

[54] SMOOTHENING DEVICE FOR
CROSS-LAPPER

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[58] Field of Search..... 19/161 R, 163; 270/79

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[57]

ABSTRACT

A cross-lapping device for cross-lapping pile or laying web to form fleece, according to which one or two rotatable blade wheels in addition to the cross-lapping means, preferably together therewith, are reciprocable in such a way that an air current is generated which is directed toward the lateral rim portions of the fleece to be cross-lapped.

6 Claims, 4 Drawing Figures

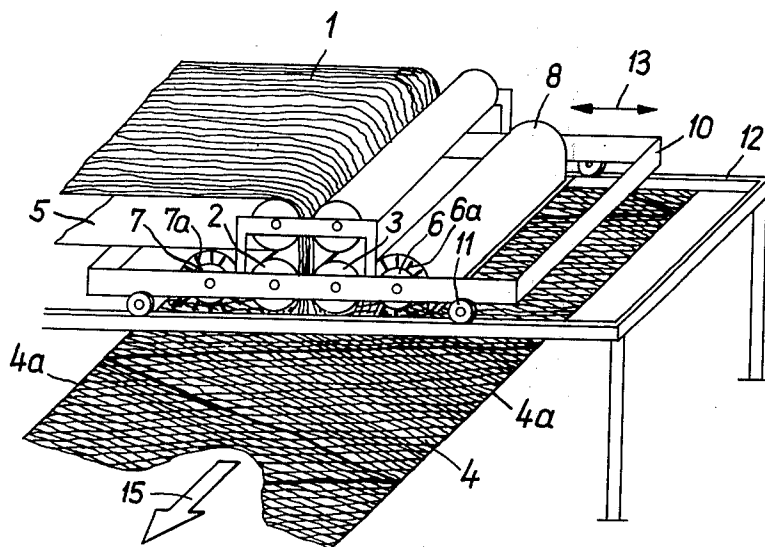


FIG. 1

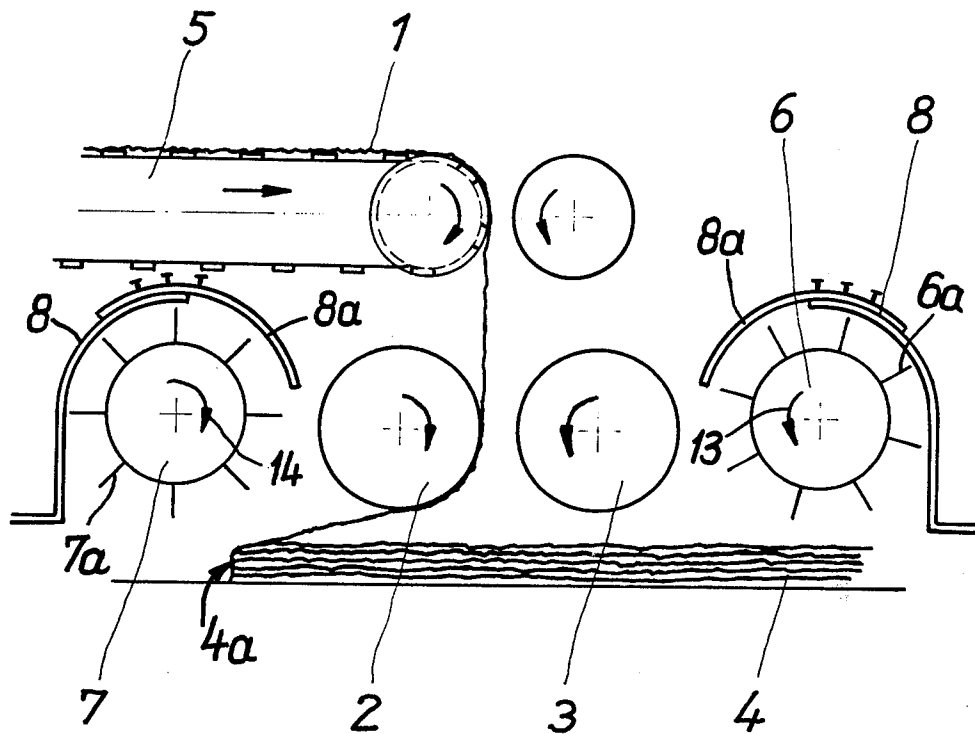


FIG. 2

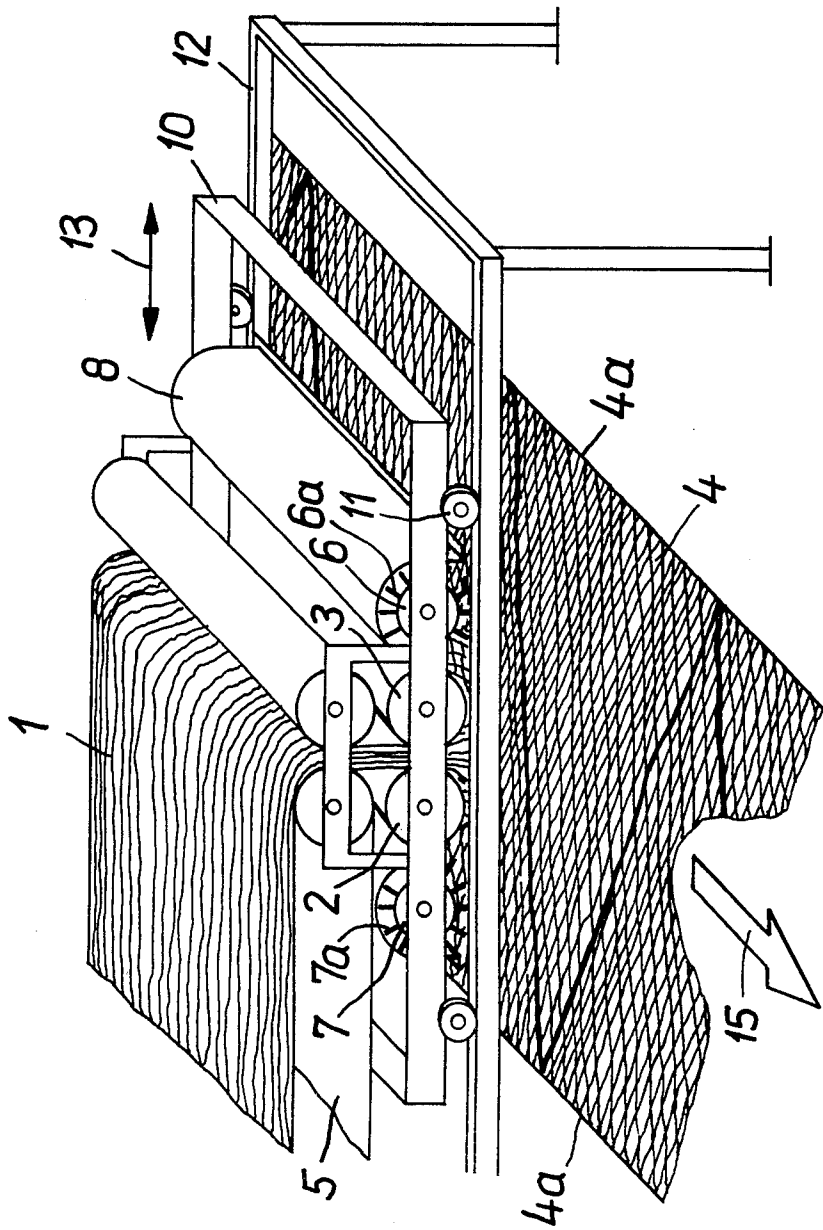


FIG. 3

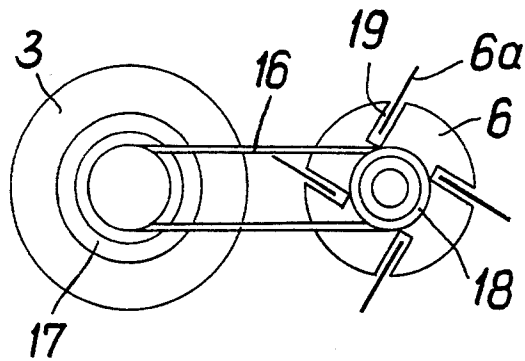
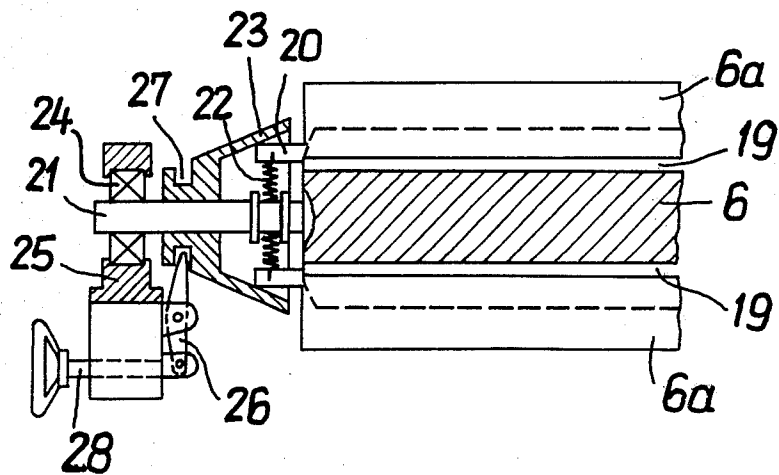


FIG. 4



SMOOTHENING DEVICE FOR CROSS-LAPPER

The present invention relates to a cross-lapping device for cross-lapping pile or laying web to form fleece. All heretofore known cross-lapping devices, regardless of their construction, have the drawback that the guidance of the air during the back and forth movement of the cross-lapping carriage takes place in an uncontrolled manner. This results in an air suction which in particular with a laying web of low specific weight causes a disadvantageous turning over at the lateral margins or rims of the fleece to be cross-lapped.

It is, therefore, an object of the present invention to provide a cross-lapping device which will overcome the above mentioned drawback.

It is another object of this invention to provide an improved cross-lapping device by means of which the turning over of the laying web at the folded edges and lateral margins of the fleece to be cross-lapped can be avoided so that a uniform substantially fold-free fleece can be cross-lapping.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 diagrammatically illustrates a side view of a cross-lapping device according to the invention with blade wheels or drums and adjustable guide hoods therefor.

FIG. 2 shows in a more detailed manner and by way of an isometric view the arrangement of FIG. 1.

FIG. 3 diagrammatically illustrates a speed variable drive for the blades of the blade wheels or drums.

FIG. 4 shows a device for adjusting the position of the blades of the blade wheels or drums.

In conformity with the fundamental feature of the present invention, it is provided to equalize or compensate for the air suction which is generated during the back and forth movement of the leasing carriage. Accordingly, the present invention is characterized primarily in that adjacent the leasing devices there are provided one or more drivable blade wheels or drums, which are preferably movable back and forth together with the leasing devices, in such a way that an air flow is generated which is directed at the lateral margins of the fleece to be leased.

In view of this arrangement, it is possible to effectively avoid an air suction effect in the region of the lateral margins of the fleece to be cross-lapped. This in turn prevents the turning over of the fleece within the region of the lateral margins so that it will be possible to lease a uniform and substantially fold-free fleece.

According to an advantageous feature of the invention, the speed and/or the position of the blades of the blade wheels can be varied. Furthermore, according to an advantageous further development of the invention, the blade wheels have associated therewith adjustable guiding blades by means of which the air flow can be guided in a desired direction.

With all cross-lapping devices in which pile is transformed into fleece, the pile or laying web 1 is cross-lapped between so-called mangle or calender rollers 2 and 3 to form a fleece 4 which is withdrawn on a transversely moving surface in the direction of the arrow 15 (FIG. 2). In this connection, the pile 1 is passed over a feeding table 5. As will be seen from FIG. 2, this feeding table 5 and the mangle or calender rollers 2 and 3

are arranged on the cross-lapping carriage 10 which by means of the rollers 11 is movable back and forth on a frame 12 in the direction of the double arrow 13a to form folds in the fleece on the moving receiving surface.

In view of the back and forth movement of the cross-lapping carriage 10, a suction effect occurs in the direction of movement, especially at the reversing points of the back and forth movement. This suction effect is to be equalized or compensated for in conformity with the principle of the present invention. According to the invention, this is brought about by generating a directed air flow which counteracts the suction effect. To this end, in addition to the calender rollers 2 and 3, there are according to the present invention, provided two blade wheels or drums 6 and 7 which are rotatable and adapted to generate an air flow directed toward the lateral rim areas 4a of the fleece 4 and prevent the pile or laying web from being turned over.

According to FIG. 2, the two blade rollers or drums 6 and 7 are preferably likewise arranged on the cross-lapping carriage 10 and thus are adapted to be moved back and forth together with the feeding table 5 and the calender rollers 2 and 3.

With an embodiment according to the invention having for instance two blade drums of which one drum 6 is located at the outside of the calender roller 3 and the other drum 7 is located at the outside of drum 2, the blade drums 6 and 7 rotate in opposite direction with regard to each other as indicated by the arrows 13 and 14.

Each of said blade rollers or blade drums 6 and 7 has a protective hood 8 associated therewith. By adjusting the section 8a of said hoods 8 it is possible to precisely control and adjust the intensity and direction of the air streams generated by said blade rollers or drums 6 and 7.

By varying the speed of the blade drums 6 and 7 and by varying the position of the blades 6a and 7a of the blade drums, it is possible precisely to adjust the circulated quantity of air in conformity with the occurring suction and, if desired, to vary said quantity of air in conformity with the desired setting. The static pressure generated by the rotating blade drums 6 and 7 is preferably selected so as to be greater than or equal to the underpressure generated by the movement of the cross-lapping carriage 10.

FIG. 3 diagrammatically illustrates a drive for blade drums with variable speed of rotation thereof. The drawing illustrates by way of example a drive for the blade drum 6 arranged on the outside of calender roller 3. The drive is derived from the driven calender roller 3 by means of the driving belt 16. A change in the speed of the blade drum 6 is possible by the stepped pulleys 17 and 18 on calender rollers 2 and 3 respectively.

FIG. 4 diagrammatically illustrates a device for adjusting the position of the blades 6a and 7a of blade drums 6 and 7 respectively. As will be seen from FIG. 3, the blades are slidably arranged in slots 19 and by means of the device of FIG. 4 can be more or less moved out of or into the respective slots 19. The blades 6a are equipped with adjusting pins 20 which axially project beyond the periphery of the roller body 6. These pins 20 are respectively acted upon from drum shaft 21 by pressure springs 22 in outward direction against the inner mantle of an adjusting funnel 23 while

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the pressure springs and said adjusting funnel rotate with the blade drum 6 and shaft 21 thereof. Shaft 21 is supported in bearing support 25 by means of the bearing 24. By axially displacing the adjusting funnel 23, it is possible to adjust the blades 6a in slots 19 of drum body 6 in inward or outward direction. The adjustment of the adjusting funnel 23 is effected by means of the two-arm lever 26 which is shiftably supported by the bearing support 25. Lever 26 has one of its ends extend into a radial annular groove 27 of the adjusting funnel 23 and can at its other end be tilted by means of an adjusting spindle 28.

It is, of course, to be understood that the invention is, by no means, limited to the specific showing in the drawings but also comprises any modifications within the scope of the appended claims. Thus, while the specific embodiment shown in the drawings has two blade drums, the device according to the invention is also operable with one blade drum.

What I claim is:

1. A cross-lapping device for cross-lapping a web onto a receiving surface to form folds in said fleece, which includes a reciprocable carriage having a feeding table and calendar rollers between which the web is fed and is crosslapped, whereby said web is folded at each end of movement of said reciprocating carriage to form folded edges, blade wheel means at opposite ends of

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said carriage between said calendar rollers and the end of said carriage to direct a current of air onto the folded edge at each end of the travel of said carriage, and drive means to drive said blade wheel means.

2. A device in combination according to claim 1, which includes control means associated with said blade wheel means for variation of the speed of rotation of said blade wheel means.

3. A device in combination according to claim 2, in which the blades of said blade wheel means are adjustable, and which includes adjusting means for adjusting said adjustable blades.

4. A device in combination according to claim 1, which includes adjustable guide means arranged adjustably with said blade wheels including protective hoods for variably influencing the flow intensity of said air current.

5. A device in combination according to claim 4, which includes means for controlling within the region of the lateral folded edges of the fleece to be cross-lapped generation of the static pressure of the air current generated by said blade wheel means.

6. A device in combination according to claim 5, which includes means for controlling said static pressure so as to cause the same to at least equal the under-pressure created by the reciprocable feeding table.

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