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(54) **WEB INTRODUCTION ARRANGEMENT FOR A WINDING MACHINE**

BAHNEINZUGSVORRICHTUNG FÜR WICKELMASCHINE

DISPOSITIF D'INTRODUCTION DE BANDE POUR EMBOBINEUSE

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Description

[0001] The invention is related to a web introduction arrangement for a winding machine for winding up web-like winding material such as one or more paper webs, with a support cylinder partially wrapped by the web and optionally additional support or backing cylinders for at least partially supporting the roll to be wound from the winding material.

[0002] Such winding machines are employed, for instance, in so-called reel-slitting machines, in which a wide material web is divided lengthwise into several partial webs and the partial webs are subsequently wound in a winding machine about one or more winding cores. The roll or rolls to be wound can be wound up in winding stations arranged alternately on the one or more support cylinders and are supported with at least a horizontal component on the support cylinder, the remaining roll weight being borne by pivoting support arms with rotating roll-tensioning heads, or the roll or rolls are supported exclusively by the partly wrapped support cylinder, or in an essentially identically oriented arrangement by two or more parallel support rolls forming a winding bed, of which the first support roll in machine direction is wrapped by the belt.

[0003] For all these winding machines there exists the problem of introducing the beginning of the web quickly and free of folds into the winding machine in order to begin the winding process. This problem exists both in the introduction of a completely new web at the beginning and following the occasionally occurring cross tearing of the web to be wound and creation of a new web start.

[0004] While there are a number of practicable web introduction arrangements for inserting a web start at the beginning of the winding process for a roll or set of rolls, for instance, guide sheets, blown air or wrapped support cylinders with web suction openings in its surface connected to a vacuum, the handling when inserting a new web start at a time in which the roll or rolls are already partly wound is extraordinarily difficult, since these rolls can take on a considerable size and thus represent an obstacle. Web introduction arrangements are known (see, for example WO 92/05099) that consist of several, at least two, rollers which are wrapped by a shared pressing belt or strip and are arranged at some distance from the wrapped support cylinder. The pressing belt or strip automatically adapts to the support cylinder circumference. These systems occupy a relatively large space and can be meaningfully utilized only for a relatively small angle of wrap on the support cylinder.

[0005] An additional problem occurs particularly with those winding machines that consist of several support cylinders forming a winding bed, particularly if their axial spacing is variable during the winding process and in which the web material to be wound is fed from below into the winding bed through a spacer gap between the support cylinders. Even if the spacer gap does not en-

large during the winding process, handling units, such as roll ejectors, web cross-cutting devices and clamping devices for the web start and insertion devices for new winding cores are an obstacle to the introduction of a web start into the winding machine.

[0006] Finally, another problem exists for winding machines, particular of the reel-slitting type, because the rolls to be created from the web-like winding material have a considerably smaller diameter than the supply roll, from which the web-like winding material is fed to the winding machine, and therefore the web-like winding material must be crosscut after finishing each roll or set of rolls and the resulting new web start must be joined to newly introduced winding cores in order to begin a new winding process (roll change). Since the longitudinal tension is lost in the web-like winding material after the cross-cutting process, the web has a tendency to detach from its partial wrapping around the respective support cylinder. Here, too, a correct positioning of the new web start in the winding machine must be assured. A web introduction arrangement can therefore also have the task of holding a web start already located in the winding machine in the correct position or bringing it into a correct position. This is achieved usually by suctioning the web onto the partially wrapped support cylinder under application of a vacuum as mentioned above. Such vacuum units are expensive, in particular, and are problematic in some cases when support cylinders with a soft outside coating are used.

[0007] With this background, the problem of the invention is based on proposing a functionally secure web introduction device which can be used in the winding machine even under difficult geometrical situations and preferably without applying a vacuum.

[0008] To solve this problem, a web introduction arrangement of the type described initially is proposed in which a number of pressure rollers or cylinders are arranged essentially parallel to the support cylinder and distributed on the portion of the circumference of the support cylinder wrapped by the web and the pressure rollers or cylinders can be displaced by drive units radially and also, at least in part, circumferentially from a rest position into a contact pressure position and vice versa and in which the pressure rollers or cylinders consist of at least two axially spaced component rollers or cylinders for each circumferential position.

[0009] By means of the invention, it is achieved, among other things, that the web introduction means can be designed to be dimensioned relatively small and easily movable, its circumferential position and spacing from the periphery of the partially wrapped support cylinder can be optimally adapted to the needs of web introduction without hampering other handling units of the winding machine. Moreover, a relatively large angle of wrap on the first support cylinder can be covered with relatively few pressure roller arrangements with functional security in the sense of web introduction or web retention.

[0010] If the spaces between the pressure rollers or cylinders in the various circumferential positions together form a passageway for at least one adhesive track, the start of a new web can be introduced simply and to a large extent automatically even if rolls already partially wound are present in the winding machine.

[0011] Additional features that guarantee an optimally flawless and to a large extent automatic web introduction result from the dependent claims.

[0012] The aforementioned components to be used according to the invention, as well as those claimed and described in the embodiment cited as an example, are not subject to any special exceptional conditions with regard to their size, shaping, material selection and technical design, so that the selection criteria known in the respective field of application can be applied without restriction.

[0013] Additional details, characteristics and advantages of the object of the invention result from the description below of the associated drawing in which, by way of example, a preferred embodiment is illustrated. Shown in the drawing are:

Fig. 1 a web introduction arrangement for a winding machine with two support cylinders in a schematized side view directly before a roll change;

Fig. 2 a first roll pressure arrangement from the same web introduction arrangement in an enlarged detail representation - section along line II-II according to Fig. 4;

Fig. 3 a view of the same web introduction arrangement as in Fig. 2, but in an operating position immediately after a roll change; and

Fig. 4 a simplified view of the same web introduction arrangement from below at an angle, corresponding to view A according to Fig. 1.

[0014] As is evident from Fig. 1, the winding machine in the embodiment shown consists of a first support cylinder 14 in the machine direction, partially wrapped by a web 10 to be wound or several webs 10 arranged side by side, and a second support cylinder 16 parallel to the first one, which together form a winding bed 18 for winding a roll 20 of the web-like winding material. The winding machine may also have a conventional load bearing rider roll arrangement 22. The one or more webs 10, 10', 10'', ... are stretched flat via idler rollers 26, 28 and appropriately fed to the first support cylinder 14. A marking 30 shows the position inside the winding machine in which the cross-cutting of the web takes place after the finishing of a roll 20, so that the finished roll 20 can be removed in a conventional manner and, after insertion of a winding core or a set of winding cores 24 into the winding bed 18, the entering web end resulting from the cross-cut is joined to the winding core(s) 24 by, for in-

stance, gluing.

[0015] In the illustrated and thus described embodiment, the web introduction arrangement consists of a first, second and third pressure roller arrangement 31, 32, 33.

[0016] The first pressure roller arrangement 31 consists of a rather large number of relatively small calibrated pressure rollers 31A, each approximately the same size, arranged at the front end of a support beam 34 beneath a clamping strip 34A forming the front edge and each supported at each end by piston/cylinder means 36 at their end faces so as to be free to rotate. The support beam 34 can be raised and lowered along a guide 38 illustrated by dashed lines in the drawing such that, when being increasingly raised, it approaches the surface of the wrapped support cylinder 14, at least in the area of its front end, viewed in machine direction, that is, with the clamping strip 34A and the pressure rollers 31A, and increasingly moves away when being lowered. In the illustrated embodiment, the support beam 34 has reached its highest position, in which the clamping strip 34A is slightly in front of the cross-cutting point 30 for the material web, in the operating state immediately before a roll change (according to Fig. 1). By actuating the piston/cylinder means 36 in the direction of the double arrow (Fig. 2), the first pressure rollers 31A are moved towards the surface of the wrapped support cylinder 14, until they make contact there and exert an adjustable contact pressure on the material web 10, 10', 10'', ... wrapping the support cylinder 14.

[0017] From the contact pressure position the first pressure rollers 31A can be spaced further apart by retraction. In that way an arriving web end can be introduced in proper position into the winding bed, in addition to the web end being capable of being held in place until the introduction of the winding cores for starting new winding after crosscutting in case of a roll change, without a vacuum having to be applied to the support cylinder surface. The first pressure rollers are supported in their function by the clamping strip 34A on one side and the contour of the support beam 34 on its other side - both act as web guide surfaces during web insertion and are appropriately spaced laterally from the support cylinder periphery. Only during cross-cutting and the roll change does the clamping strip 34A make firm contact at the support cylinder periphery under the pressure of the finished wound rolls 20, 20', 20'', ... displaced on the support beam.

[0018] An arrangement comparable to the first pressure roller arrangement is implemented in the second pressure roller arrangement 32. Here too, axially spaced, coaxially oriented second pressure rollers 32A fastened to the support element 32B can be displaced from the contact pressure position represented in solid lines into a rest position represented in dash-double-dot lines and vice versa, the second pressure rollers 32A moving both radially with respect to the support cylinder surface 14 and with a component in the circumferential

direction of the support cylinder. Here too, web guide surfaces are implemented on both sides of the axes of rotation of the second pressure rollers 32A in the shape of two axially spaced bent guide surfaces 32C, for instance, in the form of sheet metal supporting the second pressure rollers. The second pressure roller arrangement 32 can thus likewise be effectively moved out of its contact pressure position in order to make room for other devices when not in use.

[0019] Finally a third pressure roller arrangement 33 is provided in the area of the web entry onto the wrapped support cylinder 14, consisting again of axially spaced third pressure rollers 33A in coaxial orientation. The third pressure rollers 33A can be pivoted along the double arrow by means of pivot arms 33B with comparatively short levers from the contact pressure position shown in Fig. 1 in straight lines into the retracted or rest position in dot-dash lines and vice versa.

[0020] As is evident from Fig. 3, all three pressure roller arrangements can lie against the wrapped support cylinder 14 in a contact pressure position until the beginning of a new winding process. The first pressure roller arrangement 31 can even remain in contact with the support cylinder periphery and thus the winding material during the retraction of the support beam 34, because the increasing radial distance to the support beam can be compensated for by extension of the piston/cylinder means 36. The second pressure rollers 32A can optionally also be held on the periphery even during the initial retraction of the support elements 32B, if the guide surfaces 32C have a sufficient resilience directed towards the support cylinder surface.

[0021] In order to provide a new web start 10A with an adhesive track 40 and to introduce the adhesive track around the support cylinder 14 into the winding position, with pressure rollers already in contact pressure position on the support cylinder 14 to be wrapped, the spaces 31D, 32D, 33D between the pressure rollers as well as the pressure roller arrangement form a common passageway 42.

[0022] A spray gluer 44 upstream of the web introduction arrangement carries the adhesive track 40, if needed, into a position flush with the passageway 42 in the area of the web start 10A.

List of reference numbers

[0023]

10'	Web
10"	Web
10'''	Web
10A	Web start
14	Support cylinder
16	Support cylinder
18	Winding bed
20	Roll
22	Load bearing rider roll

24	Winding core
26	Idler rollers
28	Idler rollers
30	Marking
5 31	First pressure roller arrangement
31A	First pressure rollers
31D	Spaces
32	Second pressure roller arrangement
32A	Second pressure rollers
10 32B	Support element
32C	Guide surfaces
32D	Spaces
33	Third pressure roller arrangement
33A	Third pressure rollers
15 33B	Pivot arms
33D	Spaces
34	Support beam
34A	Clamping strip
36	Piston/cylinder means
20 38	Guide
40	Adhesive track
42	Passageway
44	Spray gluer
A	View

Claims

1. Web introduction arrangement for a winding machine for winding up web-like winding material such as one or more paper webs (10, 10', 10'', ...) with a support cylinder (14) wrapped by part of the web for at least partial support of the roll/rolls to be wound (20, 20', 20'', ...),
characterized by
a number of pressure rollers or cylinders (31A, 32A, 33A) arranged essentially parallel to the first support cylinder (14) in machine direction and distributed on the portion of the circumference of the support cylinder (14) wrapped by the web (10, 10', 10'', ...) and by
drive units for radial and also, at least in part, circumferential displacement of the pressure rollers or cylinders from a rest position into a contact pressure position and vice versa,
wherein the pressure rollers or cylinders consist of at least two axially spaced component rollers or cylinders (31A, 31A'; 32A, 32A'; 33A, 33A) for each circumferential position.
2. Web introduction arrangement according to claim 1, **characterized in that** the spaces (31D, 32D, 33D) between the pressure rollers (31A, 31A'; 32A, 32A'; 33A, 33A) form a passageway (42) for at least one adhesive track (40).
3. Web introduction arrangement according to claim 1 or 2, **characterized in that** for at least one of the

pressure roller arrangements, the axially spaced pressure rollers are seated so as to be jointly movable with a radial component with respect to wrapped support cylinder (14), in addition to the displacement of the drive means, such as a support bean (34).

4. Web introduction arrangement according to one of claims 1 to 3, **characterized in that** the drive arrangements for moving the pressure rollers have web guiding surfaces for the winding material.
5. Web introduction arrangement according to one of claims 2 to 4, **characterized by** a gluer for applying glue to one or more specifiable surface elements (40) of a web start (10A) of the winding material in an arrangement flush with the passageway (42).

Patentansprüche

1. Bahneinzugsvorrichtung für Wickelmaschinen zum Aufwickeln bahnartigen Wickelmateri als, wie eine oder mehrere Papierbahn(en) (10, 10', 10'', ...) mit einem Unterstützungszylinder (14), umgeben mit einem Teil der Bahn für eine zumindest teilweise Unterstützung der aufzuwickelnden Rolle/Rollen (20, 20', 20'', ...),
dadurch gekennzeichnet, dass
eine Anzahl von Andruckrollen oder -zylindern (31A, 32A, 33A), im wesentlichen parallel in Maschinenrichtung zu dem ersten Unterstützungszylinder (14) angeordnet und auf den Bereich des Umfanges des Unterstützungszylinders (14) verteilt sind, umgeben von der Bahn (10, 10', 10'', ...) und von Antriebseinheiten zum radialen und auch, zumindest teilweise, umlaufenden Versetzen der Andruckrollen oder -zylinder von einer Ruheposition zu einer Kontaktandruckposition und vice versa, wobei die Andruckrollen oder -zylinder zumindest aus zwei axial beabstandeten Teilrollen oder -zylindern (31 A, 31 A; 32A, 32A; 33A, 33A) für jede Umfagsposition bestehen.
2. Bahneinzugsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Abstände (31D, 32D, 33D) zwischen den Andruckrollen (31A, 31A; 32A, 32A; 33A, 33A) einen Durchgang (42) für zumindest eine anhaftende Führung (40) bilden.
3. Bahneinzugsvorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** für zumindest eine der Andruckrollenanordnungen die axial beabstandeten Andruckrollen derart gelegen sind, dass sie gemeinsam mit einer radialen Komponente bezüglich des umgebenen Unterstützungszylinders (14) bewegbar sind, zusätzlich zu der Versetzung

der Antriebsmittel, wie ein Unterstützungsträger (34).

4. Bahneinzugsvorrichtung nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Antriebsvorrichtungen zum Bewegen der Andruckrollen bahnführende Oberflächen für das Wickelmaterial aufweisen.
5. Bahneinzugsvorrichtung nach einem der Ansprüche 2 bis 4, **gekennzeichnet durch** eine Klebevorrichtung zum Aufbringen von Kleber auf ein oder mehrere unterscheidbare Oberflächenelement(e) (40) eines Bahnanfangs (10A) des Wickelmateri als in einer mit dem Durchgang (42) bündigen Anordnung.

Revendications

1. Dispositif d'introduction de bande pour une bobineuse permettant de bobiner une matière de bobinage en forme de bande telle qu'une ou plusieurs bandes de papier (10, 10', 10'', ...),
avec un cylindre de support (14) enveloppé par une partie de la bande pour un support au moins partiel du ou des rouleaux à bobiner (20, 20', 20'', ...),
caractérisé par
un certain nombre de galets ou de cylindres de pression (31A, 32A, 33A) disposés de manière essentiellement parallèle au premier cylindre de support (14) dans la direction machine et répartis sur la portion de la circonférence du cylindre de support (14) enveloppé par la bande (10, 10', 10'', ...) et par
des ensembles d'entraînement pour un déplacement radial et également, au moins en partie, circonférentiel des galets ou cylindres de pression depuis une position de repos jusqu'à une position de pression de contact et vice versa,
où les galets ou cylindres de pression consistent en au moins deux galets ou cylindres à éléments constitutifs écartés axialement (31A, 31A; 32A, 32A; 33A, 33A) pour chaque position circonférentielle.
2. Dispositif d'introduction de bande selon la revendication 1, **caractérisé en ce que** les espaces (31D, 32D, 33D) entre les galets de pression (31A, 31A; 32A, 32A; 33A, 33A) forment une voie de passage (42) pour au moins une piste adhésive (40).
3. Dispositif d'introduction de bande selon la revendication 1 ou 2, **caractérisé en ce que**, pour au moins une des dispositions des galets de pression, les galets de pression espacés axialement sont placés de manière à être mobiles en combinaison avec un

élément constitutif radial par rapport au cylindre de support enveloppé (14), en plus du déplacement des moyens d'entraînement, tel qu'un haricot de support (34).

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4. Dispositif d'introduction de bande selon une des revendications 1 à 3, **caractérisé en ce que** les dispositions d'entraînement pour déplacer les galets de pression présentent des surfaces de guidage de bande pour la matière de bobinage.

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5. Dispositif d'introduction de bande selon une des revendications 2 à 4, **caractérisé par** une machine de collage pour appliquer de la colle sur un ou plusieurs éléments de surface spécifiables (40) d'un début de bande (10A) de la matière de bobinage dans une disposition de niveau avec la voie de passage (42).

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