Jan. 12, 1926. 1,569,343

F. B. VOEGELI

CLOTH EXPANDER

Filed Nov. 20, 1924

FIG. 1.

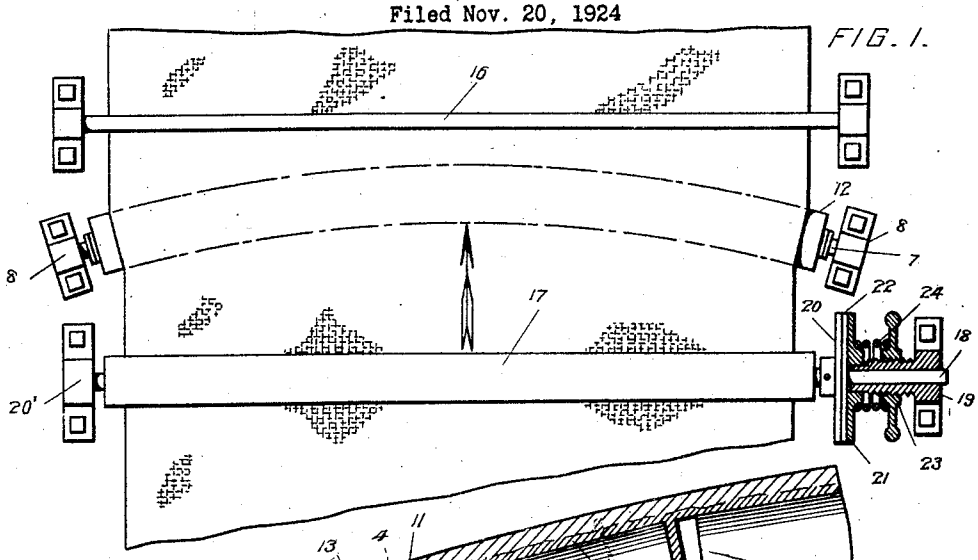


FIG. 2.

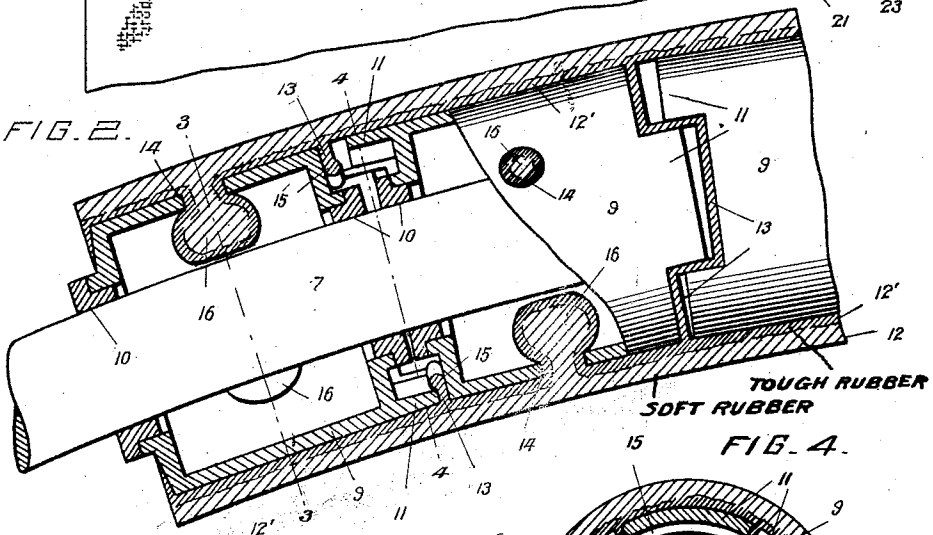
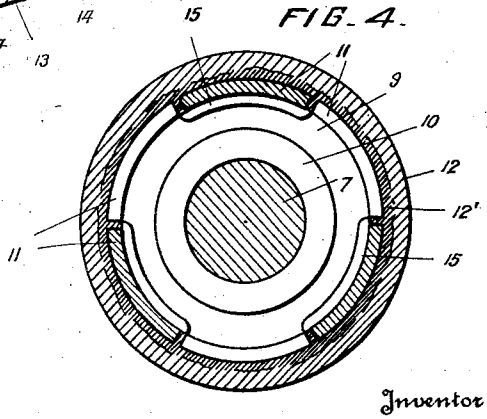


FIG. 4.



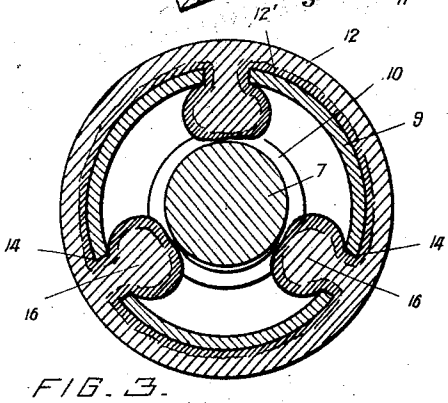


FIG. 3.

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UNITED STATES PATENT OFFICE.

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CLOTH EXPANDER.

Application filed November 20, 1924. Serial No. 751,135.

To all whom it may concern:

Be it known that I, FREDERICK B. VOEGELI, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Cloth Expanders, of which the following is a specification, reference being had therein to the accompanying drawing.

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.

Cloth expanders which have been in prevailing use comprise rollers mounted on a curved rod or bar and having peripheral contact with the cloth for stretching or expanding same edgewise, as well known in the art. The rollers of such an expander are arranged at angles relatively to one another, so that the stretching or expanding action is not uniform transversely of the cloth, and joints or breaks also occur between the rollers which not only impair the uniformity of stretching or expanding action, but which also permit lubricating oil to escape from the bearings of the rollers, which, if it occurs, may soil the cloth.

It is the object of the present invention to provide a cloth expander constituting a curved roller having 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.

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 expander and a tension roll, portions being shown in section.

Fig. 2 is a fragmentary longitudinal section of the expander.

Figs. 3 and 4 are cross sections on the respective lines 3—3 and 4—4 of Fig. 2.

The expander comprises a curved non-rotatable rod or shaft 7 held at its ends in suitable supports 8. Roller members or sections 9 are rotatable on the rod 7, being provided with plain or other suitable bearings 10 to rotate freely on said rod, and the adjacent ends of said members 9 have interengaging clutch teeth or lugs 11 whereby all of said members rotate as a unit.

The construction of the expander as described up to this point is substantially the same as that of expanders used heretofore, and the roller members, as now used, have their peripheries formed with grooves or other surfaces to engage the cloth.

In carrying out the present invention, a tubular cover 12 of rubber or other flexible resilient material is disposed on the roller members, thereby providing a curved roller which rotates around the arcuate rod 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 cover 12 is secured to the roller members 9 in order to prevent the cover from being displaced on said members. Thus, the rollers are hollow and have apertures 14 in the peripheries thereof. The cover 12 is molded over the roller members and the rubber or other material, while in a plastic condition, enters the apertures 14, thereby forming the cover at the interior with headed studs 16 anchored to said roller members. The necks of the studs 16 extend through the apertures 14 and the heads of the studs are located within the roller members, thereby anchoring the cover on said members. When molding the cover over the roller members, it is preferable to do so with said roller members removed from the curved rod 7 and straightened out, and said roller members are preferably disposed in alinement end to end on a straight rod. The material also flows inwardly, while being molded, between the ends of the roller members, so as form the webs 13 between the lugs or teeth 11 bearing flatly against the ends of the members 9 and formed with beads 15 to assist in anchoring the cover on said members. The beads 15 overlap the edge portions of the lugs 11 of the companion members 9 at the inner

surfaces of said lugs. The rubber or other material forming the cover is also preferably provided with an inner layer 12′ which is of tougher quality, and which is in contact with the roller members so as to provide an effective attachment of the cover to said members, the material outside of said layer being freely pliable or elastic so as to conform to the curvature of the roller and to afford a good friction group on the cloth.

After the material forming the cover has set, the roller can then be slid on the curved rod 7 and will assume its arcuate shape. The degree of curvature of the roller may vary according to the conditions or requirements, and the roller may also be of different diameters and lengths. The periphery of the cover 12 may be smooth or rough according to the fabric or cloth operated on.

In the embodiment as shown in Fig. 1, the expander is positioned between a bar 16 and a tension roll 17, the cloth moving in the direction of the arrow into the finishing, coating or similar machine. The roll 17 is mounted on a shaft 18 journaled in bearings 19 and 20′, and a friction device is employed for retarding the rotation of the roll 17 so as to stretch or pull the cloth lengthwise past the expander. For this purpose, a friction disk 20 is secured on the shaft 18, and a complementing friction disk 21 is slidable on the bearing 19 and does not rotate, a felt or similar friction disk 22 being disposed between the disks 20 and 21. A nut 23 is screw-threaded on the bearing 19 and a spring 24 is confined between said nut 23 and the disk 21, so that by adjusting the nut the pressure of the spring can be regulated, to regulate the pressure between the disks 20 and 21 and the degree of friction. The disk 20 rotating with the tension roll 17 is in frictional connection with the non-rotatable disk 21, thereby bringing the cloth under longitudinal tension as it is pulled into the machine, and the expander or expanding roll contacts with the cloth as it moves beyond the roll 17. The expander having a continuous unbroken periphery from end to end will have a continuous contact with the cloth from one edge of the cloth to the other edge, thereby providing for a uniform stretching or expanding action transversely of the cloth so that each thread is uniformly taken hold of by the expander. The stretching is done uniformly for coarse as well as fine fabric, and the cover 12 being of rubber or other frictional material will prevent the cloth from slipping when passing the expander. The cloth is stretched or expanded edgewise in proportion to the curvature of the expanding roller.

The present expander can be 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. Thus, the herein described expander can be rotated by power if desired, and a group of the expanders can also be used which may be adjusted upwardly and downwardly to regulate the contact thereof with the cloth, or the expanders may be superposed to grip and squeeze the cloth between them.

The bearings 10 can be lubricated without the possibility of the lubricant escaping and soiling the cloth, inasmuch as the oil or lubricant is retained within the cover 12 even though the lubricant may escape from the bearings and run between the ends of the roller member 9.

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

1. A cloth expander comprising rotatably mounted roller members to be disposed along a curved line, and a rubber cover molded on and anchored to said members.

2. A cloth expander comprising a curved rod, roller members rotatable thereon, and a tubular rubber cover molded on and anchored to said members.

3. A cloth expander comprising rotatable mounted roller members to be disposed along a curved line and having apertures in their peripheries, and a rubber cover molded on said members having portions anchored in said apertures.

4. A cloth expander comprising rotatably mounted roller members having apertures, and a rubber cover molded on said members having portions engaging through said apertures and formed with heads.

5. A cloth expander comprising roller members disposed end to end, and a rubber cover on said members having portions engaging between the ends of the rollers.

6. A cloth expander comprising roller members having clutch lugs at their adjacent ends for rotating said roller members as a unit, and a rubber cover on said members having portions extending inwardly at the adjacent ends of the rollers between said lugs.

7. A cloth expander comprising roller members having clutch lugs at their adjacent ends for rotating said roller members as a unit, and a rubber cover on said members having portions extending inwardly at the adjacent ends of the rollers between said lugs, said portions being formed with beads overlapping said lugs to assist in anchoring said cover on said members.

In testimony whereof I hereunto affix my signature.

FREDERICK BENEDICT VOEGELI.