April 8, 1969 K. QUOOS ET AL 3,436,935

DEVICE FOR THE BREADTH TREATMENT OF TEXTILE BREADTHS BY MEANS OF A LIQUID

Filed March 17, 1967 Sheet 1 of 4

FIG. 1

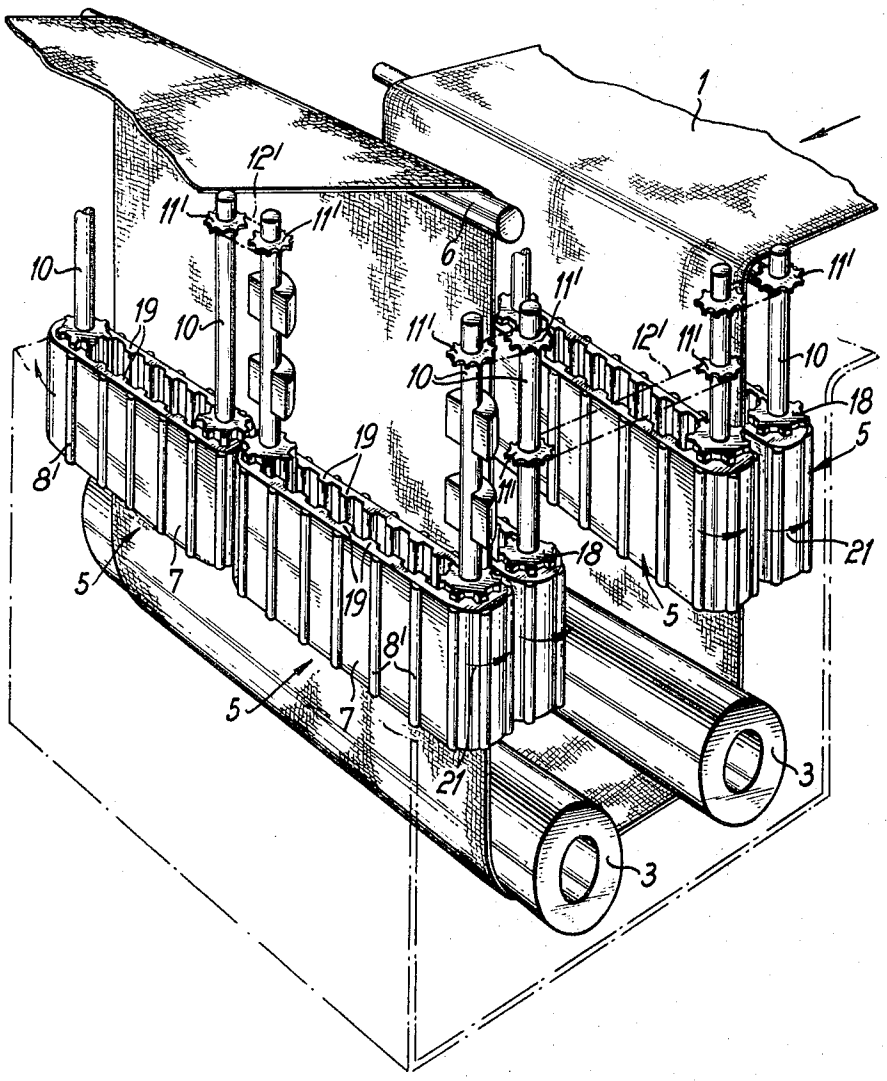

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FIG. 2

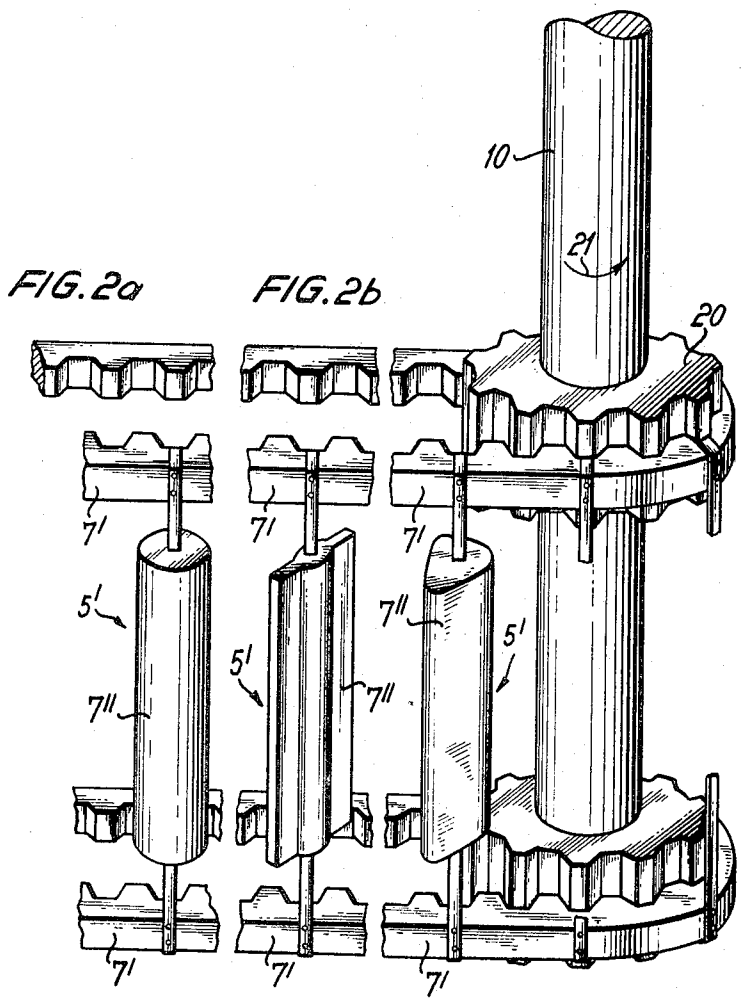

FIG. 2a FIG. 2b

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FIG. 3

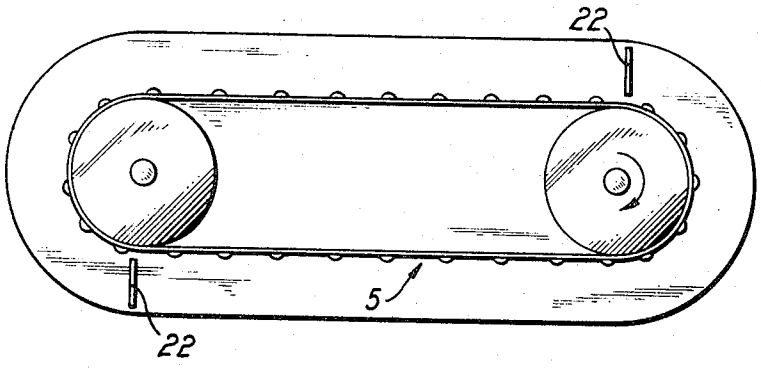

FIG. 4

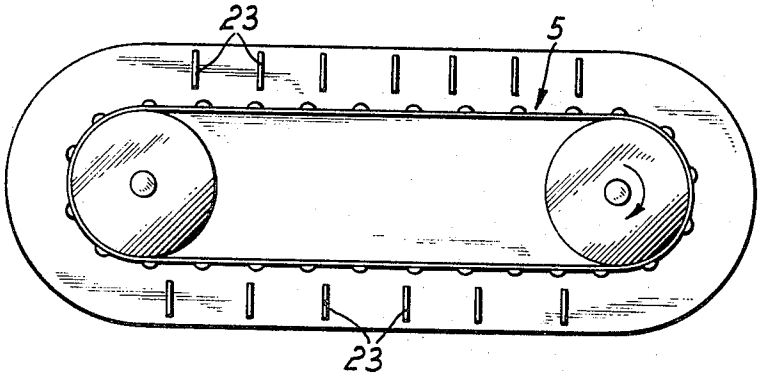

FIG. 6

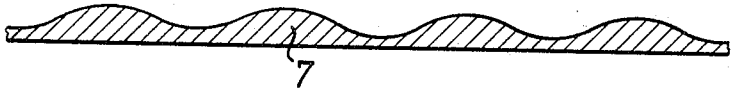

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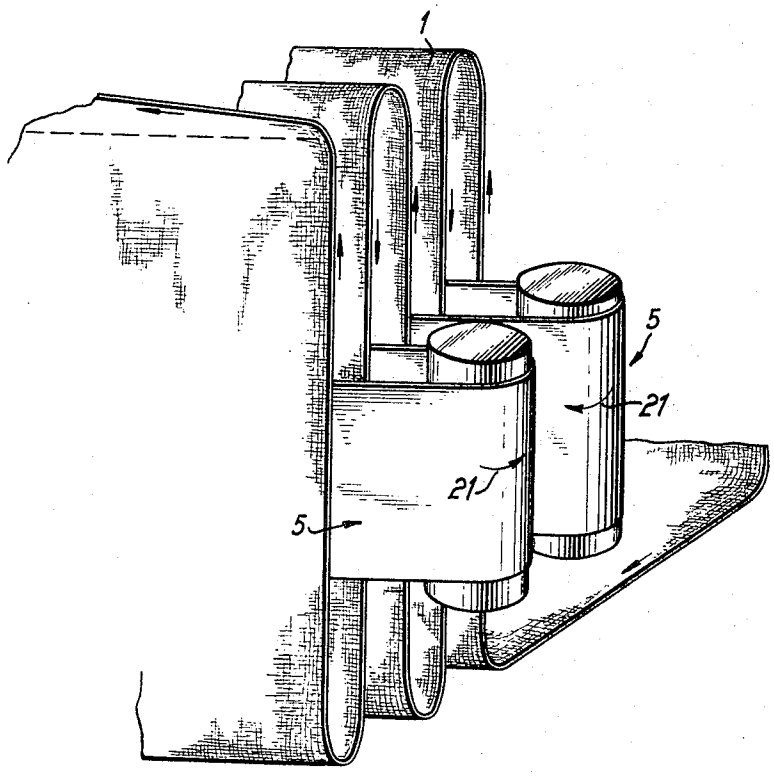
FIG. 5



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DEVICE FOR THE BREADTH TREATMENT OF TEXTILE BREADTHS BY MEANS OF A LIQUID

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Int. Cl. D06f
U.S. Cl. 68—175
10 Claims

ABSTRACT OF THE DISCLOSURE

A breadth washing machine for textiles particularly for wide breadths of knitted material in which the breadths pass through the processing liquid has driving means which agitate the processing liquid in a direction substantially transverse to the direction of the breadths, thus providing a more intensive treatment of the breadths by the processing liquid as they pass therethrough.

The present invention relates to a device for the breadth treatment of textile breadths, and more particularly to wide breadths of knitted material, by means of a liquid, in which device the breadth is passing the processing liquid in loops and the processing liquid is subject to a movement due to driving means passing above said liquid substantially in a transverse direction with respect to the breadth. In particular, the device is intended as a breadth washing machine for textiles.

With the device according to the present invention it is intended to produce a liquid flow in a transverse direction with respect to the way of the breadth by the aid of the driving means, thus to obtain an effective washing result without any detrimental influence on the textile breadth and without requiring excessive or uneconomic power.

In the first line, the present invention aims at an improvement of the effect of the device such that the processing liquid is affecting the breadth more intensely and may even destroy the surface layer of the breadth, i.e. the layer formed or present on the breadth surface, or penetrate the breadth.

Preferably, for achieving this aim the driving means are of such design that they will cause the processing liquid to be subject to a pulsing and/or whirling movement in a direction passing the breadth area or taking place in this direction.

Due to this flow or movement of the liquid a whirl path is established in the transverse direction of the breadth which will have to be passed by said breadth, the processing liquid in said whirl path being alternately pulled away from and driven against the breadth. The surface layer of the breadth is destroyed by such pulsation and whirling so that the processing liquid will be able to penetrate the breadth and results in favorable washing effects.

The driving means may be endlessly rotating belts, and it may be possible that the belt surface facing the breadth when rotating has been provided with deviations from its flat surface said deviations causing whirling and/or pulsation of the processing liquid against the breadth.

Such deviations may, for instance, consist in corrugation of the belt surface facing the breadth in the direction rotation so that said belt surface will have crests and troughs in the direction of rotation. By providing one such belt each on opposite locations on either breadth side it will be especially favorable that suction and pressing are alternating due to the fact that a pressure will be produced at the crests and a suction in the troughs.

Other forms of deviation from the flat surface are also possible. For instance, the belt surface facing the breadth may be provided with more or less high transverse ribs of a suitable cross section.

Another embodiment according to the present invention of the endlessly rotating driving means provides for two belts of each driving means said belts being arranged at a certain distance from and on top of each other and endlessly rotating in a synchronous form, in which case the belts are connected to each other by cross bars which in their turn are the bodies causing the flow.

It may be possible to arrange several driving means of the types mentioned above on top of each other. The driving means may even be arranged such that they are acting from the breadth center to the breadth edges.

It will be practical to arrange the driving means such that, with driving means endlessly rotating on opposite breadth sides, in each case the same driving means locations are opposite each other or that the driving means will have a determined position with respect to each other so that always the same locations will jointly be effective and thus the desired effect will be improved.

In order to secure the determined position of the driving means with respect to each other it will be recommendable to provide the driving means with a positive shape drive and to connect all drives with a view to positive shape.

Due to the positive shape drive and due to the positive shape connection of the drives with each other it will be achieved that the driving means being on opposite sides of the breadth will always be opposite each other in the same position, i.e. the transverse ribs of one driving means are always in the predetermined position with respect to the transverse ribs of the other driving means.

According to the present invention an improvement of the effect of the processing liquid against the breadth will be obtained by the fact that within the area of the breadth edges or the turning points of the driving means respectively there have been provided baffle plates for the processing liquid; the rotating flow of the processing liquid in the transverse direction towards the breadth will be disturbed and obstructed by such baffle plates causing the formation of whirls directed against the breadth.

Preferably for the same purpose with driving means consisting of two belts connected by cross bars baffle plates for the processing liquid may be provided within the distance of the turning points of the driving means from each other. Of course even here baffle plates may have also been provided at the turning points. The baffle plates may face the breadth.

According to the present invention further improvement of the effect of the processing liquid with respect to the breadth may be achieved without enlarging or sensitively enlarging the device by guiding the breadth in a loop at the outside of the loops formed by the endlessly rotating driving means and by guiding the breadth through the latter loops.

By guiding the breadth in this manner it will be practical that both belt areas are provided with deviations from their flat surfaces causing the processing liquid to whirl and/or pulse against the breadth.

For obtaining a positive shape drive of the endlessly rotating driving means the same may be guided via toothed discs engaging by means of their toothing into the tooth spaces thereof.

The drawing is a diagrammatic view of several examples of a construction according to the present invention.

FIG. 1 is an elevational view of a processing device comprising driving means acting from the center line of the breadth towards the longitudinal edges of the same.

FIGS. 2, 2*a*, and 2*b* show the formation of the driving means by two belts connected by cross bars.

FIG. 3 is a horizontal view of the baffle plate arrangement at the turning points of the driving means.

FIG. 4 shows the arrangement of baffle plates within the distance between the turning points of the driving means from each other.

FIG. 5 illustrates the breadth as guided through the processing liquid.

FIG. 6 is a partial view of a longitudinal section of a belt corrugated on the side facing the breadth.

In the drawing the breadth has been identified by **1**, the driving means by **5** or **5'** respectively and the shafts of the driving means by **10**.

In FIG. 1 the driving means **5** are endlessly rotating belts **7** which are driven via the shafts **10** the connection between which is effected due to positive shape engagement. The return pulleys for the breadth within the processing liquid have been defined as **3**, while the outgoing roll has been identified by **6**. Positive shape engagement is effected by means of chain discs **11'** on the shafts **10** and endless tooth belts **12'** the toothing of which are engaging into the tooth spaces of the tooth discs. The belts forming the driving means have been guided over tooth pulleys **18** located on the shafts **10**, the tooth ribs **19** of said belts engaging into the tooth spaces of the tooth pulleys.

In the example of a construction according to the present invention as shown in FIG. 1 the deviations of the flat surface of the side of the belts **5** facing the breadth for producing a pulsing or whirling movement of the processing liquid against the breadth have been shown as transverse ribs **8'** which may have a cross section in accordance with their purpose and which may even have the form of flat bars.

The embodiments of the present invention according to FIGS. 2, 2*a*, and 2*b* are showing the driving means as tow belts **7'** at a certain distance from each other which are connected by cross bars **7''**. The cross bars are bodies causing whirling effects of the processing liquid and, for this end, may have various appropriate shapes. FIG. 3 shows some of such shapes. The belts **7'** have been provided as tooth belts and guided via tooth discs or tooth pulleys **20** on the shafts **10**. The direction of rotation has been indicated by the arrows **21**.

Due to the positive shape drive and the positive shape connection of the drives it will be achieved that the driving means being located on opposite sides of the breadth are positioned opposite each other always in the same position, i.e. the transverse ribs **8'** of one driving means are always in the predetermined position opposite the transverse ribs **8'** of the other driving means.

The arrangement of baffle plates **22** at the turning points of the driving means may be seen from FIG. 3.

FIG. 4 illustrates the provision of baffle plates **23** within the distance between the turning points of the driving means if the driving means have been provided in accordance with FIG. 2.

FIG. 5 shows routing of the breadth **1** in a loop at the outside along the endless loops formed by the driving means **5** and passing of the breadth through said loops. The breadth may be routed in this way if the driving means are acting towards one side and are extending over the total width of the breadth.

FIG. 6 shows a belt driving means **7** the side facing the breadth being corrugated.

We claim:

1. A device for the breadth treatment of textile breadths, and more particularly of wide breadths of knitted material by means of a liquid, in which the breadth is passing the processing liquid in the form of a loop and the processing liquid is caused to move against the breadth by means of driving means passing the liquid above the same substantially in a transverse direction with respect to the breadth, characterised in that the driving means are of such form that they cause, within the processing liquid, a movement taking place in a direction passing the breadth surface and pulsing and/or whirling respectively in said direction.

2. A device according to claim **1**, characterised in that the driving means are endlessly rotating belts and that the belt surface facing the breadth when rotating shows deviations from the flat surface said deviations causing the processing liquid to whirl and/or pulse against the breadth.

3. A device according to claim **1**, characterised in that the driving means are endlessly rotating and each driving means has two belts located at a certain distance from and on top of each other and endlessly rotating in a synchronous form, said belts being connected by bodies causing the flows of the processing liquids, the bodies being cross bars.

4. A device according to claim **1**, characterised in that the driving means are endlessly rotating and are located on opposite breadth sides, and in that the driving means being opposite to each other are in such position determined in relation to each other that, when the driving means are rotating, identically designed driving means locations are always opposite each other.

5. A device according to claim **1**, characterised in that the driving means are endlessly rotating and have a positive shape drive, and in that all drives are connected with each other in a positive shape form.

6. A device according to claim **5** characterised in that the endlessly rotating driving means are guided via tooth discs their toothing engaging into the tooth spaces thereof.

7. A device according to claim **1**, characterised in that the driving means are endlessly rotating and that, within the area of the breadth edges or within the area of the turning points of the driving means respectively, baffle plates have been provided for the processing liquid.

8. A device according to claim **1**, characterised in that the driving means are endlessly rotating and that, within the distance between the turning points of the driving means from each other, baffle plates have been provided for the processing liquid.

9. A device according to claim **1**, characterised in that the driving means are endlessly rotating and that the breadth is guided in the form of a loop along the outside of the loops formed by the endlessly rotating driving means and through said loops.

10. A device according to claim **9**, characterised in that both driving belt surfaces have deviations from the flat surface said deviations causing whirling and/or pulsing of the processing liquid against the breadth.

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WILLIAM T. PRICE, *Primary Examiner.*