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(54) Device to uniformly raise the centre and selvages of a fabric

(57) Device to uniformly raise the centre and the selvages of a fabric, the device being applied to raising machines (10) with a raising drum (16) having a plurality of raising cylinders (11) on the circumference, the raising drum (16) cooperating with an inlet drawing cylinder (17a) and an outlet drawing cylinder (17b), the device including means (13) suitable to differentiate the winding angle (a,b) of the fabric (12) onto the raising drum (16) at least between the central strip and at least a lateral strip near the selvages.

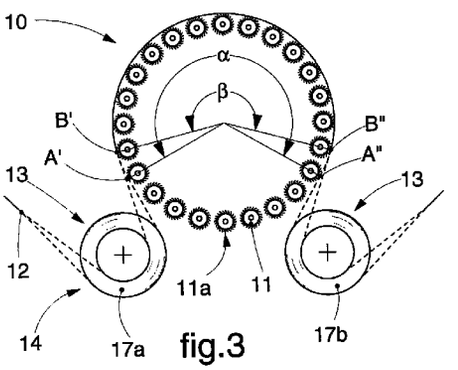

fig.3

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Description

FIELD OF THE INVENTION

[0001] This invention concerns a device to uniformly raise the centre and selvages of a fabric, as set forth in the main claim.

[0002] The invention is applied in raising machines in order to make uniform the action of the raising cylinders over the whole width of the fabric, preventing dis-uniformity between the centre and the areas near the lateral edges, or selvages, of the fabric.

BACKGROUND OF THE INVENTION

[0003] The state of the art in the textile field includes raising machines wherein the fabric is wound onto a raising drum which has a plurality of rotary raising cylinders on the circumference.

[0004] Each of the raising cylinders is lined with a packing consisting of a linen and/or rubberised strip, or felt, covered by metallic needles inclined in the direction of advance of the fabric, or in the opposite direction, which penetrate the passing fabric and pull the fibres of the threads.

[0005] At the outlet of the raising machines we obtain a fabric with a desired downy surface so that the weave of the warp yarn and the weft yarn is hidden.

[0006] The length of the raising cylinders is usually greater than the width of the fabric being worked; this is so as to cover a vast range of fabric widths with the same machine and also to make absolutely certain that the entire width of the fabric is raised.

[0007] For different fabric widths, however, the central area of the packing is always influenced by the raising action, whereas the lateral areas are not always so, which causes a differentiated wear on the packing.

[0008] It should also be remembered that the fabric, from inlet to outlet and due to the effect of the raising action, progressively shrinks so that the lateral parts of the packing of the cylinders in any case become worn in a differentiated manner with respect to the central part.

[0009] The different wear on the packings entails a different raising action on the centre of the fabric and the selvages, or edges, thereof.

[0010] This problem of dis-uniformity between the centre and the selvages, and even between one selvage and the other, is also caused by other factors which depend on the weave of the fabric itself, the type of yarn used, the type of selvage, and on whether the fabric is obtained on frames with or without shuttles, and on other factors.

[0011] In order to solve this shortcoming, there has been a proposal to feed the raising machines cyclically, with the fabric displaced completely to the right and then in the subsequent cycle with the fabric displaced completely to the left; but even with this embodiment, the wear on the packings in the central area is still more accentuated than on the periphery and therefore the problem is reduced but not eliminated.

[0012] Various guide devices have been proposed, suitable to laterally displace the fabric in correspondence with the less worn parts of the packings.

[0013] These guide devices have proved to be inefficient, costly, complex both to make and to operate, and difficult to maintain. Even with these devices, the problem of uneven raising is not completely eliminated.

[0014] The lateral translation of the fabric being worked, moreover, often leads to the formation of creases which can compromise the raising process and therefore make it necessary to discard the sections of fabric with such creases, with a consequent loss of production.

[0015] The guide devices, moreover, cannot easily be implemented on existing textile machines, since they require substantial modifications in the configuration thereof.

[0016] The present Applicant has designed and embodied this invention to overcome these shortcomings and to obtain further advantages.

SUMMARY OF THE INVENTION

[0017] The invention is set forth and characterised in the main claim, while the dependent claims describe other characteristics of the main embodiment.

[0018] The purpose of the invention is to provide a device suitable to raise the entire width of the fabric in a uniform manner, particularly the centre and the selvages, which will be simple to construct and to operate, economical and easily applicable even to existing textile machines and efficient for every type of fabric and for every type of yarn.

[0019] The device according to the invention includes means suitable to change the winding angle, or angle of adherence, of the fabric onto the raising drum in the various transverse zones of the fabric and in particular to change the winding angle between the centre and the lateral zones thereof.

[0020] "Winding angle" should be taken to mean the angle measured at the centre of the raising drum, subtended between the point of contact, or inlet, and the point of detachment, or outlet, of the fabric with the raising drum.

[0021] Thanks to these means, in correspondence with at least one of the lateral zones, or of both, the fabric has a different winding angle onto the drum, for example smaller, compared with that of the fabric at the centre.

[0022] A different angle means that the raising action is performed for a different time, for example, a shorter time, in the proximity of the selvages compared with the centre.

[0023] A possibly reduced raising time compensates the lesser wear of the packings in correspondence with the lateral zones of the raising cylinders and therefore

balances the raising action thereof in order to make the raising action uniform over the whole length of the cylinders, that is over the whole width of the fabric.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The attached Figures are given as a non-restrictive example, and show some preferential embodiments of the invention, as follows:

- Fig. 1 shows a raising machine in diagram form to which the device according to the invention is applied;
- Fig. 2 is a diagram showing the working of the device according to the invention;
- Fig. 3 shows a first embodiment according to the invention;
- Fig. 4 shows another embodiment of the invention;
- Fig. 5 shows a detail outlining the working of the embodiment shown in Fig. 4.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0025] Fig. 1 shows a diagram of a raising machine 10 comprising a raising drum 16 on the circumference of which a plurality of raising cylinders 11 is mounted, equipped with their own rotatory motion, in the same and/or in the opposite direction with respect to the motion of the drum 16.

[0026] Each of the raising cylinders 11 is lined by a packing 11a with needles or hooks to extract the threads from the fabric 12 while it is winding onto the drum 16 and to give the fabric the desired downy feel.

[0027] The raising machine 10 has an inlet drawing cylinder 17a and an outlet drawing cylinder 17b between which the fabric 12 is maintained under tension while it is winding around the drum 16.

[0028] The drawing cylinders 17a and 17b substantially define the winding angle of the fabric 12 around the drum 16, defined as the angle at the centre subtended between the point of contact A at the inlet and the point of contact B at the outlet from the drum 16.

[0029] The device 14 according to the invention consists of means 13 which are pre-disposed to make the winding angle of the fabric 12 onto the drum 16 different, at least between the central zone of the fabric 12 and its lateral zones near the edges or selvages of the fabric 12.

[0030] In other words (Fig. 2), the means 13 make the winding angle α of the central strip of the fabric 12 different, and in this case greater, compared with the winding angle β of the lateral zones; in this way, the lateral zones are affected by the raising action for a shorter time, thus balancing and compensating the differentiated wear of the packing 11a of the raising cylinders 11, which is usually greater in correspondence with the central zone.

[0031] In this way the means 13 are pre-disposed to make the points of contact, inlet A' and outlet B', of the central part of the fabric 12 different from the points of contact, respectively inlet A" and outlet B", of the lateral zones of the fabric 12.

[0032] In a typical application of the invention, the winding angle α assumes a value of between 220° and 290°, preferably around 240°÷250°, and the winding angle β assumes a value of between 190° and 260°, preferably around 220°÷230°.

[0033] According to a first embodiment of the invention, the means 13 cooperate with the conformation of the profile of at least one of the drawing cylinders 17a and 17b.

[0034] In the embodiment shown in Fig. 3, the drawing cylinders 17a and 17b, in this case both, have a rounded profile with a central convexity so that the fabric 12, winding under tension between the drawing cylinders, comes into contact with the raising cylinders 11 first with its central strip and then with its lateral zones.

[0035] According to a variant which is not shown here, the profile of the drawing cylinders 17a and 17b is concave.

[0036] According to another variant which is not shown here, the profile of the drawing cylinders 17a and 17b is substantially plane, but their axis of rotation is arched, so that during the rotation movement the generatrix of the cylinders 17a and 17b assumes a desired, non-circular trajectory which causes an effect of differentiation, at inlet and at outlet, between the centre and the lateral zones of the fabric 12.

[0037] In the embodiments described above, the drawing cylinders 17a and 17b may be made revolving with respect to the axis of advance of the fabric 12 or the axis of the drum 16 so as to vary the angles with which the fabric is brought nearer to the drum 16 and therefore to displace the relative points of contact A', B' and A", B" so as to regulate in a desired manner the raising time and hence the raising action, for example according to the wear of the packing 11a of the cylinders 11, the type of processing and other factors.

[0038] According to another variant, the drawing cylinders 17a and 17b can be replaced by others with a different rounded shape, or with a differently arched axis of rotation, according to the desired differentiation of the winding angle between the various zones of the width of fabric 12.

[0039] In the variant shown in Figs. 4 and 5, the means 13 consist of a shaped bar 15 with an axis substantially parallel to that of the raising cylinders 11 and a convex profile towards the centre of the raising cylinders 11.

[0040] A first shaped bar 15 is arranged between the inlet drawing cylinder 17a and the first point of contact of the fabric 12 on the drum 16 and a second shaped bar 15 is arranged between the last point of contact of the fabric 12 with the drum 16 and the outlet drawing cylinder 17b (Fig. 4).

[0041] The arched conformation at the centre of the

shaped bars 15 with the rounded shape 115, in cooperation with relative return rollers 18, changes the direction of the fabric 12 before it comes into contact with the drum 16, so that the central part of the fabric 12 is taken into contact at the point A' of the raising cylinders 11 before the lateral zones (point B').

[0042] In the same way, at outlet, the rounded shape 115 makes the central part of the fabric remain in contact with the raising cylinders 11 until point A", while contact between the raising cylinders 11 and the lateral zones remains until point B", upstream of point A".

[0043] In this way the winding angle α of the central strip of the fabric 12 is greater than the winding angle β of the lateral zones.

[0044] According to other variants which are not shown here, but which in any case come within the field and scope of this invention, the shaped bar 15 can be replaced by rounded or convex cylinders, by rotary cylinders with an arched axis, by shaped blades or other appropriate devices, with adjustable rounded, convex or concave shape, or with an inclination or position which can be regulated according to the desired differentiation of the points of first and last contact between the fabric 12 and the raising drum 16.

Claims

1. Device to uniformly raise the centre and the selvages of a fabric, the device being applied to raising machines (10) with a raising drum (16) having a plurality of raising cylinders (11) on the circumference, the raising drum (16) cooperating with an inlet drawing cylinder (17a) and an outlet drawing cylinder (17b), the device being characterised in that it includes means (13) suitable to differentiate the winding angle (α,β) of the fabric (12) onto the raising drum (16) at least between the central strip and at least a lateral strip near the selvages.

2. Device as in Claim 1, characterised in that the means (13) cooperate with the conformation of the profile of at least one of the drawing cylinders (17a, 17b).

3. Device as in Claim 2, characterised in that at least one of the drawing cylinders (17a, 17b) has a rounded profile at the centre.

4. Device as in Claim 2, characterised in that at least one of the drawing cylinders (17a, 17b) has a convex profile.

5. Device as in any claim hereinbefore, characterised in that at least one of the drawing cylinders (17a, 17b) rotates around an arched axis.

6. Device as in any claim hereinbefore, characterised in that the drawing cylinders (17a, 17b) have an inclination which can be adjusted with respect to the axis of advance of the fabric (12) and/or the axis of the drum (16).

7. Device as in Claim 1, characterised in that the means (13) comprise at least a shaped element (15) with an axis substantially parallel to the raising cylinders (11) and with a central rounded shape (115) facing towards the raising cylinders (11), at least one of the shaped elements (15) being arranged between the inlet drawing cylinder (17a) and the entrance of the fabric (12) onto the drum (16).

8. Device as in Claim 7, characterised in that at least one shaped element (15) is arranged between the outlet of the fabric (12) from the drum (16) and the outlet drawing cylinder (17b).

9. Device as in Claim 7 and 8, characterised in that the shaped element (15) is a bar, a blade or a cylinder.

10. Device as in any claim from 7 to 9 inclusive, characterised in that the shaped element (15) has an inclination which can be adjusted with respect to the axis of advance of the fabric (12) and/or the drum (16).

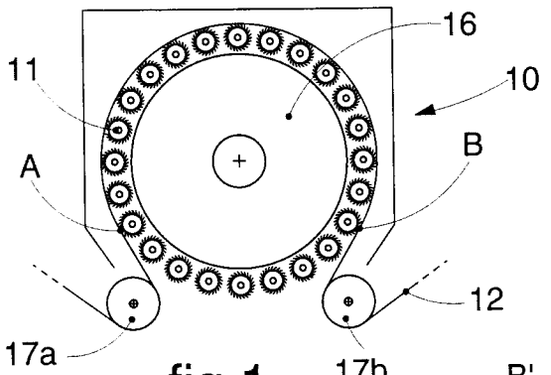

fig.1

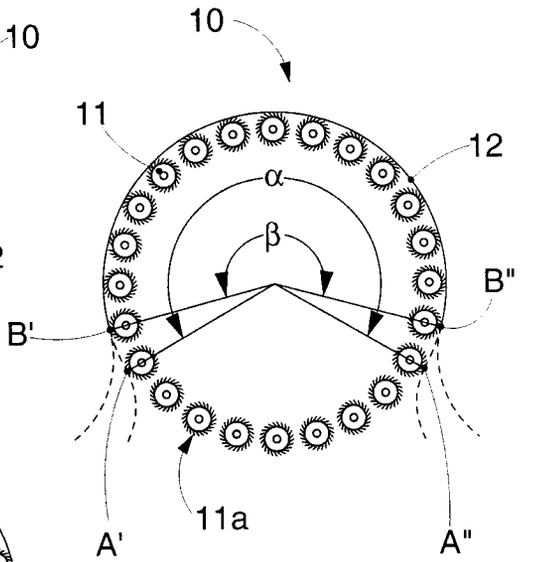

fig.2

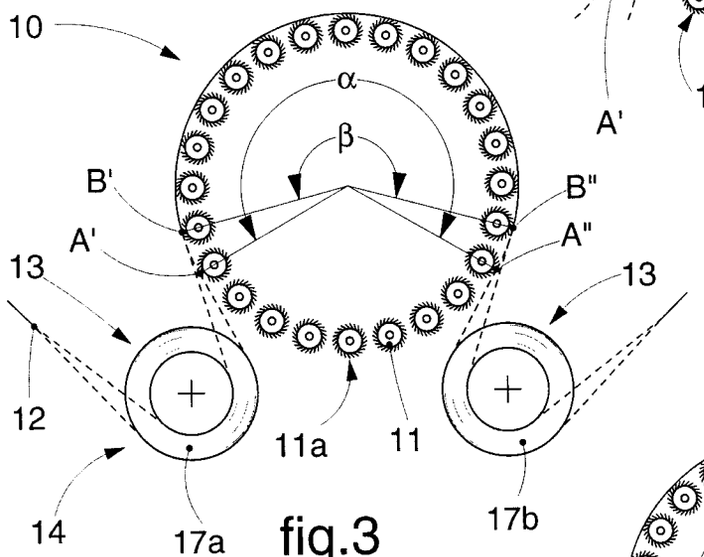

fig.3

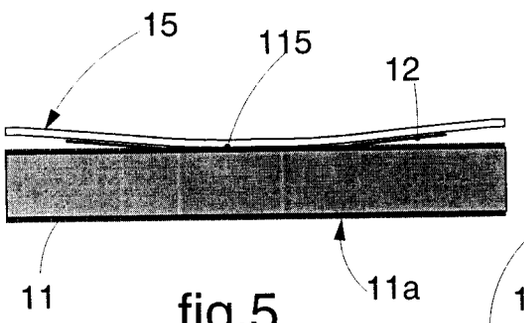

fig.5

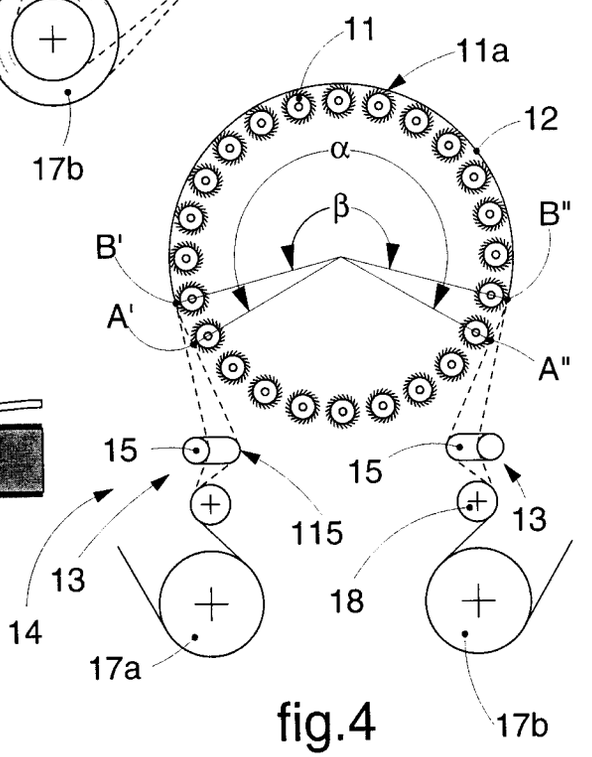

fig.4