

Aug. 4, 1953

E. E. THOMAS ET AL

2,647,300

DETACHABLE TUBULAR COVER FOR PAINTING ROLLERS

Filed March 10, 1949

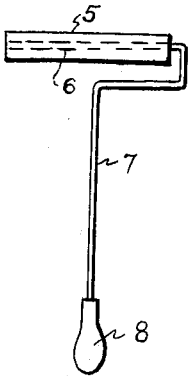
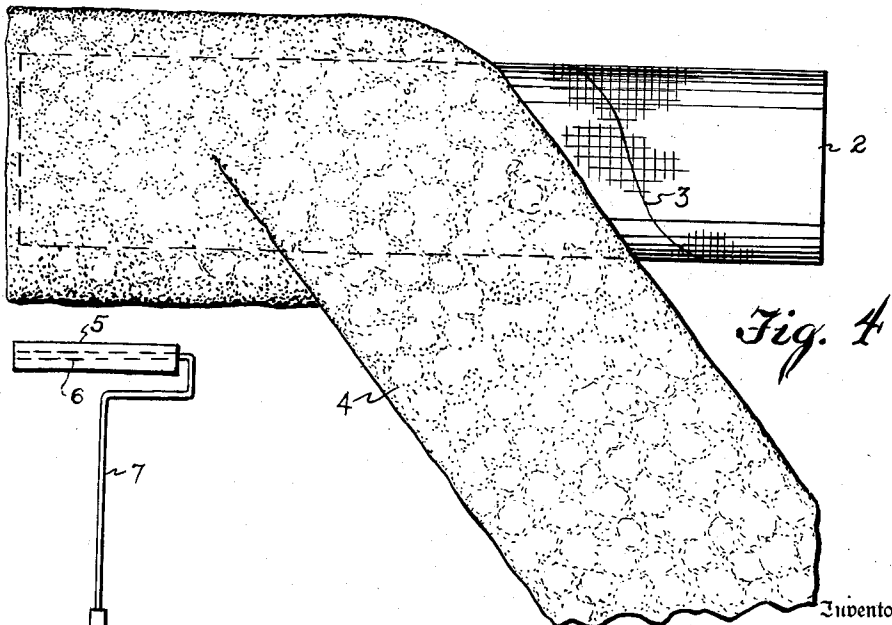
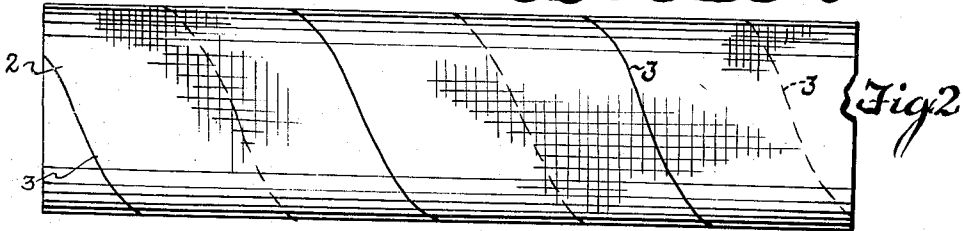
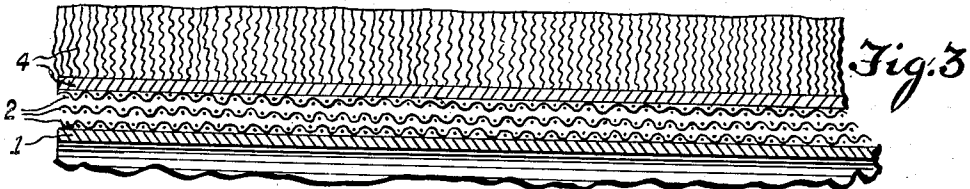
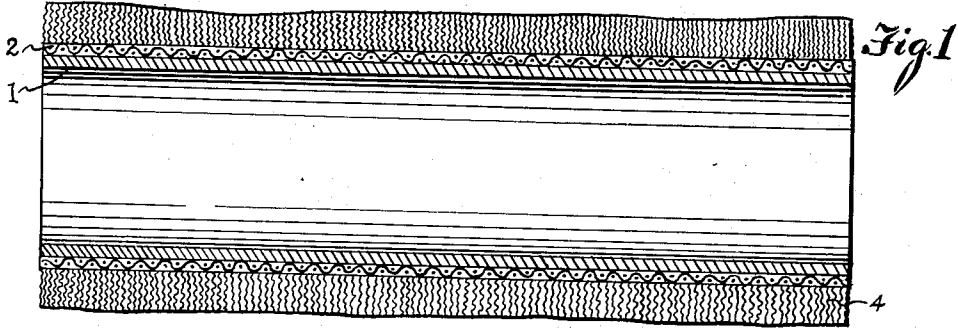


Fig. 5

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2,647,300

DETACHABLE TUBULAR COVER FOR
PAINTING ROLLERS

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Application March 10, 1949, Serial No. 80,652

6 Claims. (Cl. 29—120)

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This invention relates to rotary painting appliances, and particularly tubular covers for the rollers of such appliances.

Sleeves formed of wool-retaining lambs' skin, mohair, plush, or carpeting of a suitable nap type are commonly applied to painting rollers, and it is common also to afford ready removal of such sleeves for cleaning or replacement thereof and for alternative use of different types. The described sleeves have, moreover, been reinforced to the extent of cementing them to inner cardboard tubes, which have tended to maintain their cylindrical form, and facilitated their application to and removal from rollers. We have found the direct application of such a sleeve to a fibrous tube unsatisfactory, regardless of the strength of adhesive employed, since only a moderate force suffices to peel the sleeve free of the tube, particularly when the sleeve is formed, as is our preference, by helically winding a strip of suitable material on the tube. This is for the reason that such fibers of the tube as carry the adhesive can readily be torn from the tube. It is to be understood that sleeves of the described type are occasionally subjected to rough usage, particularly when lacking roller support. Thus such sleeves, either prior or subsequent to use, may be carelessly subjected to unduly heavy weights, and attempted paint removal may entail submergence of the sleeves for considerable periods in liquid solvents, potent or otherwise.

An object of the invention is to strongly attach a nap-forming sleeve to an interior tube of relatively weak fibrous material by first reinforcing the tube with an outer covering of a relatively strong woven fabric, as cheesecloth, gauze, or burlap, stiffened by impregnation with a strong adhesive, the sleeve being adhesively carried by the fabric.

Another object is to helically wind the nap-forming outer material on the woven reinforcement in the form of a strip, whereof the edges of the convolutions are closely abutting and concealed by the nap, the latter thus presenting an unbroken cylindrical surface.

Another object is to apply the aforementioned tube-reinforcing woven fabric as a strip helically wound on the tube to a thickness of several plies, each succeeding ply covering the spiral joint of the previously applied ply.

Another object is to impregnate the reinforcing woven fabric with an adhesive which will materially stiffen the fabric, while allowing a very considerable deformation, without cracking, whereby the sleeve and its adherent members withstand rough usage and abuse.

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These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawing, wherein:

Fig. 1 is a longitudinal axial sectional view of our improved tubular cover.

Fig. 2 is a view of said cover in elevation, as completed to the extent of applying a woven fabric reinforcement to the card-board tube.

Fig. 3 is a radial axial, diagrammatic sectional view, showing a fragmentary portion of a wall of the completed cover.

Fig. 4 shows the cover with a nap-forming strip partially applied.

Fig. 5 is an elevational view of the type of appliance to which our improved cover is applicable.

In these views, the reference character 1 designates a tube inexpensively formed of light fibrous material such as cardboard, preferably by winding a strip or strips of paper in successive plies on a mandrel (not shown) until the resultant tube acquires a required thickness and stiffness. Such paper is preferably treated to render it waterproof as well as resistant to common paint solvents such as turpentine. Externally applied to the tube 1 is a reinforcement consisting of several plies of an open mesh woven fabric 2. Suitable fabrics for this purpose are cheese-cloth, gauze, and burlap, which are all quite inexpensive. It is preferred to apply the fabric 2 as a strip helically wound on the tube 1 with the edges of successive convolutions substantially abutting, as indicated at 3. To derive the desired reinforcing effect, three or more plies of this fabric are preferred. It is necessary to firmly secure the fabric reinforcement 2 to the tube 1, and to also firmly secure the several plies of such fabric to each other. Also it is necessary, or at least highly desirable, to stiffen the cylinder formed by the fabric so that it will add materially to the resistance offered by the tube 1 to collapse or other distortion. These various requirements are all met by simply impregnating the fabric 2 with a suitable adhesive plastic, such as cellulose nitrate. The latter may be applied either preliminary to the winding operation, or by an immersion of the fabric-wound tube in the plastic. It has been found that cellulose nitrate is particularly desirable for our purpose since it will not readily crack when hardened. Consequently, if our improved cover is forced out of shape by rough usage, it may, upon restoration to its original shape, in most instances, still give satisfactory service.

It is preferred to allow the fabric-wound tube

1 to dry, before applying the nap-forming sleeve 4 which completes the cover. Such sleeve, as best appears in Fig. 4, consists of a strip or strips 4 of suitable material, as lambs' wool, mohair, carpeting or the like, helically wound on the fabric-covered tube and held firmly in place by a suitable adhesive on its inner face. Cellulose nitrate also serves very well as this adhesive. The convolutions of the strip 4 have either a mutually abutting or closely adjoined relation, their edges 10 being thus completely hidden by the nap.

Upon drying of the last-used adhesive, the strip 4 is so powerfully held in place that only a quite considerable and unusual force can effect its detachment. Durability of the described cover far exceeds that of covers heretofore produced for a like purpose. This is evidenced by the fact that even if the inner tube 1 of paper or the like be removed, as by prolonged immersion in water or use of strong chemicals, there is still a firm adhesion of the strip 4 to the fabric cylinder, these parts forming a unit such as will still function quite well as a paint-applying roller cover.

Formation of the cylinder 2 by helically winding a strip of fabric on the tube 1 and similarly forming the outer covering 4 is conducive to inexpensive quantity production at low cost, since automatic machines may be used for these winding operations. Thus both the methods of construction and materials employed are such as to render cost of our improved cover at least as low as that of far less durable covers heretofore employed.

As shown in Fig. 5, the common type of appliance to which our cover is applicable comprises a roller 5 journaled on a shaft 6 formed by an end portion of a rod 7 projecting from one end of the roller and bent at right angles to the roller axis to carry a handle 8 on its other end portion. Details of such an appliance are to be found in our Patent 2,520,863, of August 29, 1950.

What we claim is:

1. A paint-applying roller cover comprising an inner tube of light, non-metallic fibrous material, a woven fabric exteriorly covering said tube, an adhesive securing the fabric directly to the tube substantially throughout the peripheral exterior area of the tube, a sleeve having an exterior paint-retaining nap and embracing the fabric-

covered tube, and an adhesive securing substantially the entire interior area of the sleeve to the fabric.

2. A paint-applying roller cover as set forth in claim 1, said fabric comprising a plurality of plies and being formed by a strip helically wound on the tube.

3. A paint-applying roller cover as set forth in claim 1, said sleeve comprising a strip of material helically wound on the fabric-covered tube.

4. A paint-applying roller cover as set forth in claim 1, said fabric and sleeve both being in strip form and helically applied.

5. A paint-applying roller cover as set forth in claim 1, said adhesives being cellulose nitrate.

6. A paint-applying roller cover comprising an inner tube of light, non-metallic fibrous material, a flexible reinforcement spirally exteriorly applied to and substantially covering such tube and resisting separation from the tube of its surface fibers, a sleeve having an exterior paint-retaining nap and embracing the reinforced tube, and an adhesive securing the reinforcement to the tube and said sleeve to the reinforcement substantially throughout their contiguous faces.

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