

July 14, 1931.

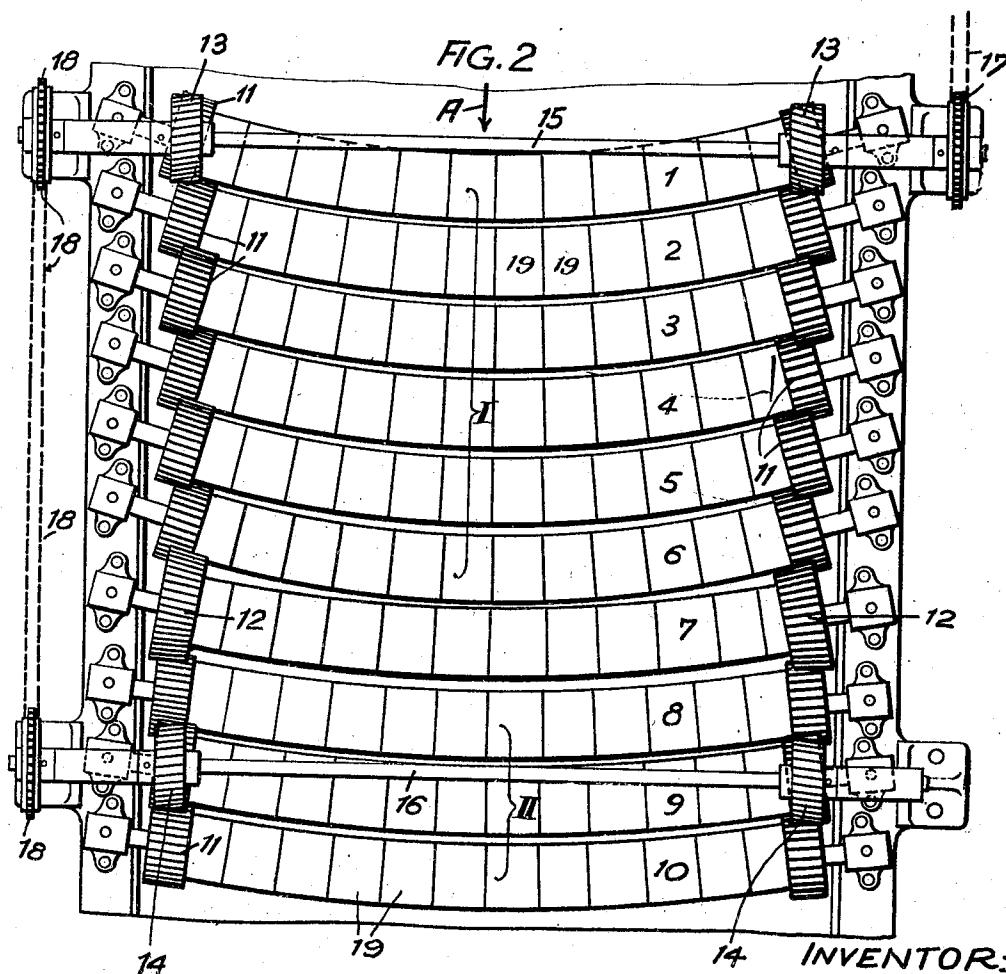
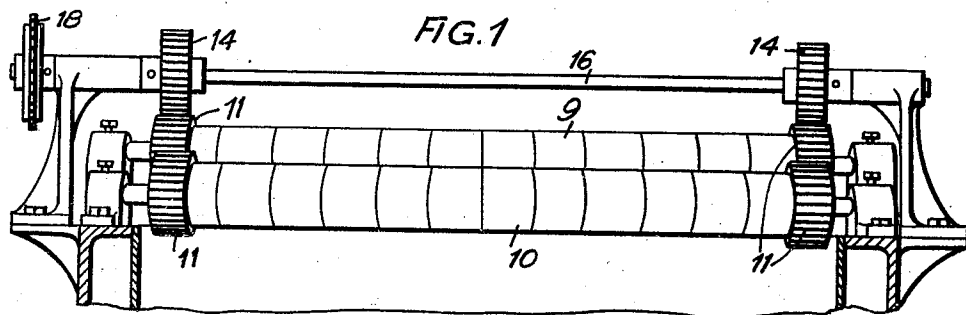
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1,814,652

DEVICE FOR STRETCHING FABRICS WIDTHWISE

Filed May 1, 1930

2 Sheets-Sheet 1



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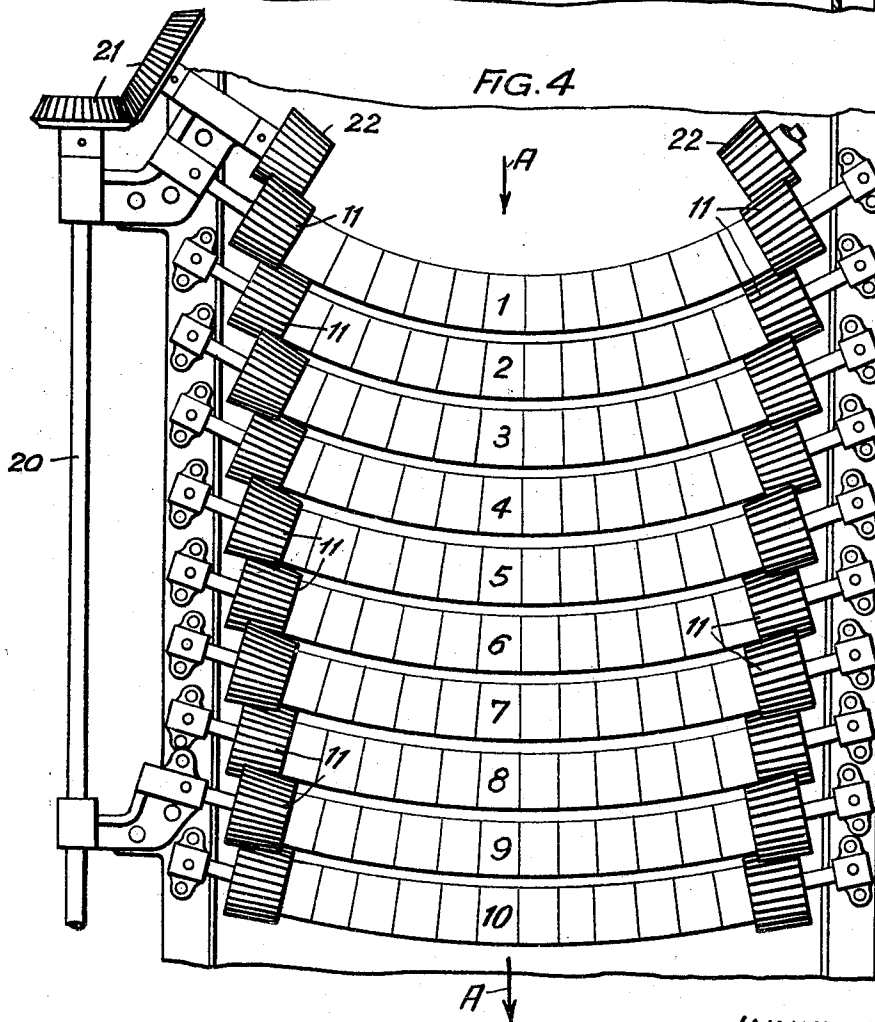
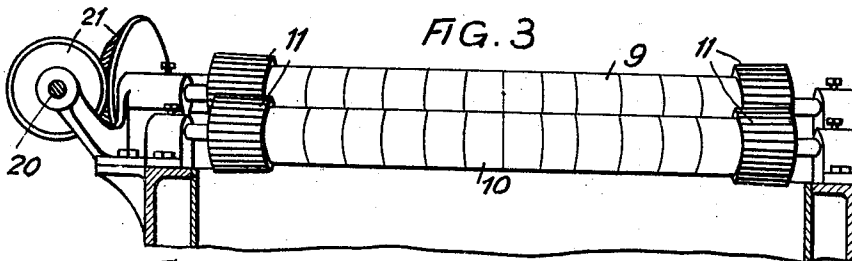
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DEVICE FOR STRETCHING FABRICS WIDTHWISE

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2 Sheets-Sheet 2



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DEVICE FOR STRETCHING FABRICS WIDTHWISE

Application filed May 1, 1930, Serial No. 449,030, and in Germany May 6, 1929.

This invention relates to devices for stretching fabrics widthwise, of known type, comprising a series of curved rollers which are driven by means of gear wheels.

When a shrunk web of fabric impregnated with sodium lye, for stretching the same widthwise, is passed over rollers of this type, at the end of the series of rollers very often an unequal lateral stretching effect and a deflection of the weft threads results for the following reason: In passing over the front rollers of the device for stretching the fabric widthwise the latter due to its elasticity and the small initial internal stresses is induced to positively follow the individual stretching roller elements and, consequently, it is uniformly stretched all over its entire width. With increasing lateral stretching action the internal stresses of the fabric are increased and the moment that these stresses become greater than the adhesion of the fabric the latter begins to slip in the axial direction. Experience shows that the axial slippage is greatest at the edges of the fabric, whilst the center thereof has no tendency to slip. Thus the edge portions are subjected to less lateral stretching than the center portions of the web of fabric.

In consequence of the adhesion of the web of fabric being eliminated at the edges thereof the fabric besides begins to slip in the direction tangentially of the rollers, thus lagging behind the circumference of the roller so that the edges of the fabric are leading on the center portion of the same, whereby the deflection of the weft threads is caused. When the said slippage occurs abruptly or irregularly, as the case may be, an undulous edge line and a web of fabric of variable width will result.

To overcome these drawbacks devices for stretching fabrics widthwise were provided with rollers of different character, whereby either straight and curved rollers were arranged in a row, or else groups of rollers of

different curvature were interconnected by conical transmission rollers. Both arrangements were not satisfactory in respect of the lateral stretching effect and the worst of all was that the wear of the driving means for the individual rollers was too great.

The object of the invention is to obviate these drawbacks in that according to the invention in a device for stretching fabrics widthwise the curvature of stretching rollers of the same character, the curvature being continuous all over the length of the roller, is gradually decreased from the entrance to the delivery end of the device.

Owing to this arrangement the extent of the stretching effect in the fabric decreases corresponding to the increase of the lateral stresses in the fabric and thereby the latter is prevented from slipping on the periphery of the rollers. Consequently, the total lateral stretching effect is improved by the slipping of the edge portions being avoided and the fabric is uniformly stretched along its entire width, the weft threads thus remaining straight. Furthermore, the formation of an undulous edge line i. e. a variation in the width of the fabric is prevented. Moreover, as the gaps between the roller elements decrease with the curvature of the rollers decreasing a detrimental overstretching of the fabric which is already considerably stretched is avoided.

Suitably the arrangement is such that the rollers for the lateral stretching of the same character are combined into groups of stretching rollers of equal curvature and between each pair of adjacent groups a middle roller is arranged which averages in curvature between the curvatures of the adjacent rollers of the respective individual groups and forms with said rollers a group of three rollers of decreasing curvature with regard to the run of the fabric web, whereby a slightly conical driving gear wheel is provided at each end of said middle roller.

Alternatively, with an arrangement of a series of rollers with the curvature of the latter gradually decreasing from roller to roller all rollers may be provided with slightly conical driving gear wheels.

In the accompanying drawings two constructional forms of the invention are schematically illustrated, by way of example, only the parts necessary for a good understanding of the invention being shown.

Fig. 1 shows a first constructional form of the invention in plan view;

Fig. 2 is an elevation of Fig. 1;

Fig. 3 shows a second constructional form of the invention in plan view; and

Fig. 4 an elevation of Fig. 3.

The device for stretching fabrics widthwise shown in Figs. 1 and 2 comprises ten stretching rollers 1 to 10. The first six rollers 1 to 6 from the entrance end of the device constitute a first group I and are all provided with the same relatively great continuous curvature which may be circular, parabolical or elliptical. The three last rollers 8, 9 and 10 are combined to a further group II of rollers of equal, but considerably smaller curvature than the rollers of the first group. In elevation the axes of the rollers are arranged in a zig-zag line, in known manner (see Fig. 2). The transmission roller 7 between the groups I and II has a curvature which is equal to the mean value of the curvatures of the other rollers. All the rollers 1 to 6 and 8 to 10 are fixed on the machine frame in known manner and operatively connected with each other by means of spur gear wheels 11, whilst the roller 7 is provided with slightly conical gear wheels 12. The spur gear wheels 11 of roller 1 as well as those of roller 9 each mesh with a gear wheel 13 and 14 respectively having helical teeth, and being mounted in pairs on a common shaft 15 and 16 respectively, whereof the former is actuated by a chain drive 17 and connected to the shaft 16 by a further chain drive 18. The shafts 15 and 16 are mounted on the machine frame in known manner. All the rollers 1 to 10 are composed of individual roller elements 19 rotatably arranged on the shaft of the roller in a manner known per se. The direction of movement of the web of fabric through the device is indicated by the arrows A.

The described device permits a greater number of stretching rollers to be used in order to be enabled to obtain a thorough washing effect along a travel of considerable length of the web of fabric with the latter in stretched condition without the quality of the fabric being impaired, such washing effect being required for a complete mercerization. Thereby, in contradistinction to known arrangements, a gradual transition from the curved entrance rollers to the straight delivery roller is brought about and

the possibility of the structure of the web being brought out of shape at the delivery end is greatly reduced. The rollers of smaller curvature are naturally subjected to less strain and wear which is very advantageous for instance in mercerizing machines where the last rollers are entirely or in part immersed in the liquid bath and thus are difficult to be lubricated.

In the constructional form, shown in Figs. 3 and 4, a series of rollers 1 to 10 of the same character and of gradually decreased curvature in respect of the direction of movement of the fabric web, as indicated by the arrows A, are arranged behind each other. The rollers are operatively connected with each other by slightly conical spur gear wheels 11 at each end thereof and the drive is imparted to the whole series at the roller 1 from the driving shaft 20, mounted on the machine frame in usual manner, by means of a pair of conical gear wheels 21 and a further conical wheel 22.

I claim:

1. In a device for stretching fabrics widthwise of the type described, in combination, a series of stretching rollers of the same character and of continuous curvature, said curvature of the rollers decreasing from the entrance end towards the delivery end of the device.

2. In a device for stretching fabrics widthwise of the type described, in combination, a plurality of individual groups of stretching rollers, all rollers being of the same character and of continuous curvature and each group comprising rollers of equal curvature, a spur gear wheel at each end of each roller of each group, a roller arranged between each pair of adjacent individual groups, said middle roller averaging in curvature between the curvatures of the adjacent rollers of the respective individual groups and forming with said rollers a group of three rollers of decreasing curvature with regard to the run of the fabric web, and a slightly conical driving gear wheel at each end of said middle roller.

3. In a device for stretching fabrics widthwise of the type described, in combination, a series of stretching rollers of the same character and of continuous curvature, said curvature of the rollers decreasing from the entrance end towards the delivery end of the device and each roller provided with slightly conical driving gear wheels.

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

HANS WEISS.