Sept. 7, 1926. 1,599,257

F. B. VOEGELI

CLOTH EXPANDER

Filed Oct. 28, 1925

FIG. 1.

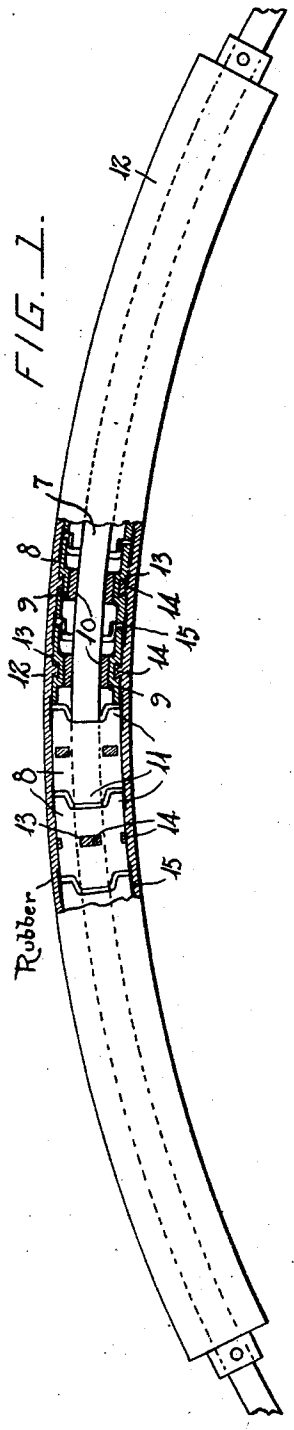


FIG. 3.

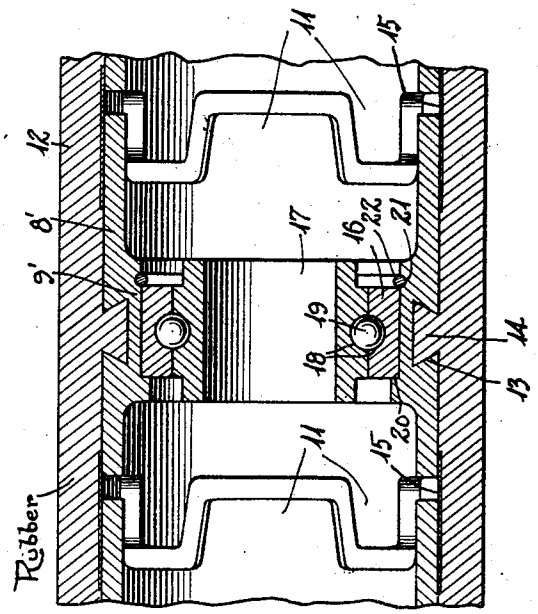
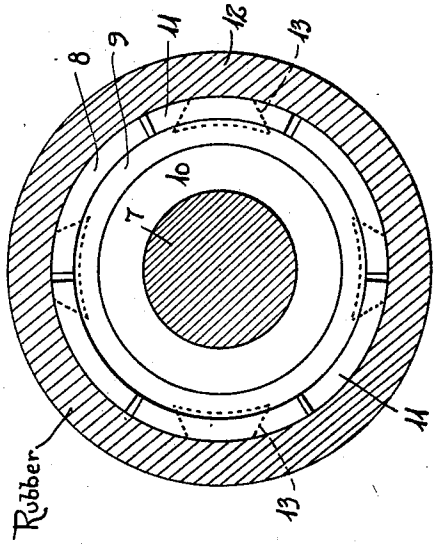


FIG. 2.



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UNITED STATES PATENT OFFICE.

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CLOTH EXPANDER.

Application filed October 28, 1925. Serial No. 65,337.

The present invention relates to cloth expanders, such as are used for stretching cloth in the process of finishing, coating, or the like, so as to eliminate the wrinkles in the cloth when it passes into the machine before which the expander is placed or for stretching the cloth when mercerizing same or otherwise finishing or operating on the cloth, the present expander being an improvement over the cloth expander disclosed in my copending application Serial No. 751,135, filed Nov. 20, 1924 (now Patent No. 1,569,343, granted Jan. 12, 1926).

It is an object of the invention to provide an improved cloth expander constituting a curved roller composed of a plurality of roller members and a rubber or similar cover thereon, so that the roller will have a continuous unbroken contact with the cloth from edge to edge, in order that the stretching or expanding action will be uniform, as well as avoiding breaks or joints in the expander at its periphery.

A further object is the provision of such an expander having roller members or sections of novel construction to be mounted on a curved rod and to have molded and anchored thereon the rubber or similar cover.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts, as hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein—

Figure 1 is a plan view of the improved expander, portions being broken away and shown in section.

Fig. 2 is an enlarged end view of one of the roller members or sections showing the rod and cover in cross section.

Fig. 3 is an enlarged longitudinal section of a fragmentary portion of the expander illustrating a ball bearing mounting.

The expander comprises a curved non-rotatable rod or shaft 7 held at its ends in suitable supports (not shown) similar to ordinary expanders, and roller members or sections 8 are rotatable on the rod 7, being disposed end to end. The members 8 may be cast from aluminum or other suitable metal or alloy, and constitute sleeves surrounding and of larger diameter than the rod 7. The members or sleeves 8 are relatively thin at their end portions, and are thickened internally, as at 9, between their ends to receive plain bearings or bushings 10 which are forced or driven tightly into the thickened portions 9 so as to be held therein by friction. The bushings 10 turn loosely on the rod 7, and said rod being curved will position the members 8 at obtuse angles with one another. The members 8 are provided at their ends with interengaging clutch teeth or lugs 11, the teeth or lugs of each member extending between the adjacent teeth or lugs of the companion members, in order that all of the members 8 will rotate as a unit, and the teeth or lugs are spaced apart slightly so as to permit of slight relative movements of the teeth or lugs as the members rotate about curved axis of the rod 7.

A tubular cover 12 of rubber or other flexible resilient material is disposed on the roller members, providing a curved roller which rotates around the arcuate rod 7 with the periphery of the roller unbroken from one end thereof to the other, so as to present a continuous line of contact with the cloth from one edge of the cloth to the other edge. The cover 12 may be of any suitable thickness and will bend or yield to conform to the curvature of the rod 7 as the roller rotates. The members 8 have dove-tailed recesses or openings 13 between their ends and extending into the thickened portions 9, and the cover 12 has the dove-tailed lugs or studs 14 within the recesses or sockets 13 so as to anchor the cover on the members 8. The cover 12 is fitted loosely on the members 8 excepting between the ends of said members or at the anchor portions 14, thereby permitting greater freedom in the stretching and compression of the cover 12 on the end portions of said members when the expander is rotated on the rod 7. The cover is secured on the members 8 between the ends of said members so as to rotate therewith, and to prevent the cover from being bodily displaced relatively to or shifted on said members, but the cover may spring longitudinally on the end portions of said members to facilitate flexing of the cover.

The cover 12 may be provided on the members 8 in any suitable manner. For example, the members 8 may be positioned on

a straight rod and sheets or layers of unvulcanized rubber or similar material may be placed around the members 8 to build up the cover to the desired thickness. Then, the sheets or layers may be vulcanized together into an integral mass, and pressure is applied in order to force the material into the recesses 13 so as to anchor or secure the cover on said members. The pressure may be applied by any suitable means, such as a mold enclosing the cover and designed to apply pressure, as well as heat when it is desired to vulcanize the rubber. The cover may also be produced by placing the members 8 while on a straight rod within a mold and pouring plastic or molten rubber into the mold so as to produce the cover. In either event it may be said that the cover is molded on the members 8. After the cover has been formed on the members 8, the straight rod may be withdrawn from said members, and the roller or expander may then be slipped on the curved rod 7. The periphery of the cover may be smooth or may be roughened in any suitable manner according to the grip desired on the cloth.

In order to prevent the cover 12 from adhering to the members 8 excepting in the recesses 13, the surfaces of said members may be coated with powder or other material before the cover is molded on said members. Also, to prevent the material of the cover being forced inwardly between the ends of the members 8, sleeves 15 of paper or other material capable of tearing or breaking are placed on the members 8 over the end portions and spaces or slots between them, thereby preventing the rubber or other material from being forced between the ends of the members 8. Then, after the cover 12 has been set and the expander removed from the straight rod, the expander is bent so as to break the sleeves 15 between the ends of the members 8.

The expander is used in the same manner and in the same arrangements as the expanders of the prior art, and may also be used for paper and other fibrous sheets, as well as for cloth. The expander may be used singly or in groups, as well known in the art, and the expander may rotate freely or may be driven by power. Two or more of the expanders may also be associated for squeezing the cloth between them as well as expanding or stretching the cloth. It is also possible to inject lubricant within the roller or expander to lubricate the bearings or bushings 10 without the possibility of the lubricant escaping and soiling the cloth, inasmuch as the oil or lubricant is retained within the cover 12 and can not escape from between the members 8. By anchoring the flexible resilient cover on the members 8, the expander can be used for practically every class of goods, and particularly for such goods which exert tremendous tension upon the expander or roller. For this purpose it is essential that the cover be anchored securely on the roller members, and this also lengthens the life of the expander. The roller members 8 are economically manufactured and each of them has but a single bearing between its ends, thus providing a simple and practical construction. The thickened portion 9 of each member 8 not only accommodates the bushing or bearing 10 but also enables the recesses 13 to be deeper than those portions of the members 8 beyond the portion 9, thus effecting a saving in material, and enabling the members 8 to be of light weight.

Fig. 3 illustrates the use of a ball bearing comprising a collar 16 fitted within the thickened portion 9′ of the member 8′, and a sleeve 17 within said collar to fit on the supporting rod, said collar and sleeve having the ball races 18 in which the anti-frictional balls 19 roll. The portion 9′ has a shoulder or stop 20 against which the collar 16 seats, and at the opposite side of the collar has an annular groove 21 in which a removable spring ring 23 is seated to retain the collar in place, said collar being removable when the ring 23 is removed from the groove 21. Thus, the sleeve 17 may fit non-rotatably on the rod, and the collar 16 will rotate with the member 8′ around said sleeve with minimum friction.

Having thus described the invention, what is claimed as new is:—

1. A cloth expander comprising a curved rod, sleeves surrounding said rod and having internal thickened portions between their ends, bearings fitted in said portions and on said rod, said sleeves having recesses in their outer peripheries extending into said thickened portions, and a flexible cover molded on said sleeves and having portions anchored in said recesses.

2. A cloth expander section comprising a sleeve having an internal thickened portion between its ends and a bearing fitted in said portion to be disposed on a curved rod, said sleeve having recesses in its outer periphery extending into said thickened portion for the engagement of a cover disposed on said sleeve.

3. A cloth expander comprising rotatably mounted roller members to be disposed along a curved line, and a cover of flexible material on said members and anchored to said members between the ends of said members, the cover being loose on the end portions of said members.

4. A cloth expander comprising a curved rod, roller members rotatable thereon, and a tubular cover of flexible material on said members and anchored to said members between the ends of said members, said cover

being loose on the end portions of said members.

5. A cloth expander comprising rotatably mounted roller members to be disposed along a curved line and having recesses between their ends, and a cover on said members having portions anchored in said recesses, the cover being loose on the end portions of said members.

6 A cloth expander comprising a curved rod, roller members rotatable thereon and having recesses between their ends, and a tubular rubber cover mounted on said members and having portions anchored in said recesses, said cover being loose on the end portions of said members.

In testimony whereof I hereunto affix my signature.

FREDERICK BENEDICT VOEGELI.