

SPECIFICATION

A tread roll

5 This invention relates to those rolls, known as "tread" rolls, by which a moving layer of water-laden material is dewatered and compacted, in the manner of a scroll, on an accumulator roll. A typical instance of the use
10 of a tread roll occurs in the manufacture of pipes, sheets and other articles out of fibre-reinforced cementitious material such as asbestos-cement. In that industry, a film-like web of the constituent material is usually
15 partly dewatered while being carried towards the tread roll by an endless conveyor belt known as a "felt". The film-like layer is fed from the conveyor into the nip of a tread roll and a parallel accumulator roll; the tread roll
20 being loaded to bear resiliently towards the accumulator roll so that by the wringer effect of the two the layer is further dewatered; and, due to the bearing pressure of the tread roll on the accumulator roll, the dewatered layer is
25 compacted onto the accumulator roll in scroll formation until the scroll becomes of a thickness equal to that required for the ultimate product. Where the ultimate product is a pipe, the accumulator roll may be a mandrel; where
30 the ultimate product is a sheet, the accumulator roll is known as a "size" roll, and the scroll wound on it is in the form of a large diameter sleeve which is axially severed and then laid out flat, corrugated or otherwise
35 formed and then cured to give the required final sheet.

Tread rolls are widely in use which are simply plainly cylindrical, but to assist the get-away of water expressed from the layer as it is
40 being added to the scroll, it has been proposed to furnish the tread roll with a multiplicity of shallow circumferential grooves which act as channels into which water to be removed may relatively easily enter, and along
45 which the expressed water may flow clear of the layer being dewatered.

The use of a grooved tread roll as aforesaid is quite satisfactory in its augmentation of the dewatering effect. However, to provide the
50 grooves is a fairly extensive machining operation and when they have to be renewed it means removal of the roll from the rest of the apparatus to re-form the grooves and then re-installation of the tread roll in the working
55 position. Moreover, each re-grooving by a turning or like machining process removes the metal or other material out of which the roll is made.

According to the present invention there is
60 provided a rotatable tread roll for use in dewatering a moving layer of film-like material and compacting the de-watered layer onto an accumulator roll; said tread roll being of the kind provided with circumferentially-extending
65 water runway channels on its work surface

and comprising a cylindrical base roll, an array of girdles each of which encircles said base roll so to leave a space between each neighbouring pair of said girdles thereby to
70 constitute one of said runway channels, means at the ends of each of said girdles whereby said ends are held in close contact with said base roll, said means, in respect of
75 at least two of said ends, being formed by a bend in a girdle free-end and housed within a hole in said base roll, and connective means whereby each of said girdles is separably
80 joined to said base roll so as to permit removal of any one of said girdles from said base roll without disturbing all of the remaining girdles.

An embodiment of the invention will now be described, by way of an example, with reference to the accompanying drawings, in
85 which:—

Figure 1 is a perspective view of a tread roll according to the present invention,

Figure 2 is a plan view showing the same roll having a plurality of girdles in the form of
90 a continuous wire-strand applied thereto,

Figure 3 is a detail on a somewhat enlarged scale showing how one or both ends of the wire-strand shown in Fig. 2 may be secured relative to the base, and

95 *Figure 4* on a still more enlarged scale illustrates a manner of splicing a wire-strand to be wound on the base.

The illustrated tread roll consists of a cylindrical roll base 5 having a wire-strand 6
100 helically wound on it. For simplicity the wire-strand 6 is of circular cross-section and is closely wound as a helical coil on the base 5 so that although the helices of the strand are in contact, they still leave sufficient space
105 between adjacent turns to act as water runway channels. The wire-strand 6 need not be closely wound and it need not necessarily be of circular cross-sectional shape. However, close winding is convenient since without ef-
110 fort it ensures uniformity of winding. The size and the spacing of the channels will of course be related to the diameter of the wire-strand 6 employed. But if greater channel space is required a first strand helix may be applied to
115 the roll and then a second strand helix of somewhat less diameter may be wound on the first helix in the spaces between its turns.

The base 5 is provided with journals 7 for its rotational mounting, and while it is being
120 wound the strand 6 is preferably fed through a friction clamp or the like as indicated at 8 in Fig. 2 so that the strand 6 will be suitably tensioned. To ensure close winding, the strand feed lags the helix axial progress by an amount indicated exaggeratedly by the span
125 marked "9" in Fig. 2. Stationary post 10 is merely in the nature of a strand guide and may act as a mounting arrangement for the clamping means indicated at 8.

130 The ends of the strand 6 are secured to the

base 5. This may be done in several ways, but preferably it is one providing for simple removal of the strand 6 when it is to be replaced or in the event of its breaking and some fraction of it is to be replaced. Fig. 3 indicates the preferred manner of making this attachment. It consists in radially bending the strand 6 as indicated at 11 and hammering the bent portion 11 into a hole 12 provided in the roll base 5. To ensure unwanted separation, the joint may be completed by spot soldering which can easily be melted or torn away to release the strand.

One simple way to handle the strand 6 and the winding process is to have a strand coil mounted on a common feed turntable. The strand 6 is then led through the post 10 and suitably tensioned by operation of the clamp 8. The leading end of the strand 6 is then secured to the base 5 in the manner discussed above in relation to Fig. 3.

If the coil length of the strand 6 is insufficient to en-girdle the full working length of the base 5, or in the event of a strand breakage occurring so that a portion of the coiled strand is to be replaced, continuity of the wrapping strand may be effected by smooth splicing as shown in Fig. 4. Referring to that figure, it will be seen that the trailing end 13 of a partly coiled strand 6 and the leading end 14 of a fresh length of strand 6 are both obliquely tapered, soldered, spot-welded or otherwise joined together, and then the joint externally smoothed for example by filing. The strand 6 may then be fed to and onto the base 5 as though it (the strand) is continuous.

It will be appreciated that in the event of coiled strand breakage it is desirable to limit the need for replacement to the close vicinity of the break. Therefore it is desirable, throughout the axial length of the coil, to spot solder it, as indicated at 15 in Fig. 1, to the base 5. When a breakage occurs the related solder joints 15 may be easily torn or melted and the remainder of the strand 6, other than that in the vicinity of the break, will remain intact. A portion of new strand may then be spliced to the trimmed-off ends of the broken strand, thus obviating necessity to unwind the entire strand 6 from the base 5.

It will be seen that a strand providing water runway channels as previously described can be applied to a roll base while it is in situ. Similarly, any breakage of such a strand may be remedied without necessity for dismantling the roll base 5.

As already indicated, the base roll 5 may be furnished with a strand coil consisting of a single wire. Alternatively, the wire may be in any selected number of lengths arranged in helical continuity; the ends of each such length being removable secured to the roll base; for example in the manner shown in Fig. 3.

As a further alternative, instead of having

each girdle in the form of a single turn of a helical coil, the plurality of girdles could each consist of a circular ring, transversely severed and the ends thus created bent for attachment to the base roll in holes in the manner shown in Fig. 3.

As previously indicated, the girdles, whether they be helical or circular, are preferably of circular cross-sectional shape. They could be non-circular in cross-section provided they are so located on the base as to provide the necessary runway channels. For example, the girdles may be of square cross-section if spaced apart sufficiently to provide channels between each neighbouring pair thereof.

CLAIMS

1. A rotatable tread roll for use in de-watering a moving layer of film-like material and compacting the de-watered layer onto an accumulator roll; said tread roll being of the kind provided with circumferentially-extending water runway channels on its work surface and comprising a cylindrical base roll, an array of girdles each of which encircles said base roll so to leave a space between each neighbouring pair of said girdles thereby to constitute one of said runway channels, means at the ends of each of said girdles whereby said ends are held in close contact with said base roll, said means, in respect of at least two of said ends, being formed by a bend in a girdle free-end and housed within a hole in said base roll, and connective means whereby each of said girdles is separably joined to said base roll so as to permit removal of any one of said girdles from said base roll without disturbing all of the remaining girdles.

2. A tread roll as claimed in claim 1, in which said girdles are of circular cross-sectional shape.

3. A tread roll as claimed in claim 1 or claim 2, in which the girdles of each neighbouring pair thereof are in mutual contact.

4. A tread roll as claimed in any one of claims 1 to 3 in which said girdles are removably secured to said base roll by being soldered thereto.

5. A tread roll as claimed in any one of the preceding claims, in which said girdles are helical and each, at least at one end, is held to said base roll by being integral with a neighbouring girdle.

6. A tread roll as claimed in any one of claims 1 to 4 in which said girdles are formed as circular transversely-split rings whereof the free ends so formed are held to said base roll by being bent and homed as aforesaid.

7. A tread roll as claimed in claim 5, in which said girdles are constituted by a first strand wound as a helical coil on said base roll, and a second strand wound on and about said coil, said second strand having a lesser diameter than that of said first strand.

8. A tread roll substantially as hereinbe-



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fore described with reference to and as illustrated in the accompanying drawings.

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