

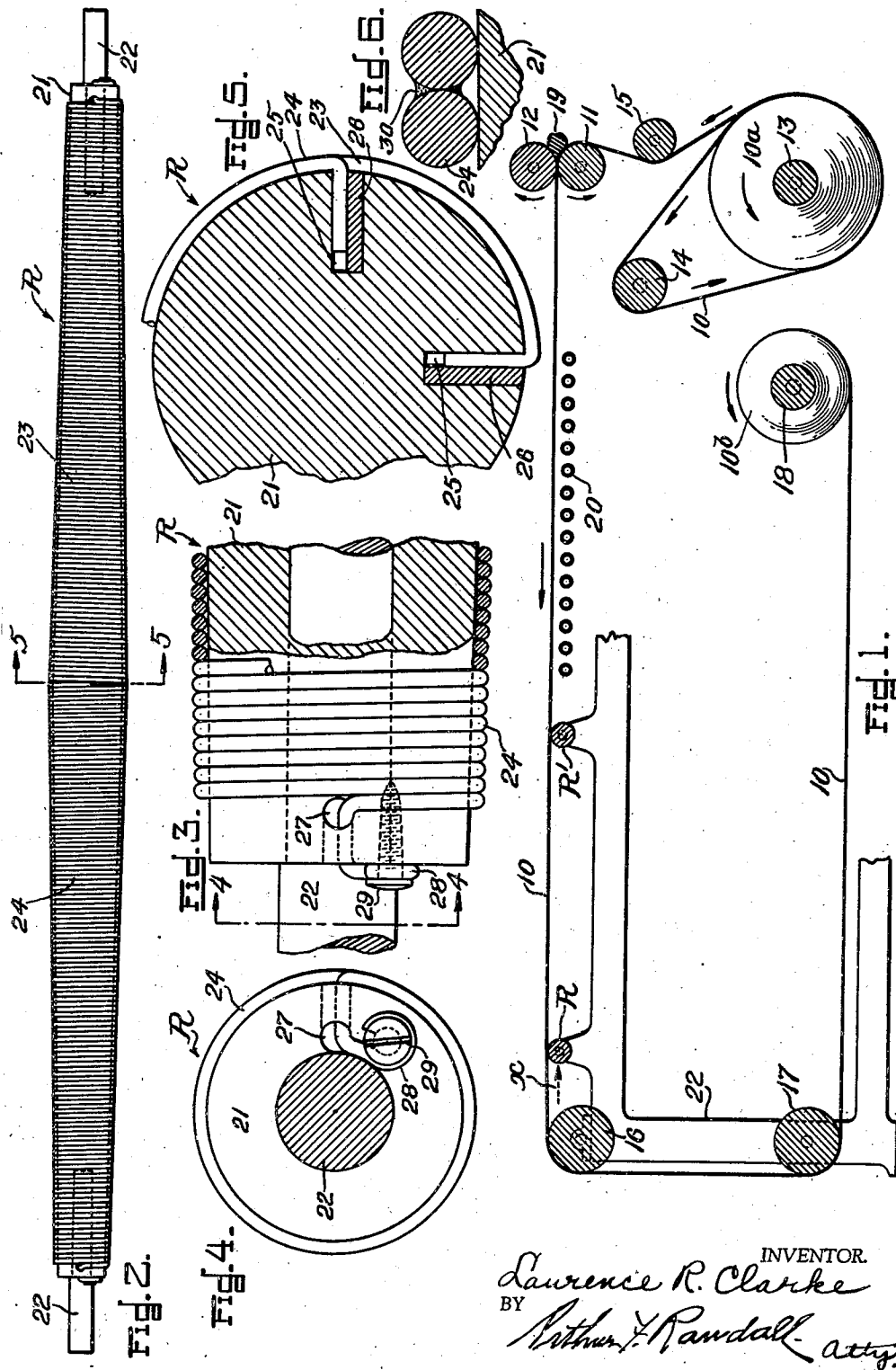
Jan. 9, 1945.

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2,367,005

WEB-CONTROLLING MECHANISM

Filed June 12, 1942



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UNITED STATES PATENT OFFICE

2,367,005

WEB-CONTROLLING MECHANISM

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Application June 12, 1942, Serial No. 446,792

6 Claims. (Cl. 26-68)

This invention relates to web-controlling mechanism for machines for coating or impregnating cloth and for other machines of that class through which a web of cloth or other sheet material of indeterminate length is passed for treatment or otherwise and the invention has for its object to provide for properly directing the movement of the web through the machine and also to prevent the formation of longitudinal folds or creases therein.

To this end I provide a machine of the class described with one or more rotatable web-supporting rolls which are peculiarly constructed and arranged to guide the web and also to prevent the formation of the objectionable creases and folds referred to.

In the accompanying drawing—

Figure 1 is a diagrammatic longitudinal sectional view of a cloth-coating machine constructed in accordance with this invention.

Figure 2 is a side elevation of a web-supporting and guiding roll constructed in accordance with this invention and as viewed in the direction of the dotted arrow X of Fig. 1.

Figure 3 is a side elevation, full size and partly in section, of an end portion of the roll shown in Fig. 2.

Figure 4 is a section on line 4-4 of Fig. 3.

Figure 5 is a section on line 5-5 of Fig. 2.

Figure 6 is an enlarged sectional detail hereinafter referred to.

In Fig. 1 of the drawing 10 represents a cloth web which is drawn through a constricted passage existing between a pair of rolls 11 and 12 which are driven in the directions indicated by the arrows. The web 10 may be supplied to the apparatus in the form of a roll 10a wound upon a core 13 that is rotatably supported in the position shown. From the roll 10a the web 10 is led around a guide roll 14 and then back to and partly around the roll 10a to a guide roll 15 from which it extends to and between the rolls 11 and 12. From the rolls 11 and 12 the web travels horizontally to and around a cylindrical guide roll 16 and thence around another guide roll 17 to a core 18 on to which it is wound into a roll 10b.

When a roll 10a of cloth is placed within the apparatus of Fig. 1 and its outer end has been passed around rolls 14, 15, 11, 12 and 17 and fastened to the core 18, the machine is started after which a bank of somewhat fluid or stiff viscous adhesive agent, or rubber composition, 19 is deposited upon web 10 immediately in front of rolls 11 and 12. The adhesive material 19 is

commonly a rubber composition including naphtha as a solvent. The web travels through the machine as indicated by the arrows and is coated or impregnated at the rolls 11 and 12. The mechanism for driving the rolls and cores of the apparatus may be as usual in doubling or facing machines as heretofore constructed.

As the saturated web travels horizontally from rolls 11 and 12 to the guide roll 16 it passes over steam heated pipes 20 which assist in drying the coating or saturating agent by removing the solvent therefrom.

The web 10 is moved from the rolls 11 and 12 to the take-up roll 10b by rotation of the latter in the direction indicated so that the partially dried portion of the web adjacent to and approaching guide roll 16 is under considerable tension. This tension will, if uncontrolled, cause longitudinal creases and folds to form in the web as it approaches and passes into engagement with the guide roll 16, and it is the primary object of this invention to obviate this objectionable feature characterizing machines of this type as heretofore constructed.

To accomplish this object I provide an auxiliary web-supporting and web-guiding idler roller R disposed adjacent to, and in front of, the main guide roll 16 so as to engage the partially dried heat-treated portion of the web 10 as the latter approaches said main guide roll.

The idler roller R illustrated in Figs. 2 to 5, inclusive, comprises a wood core 21 of bi-conic or bi-conoidal form which is approximately three and one-half inches in diameter at its middle, fifty-eight inches long and two and one-quarter inches in diameter at its opposite ends. The opposite ends of core 21 are formed with axial bores into which are driven gudgeons 22 whose outer end portions provide journals which are rotatably supported in bearings provided upon the opposite side sections of the frame 22 of the machine.

One-half of core 21 is provided with a metallic jacket 23 consisting of a length of round wire closely wound thereon in a right-hand direction, while the other half of the core is provided with a metallic jacket 24 consisting of a length of round wire closely wound thereon in a left-hand direction. The wire employed for these jackets may be one-eighth inch in diameter or thereabouts.

The inner end portion of the wire of each jacket 23 and 24 is bent laterally to occupy a radial socket 25, Fig. 5, formed in core 21 and said end portion is securely fastened within said

socket by a wedge 26. The outer end portion of the wire of each jacket is threaded through a hole 27, Figs. 3 and 4, formed in core 21 and is provided at its extremity with an eye 28 that is fastened in position against the end of the core by a screw 29.

Preferably some of the outermost convolutions of each jacket are fastened together by means of solder as shown at 30 in Fig. 6 which prevents accidental loosening thereof through displacement toward the outer end of the core while the idler roll is in use.

The idler roller R constructed as above described is incorporated in the coating or impregnating machine adjacent to, and in front of, the cylindrical guide roll 16 where it is between the latter and the web heating apparatus 20 and where it supports, and is rotated by, the web 10. Under these conditions the idler roller performs the two important functions of maintaining the incompletely dried web in an unwrinkled condition as it passes on to the guide roll 16 thereby eliminating the objectionable longitudinal folds and creases referred to, and of holding the web against edgewise or lateral displacement relatively to guide roll 16. The first-mentioned function is performed through the action of the opposed spiral windings 23 and 24 which urge or stretch the web laterally in opposite directions from its middle, while the second function is accomplished by the crowned or bi-conoidal shape of the idler.

The wire windings 23 and 24 provide the exterior of the idler with right and left hand helical ribs as will be clear from Fig. 3, and these ribs are caused to urge or stretch the web in opposite directions from its middle as the idler is rotated by the web.

In Fig. 1 of the drawing I have shown a second web-controlling idler roller R' rotatably supported by the frame of the machine between the idler R and the heating apparatus 20.

What I claim is:

1. In a coating machine of the character described, the combination with the web-heating apparatus and the guide roll around which the web travels after passing said web-heating apparatus, of a rotatable bi-conoidal web-supporting and web-actuated idler roller disposed between said heating apparatus and said guide roll and adjacent to the latter, said idler roller having its tapering portions provided exteriorly with right-

hand and left-hand helical ribs, respectively, for urging the portions of the web that are engaged thereby transversely in opposite directions from the middle of the web thereby to maintain said web portions flat as they move on to said guide roll.

2. In a machine of the class described, a rotatable web-supporting idler roller that is of greater diameter at its middle than at its opposite ends and which tapers from its middle toward said opposite ends so as to impose guiding and centering effects upon the web, said tapering portions being provided upon their exteriors with right-hand and left-hand helical ribs, respectively, for urging the web transversely in opposite directions from its middle.

3. In a machine of the class described, a rotatable bi-conoidal web-supporting, web-centering and web-actuated idler roller whose tapering portions are provided exteriorly with right-hand and left-hand helical ribs, respectively, for urging the web transversely in opposite directions from its middle thereby to stretch the same transversely.

4. In a machine of the class described, the combination with the web-supporting guide roll thereof, of a rotatable bi-conoidal web-supporting, web-centering and web-actuated idler roller disposed adjacent to and in front of said guide roll, said idler roller having its tapering portions provided exteriorly with right-hand and left-hand helical ribs, respectively, for urging the web transversely in opposite directions from its middle so as to present the same flatwise to said guide roll.

5. In a machine of the class described, a rotatable web-supporting, web-centering and web-actuated idler roller comprising an exteriorly smooth wooden bi-conoidal core provided at its opposite ends with metal journals; a metal wire wound in a right-hand direction on to one of the tapering portions of said core; a metal wire wound in a left-hand direction on to the other tapering portion of said core, and means fastening said wires to said core with the convolutions of each winding in contacting relationship.

6. An idler roller constructed in accordance with claim 5 and wherein there is also provided means uniting the convolutions of said metal wire windings.

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