

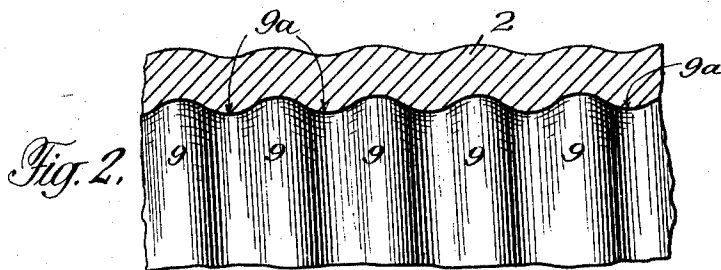
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E. WAGNER

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FABRIC EXPANDING DEVICE

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UNITED STATES PATENT OFFICE.

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FABRIC-EXPANDING DEVICE.

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Fabric expanding devices, i. e. devices for stretching fabrics widthwise, consisting of a plurality of expanding or spreading rollers turnably arranged in the manner of an arc on a curved shaft are already known. Figure 1 is a view of the expanding device, and Fig. 2 is an enlarged cross section of a portion of one of the roller sections 4, showing the undulations. A constructional example of my device is illustrated in Fig. 1 of the drawings. In this example 5 denotes the curved shaft which is rigidly held in bearings 6. Rotatably mounted on the shaft 5 are expanding rollers 4 which are in engagement with each other by means of interengaging dogs and recesses 7. Two of these rollers are provided with toothed rims serving for imparting rotation to all the rollers. Experiments have shown that the tearing of fine fabrics during spreading may be overcome by providing an undulated or corrugated circumferential surface on the spreading rollers as is shown in Fig. 2 in which 9 denotes the crests of the waves and 9^a the wave hollows. In this construction spaces as well as excessive expanding stresses are avoided. The dimensions of the waves may vary, only care has to be taken that the fabric fills out the wave hollows 9^a. In this manner different rollers may be provided for fabrics of different strength by choosing different curves and different wave crests and wave hollows or by adjusting the height of the waves to suit the special purpose.

Further experiments have shown that a particular advantage is obtained if, as is mostly the case, several sets of expanding rollers arranged in series act upon the fabric. If to this end rollers with corrugated circumferences as shown in Fig. 2 are utilized the following effect is obtained:

The generally somewhat damp fabric, which may also be dry in some cases, runs without being subjected to widthwise stretching stresses but with a certain longitudinal tension on the concave side of the first expanding roller and contacts completely and without forming hollow spaces 3 with the circumferential face as it is so to speak sucked against said face by the longitudinal tension and by capillary action. In consequence of the adhesion surface increased by the corru-

gated shape a more pronounced expanding effect is practically obtained than with known types of rollers. After half a revolution of the expanding rollers 4 is completed, i. e. after the fabric has passed the complete spreading range of these rollers, the fabric leaves the latter at the convex side at α^1 and engages with the concave side α of the next expanding roller where it is subjected to a further partial expanding effect. The same effect occurs with any further set of expanding rollers. As soon as the treated fabric has been subjected to a suitable expanding effect, or as soon as the elastic limit of the fabric is reached, it has been shown by practical tests that the fabric begins to separate itself from the wave hollow 9^a (Fig. 2) and thereby to automatically decrease the adhesion. With rollers of corrugated shape the fabric which has already been sufficiently expanded is tightly tensioned and bears only on the wave crests whereby any excessive expanding or tearing of the fabric is avoided. A further advantage inherent to the corrugated profile is that fine fabrics are less worn when they slip sideways, therefore the formation of a tough slurry of fibres which hitherto deposited itself in the known types of rollers and which contaminated the dyeing liquor is almost completely avoided.

I claim:

1. A fabric stretching roller having a curved shaft and a plurality of stretching roller sections loosely mounted on said shaft, the surfaces of which sections are an undulating curve of such a construction that the fabric will fill the hollows of the sections and automatically separate from the hollows when the transverse tension becomes too great.

2. A fabric stretching roller having a curved shaft and a plurality of stretching roller sections mounted on said shaft, the surfaces of which sections are an undulating curve the crests and hollows of which curve being substantially equal as regards extent in the axial and radial directions.

In testimony whereof, I have signed my name to this specification.

ERNST WAGNER.