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APPARATUS FOR THE PRODUCTION OF FLEXIBLE TUBES OR HOSES HAVING HELICALLY EXTENDING REINFORCING ELEMENT

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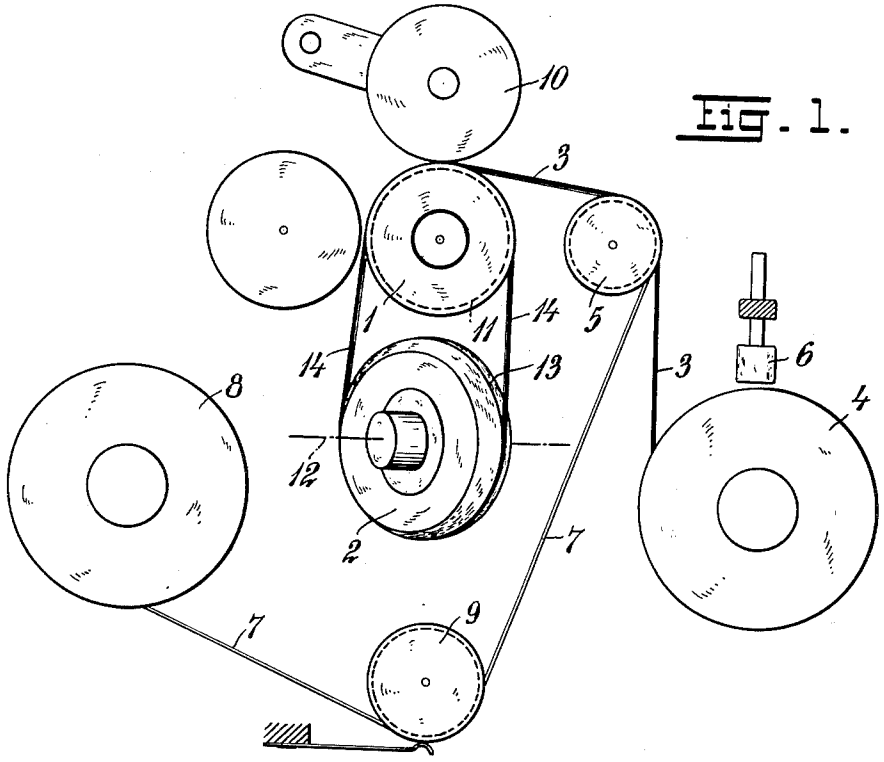
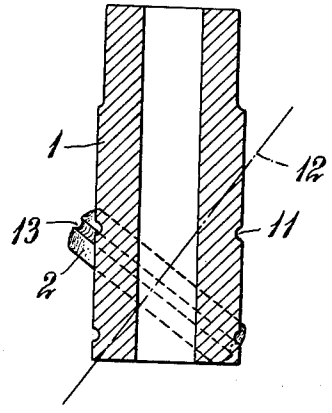


Fig. 1.

Fig. 2.



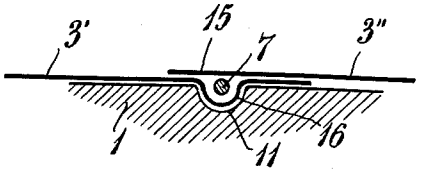


Fig. 3.

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APPARATUS FOR THE PRODUCTION OF FLEXIBLE TUBES OR HOSES HAVING HELICALLY EXTENDING REINFORCING ELEMENT

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1 Claim. (Cl. 156—429)

The present invention relates to an apparatus for the production of flexible tubes or hoses provided with a helically extending reinforcing element for instance in the form of a metal wire, a nylon monofil or the like. The material of the tube may be arbitrarily chosen provided it is weldable. Preferable various types of plastic materials are used.

Flexible tubes or hoses at present are used for many purposes such as for supplying air in drying plants. Such hoses preferably ought to have a certain stiffness in spite of its flexibility and this is obtained either by producing the wall of the hose from a more or less self supporting material as for example plastic-covered canvas or producing them from a thin material which is stiffened by means of a helical reinforcing. Usually such reinforcing element has been secured on the outside or the inside of the tube by means of stitching.

It is however also known apparatuses for the production of tubes having helical reinforcing inserted between the overlapping edges of a similarly helically wound strip. Such previously known apparatus have however been complicated and expensive at the same time as they have given a heterogeneous final product.

The invention has for its object to make it possible to produce reinforced tubes or hoses of flexible material in a simplified way, whereby still is obtained very good products.

The invention is further described under reference to the drawing in which an example of an embodiment is schematically shown:

FIG. 1 shows an apparatus for the production of reinforced tubes or hoses according to the invention.

FIG. 2 shows a detail of FIG. 1 as seen from above.

FIG. 3 shows how the edge joint and insertion of the reinforcing element is carried out.

From a supply roll 4 a strip 3 of weldable flexible material via a guide roller 5 is led over a rotatable winding drum 1. A brake 6 cooperates with the supply roll 4 to regulate the winding off of the strip 3.

For another supply roll 8 at the same time a nylon thread 7 is led over a guide roller 9, on which acts a braking leaf spring or the like to give the thread 7 the desired tightening. The nylon thread is then led over the same guide roller 5 as the strip 3 and strip and thread are then both led to the winding drum 1 in correct mutual position. The winding drum 1 is provided with a circularly extending groove 11 adapted to take up the nylon thread 7 and that part of the strip edge which is located under said thread as further explained below. The winding drum 1 cooperates with a welding electrode wheel 10. The strip 3 is wound up in overlapping position to form a tube or hose, said overlapping edge portions being welded together. The apparatus is so adjusted that the nylon thread 7 during the welding operation is situated in about the middle of the overlapping edge portions, which thereby is welded together on both sides of the

thread. The nylon thread thus will be situated in the interior of a helically extending canal in the wall of the finished tube or hose.

In FIG. 3 is shown in an exaggerated form how the thread 7 is located in the groove 11 of the drum 1 during the welding operation. The groove 11 is thus dimensioned to take up the thread 7 as well as that part 16 of the edge of the strip 3', which is located partly around the thread in the groove. When the overlapping edge 15 for the adjacent winding 3'' of the strip is welded to the edge of the winding 3', the thread will be located in a canal extending on the inner side of the wall of the tube or hose. The outside of the tube or hose is even.

The feed of the finished tube or hose 14 in its axial direction is adjustably carried out by means of the guide roller 2, which is arranged having its axis of rotation oblique in relation to the axis of the winding drum 1 and being provided with a groove 13 adapted for the reinforcing thread. This guide roller 2 thus will feed the finished product 14 axially away from the drum 1 by means of the engagement between the thread-and-edge portion 7, 16 and the groove 13. The adjustment of the inclination of the axis 12 in relation to the axis of the winding drum 1 will regulate the feed and thereby also the overlapping of the two edge portions of the strip which are to be welded around the reinforcing element 7.

From the above will appear that according to the invention a very simple and reliable apparatus is provided for the production of such wound tubes or hoses of plastic material or the like having helical reinforcing. It will further be understood that the example disclosed in the drawing is meant as an illustration only of the invention idea, and that this may be varied in different ways without thereby departing from the scope of the application. Thus two or more reinforcing threads can be placed side by side, or the reinforcing can consist in a flat tape or a strip of metal. Further the groove of the winding drum can be altered according to desire to have the reinforcing element located on the one or the other side or in the middle of the wall of the finished tube or hose. Further an arbitrary kind of reinforcing element can be used provided it has the desired flexibility and/or resilience.

I claim:

Apparatus for continuously forming flexible hose of the wire reinforced type having tape disposed helically in overlapping relationship comprising a winding drum and a guide roller disposed adjacent one another on axes extending at an acuate angle to each other in parallel planes, said winding drum having a pair of annular grooves at the periphery thereof in planes extending in spaced relationship normal to the drum axis, said guide roller having an annular groove at the periphery thereof in a plane extending normal to the roller axis, drive means for rotating each of said drum and said roller through engagement with a corresponding end of each, the other end of each of said drum and said roller being free and unobstructed, means for feeding the tape and the wire onto the drum with one edge of the tape in overlapping relationship with the wire in the drum groove remote from said free end thereof, whence the tape and the wire pass onto the roller with the wire and said edge in overlapping relationship in the groove thereon, said roller extending in the space between said planes of the drum grooves in such angular relationship with the drum that rotation of

the roller and the drum carries the wire and said overlapping edge of the tape into the other of the drum grooves, whereby the other edge of the tape overlaps said wire and said first-named overlapping edge in the first-named drum groove, and means for welding the wire and the two overlapping edges of the tape together in the first-named drum groove.

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