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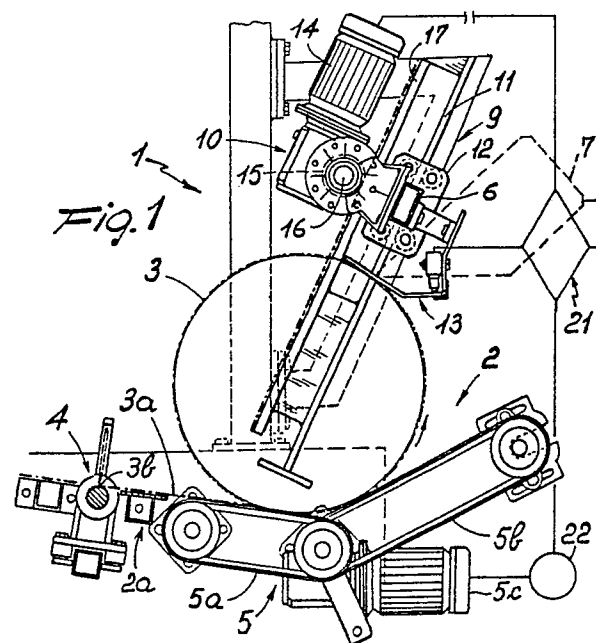
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54 **Device and process for locking a terminal edge of a fabric roll.**

57 It is foreseen a device used for locking a terminal edge of a fabric roll, including lock devices (7) suitable for applying adhesive labels (8), positioning members (5) including mobile bearings (5a, 5b) for a fabric roll (3) and a drive member (5c) suitable for turning said roll (3) therearound, a positioning zone (2a) for a terminal edge (3a) of said fabric developing along a prefixed length between a cutting edge (3b) of said terminal edge (3a), and synchronization means (21) suitable for locating the position of said cut edge (3b) and active onto said drive member (5c) and onto said lock device (7). Further it is foreseen a process including the rotation of said roll (3) in a direction suitable for winding said terminal edge (3a) and the application of adhesive labels (8) to said roll (3), these labels being forcedly supplied with a feeding speed coincident with the peripheral rotation speed of said roll (3).



DEVICE AND PROCESS FOR LOCKING A TERMINAL EDGE OF A FABRIC ROLL

The present invention has the scope of supplying a device and a process for locking a terminal edge of a fabric roll and it is included within the technical field of machines used for automatical winding of fabrics and cloths.

As it is well-known, actually the locking of the terminal edge of a fabric roll formerly wound around e.g. a cylindrical cardboard element is made by some proper lock elements of the wound fabric applied to the said roll, using one or more lock devices. Generally the lock elements are adhesive bands that, using proper lock devices including particular feeders, are applied by adhesion onto the fabric roll on a length corresponding to its whole circumference.

The adhesive bands are normally fed from the lock devices by the drawing action of the rotating fabric roll after a little initial part of lock device was joined by adhesion to this last roll.

The above mentioned technics shows important drawbacks.

In fact a first drawback is caused by the surface length related to the adhesive band contact.

This length corresponds, for each applied band, to the whole circumference of the fabric roll. This causes the possibility of damaging the whole more external turn of the fabric roll, as generally the adhesive band causes some traces or signs onto the fabric, above all if the said fabric is of soft type.

Further during the use it is necessary to cut the adhesive band, instead of separating it simply by detaching, using particular attention for avoiding the fabric damages, as it is not possible to find easily the band final point, overlapped to another zone thereof, and starting its removal from this position.

A second important drawback is the stretch of the fabric, that is caused onto the roll surface, being the adhesive band applied onto the same roll by the motoring over of this last roll, driven previously in rotation. This drawback is particularly important in the fabrics of soft type.

Both above mentioned drawbacks make often impossible the use of at least the more external turn of the fabric roll, and this damaged turn must be rejected.

It was tried to solve at least the first drawback using special strips of adhesive band, having a considerably high cost, suitable for avoiding to let the traces onto the fabric, but the obtained results are not satisfactory.

In this situation the technical scope of the present invention is to supply a device and a process for locking a terminal edge of a fabric roll

suitable for obviating substantially the above mentioned drawbacks.

In the field of this technical scope, an important aim of the invention is to supply a device and a process in which the damages caused to the external surfaces of the fabric roll by the lock elements of the terminal edge are substantially reduced, and in which the stretches or tensions of the fabric are totally avoided above all in the application zones of the locking element of the terminal edge.

Another important scope of the invention is to supply a device and a process in which the removal of the lock elements is easier during the use of the fabric roll.

The above mentioned technical scope and the specified scopes are substantially obtained by means of a device used for locking a terminal edge of a fabric roll, including a seat suitable for housing a fabric roll and at least a lock device suitable for applying the adhesive bands onto said roll, characterized in that it includes the positioning members for said roll establishing at least partially said seat and including mobile bearings and a drive member suitable for turning said roll therearound, a positioning zone for the terminal edge of said fabric developing along a prefixed length between a cutting edge of said fabric and said roll, and synchronization means supplied with sensors suitable for locating the position of said cutting edge, said synchronization means being joined to said drive member and to said lock member for operating said lock member substantially during the passage of said cutting edge thereunder, in said device being foreseen with at least a said lock device suitable for supplying the adhesive elements developing along a no prevailing part of the circumference of said roll.

Further it is foreseen a process for locking a terminal edge of a fabric roll that is characterized in that it includes: the rotation of fabric roll in a direction suitable for winding a terminal edge of the said fabric and applying at least an adhesive element onto said roll, the adhesive element developing in a tangential direction with respect to said roll and being forcedly supplied with an feeding speed coincident with the peripheral rotation speed of said roll. Further characteristics shall appear better by the following description of a preferred but not limited fulfilment form of a device and a process for locking a terminal edge of a fabric roll, that is supplied making reference to the annexed drawing tables, in which:

Figure 1 shows in lateral view the device according to the invention;

Figure 2 shows in plan view a part of the

Figure 1; and

Figures 3 and 4 show, in enlarged scale, the details of the device of the Figure 1.

Making reference to the above mentioned figures, the device according to the invention is generally indicated by the reference number 1. It includes a seat 2, suitable for housing a fabric roll 3, showing a terminal edge 3a obtained by the cutting made by a cutting member 4 flanked to the device 1.

In practice the cutting member 4 establishes a cutting edge 3b of the fabric by truncation and it is adjacent to a winding device, located on the left of the cutting members 4 with respect to the Figure 1 in which the roll 3 is formed and then ejected in the direction of the seat 2, passing under the cutting members 4.

The seat 2 is substantially formed by positioning members 5 of the roll 3, including a couple of conveyor belts 5a and 5b and a drive member 5c. The conveyor belts 5a and 5b are laid on a cradle and the drive member 5c drives the same conveyor belts in a manner suitable for turning the fabric roll 3 onto the axle thereof by tangential motoring over.

It is advantageously foreseen a prefixed and substantially constant peripheral speed, corresponding to the progress speed of the same conveyor belts. During the rotation, the roll 3 remains always housed into the seat 2, with the central axle being located in substantially fixed position.

Before rotating the roll 3 around the axles thereof, the terminal edge 3a engages a positioning zone 2a of the fabric having a constant length, equal to the distance between the cutting members 4 and the roll 3.

A bar 6, parallel to the fabric roll 3 and mobile by approaching and moving away with respect to the roll, supports a plurality of lock devices 7, spaced with one another and positioned along the bar 6 (Figure 2) and suitable for feeding adhesive elements 8 defined by adhesive labels, that are wound on a reduced part of the circumference of the fabric roll 3.

The guide members 9 and propulsion members 10, located onto the bar 6, are foreseen at the ends of this last bar.

The guide members 9 include rail elements 11, mounted substantially in radial direction with respect to the fabric roll 3 and trolley elements 12, joined to the bar 6 and sliding onto the rail elements 11. The drive means 10 include, in conjunction with an end 6 of the bar, an electric motor 14, joined to the bar 6 and mobile therewith, a gear 15 keyed onto a shaft 16 parallel to the bar 6 and driven by the rotation of the motor 14 and a rack 17 substantially directed in radial direction with respect to the fabric roll 3 and meshed with the

gear 15.

Each one of the above described lock devices 7 supported by the bar 6, includes (Figure 3) rewinding members 18 of a continuous support band 19, on which the adhesive labels 8 are mounted in succession and separated with one another.

Each lock device 7 includes also propulsion elements 7a suitable for supplying forcedly the adhesive labels 8 with a feeding speed coincident with the foreseen peripheral speed of the roll 3, that is the peripheral speed caused by conveyor belts 5a, 5b by means of the drive member 5c.

Further in conjunction with the lock devices 7 the pressure members 20 of their labels 8 made up of rolls parallel to the fabric roll 3 and supported by elastic members 20a active in the direction of the roll 3 are provided.

Further the device 1 including the synchronization means 21 including electronic programmed logic units and connected both to the locking members 7 and to the drive member 5c.

In detail the synchronization means 21 are suitable for activating the lock devices 7 during the passage of the cutting edge 3b under the said lock devices and for this aim they include sensors, such as a finger 13 and a rotation time gauge 22.

The finger 13 is supported by the bar 6, joined to the electric motor 14 and directed to the roll 3 for locating the diameter of the roll 3. The time gauge 22 is joined to the drive member 5c and is suitable for surveying the rotation time of the roll 3 corresponding to the activation time of the drive member 5.

When the finger 13 causes the stop of the motor 14, the same finger supplies also the informations necessary for recognizing the measure of the diameter of fabric roll 3 and therefore allows the calculation of the above mentioned rotation time of this roll necessary for causing the passage of the cutting edge 3b before the locking devices 7. The running of the above described device according to the invention, that was described under the structural point of view, occurs as follows.

The fabric roll 3, after being formed between the proper winding cylinders, is ejected and partially unwound towards the cutting members 7 and towards the seat 2. The operation of the cutting members 4, located in the side of the seat 2, causes the formation of the cut edge 3b, forming the end of the terminal edge 3a to be wound and fixed. The terminal edge 3a remains unwound and laid onto the positioning zone 2a, with a prefixed length, while the roll 3 is located into the seat 2 onto the positioning members 5.

In this situation the bar 6 is lowered until the finger 13 enters in mesh with the roll 3. In this manner the lock devices 7 are correctly positioned at a suitable operative distance from the surface of

the roll 3. Further the finger 13 supplies a signal for the synchronization means 21 that establishes the exact value of the diameter of the roll 3.

The synchronization means 21 can calculate in this manner a time **T1** necessary for rotating with a prefixed speed the roll 3 by the angle included between the contact zone of the seat 2 located approximatively on the vertical direction with respect to centre of the roll 3, and the feeding point of the adhesive label 8.

Further the synchronization means 21 store a time **T2** necessary for winding of the fabric section having a constant length included between the cutting member 4 and the above mentioned contact zone. Therefore it is foreseen that the roll 3 is wound with a constant peripheral or tangential speed as the conveyor belts 5a, 5b are driven by the drive member 5c with a substantially constant speed, and the time T2 is constant and independent from the diameter of the fabric roll 3.

Also the time T1 can be calculated easily.

The sum of the time T1 and time T2 supplies in this manner the total time **T** corresponding to the rotation of the fabric roll 3 suitable for positioning the end of the terminal edge 4 in the zone foreseen under the lock devices 7.

The feeding of the adhesive labels 8 occurs at a speed coincident with the progress speed of the conveyor belts 5a and 5b, that is also the peripheral speed of the fabric roll 3. In this manner the adhesion of the label to the fabric is made without applying any stretch on the fabric. The roll 20 supplies the application of an spring pressing force, suitable for guaranteeing the perfect adhesion of the label 8 onto the fabric.

The device 1 fulfils a process for locking a terminal edge of a fabric roll, also this being a part of the invention.

This process includes the installation of the fabric roll 3 with a terminal edge 3a to be wound having a prefixed length and the positioning of lock devices 7 of the terminal edge 3a in prefixed position with respect to the fabric roll 3.

In the following the fabric roll 3 is turned for being wound with a prefixed peripheral speed and the lock devices 7 are driven only when the cutting edge 3b of the terminal edge 3a passes thereacross, that is being interlocked to the said above described peripheral speed and the prefixed length of the terminal edge 3a. The adhesive label is applied onto the fabric roll, this label being advantageously supplied at a speed coincident with the peripheral rotation speed of the same fabric roll.

The invention achieves important advantages.

In fact the locking of the terminal edge of the fabric roll damages in a very reduced manner the external surface of the fabric, if it is made accord-

ing to the invention. In fact a very reduced area is taken by the adhesive labels and the same labels are applied without stretching the fabric.

Further it must be underlined that the manual removal of the adhesive labels is made easier by the more simple location of the start and final ends thereof, made easier by the visual contrast with the fabric. In this manner it is also avoided the necessity of using cutting elements that can damage the underlying fabric.

Claims

1) A device used for locking a terminal edge of a fabric roll, including a seat (2) suitable for housing a fabric roll (3) and at least a lock device (7) suitable for applying the adhesive elements (8) onto said roll (3), characterized in that it includes:

-positioning members (5) for said roll (3) establishing at least partially said seat (2) and including mobile bearings (5a, 5b) and a drive member (5c) suitable for turning said roll (3) therearound,

-a positioning zone (2a) for a terminal edge (3a) of said fabric developping along a prefixed length between a cutting edge (3b) of said fabric and said roll (3),

-and synchronization means (21) supplied with sensors (13, 22) suitable for locating the position of said cutting edge (3b), said synchronization means (21) being connected to said drive member (5c) and to said lock member (7) for causing the operation of said lock member (7) substantially during the passage of said cutting edge (3b) thereunder,

-in said device being foreseen with at least a said lock device (7) suitable for supplying the adhesive elements (8) developping along a no prevailing part of the circumference of said roll (3).

2) A device according to Claim 1, in which said positioning means (5) include conveyor belts (5a, 5b) driven by said drive member (5c) with a constant and prefixed speed suitable for rotating said fabric roll (3) with a constant and prefixed peripheral speed.

3) A device according to Claim 2, in which said synchronization means (21) include sensor elements defined by a finger (13) suitable for measuring the diameter of said fabric roll (3) and a time gauge (22) suitable for surveying the activation time of said drive member (5c).

4) A device according to Claim 1, in which said positioning zone (2a) of said terminal edge (3a) develops between said roll (3) and a cutting member (4) external to said positioning members (5), said cutting member (4) being suitable for fulfilling said cutting edge (3b) truncating said fabric.

5) A device according to Claim 1, in which it is foreseen at least one said lock device (7) including

internally the drive elements (7a) suitable for supplying forcedly said adhesive elements (8) onto said fabric roll (3) with a feeding speed coincident with the peripheral speed of said fabric roll (3), that is turned by means of said positioning members (5).

6) A device according to Claim 5, in which said adhesive elements (8) are defined by adhesive labels, said adhesive labels being mounted in succession among one another onto a continuous support strip (19) and said lock device (7) including rewinding members (18) for said support strip (19).

7) A device according to Claim 1, in which at least one said lock device (7) is mounted onto a bar (6) parallel to said fabric roll (3) and in which it is foreseen the guide members (9) and control members (10) for said bar (6) foreseen at the end thereof, suitable for moving said bar (6) approaching and moving away with respect to said roll (3).

8) A device according to Claim 7, in which said guide members (9) include rail elements (11), located substantially in radial direction with respect to said fabric roll (3) and trolley elements (12) joined to said bar (6) and sliding onto said rail elements (11).

9) A device according to Claim 7, in which said control members (10) include an electric motor (14) joined to said bar (6) and mobile therewith, a gear (15) driven rotatably by means of said electric motor (14) and mobile in translation therewith, and a rack (17) fixed in position substantially directed in radial direction with respect to said fabric roll (3), said rack (17) being meshed with said gear (15) and said electric motor (14) being controlled for stopping by means of a finger (13) supported by said bar (6) and directed towards said roll (3).

10) A device according to Claim 1, in which in conjunction with at least one said locking device (7) it is foreseen a pressure member (20) for said adhesive elements (8) defined by a roll located parallel to said roll (3) and supported by spring means (20a) active in the direction of said roll (3).

11) Process for locking a terminal edge of a fabric roll, characterized in that it includes:
-the rotation of a fabric roll (3) in a direction suitable for winding a terminal edge (3a) of said fabric,
-and the application onto said rotating fabric roll (3) of at least an adhesive element (8) developing in a direction circumferential with respect to said roll (3) and supplied forcedly with a feeding speed coinciding with said peripheral rotation speed of said fabric roll (3).

12) Process according to Claim 11, characterized in that it includes the location in prefixed positions both of said terminal edge (3a) and at least a lock device (7) suitable for applying said adhesive element (8), and the actuation of said lock device (7), while said roll is driven in rotation only

when said cut edge (3b) of said terminal edge (3a) passes under said lock device (7).

13) Process according to Claim 12, characterized in that it includes the location of said fabric roll (3) with a section still unwound by a prefixed length, the rotation in winding direction of said roll (3) with a substantially constant and prefixed peripheral speed, and interlocking the operation of said lock device (7) with a time measure related to said prefixed length and speed and to the diameter of said roll (3).

