Device and process for the handling and control of the yarn in a crosswinding head of a crosswinding machine in bobbin doffing operations

Vorrichtung und Verfahren zum Handhaben und Steuern eines Fadens in einem Kreuzwickelkopf einer Kreuzwickelmaschine beim Auswechseln von Spulen

Dispositif et procédé de manipulation et de réglage du fil dans une tête de bobinage à spires croisées d’une machine de bobinage à spires croisées lors du changement de bobines

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Description

[0001] The present invention relates to a device and process for the automatic doffing of bobbins in a crosswinding machine, or for the substitution of a bobbin which has reached the pre-established dimensions, with a new tube around which the yarn coming from a feeding pirn is wound to form a new bobbin.

[0002] As is known, the procedure for the formation of a bobbin essentially consists of unwinding operations of the yarn from feeding pirns, clearing the yarn from possible faults and its crosswinding on tubes, according to forms and dimensions which vary according to the destination of the yarn. If the yarn is destined for feeding high-speed machines, the bobbins are normally cylindrical, or truncated-conical with a low conicity, if, on the contrary, the yarn is destined for feeding low-speed machines, the bobbins are truncated-conical with a higher conicity. The degree of conicity is selected so as to always ensure a correct unwinding of the bobbins during their final use, in the presence of more or less strong centrifugal forces.

[0003] A crosswinding machine allows the contemporaneous formation of a series of bobbins, i.e. it normally comprises a series of so-called crosswinding heads, positioned side by side, and served by at least one common service device, also called trolley, which can run along the whole crosswinding machine, positioning itself in correspondence with each crosswinding head and which effects, in an automated manner, the operations which are cyclically required by each crosswinding head.

[0004] During the formation of the bobbin it may be necessary to intervene to substitute the run-down or faulty pirns, or to substitute the bobbin which has reached the pre-established dimensions, with a new tube.

[0005] In particular, in the case of bobbin doffing, or if it is necessary to substitute a bobbin which has reached the pre-established dimensions, the pirn from which the yarn comes, in turn, not yet being exhausted, the crosswinding head must be stopped in order to be able to discharge the bobbin and substitute it with a new tube. The yarn coming from the pirn is cut and the end is fastened to the new tube to restart the crosswinding.

[0006] Furthermore, according to the known art, each crosswinding head is normally equipped with devices, situated along the run of the yarn from the feeding pirn to the winding bobbin, which eliminate possible defects of the yarn and remedy possible breakages. In the case of yarn defects, in fact, said defects must be located, the yarn must be cut, the faulty part eliminated and the two ends, which have formed on the side of the pirn and bobbin, respectively, must be rejoined. In case of accidental breaking of the yarn, the disruption of the yarn must be detected and the two ends of the yarn, respectively from the one side of the spool/pirn and from the one side of the bobbin, must be once again jointed to each other.

[0007] It is evident that, along the run of the yarn from the unwinding pirn to the winding bobbin, in a crosswinding head, devices for detecting the characteristics of the yarn must be present, together with devices for cutting the yarn, devices for capturing the ends of the cut (or accidentally broken) yarn and devices for joining the ends of the yarn. In particular, the capturing devices of the cut yarn ends normally consist of two suction mouths, for the collection of the yarn end coming from the pirn and from the bobbin, respectively, situated on arms oscillating between a first position, corresponding to the pirn and the bobbin, respectively, and a second position, in correspondence with the device for joining the yarn ends, also called joiner or knotter.

[0008] The handling and control of the yarn during the bobbin doffing operations, require the intervention of the common service device which, in cooperation with the devices of the crosswinding head situated along the run of the yarn from the feeding pirn to the winding bobbin, recovers the yarn end coming from the pirn, positions the new winding tube and arranges the yarn end on the new winding tube.

[0009] It is therefore important to provide for all the necessary expedients so that all the devices of the different crosswinding heads can cooperate in an optimal way with the common service device, so that the yarn coming from the new pirn is effectively collected by the common service device, which, subsequently, provides for its disposal on the new tube.

[0010] According to the known art, when it is necessary to substitute a bobbin which has reached the pre-established dimensions, the yarn running from the pirn to the bobbin is cut to prevent its continued winding onto the bobbin as a result of the rotation inertia of the same. The yarn ends connected to the pirn and the bobbin are recovered by means of respective suction mouths (in particular, for the end wound onto the bobbin, it is necessary to wait until the bobbin has stopped, the bobbin is then rotated in the opposite direction with respect to the winding direction, until a sufficiently long yarn end is unwound from the bobbin and can be sucked by the suction mouth) and carried by the same to the joining device, which re-establishes the yarn continuity. Only at this point, as the yarn is not moving, can the service trolley intervene, collecting the yarn by means of a first manipulation device, cutting it, maintaining the end coming from the pirn, then, by means of a second manipulation device, removing the bobbin, which has reached the pre-established dimensions, and positioning a new winding tube, whereas the first manipulation device wedges the yarn coming from the pirn between the tube base and the counterpoint of the bobbin-holder arm. In this way it is possible to restart the yarn winding operations around the tube, to form a new bobbin.

[0011] The above procedure is not very effective as it requires a cutting and subsequent joining of the yarn before the service trolley can intervene and recut the yarn. This procedure however not only solves the problem of the undesired winding of the yarn around the bobbin, due to the rotation inertia of the same, but, above all, it facil-
itates the withdrawal of the yarn by the manipulation device of the service trolley, which only intervenes when the yarn has stopped. In order to assure a uniform winding of the yarn on the bobbin, in fact, a so-called crosswinding is effected, using means which guide the yarn with a backward-forward movement along the whole length of the bobbin in formation. These means can consist, for example, of a so-called driving or traversing cylinder i.e. which makes the bobbin rotate and having grooves on its surface which, while the cylinder is rotating and makes the bobbin rotate, direct the yarn according to a backward-forward movement from one end to the other of the bobbin. Under these conditions, the difficulty for the trolley to intervene on the moving yarn, due to the continuous movement of the yarn during its winding onto the bobbin, can be easily understood.

According to alternative solutions of the known art, it was proposed to cut the yarn when the bobbin has reached the desired dimensions, not to recover however the two ends to re-establish the yarn continuity, but only to recover the end on the pirn side and deliver it to the trolley to be inserted on the winding tube.

A known procedure for the capturing of the feeding pirn end and its consignment to the service trolley, is described in the patent EP 1127831 in the name of Schlafhorst AG, and envisages that the yarn end be collected by an arm equipped with a nipper which delivers it to a seizure and cutting device situated near the joiner. The yarn is cut by this seizure and cutting device and is collected by a collecting device, from which it is collected by a special supplementary sucking tube which transfers the cut yarn to a seizure and cutting device situated in the upper zone of the crosswinding head, wherein the yarn can be easily reached by the manipulator of the service trolley. This solution requires a series of specific devices, in correspondence with each crosswinding head, which only operate when necessary.

According to European patent application EP 1236668, in the name of Murata Kikai Kabushiki Kaisha, a procedure is described wherein the yarn end on the pirn side is collected by the suction mouth which is on the side of the pirn and directly delivered by the same to the manipulator of the common service trolley. This solution does not require additional devices on the crosswinding heads, but it is necessary to equip the service trolley manipulator with an extendable arm, capable of reaching and collecting the yarn end in a lowered position with respect to that required for its subsequent arrangement on the tube.

In European patent application EP 1428783, in the name of Sauer GmbH, a process and a device are described which allow the recovery of the yarn end coming from the pirn, by sucking it with the suction mouth which is situated on the side of the pirn and carrying it to a area crossed by the run of the suction mouth situated on the side of the bobbin. After positioning the suction mouth which is on the side of the bobbin, near the yarn, the suction of the suction mouth situated on the bobbin side is stopped, whereas the suction is activated of the suction mouth which is on the side of the bobbin. In this way, the suction mouth on the side of the bobbin takes delivery of the yarn end. The suction mouth situated on the bobbin side is then rotated to the position near the bobbin, wherein the yarn is collected by the manipulator of the common service trolley. In this way, the intervention of the service trolley is facilitated with respect to the disclosure of the Murata patent, as it is not necessary to excessively extend the arm of the service trolley, but the exchange efficiency of the yarn between the two suction mouths which takes place by deactivating the suction of the suction mouth which is on the side of the pirn and thus allowing the suction mouth situated on the side of the bobbin to suck the yarn end, does not guarantee adequate success, bearing in mind that there can be a considerable yarn length already engaged by the suction mouth on the pirn side, which can therefore hinder the sucking action on the part of the suction mouth on the side of the bobbin. This possibility of error in the consignment of the yarn is extremely undesirable as it would jeopardize the restarting of the crosswinding head, thus creating a lack of production.

DE 3819873 A1 discloses a service trolley comprising means for collecting and positioning the run of the yarn coming from the lower pirn, to delivery it to the manipulation device on board of the service trolley. The run of the yarn is captured from the side of the bobbin. DE 4139892 A1 discloses a winding machine equipped with a suction mouth on the bobbin side having on its back a concave profile.

An objective of the present invention is to facilitate the intervention of the service trolley, in particular its collection of the yarn to be inserted in the new winding tube during the doffing operations of a bobbin which has reached the desired dimensions.

A further objective of the present invention is to guarantee a higher productivity of the crosswinding machine through a higher operating factor.

These objectives according to the present invention are achieved by providing a process for the handling and control of the yarn in a crosswinding machine in doffing operations of a bobbin, as specified in claim 2, and a crosswinding machine particularly suitable for the embodiment of this process as claimed in claim 1.

The present invention will be now described, for illustrative but non-limiting purposes, according to one of its preferred embodiments, with particular reference to the figures of the annexed drawings, wherein

- figure 1 schematically shows some of the devices of a crosswinding head and a service trolley of a crosswinding machine during crosswinding,
- figures 2-5 schematically show some of the devices of a crosswinding head and a service trolley of a crosswinding machine during a sequence of phases of the process for the handling and control of the yarn in bobbin doffing operations,
traversing cylinder 4 being maintained under rotation. Inside which the yarn 1 is passed, the same driving and traversing cylinder 4 is crossed by a series of grooves, also called cavities, for the purpose, the surface of the driving and traversing cylinder 4 is distributed on the whole length of the bobbin 2. For this reason, the yarn 1 is uniformly delivered to the joining device 7, which reestablishes the continuity of the yarn 1. When the rotation of the bobbin 2 is interrupted at any point of the back of the suction mouth 6, the nipping and cutting device 15 is actuated, during the rotation of the bobbin 2, or, in any case, in correspondence with a predetermined position of the suction mouth 6. In correspondence with reaching the pre-established fill-out position of the suction mouth 6, the yarn ends joined, as in the procedure of the known art described above, before starting the movement of the suction mouth 6 on the side of the bobbin 2. When the rotation of the bobbin 2 is interrupted before the suction mouth 6 has reached the position near the bobbin 2 from its rest position, the necessary amount of yarn due to the engagement of the yarns themselves on the back of the suction mouth, will be taken from the pirn. Furthermore, in order to facilitate the exit of the yarn 2 from the grooves of the traversing cylinder 4, it may be necessary to maintain the same driving and traversing cylinder 4 in rotation, after removing the connection through which the cylinder 4 transmitted its movement to the bobbin 2 in formation. During the movement phase of the suction mouth 6, the position of the yarn 1 on its back, can be conveniently constrained through positioning means. With reference to figure 6, in fact, as the suction inlet 8 of the suction mouth 6 is extremely large (due to the main function of the suction mouth 6, consisting in recovering the end of a cut yarn from the bobbin 3, said end being at any point of the bobbin length), the back of the suction mouth 6 becoming narrower from the suction inlet 8 towards the oscillating arm 9, the yarn 1 can be situated in any point of the back of the suction mouth 6 and, during its rotation around the rotation axis A, in the absence of positioning means, it could also fall to the side. The positioning means of the yarn 1 are in the form of at least one draft, situated on the back of the suction mouth 6, V-shaped so that, once the yarn 1 is collected along the arms of the V-shaped draft, the same tends to converge towards the center of the draft itself. With reference to figure 6, the positioning means of the yarn comprise two V-shaped drafts, a first draft 10 near the suction inlet 8 of the suction mouth 6, substantially having the same width as the inlet 8 of the suction mouth 6, and a second draft 11, near the oscillating arm 9, with reduced dimensions. During rotation around the axis A, in fact, the suction mouth 6 engages the yarn 1 first with its portion closer to the suction inlet 8. Consequently, due to the effect of the first draft 10, the yarn 1 will have already reached a well-defined position when it engages the whole back of the suction mouth 6, and consequently the second draft 11. With reference to figure 6, when the suction mouth 6 has reached the end of its run, or with the suction inlet 8 near the driving and traversing cylinder 4, the yarn 2 occupies a well-defined position in the space between the back of the suction mouth 6 farthest away from the suction inlet 8 and the slit plate 3. In correspondence with this position, the yarn 1 can be reached with great precision by the manipulating device 12 of a service trolley 13. In particular, the manipulating device 12 comprises a telescopic arm 14, which can rotate around an axis B, at whose end there is a nipping and cutting device 15. From an operative point of view, the call signal of the service trolley 13 on the part of the crosswinding head during a doffing operation of a bobbin, can be sent in correspondence with reaching the pre-established filling degree of the bobbin 2, but also before this, so that the service trolley 13 is positioned in correspondence with the crosswinding head before the suction mouth 6 reaches the intervention position of the manipulation device 12. In this way, the devices of the trolley 13 which are involved in the doffing operations of the bobbin and its substitution with a new tube, are ready to intervene the very moment in which the suction mouth 6 has reached the intervention position, but the trolley 13 could
be forced to wait.

[0031] As an alternative, the call signal of the service trolley 13 can be sent subsequently, so that the trolley 13 is situated in correspondence with the crosswinding head after the suction mouth 6 has reached the intervention position of the manipulation device 12. In this way, the time the service trolley 13 dedicates to the specific crosswinding head for the doffing operations of the bobbin 2 and its substitution, is minimized, but the crosswinding head could be forced to remain on standby.

[0032] With reference to figure 4, once the service trolley 13 and the suction mouth 6 are in the right position, the telescopic arm 14 extends and the nipping and cutting device 15 collects the yarn 1, in correspondence with the area immediately behind the back of the suction mouth 6, as defined by the positioning device situated on said back.

[0033] With reference to figure 5, the nipping and cutting device 15 subsequently cuts the yarn 1 and withholds the end coming from the pirn, whereas the bobbin 2, freed by the bobbin-holding arm 5, is moved away.

[0034] Still maintaining the hold of the yarn end 1 coming from the pirn, the manipulating device 12 moves away from the crosswinding head to facilitate the return of the suction mouth 6 to its rest position.

[0035] The subsequent insertion phase of the yarn 1 on the new winding tube, can be completed, at this point, by the manipulation device 12, according to any of the known techniques, which have the common aspect of inserting the end of the yarn 1 between the base of the tube and a counterpoint envisaged on the arm of the bobbin-holder 5.

[0036] The manipulation device 12 of the service trolley 13 subsequently leaves the yarn 1, and it is possible to start the formation of a new bobbin, whereas the service trolley 13 is free to intervene on other crosswinding heads of the crosswinding machine.

Claims

1. A crosswinding machine comprising a series of crosswinding heads and at least one service trolley (13), each of said crosswinding heads comprising a pirn, from which a yarn (1) is unravelled and is wound around a bobbin (2), two mouths for the suction of the yarn (1) ends possibly formed, by breakage or cutting, on the side of the pirn or on the side of the bobbin (2) respectively, and the delivery of these ends to a joining device (7), situated along the run of the yarn (1) from the pirn to the bobbin (2), to re-establish the yarn continuity, said service trolley (13) being capable of running along the whole crosswinding machine, in order to position itself in correspondence with each crosswinding head and comprising a manipulation device (12) of the yarn (1) characterized in that the crosswinding machine comprises means for moving the run of the yarn (1) to a definite position, close to the terminal portion of its course from the pirn to the bobbin (2), said means being positioned on each crosswinding head and consist of two V-shaped drafts, situated on the back of the suction mouth (6) on the side of the bobbin, a first draft (10) near the sucking inlet (8) of the suction mouth (6), substantially having the same width as the inlet (8) of the suction mouth (6), and a second draft (11), near the oscillating arm (9) of the suction mouth (6).

2. A process for the handling and control of the yarn (1) in a crosswinding head of a crosswinding machine in bobbin (2) doffing operations, said crosswinding machine being equipped with a series of crosswinding heads and with at least one service trolley (13), each of said crosswinding heads comprising a pirn, from which a yarn (1) is unravelled and is wound to form a bobbin (2), around a winding tube, two mouths for the sucking of the yarn (1) ends possibly formed, by breakage or cutting, on the side of the pirn or on the side of the bobbin (2) respectively, and for the delivery of these ends to a joining device (7), situated along the run of the yarn (1) from the pirn to the bobbin (2), to re-establish the yarn continuity, said service trolley (13) being capable of running along the whole crosswinding machine, in order to position itself in correspondence with each crosswinding head and comprising a manipulation device (12) of the yarn (1) according to the following phases:

- moving the yarn (1) run in a defined position, near the terminal portion of its course from the pirn to the bobbin (2),
- seizure and cutting of the yarn (1), in correspondence of said defined position on the part of a manipulation device (12) of the service trolley (13), which withholds the end coming from the pirn,
- distancing of the bobbin (2), arrangement of a new winding tube of the yarn (1) coming from the pirn and start of the formation of a new bobbin, characterized in that said movement phase of the yarn (1) run to a definite position is effected by positioning means present on each crosswinding head and said positioning means consist of two V-shaped drafts, situated on the back of the suction mouth (6) on the side of the bobbin, a first draft (10) near the sucking inlet (8) of the suction mouth (6), substantially having the same width as the inlet (8) of the suction mouth (6), and a second draft (11), near the oscillating arm (9) of the suction mouth (6).
Patentansprüche

1. Kreuzwickelmaschine umfassend eine Reihe von
Kreuzwickelköpfen und mindestens ein Serviceaggregat (13), wobei jeder der Kreuzwickelköpfe
eine Garnspule, von welcher ein Faden (1) aufgetrennt und auf eine Spule (2) aufgewickelt wird,
zeilen Öffnungen zum Ansaugen der Fadenenden (1), die sich möglicherweise durch Brechen oder Schneiden bilden, an der Seite der Garnspule oder an der Seite der Spule (2), und
bei der Zuführung dieser Enden zu einer Zusammenführungseinrichtung (7), die entlang dem Verlauf des Fadens (1) von der Garnspule zu der Garnrolle (2) angeordnet ist, um den Fadenzusammenhang wiederherzustellen, umfasst, wobei das Serviceaggregat (13) dazu ausgebildet ist, entlang der gesamten Kreuzwickelmaschine zu verlaufen, um sich in Übereinstimmung mit jedem Kreuzwickelkopf zu positionieren, und umfassend eine Handhabungsvorrichtung (12) des Fadens (1), gemäß den folgenden Schritten:

- Bewegen des Verlaufs des Fadens (1) zu einer definierten Position nahe des Endbereichs auf seiner Bahn von der Garnspule zu der Garnrolle (2),
- Greifen und Schneiden des Fadens (1), nach Maßgabe der definierten Position auf einem Teil einer Handhabungsvorrichtung (12) des Serviceaggregats (13), welches das von der Garnspule kommende Ende, zurückhält,
- Entfernen der Spule (2), Anordnung einer neuen Wickelrolle des Fadens (1), der von der Garnspule kommt, und Beginnen eine neue Spule auszubilden,

dadurch gekennzeichnet, dass die Kreuzwickelmaschine umfasst
Mittel zum Bewegen des Verlaufs des Fadens (1) zu einer definierten Position nahe des Endbereichs seines Verlaufs von der Garnspule zu der Spule (2), wobei die Mittel an jedem Kreuzwickelkopf angeordnet sind und aus zwei V-förmigen Schrägen bestehen, die auf der Rückseite der Ansaugöffnung (6) auf der Seite der Garnrolle gelegen sind, nämlich
- eine erste Schräge (10) nahe des Ansaugseinlasses (8) der Ansaugöffnung (6), die im Wesentlichen dieselbe Breite wie die Einlass (8) der Ansaugöffnung (6) aufweist, und
eine zweite Schräge (11) nahe des Schwenkhebels (9) der Ansaugöffnung (6).

2. Verfahren zum Handhaben und Steuern des Fadens (1) in einem Kreuzwickelkopf einer Kreuzwickelmaschine beim Abnehmen von Spulen (2), wobei die Kreuzwickelmaschine mit einer Reihe von Kreuzwickelköpfen und mit mindestens einem Serviceaggregat (13) ausgestattet ist, wobei jeder der Kreuzwickelköpfe umfasst:
eine Garnspule, von welcher ein Faden (1) aufgetrennt und gewickelt wird, um eine Spule (2) auf einer Wickelrolle zu bilden,
zeilen Öffnungen zum Ansaugen der Fadenenden (1), die sich möglicherweise durch Brechen oder Schneiden bilden, auf der Seite der Garnspule oder auf der Seite der Spule (2), und für die Zuführung dieser Enden zu einer Verbindungseinrichtung (7), die entlang dem Verlauf des Fadens (1) von der Garnspule zu der Spule (2) angeordnet ist, um den Fadenzusammenhang wiederherzustellen, wobei das Serviceaggregat (13) dazu ausgestaltet ist, entlang der gesamten Kreuzwickelmaschine zu verlaufen, um sich in Übereinstimmung mit jedem Kreuzwickelkopf zu positionieren, und umfassend eine Handhabungsvorrichtung (12) des Fadens (1), gemäß den folgenden Schritten:

- Bewegen des Verlaufs des Fadens (1) zu einer definierten Position nahe des Endbereichs auf seiner Bahn von der Garnspule zu der Garnrolle (2),
- Greifen und Schneiden des Fadens (1), nach Maßgabe der definierten Position auf einem Teil einer Handhabungsvorrichtung (12) des Serviceaggregats (13), welches das von der Garnspule kommende Ende, zurückhält,
- Entfernen der Spule (2), Anordnung einer neuen Wickelrolle des Fadens (1), der von der Garnspule kommt, und Beginnen eine neue Spule auszubilden,

dadurch gekennzeichnet, dass die Bewegungsphase des Verlaufs des Fadens (1) zu einer definierten Position von Positionierungsmitteln durchgeführt wird, die an jedem Kreuzwickelkopf vorgesehen sind, und dass die Positionierungsmittel aus zwei V-förmigen Schrägen bestehen, die auf der Rückseite der Ansaugöffnung (6) auf der Seite der Spule angeordnet sind, nämlich
- eine erste Schräge (10) in der Nähe des Ansaugeinlasses (8) der Ansaugöffnung (6), die im Wesentlichen dieselbe Breite wie der Einlass (8) der Ansaugöffnung (6) aufweist, und
- eine zweite Schräge (11), nahe des Schwenkhebels (9) der Ansaugöffnung (6),

Revendications

1. Machine de bobinage à spires croisées comprenant une série de têtes de bobinage à spires croisées et au moins un chariot de service (13), chacune desdites têtes de bobinage à spires croisées comprenant une bobine d’alimentation de laquelle un fil (1) est extrait et est enroulé sur une bobine (2), deux buses destinées à l’aspiration des extrémités du fil (1) qui sont éventuellement produites en cas de casse ou de coupe, à côté de la bobine d’alimentation, ou respectivement à côté de la bobine (2), ainsi qu’à l’aménagement de ces extrémités à un dispositif de jonction (7) situé sur le parcours du fil (1) depuis la bobine d’alimentation jusqu’à la bobine (2), en vue de rétablir la continuité du fil, ledit chariot de service (13) étant apte à se déplacer le long de l’ensemble de la machine de bobinage à spires croisées afin de se positionner en correspondance avec chaque tête de bobinage à spires croisées et comprenant un dispo-
sitif de manipulation (12) du fil (1), caractérisée en ce que la machine de bobinage à spires croisées comprend un moyen destiné à déplacer le parcours du fil (1) jusqu'à un emplacement défini, très près de la partie terminale de sa course depuis la bobine d’alimentation jusqu'à la bobine (2), ledit moyen étant positionné sur chaque tête de bobinage à spires croisées et consistant en deux éléments de tirage en forme de V, situés à l’arrière de la buse d’aspiration (6) du côté de la bobine, un premier élément de tirage (10) proche de l’entrée d’aspiration (8) de la buse d’aspiration (6), ayant substantiellement la même largeur que l’entrée (8) de la buse d’aspiration (6), et un deuxième élément de tirage (11), proche du bras oscillant (9) de la buse d’aspiration (6).

2. Procédé de manipulation et de commande du fil (1) dans une tête de bobinage à spires croisées d’une machine de bobinage à spires croisées dans des opérations de confection de la bobine (2), ladite machine de bobinage à spires croisées étant équipée d’une série de têtes de bobinage à spires croisées et d’au moins un chariot de service (13) chacune desdites têtes de bobinage à spires croisées comprenant une bobine d’alimentation, de laquelle un fil (1) est extrait et est enroulé pour former une bobine (2) sur un tube de bobinage, deux buses d’aspiration destinées à aspirer les extrémités de fil (1) éventuellement produites, par suite de casse ou de coupe, à côté de la bobine d’alimentation ou respectivement à côté de la bobine (2) et à amener ces extrémités à un dispositif de jonction (7), situé le long du parcours du fil (1) de la bobine d’alimentation jusqu’à la bobine (2), en vue de restaurer la continuité du fil, ledit chariot de service (13) étant apte à se déplacer le long de l’ensemble de la machine de bobinage à spires croisées, afin de se positionner en correspondance avec chaque tête de bobinage à spires croisées et comprenant un dispositif de manipulation (12) du fil (1), selon les phases suivantes :

- déplacement du parcours du fil (1) à un emplacement défini, proche de la partie terminale de sa course depuis la bobine d’alimentation jusqu’à la bobine (2) ;
- saisie et coupe du fil (1) en correspondance avec ledit emplacement défini sur la partie d’un dispositif de manipulation (12) du chariot de service (13) qui retient l’extrémité venant de la bobine d’alimentation ;
- mise à l’écart de la bobine (2), mise en place d’un nouveau tube de bobinage du fil (1) venant de la bobine d’alimentation et amorçage de la formation d’une nouvelle bobine,

caractérisé en ce que ladite phase de déplacement du parcours du fil (1) jusqu’à un emplacement défini est effectuée en positionnant un moyen présent sur
REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- EP 1428783 A [0015]
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