Oct. 14, 1947. W. A. PLUMMER, JR 2,428,943

MEANS FOR TURNING FABRIC TUBES

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Fig. 1.

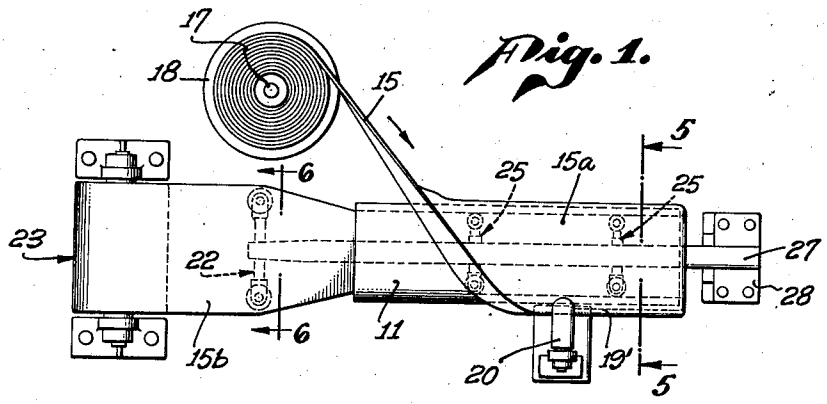


Fig. 2.

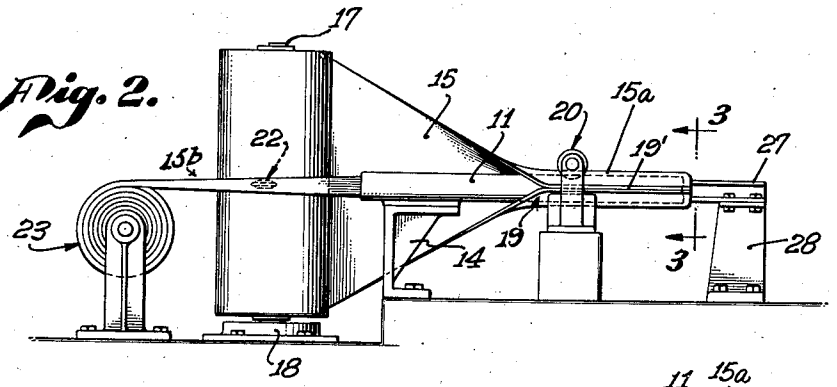
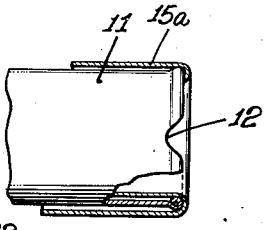


Fig. 3.



Fig. 4.



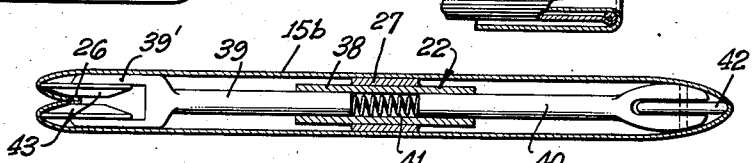


Fig. 6.

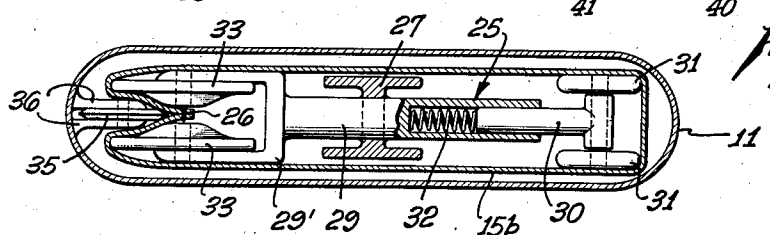


Fig. 5.

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MEANS FOR TURNING FABRIC TUBES

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3 Claims. (Cl. 112—63)

1

My invention relates generally to means for forming and turning fabric tubes and the like. It is a primary object of my invention to provide novel apparatus for the manufacture of fabric tubes wherein the tubes are formed from a long strip of fabric and continuously turned inside out after being formed.

It is a particular object of my invention to provide means about which a tube of fabric may be formed and through which the formed tube can be drawn to turn it inside out. It is also a particular object to provide guide means for maintaining the seam of the fabric tube in the same relative position and extending longitudinally at all times during the process. It is a further object of my invention to provide a means for expanding the fabric tube as it emerges from the tube turning means so that the tube can readily be rolled up or otherwise stored in a flat condition.

These and other objects will be apparent from the drawing and the following description thereof. Referring to the drawing, which is for illustrative purposes only—

Fig. 1 is a plan view of apparatus embodying the invention;

Fig. 2 is a side elevation of the apparatus of Fig. 1;

Fig. 3 is a cross sectional view on line 3—3 of Fig. 2 showing the end of the tube about which the fabric is formed and through which it is drawn, the fabric being omitted from the view;

Fig. 4 is a fragmentary side view of the end of the tube taken on line 4—4 of Fig. 3 and showing the fabric in section;

Fig. 5 is a cross section on line 5—5 of Fig. 1; and

Fig. 6 is a cross section on line 6—6 of Fig. 1.

More particularly describing the invention reference numeral 11 generally indicates a tubular member about which the fabric is brought together to form a tube and through which the formed tube of fabric is drawn to turn it inside out. The tubular member has a flattened cross sectional shape as clearly shown in Fig. 3 and is supported at one end by a suitable standard 14, the remainder of the member projecting beyond the supporting means. At its other end the tubular member 11 is provided with a notch 12, the purpose of which will be explained later.

The particular tubular member 11 is only one means which might be used and it is apparent that an ordinary tubular member or an elongated frame work consisting of two or more elongated members suitably supported over which the fabric can be formed into a tube and between which it

2

can be drawn to turn it inside out might be used.

The fabric 15 is continuously fed to the tubular member 11 and brought therearound to form a fabric tube as indicated at 15a.

The fabric may be stored on an upright rotatable spindle 17 mounted in a suitable base 18 or it may be otherwise handled as convenient. Any suitable means either manual or otherwise may be used for feeding the fabric 15 to the tubular member 11 and gathering it thereabout so that it encloses the tubular member with its edge portions in overlapping or superimposed relation in the region 19. These edges are stitched as indicated at 19' by a sewing machine or the like diagrammatically indicated at 20. It is contemplated that some other means might be used for securing the edges of the fabric tube together.

It is to be noted that the fabric is brought around the tubular member in the region intermediate its ends and at a point beyond the standard or support 14. After the fabric is formed into a tube 15a it is drawn through the tubular member to turn it inside out. As the turned fabric tube, indicated by 15b, emerges it is expanded laterally by means which will subsequently be described and which are generally indicated in Fig. 1 by numeral 22. It may then be stored in a rotatable roll generally indicated at 23 or folded into a bin or the like. Any suitable means may be used for pulling the fabric through the tubular member such as a motive means for turning the storage wheel 23.

The tubular member 11 is preferably made flattened as indicated and provided with a notch 12 at the end over which the fabric is turned. The notch 12 is adapted to receive the seam of the fabric as it turns inside out and aid in maintaining the seam straight and extending longitudinally of the tubular member. The seam portion of the fabric tube, being relatively bulky, readily enters the notch as the fabric tube is pulled through the member 11 under tension.

Guide means, generally indicated by numeral 25 in Fig. 1, are provided inside the tubular member for the purpose of taking up the slack circumferentially of the tube as it passes through the tubular member and for the purpose of maintaining the tube with the seam indicated by numeral 26 at the side of the tube on the inside thereof. For illustration only two sets of these guide means have been shown, however, any number may be employed. Each guide means 25 is supported on a beam 27 which in turn is supported beyond the unsupported end of the tubular member 11 on a standard 28. With this construc-

tion the fabric tube may be passed through the tubular member without any obstacles preventing such passage. The guide means itself comprises a cross support member 29 which receives a member 30 provided with a pair of wheels 31. Preferably these wheels are spaced apart in order to take up as much of the slack as possible. A single wheel might be substituted however. A spring 32 serves to urge the member 30 outwardly. At the opposite end the member 29 has a yoke 29' in which are mounted a pair of spaced wheels 33. The inner surfaces of these wheels converge toward their axis of rotation so that the distance between them is greater at their peripheries than at their axes.

Mounted opposite the guide means 25 on the inner surface of the tubular member 11 is a guide wheel 35 which can be supported in any suitable way as by the complementary members 36. This guide wheel 35 is adapted to engage the seam 26 of the fabric tube and hold it between the two wheels 33, the three wheels cooperating to maintain the seam of the fabric in the position shown. Thus, as the fabric tube is first formed about the tubular member and subsequently turned over the end thereof the seam tends to stay within the notch 12 and is maintained longitudinally of the tubular member by the guide means.

I also provide a means 22 for expanding the fabric tube 15 shown as it emerges from the tubular member in order to provide a flat fabric tube which can readily be stored. This guide means 22 comprises a sleeve 38 which is mounted in the beam 27. In this connection it may be pointed out that the beam 27 is reduced in height at its end as indicated in Figs. 1 and 6. Mounted in the sleeve 38 are a pair of plungers 39 and 40 which are urged outwardly by a spring 41. The member 40 is provided with a wheel 42 at its end over which the fabric may run. The other member 39 is provided with a yoke 39' which rotatably supports a pair of spaced wheels 43. These wheels are adapted to support the fabric tube in the region of the seam 26 which extends inwardly between the wheels as shown.

In the operation of the apparatus shown a strip of fabric from any suitable source is fed to and brought around the tubular member 11 intermediate its ends so that the fabric encircles the tube. The overlying edge portions of the fabric are then stitched to form a fabric tube. After a sufficient amount of fabric tube is formed it can be threaded through the tubular member 11 and over expansion guide means 22 to roll 23 after which the movement of the fabric may be continuous, the fabric tube being progressively formed about the tubular member and reversed or turned inside out as it is drawn therethrough by any suitable means. During its passage through the tubular member the guide means 25 and the notch 12 of the tube tend to maintain the tube of fabric with the seam extending longitudinally along one side, the seam, being more bulky than the remainder of the fabric, rides in the notch which acts as a guide to maintain the position of the fabric being turned on the tubular member. As the fabric tube emerges from the tubular member it is expanded laterally into a flat tube by the means 22 after which it can be stored in a roll as shown or folded into a bin or the like to form a folded bolt.

Although, I have shown particular apparatus I contemplate that various changes and modifications can be made without departing from the scope of the invention and I intend to cover such changes and modifications as come within the scope of the claims. As an example of such a change, smooth-surfaced stationary fabric engaging guides might be used in place of the wheels shown on the means 22 and 25.

I claim as my invention:

1. In apparatus for use in forming and turning a fabric tube: an elongated tubular member; means for supporting said tubular member at one end thereof; a guide member mounted inside of said tubular member and projecting inwardly from the wall of said tubular member toward the center thereof, said guide member lying in a plane extending longitudinally of the tubular member; a guide means including a pair of spaced elements adapted to overlap said guide member on opposite sides thereof for a limited extent; and means for supporting said guide means independently of said tubular member.

2. In apparatus for use in forming and turning a fabric tube: an elongated tubular member; means for supporting said tubular member at one end thereof; a guide wheel mounted inside of said tubular member, the axis of rotation of said wheel being perpendicular to a plane extending longitudinally of the longitudinal axis of the tubular member; a beam extending into said tubular member; means for supporting said beam beyond the unsupported end of said tubular member; and guide means on said beam inside of said tubular member in the region of said guide wheel comprising a pair of spaced fabric tube engaging wheels overlapping said guide wheel on opposite sides thereof and a fabric tube engaging means extending toward the inner wall of said tubular member opposite to said guide wheel.

3. In means for forming and turning a fabric tube: an elongated tubular member about which a fabric tube or the like can be formed and through which it can be drawn to turn the same inside-out, said tubular member having a notch at the end thereof over which a formed fabric tube is drawn adapted to receive the seam of a formed fabric tube as the same is drawn over the end of the tubular member; resilient guide means inside said tubular member for holding a formed fabric tube in a predetermined position as it passes through said tubular member and for maintaining the formed fabric tube taut circumferentially with the seam thereof substantially in a plane disposed parallel to the longitudinal axis of said tubular member and passing through said notch, said guide means being in part inside and in part outside of the fabric tube; and cantilever beam means mounted exteriorly of said tubular member supporting a part of said guide means.

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