which act in such a way that, when the rotary platform rotates, after one bobbin is fully wound, to a position in which an empty bobbin is located next to the guide device, the unstably formed fibre is caught by the catching device on the empty bobbin, and the fibre is broken between the fully wound bobbin and the empty bobbin and subsequently continues to be wound on to the empty bobbin, without any interruption in the roving production and winding process.

[0006] JP 50 780 12 discloses a turret winder comprising a rotary platform with bobbins, in which one bobbin is adjacent to a guide device with a set of rotating blades. The equipment also comprises a fibre manipulating device, which guides the fibre, after a bobbin has been fully wound, beyond the reach of the guide device, after which the rotary platform rotates and an empty bobbin is placed next to the guide device. Meanwhile the fibre continues to be produced and is wound, without interruption, on to the full bobbin (which has been moved away) at a single point on the width of the bobbin, because the fibre is not being guided. When the rotary platform rotates, the fibre is directed on to an auxiliary guide on a spindle located on the rotary platform. The oscillation of an auxiliary arm then causes the fibre to be directed into the area between the auxiliary guide and the empty bobbin, and on to the catching means on the empty bobbin, which is usually a tapering holder, causing the fibre to be caught by its "wedging" action, the fibre then being broken between the empty bobbin and the fully wound bobbin in such a way that the newly produced fibre is then wound on to the empty bobbin only, and the fully wound bobbin is removed from the equipment.

[0007] However, it has been found that, when the roving is wound, the bobbins used for winding the roving do not have roving catching devices, because they have only a circumferential toothed strip (such as a toothed part of a Velcro fastener or a unidirectional fine brush) which can hold a roving which is placed on it, but cannot catch a roving which simply travels past it. It has also been found that the roving does not have sufficient inherent stability to be caught by the aforementioned method on a bobbin with a catching device. Since the roving is not caught by the bobbin, it is not broken, and even when the rotary platform rotates, the roving continues to be wound on to the original full bobbin which has been rotated away from the roving guide device.

[0008] The object of the invention is to provide a reliable roving winder with a device for catching the roving on the empty bobbin and for breaking the roving when the fully wound bobbin is exchanged for an empty bobbin. Another object of the invention is to provide a method of winding roving on to a bobbin, in which the roving is reliably broken and is caught on the empty bobbin when the fully wound bobbin is exchanged for an empty bobbin.

Brief description of the invention

[0009] The object of the invention is achieved by

means of a roving winder, particularly a turret roving winder, according to independent claim 1 and by the method according to independent claim 7. The roving winder is provided with a movably fitted impulse means whose direction of movement intersects the direction of movement of the roving between the fully wound bobbin and the empty bobbin near the roving guide device in the proximity of the circumferential toothed strip on the empty bobbin, the impulse means being coupled to a drive means. The impulse means can be moved at a velocity such that its impact on the roving breaks the roving and deflects the free end of the roving on to the circumferential toothed strip on the empty bobbin near the roving guide device.

[0010] In the method of winding roving on to a bobbin, particularly on a turret roving winder, after the roving has been brought towards the toothed strip to hold the roving on the empty bobbin near the guide device, the roving is broken in a controlled way in the area between the fully wound bobbin and the empty bobbin and the free end of the roving on the empty bobbin is simultaneously directed on to the toothed strip for holding the roving on the empty bobbin, where the roving is caught by the toothed strip and starts to be wound on to the empty bobbin without any interruption in the production or the winding of the roving.

[0011] The advantage of this invention is that it enables the roving to be caught on a rotating bobbin without an interruption in the production and winding of the roving, thus increasing the productivity of the production and winding of the roving and improving the automation of the process.

Brief description of the drawings

[0012] The invention is represented schematically in the drawings, in which Fig. 1 shows a schematic side view of an exemplary embodiment of the roving winder, Fig. 2 is a plan view of the equipment of Fig. 1, Fig. 3a shows an exemplary arrangement of the impulse means, Fig. 3b shows an exemplary arrangement of the impulse means, Fig. 3c shows an exemplary arrangement of the impulse means, and Fig. 3d shows an exemplary arrangement of the impulse means.

Example of embodiment of the invention

[0013] The roving winder can be used to wind a roving on to a rotating bobbin. In order to avoid any interruption in the production and winding of roving, the preferable arrangement of the winder is the arrangement used in turret winders. A turret winder comprises a rotary platform on which at least two powered spindles are positioned rotatably about the longitudinal axis of the platform, these spindles holding bobbins on which the roving is received in the winding process. Each of the bobbins is fitted near one of its ends with a means for holding the roving, this means usually being a circumferential toothed strip. Es-

entially, this strip is a strip carrying the toothed part of a Velcro fastener or a unidirectional fine brush or the like, placed around the circumference of the bobbin.

[0014] Outside the rotating platform, a roving guide device is positioned along the axis of rotation of the bobbin, in other words along the length and/or width of the bobbin, this device being adjacent to one bobbin, while the other bobbins are brought towards the guide device by the rotation of the rotary platform when a fully wound bobbin is exchanged for an empty bobbin. The roving guide device is designed in a suitable way which is not significant for the operation of the present invention.

[0015] The winding takes place in such a way that the roving is wound on to one bobbin. After the bobbin has been fully wound with roving, the platform rotates, thus moving the fully wound bobbin away from the guide device, while an empty bobbin approaches the device. The roving continues to be guided by the guide device and is wound on to the fully wound bobbin which is moved away from the guide device, while the roving travels past the empty bobbin, because the roving bobbins do not have roving catching means, but only means for holding the roving.

[0016] The means for breaking the roving and deflecting it towards the roving holding means on the empty bobbin are then actuated, in order to impart an impulse to the roving which not only breaks the roving between the full bobbin and the empty bobbin, but also simultaneously deflects the newly formed end of the roving towards the roving holding means. This roving breaking and deflecting means takes the form of a movably fitted impulse means whose direction of movement intersects the direction of movement of the roving between the fully wound bobbin and the empty bobbin which is located near the roving guide device, this direction of movement of the roving intersecting the direction of movement of the impulse means in the area of the circumferential toothed strip on the empty bobbin. The impulse means is connected to a drive which imparts a sufficient acceleration to it as it intersects the direction of the roving near the circumferential toothed strip on the empty bobbin.

[0017] The impulse means is made in the form of a suitable element such as a hook, a plate, a bent plate, a rod, or a rod with an end for guiding the roving to facilitate the catching of the roving, or the like. Clearly, the impulse means is made from metal, plastics or composite material or from any other suitable material, provided that its mass is sufficient, when combined with the velocity of movement of the impulse means, to impart the requisite impulse to the roving. The drive to the impulse means can be mechanical, pneumatic or magnetic, or can be of a combined type, also known as "hybrid".

[0018] In order to improve the breaking of the roving by the action of the impulse means, it is preferable to provide the part of the impulse means designed to contact the roving, for example the leading edge of an impulse means in plate form, with an edge which reduces or eliminates the possibility that the roving may fail to be broken,

which might cause the roving to "whip round" the impulse means and continue to be wound on to the fully wound bobbin. In theory, the impulse means could be made in the form of a reciprocatingly projecting or reciprocatingly oscillating or reciprocatingly linearly moving or rotating device. The specific individual design of the impulse means and its drive can be varied, for example in accordance with the specific design of the winder and its spatial arrangement.

[0019] As mentioned previously, the impulse means moves with sufficient velocity or acceleration to cause the roving to break as a result of its impact on the roving, although the break must not take place at the point of the impact of the impulse means on the roving, and also to deflect the free end of the roving running from the guide device towards the circumferential toothed strip on the empty bobbin near the roving guide device, in such a way that the deflecting force acting on this end of the roving substantially presses the roving on to the circumferential toothed strip, which retains the roving because of its capacity to hold the roving. In particular, in order to improve the "pressing" of the newly formed end of the roving on to the circumferential toothed strip of the empty bobbin near the roving guide device, the whole device can be arranged in such a way that the impulse means moves closely past the circumferential toothed strip of the empty bobbin near the roving guide device, so that, if the velocity of movement of the impulse means is sufficient, the roving is not only reliably broken but is also reliably positioned on the circumferential toothed strip of the empty bobbin near the roving guide device, where it is then correctly retained, and the production of the roving and its winding on to the bobbin continue without interruption.

[0020] When the roving is wound on to a bobbin, particularly on a turret roving winder, use is made of a method in which the roving is wound on to a rotating bobbin by means of a roving guide device. When a bobbin has been fully wound, the fully wound bobbin is moved away from the roving guide device, and an empty rotating bobbin fitted with a toothed strip for holding the roving is brought towards the guide device. During this movement the roving continues to be wound on to the fully wound bobbin which is moved away from the guide device, which continues to guide the roving along the height and/or width of the bobbin. As soon as the roving is guided so as to approach the toothed strip for holding the roving on the empty bobbin near the guide device, the roving is broken in a controlled way in the area between the fully wound bobbin and the empty bobbin, and the newly formed free end of the roving running from the guide device is simultaneously directed, or deflected, on to the toothed strip for holding the roving on the empty bobbin. The movement of the newly formed free end of the roving on to the toothed strip for holding the roving on the empty bobbin is assisted by the high velocity of movement of the roving before it is broken and by the high velocity of the free end after the roving has been broken. In this way the roving reaches the toothed strip on the empty bobbin, which

thus holds the "delivered" roving, after which the roving starts to be wound on to the empty bobbin, the whole procedure taking place without any interruption in the production or winding of the roving.

[0021] Particularly for reasons of timing, when a specific time interval is required for the reliable execution of individual steps such as the breaking of the roving and the catching of the roving on the toothed strip on the empty bobbin, it is possible to reduce the rate of production and winding of the roving before the controlled breaking of the roving, and then to increase the rate to the normal production level after the roving has been caught on the toothed strip on the empty bobbin near the guide device, or increase the rate above the normal production level in order to take up the excess reserve of roving produced during the period of slower winding.

[0022] A specific exemplary embodiment of the winder in the form of a turret winder and some of its sub-units are shown in Figs. 1 to 3d.

[0023] The winder comprises a rotary platform 1 which is fitted rotatably in the frame of the equipment (not shown). At least two powered rotating spindles 2 are positioned on the platform 1, and bobbins 3 are fitted on these spindles, the roving 5 being wound on to one of the bobbins 3 with the aid of the guide device, represented in this case by a presser finger 4. The bobbins 3 are fitted in the proximity of one end, shown here as the upper end, with a means for holding the roving, in this case a circumferential toothed strip 6, which can be seen on the empty bobbin 31 near the roving guide device 5. Figs. 1 and 2 show the situation in which a fully wound bobbin 30 is located to the left and the platform 1 has rotated in such a way that the fully wound bobbin 30 is moved away from the guide device, near to which an empty bobbin 31 is positioned. The roving 5 runs from the guide device past the empty bobbin 31 to the full bobbin 30 which has been moved away, and continues to be guided and wound on to this bobbin.

[0024] In Fig. 1 the roving 5 is in the upper position, but as soon as the presser finger 4 of the roving guide device is moved downwards past the circumferential toothed strip 6, the impulse means 7 located outside the platform 1 is driven forwards at the requisite velocity and with the requisite acceleration, thus intersecting the direction of movement of the roving 5 between the fully wound bobbin 30 and the empty bobbin 31 near the roving guide device in the area of the circumferential toothed belt 6, in such a way that it strikes the roving 5 at the requisite velocity and with the requisite force, resulting in the breaking of the roving 5 between the bobbins 30 and 31 and the deflection of the free end of the roving 5 running from the guide device towards the circumferential toothed strip 6 on the empty bobbin 31 near the roving guide device 5, in such a way that the roving 5 is pressed on to this circumferential toothed strip 6, which then retains the roving 5 because of its capacity to hold the roving 5.

[0025] As shown in Figs. 3a to 3d, the construction of

the impulse means 7 can be of any suitable kind, including oscillating, projecting, reciprocating, linear or rotary means. The impulse means 7 can be straight, bent or cranked, and can be provided with a guiding means 70 at its working end, as shown in Fig. 3d. Figs. 3a to 3d show a pneumatic drive of the impulse means 7, but the drive of the impulse means 7 can equally well be of a mechanical, magnetic, hybrid, or similar type. The essential requirement is for the drive, in combination with the specific design of the impulse means 7, to impart a sufficient velocity or acceleration to the impulse means 7 at the moment when the impulse means 7 strikes the roving 5.

Claims

1. Roving winder, particularly a turret roving winder, comprising at least a pair of rotating bobbins (3), each provided with a circumferential toothed strip (6) for holding the roving (5), the bobbins (3) being fitted on a rotary platform (1) which is rotatably fitted in a frame of the equipment, the winder also comprising a roving guide device (4) located longitudinally with respect to the axis of rotation of the bobbin (3), positioned outside the rotary platform and adjacent to one bobbin (3), while the other bobbins (3) are brought towards the roving guide device (4) by the rotation of the rotary platform (1) when each fully wound bobbin (30) is exchanged for an empty bobbin (31), whereby the equipment is provided with a movably fitted impulse means (7) whose direction of movement intersects the direction of movement of the roving (5) between the fully wound bobbin (30) and the empty bobbin (31) near the roving guide device (4) in the area of the circumferential toothed strip (6) on the empty bobbin (31), the impulse means (7) being provided with a drive means, **characterized in that** the impulse means (7) can be moved at a velocity such that its impact on the roving (5) breaks the roving (5) and deflects the free end of the roving (5) on to the circumferential toothed strip (6) on the empty bobbin (31) near the roving guide device (4).
2. Winder according to Claim 1, **characterized in that** the impulse means (7) is made in the form of a hook, a plate, a bent plate, a rod or a rod with a guiding end.
3. Winder according to Claim 1 or 2, **characterized in that** the impulse means (7) is made from metal, plastics or composite material.
4. Winder according to any one of Claims 1 to 3, **characterized in that** the part of the impulse means (7) designed to contact the roving (5) is provided with an edge.
5. Winder according to any one of Claims 1 to 4, **char-**

acterized in that the impulse means (7) can be moved in a reciprocatingly projecting or reciprocatingly oscillating or reciprocatingly linear or rotating way.

6. Winder according to any one of Claims 1 to 5, **characterized in that**, in its movement, the impulse means (7) passes close to, or touches, the circumferential toothed strip (6) on the empty bobbin (31) near the roving guide device (4).
7. Method of winding rovings (5) on to bobbins (3), particularly on a turret roving winder, in which the roving (5) is wound with the aid of a roving guide device (4) on to a rotating bobbin (3), the fully wound bobbin (30) is moved away from the roving guide device (4) after the winding of the full bobbin (30), and the empty rotating bobbin (31) with a toothed strip (6) for holding the roving (5) is brought towards the roving guide device (4), while the roving (5) continues to be wound on to the fully wound bobbin (30), **characterized in that**, after the roving (5) has been brought towards the toothed strip (6) for holding the roving (5) on the empty bobbin (30) near the guide device (4), the roving (5) is broken in a controlled way in the area between the fully wound bobbin (30) and the empty bobbin (30) and the free end of the roving (5) on the empty bobbin (31) is simultaneously directed on to the toothed strip (6) for holding the roving (5) on the empty bobbin (31), where the roving (5) is caught by the toothed strip (6) and starts to be wound on to the empty bobbin (31) without any interruption in the production or the winding of the roving (5).
8. Method according to Claim 7, **characterized in that** at least the rate of the winding of the roving (5) is decreased temporarily before the controlled breaking of the roving (5), and is increased again when the roving (5) has been caught by the toothed strip (6) on the empty bobbin (31), thus increasing the reliability of the breaking of the roving (5) and the catching of the roving (5) on the toothed strip (6) on the empty bobbin (31).
9. Method according to Claim 8, **characterized in that** the rate is increased above the normal production level after the roving (5) has been caught by the toothed strip (6) on the empty bobbin (31), thus taking up the excess reserve of roving (5) produced when the winding rate was decreased.

Patentansprüche

1. Vorgarnspuler, insbesondere Revolverspuler, der mindestens ein Paar sich drehender Spulen (3) umfasst, wobei jede mit einem umlaufenden gezahnten Streifen (6) zum Halten des Vorgarns (5) versehen

- ist, wobei die Spulen (3) auf einer Drehplattform (1) installiert sind, die drehbar in einem Gestell der Apparatur installiert ist, wobei der Spuler ausserdem eine Vorgarnführungsvorrichtung (4) umfasst, die längs in Bezug auf die Drehachse der Spule (3) angeordnet ist und ausserhalb der Drehplattform und angrenzend an eine Spule (3) positioniert ist, während die anderen Spulen (3) durch die Drehung der Drehplattform (1) zu der Vorgarnführungsvorrichtung (4) hin gebracht werden, wenn jede vollständig bewickelte Spule (30) durch eine leere Spule (31) ausgetauscht wird, wobei die Apparatur mit einem beweglich installierten Impulsmittel (7) versehen ist, dessen Bewegungsrichtung sich mit der Bewegungsrichtung des Vorgarns (5) zwischen der vollständig bewickelten Spule (30) und der leeren Spule (31) nahe der Vorgarnführungsvorrichtung (4) im Bereich des umlaufenden gezahnten Streifens (6) auf der leeren Spule (31) schneidet, wobei das Impulsmittel (7) mit einem Antriebsmittel versehen ist, **dadurch gekennzeichnet, dass** das Impulsmittel (7) mit einer derartigen Geschwindigkeit bewegt werden kann, dass seine Auswirkung auf das Vorgarn (5) das Vorgarn (5) zerreisst und das freie Ende des Vorgarns (5) auf den umlaufenden gezahnten Streifen (6) auf der leeren Spule (31) nahe der Vorgarnführungsvorrichtung (4) ablenkt.
2. Spuler nach Anspruch 1, **dadurch gekennzeichnet, dass** das Impulsmittel (7) in der Form eines Hakens, einer Platte, einer gebogenen Platte, einer Stange oder einer Stange mit einem Führungsende hergestellt ist.
 3. Spuler nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Impulsmittel (7) aus Metall, Kunststoff oder einem Verbundwerkstoff hergestellt ist.
 4. Spuler nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** der Teil des Impulsmittels (7), der dazu entworfen ist, mit dem Vorgarn (5) in Kontakt zu kommen, mit einer Kante versehen ist.
 5. Spuler nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** das Impulsmittel (7) auf eine sich hin- und herbewegend vorstehende oder sich hinund herbewegend schwingende oder sich hin- und herbewegend lineare oder drehende Weise bewegt werden kann.
 6. Spuler nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** das Impulsmittel (7) in seiner Bewegung nahe an dem umlaufenden gezahnten Streifen (6) auf der leeren Spule (31) nahe der Vorgarnführungsvorrichtung (4) vorbeiläuft oder diesen berührt.
 7. Verfahren zur Spulung von Vorgarn (5) auf Spulen (3), insbesondere auf einem Revolverspuler, wobei der Vorgarn (5) mithilfe einer Vorgarnführungsvorrichtung (4) auf eine sich drehende Spule (3) gewickelt wird, die vollständig bewickelte Spule (30) von der Vorgarnführungsvorrichtung (4) nach dem Bewickeln der vollen Spule (30) weg bewegt wird und die leere sich drehende Spule (31) mit einem gezahnten Streifen (6) zum Halten des Vorgarns (5) zu der Vorgarnführungsvorrichtung (4) hin gebracht wird, während das Vorgarn (5) weiter auf die vollständig bewickelte Spule (30) gewickelt wird, **dadurch gekennzeichnet, dass**, nachdem das Vorgarn (5) zu dem gezahnten Streifen (6) zum Halten des Vorgarns (5) auf der leeren Spule (30) nahe der Führungsvorrichtung (4) hin gebracht wurde, das Vorgarn (5) auf kontrollierte Weise in dem Bereich zwischen der vollständig bewickelten Spule (30) und der leeren Spule (30) zerrissen wird und das freie Ende des Vorgarns (5) auf der leeren Spule (31) gleichzeitig auf den gezahnten Streifen (6) zum Halten des Vorgarns (5) auf der leeren Spule (31) gelenkt wird, wo das Vorgarn (5) von dem gezahnten Streifen (6) erfasst wird und damit begonnen wird, ihn ohne jegliche Unterbrechung der Produktion oder der Wicklung des Vorgarns (5) auf die leere Spule (31) zu wickeln.
 8. Verfahren nach Anspruch 7, **dadurch gekennzeichnet, dass** die Rate der Wicklung des Vorgarns (5) vor dem kontrollierten Zerreißen des Vorgarns (5) vorübergehend gesenkt wird und wieder erhöht wird, wenn das Vorgarn (5) von dem gezahnten Streifen (6) auf der leeren Spule (31) erfasst wurde, wodurch die Zuverlässigkeit des Zerreißens des Vorgarns (5) und des Erfassens des Vorgarns (5) auf dem gezahnten Streifen (6) auf der leeren Spule (31) erhöht wird.
 9. Verfahren nach Anspruch 8, **dadurch gekennzeichnet, dass** die Rate über das normale Produktionsniveau erhöht wird, nachdem das Vorgarn (5) von dem gezahnten Streifen (6) auf der leeren Spule (31) erfasst wurde, wodurch die Überschussreserve des produzierten Vorgarns (5) aufgenommen wird, wenn die Wicklungsrate gesenkt wird.

Revendications

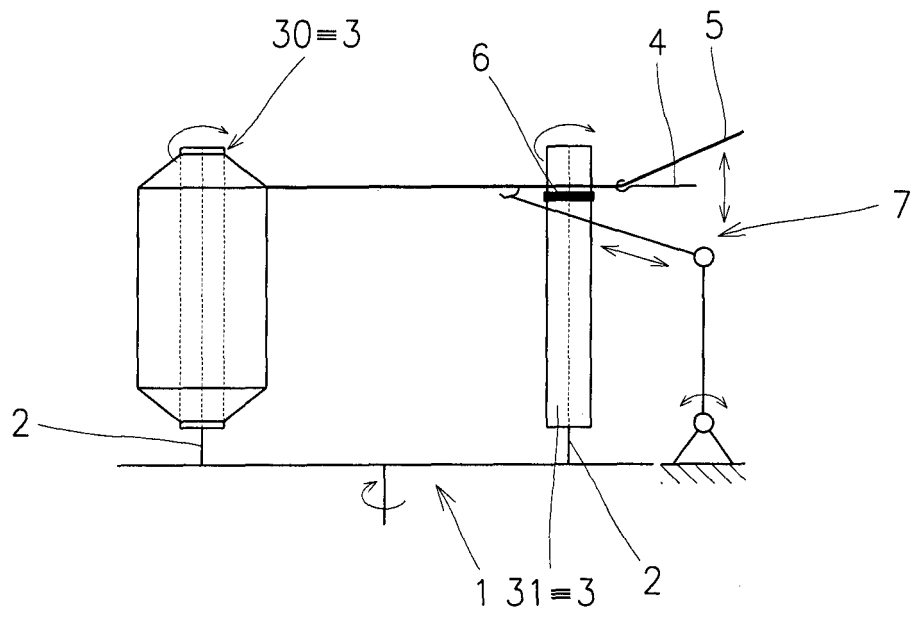
1. Dispositif d'enroulement de mèche, en particulier un dispositif d'enroulement de mèche à tourelle, comprenant au moins une paire de bobines rotatives (3), comportant chacune une bande dentée circonférentielle (6) pour maintenir la mèche (5), les bobines (3) étant montées sur une plate-forme rotative (1) qui est montée de façon rotative dans un bâti de l'équipement, le dispositif d'enroulement comprenant

également un dispositif de guidage de mèche (4) situé longitudinalement par rapport à l'axe de rotation de la bobine (3), positionné à l'extérieur de la plate-forme rotative et adjacent à une bobine (3), tandis que les autres bobines (3) sont amenées vers le dispositif de guidage de mèche (4) par la rotation de la plate-forme rotative (1) lorsque chaque bobine enroulée entièrement (30) est échangée pour une bobine vide (31), ce par quoi l'équipement comporte un moyen d'impulsion monté de façon mobile (7) dont une direction de mouvement croise la direction de mouvement de la mèche (5) entre la bobine enroulée entièrement (30) et la bobine vide (31) près du dispositif de guidage de mèche (4) dans la région de la bande dentée circonférentielle (6) sur la bobine vide (31), le moyen d'impulsion (7) comportant un moyen d'entraînement, **caractérisé par le fait que** le moyen d'impulsion (7) peut être déplacé à une vitesse telle que son impact sur la mèche (5) rompt la mèche (5) et dévie l'extrémité libre de la mèche (5) sur la bande dentée circonférentielle (6) sur la bobine vide (31) près du dispositif de guidage de mèche (4).

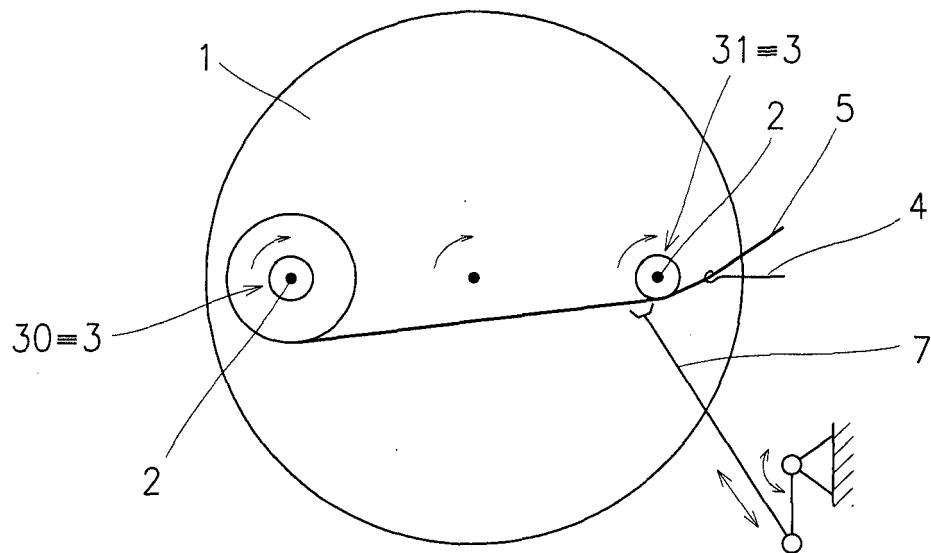
2. Dispositif d'enroulement selon la revendication 1, **caractérisé par le fait que** le moyen d'impulsion (7) est réalisé sous la forme d'un crochet, d'une plaque, d'une plaque courbée, d'une tige ou d'une tige avec une extrémité de guidage.
3. Dispositif d'enroulement selon les revendications 1 ou 2, **caractérisé par le fait que** le moyen d'impulsion (7) est réalisé à partir de matériau métallique, plastique ou composite.
4. Dispositif d'enroulement selon l'une quelconque des revendications 1 à 3, **caractérisé par le fait que** la partie du moyen d'impulsion (7) conçue pour entrer en contact avec la mèche (5) comporte un bord.
5. Dispositif d'enroulement selon l'une quelconque des revendications 1 à 4, **caractérisé par le fait que** le moyen d'impulsion (7) peut être déplacé d'une manière faisant saillie alternativement ou oscillant alternativement ou linéaire alternativement ou rotative.
6. Dispositif d'enroulement selon l'une quelconque des revendications 1 à 5, **caractérisé par le fait que**, dans son mouvement, le moyen d'impulsion (7) passe près de, ou touche, la bande dentée circonférentielle (6) sur la bobine vide (31) près du dispositif de guidage de mèche (4).
7. Procédé d'enroulement des mèches (5) sur des bobines (3), en particulier sur un dispositif d'enroulement de mèche à tourelle, dans lequel la mèche (5) est enroulée avec l'aide d'un dispositif de guidage de

mèche (4) sur une bobine rotative (3), la bobine enroulée entièrement (30) est déplacée à l'écart du dispositif de guidage de mèche (4) après l'enroulement de la bobine entière (30), et la bobine rotative vide (31) avec une bande dentée (6) pour maintenir la mèche (5) est amenée vers le dispositif de guidage de mèche (4), alors que la mèche (5) continue d'être enroulée sur la bobine enroulée entièrement (30), **caractérisé par le fait qu'**après que la mèche (5) a été amenée vers la bande dentée (6) pour maintenir la mèche (5) sur la bobine vide (30) près du dispositif de guidage (4), la mèche (5) est rompu d'une manière contrôlée dans la région entre la bobine enroulée entièrement (30) et la bobine vide (31) et l'extrémité libre de la mèche (5) sur la bobine vide (31) est simultanément dirigée sur la bande dentée (6) pour maintenir la mèche (5) sur la bobine vide (31), où la mèche (5) est saisi par la bande dentée (6) et commence à être enroulé sur la bobine vide (31) sans aucune interruption dans le production ou l'enroulement de la mèche (5).

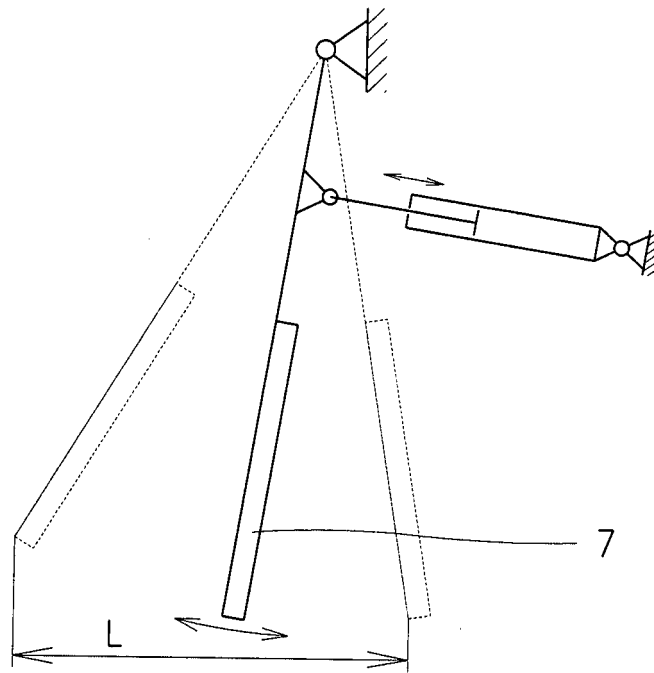
8. Procédé selon la revendication 7, **caractérisé par le fait qu'**au moins la vitesse de l'enroulement de la mèche (5) est diminuée temporairement avant la rupture contrôlée de la mèche (5), et est augmentée à nouveau lorsque la mèche (5) a été saisi par la bande dentée (6) sur la bobine vide (31), augmentant ainsi la fiabilité de la rupture de la mèche (5) et de la saisie de la mèche (5) sur la bande dentée (6) sur la bobine vide (31).
9. Procédé selon la revendication 8, **caractérisé par le fait que** la vitesse est augmentée au-dessus du niveau de production normal après que la mèche (5) a été saisi par la bande dentée (6) sur la bobine vide (31), utilisant ainsi la réserve en excès de mèche (5) produite lorsque la vitesse d'enroulement a été diminuée.



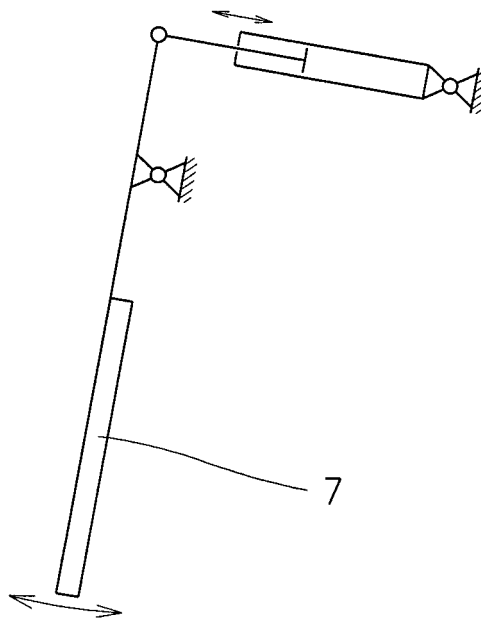
Obr. 1



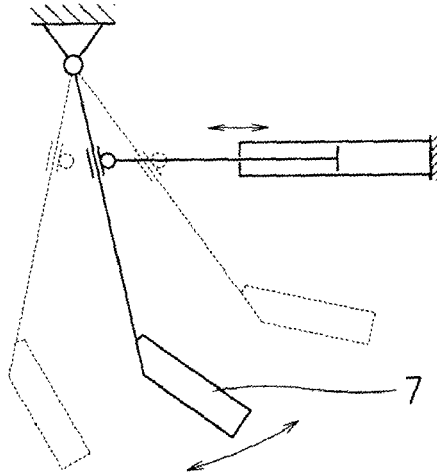
Obr. 2



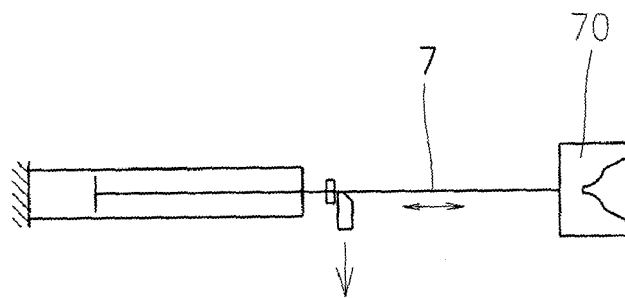
Obr. 3a



Obr. 3b



Obr. 3c



Obr. 3d

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 0367253 A1 [0005]
- WO 9912837 A1 [0005]
- JP 5078012 B [0006]