Oct. 3, 1939. W. M. SCHWARTZ 2,175,131

GARNETT WIRE

Filed July 10, 1937

Fig. 1.

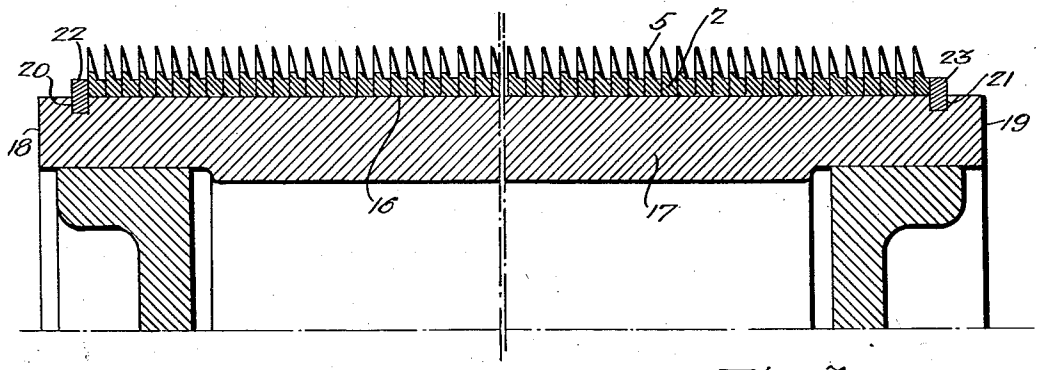


Fig. 2.

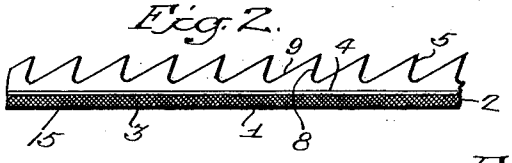


Fig. 3.

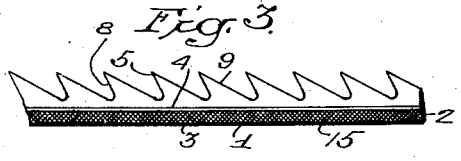


Fig. 4.

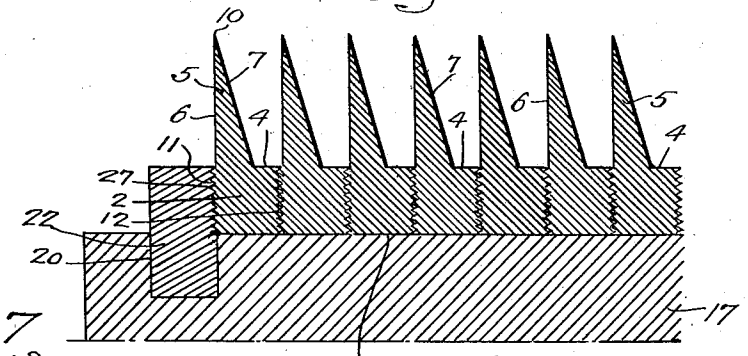


Fig. 7

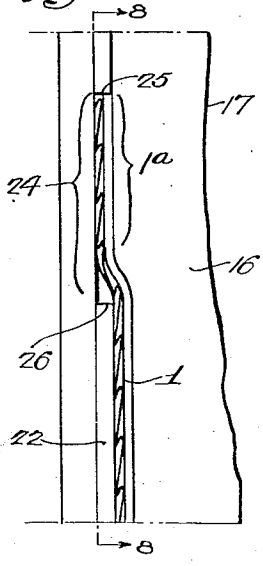


Fig. 5.

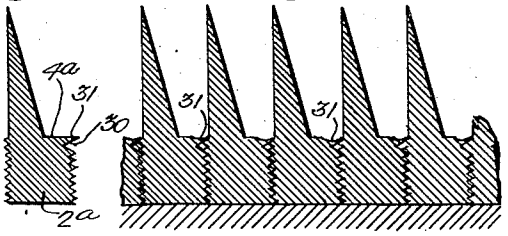
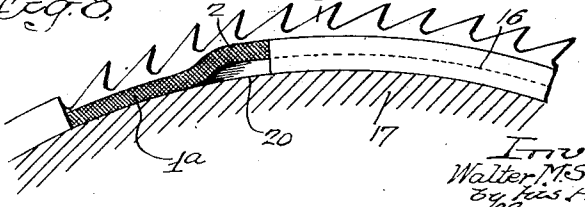


Fig. 6.

Fig. 8.



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GARNETT WIRE

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Application July 10, 1937, Serial No. 153,055

4 Claims. (Cl. 19—97)

This invention relates to toothed wire of the type employed as clothing for the various cylinders and rolls of Garnett machines.

Prior to the present invention, it has been customary, when clothing Garnett cylinders and rolls, to provide a circumferential groove in the peripheral surface of each cylinder or roll, adjacent each of the opposite ends thereof, and to place in each groove a split ring to function as an abutment for the toothed clothing wire, during and subsequent to the clothing operation. The toothed wire is wound on the peripheral surface of the cylinder or roll, between the split rings, in laterally abutting convolutions, under longitudinal tension and lateral compression. The split rings maintain the spirally wound toothed wire against shifting on and relative to the face of the cylinder or roll longitudinally thereof.

The opposite ends of the continuous clothing wire are usually secured in the grooves at the opposite ends respectively of the cylinder or roll, between the opposite ends of the split rings therein. The rings and the wire ends are caulked or swaged in the grooves or otherwise rigidly secured therein against accidental displacement therefrom.

In the winding of the clothing wire on the cylinders, rolls, etc., and during use of said cylinders, rolls, etc., in Garnett machines after being clothed with the wire, the wire at times has snapped, due to some structural deficiency or imperfection aggravated by the tension under which the wire is maintained during and after winding. As a result of the tension under which the wire is wound and retained on the cylinder, etc., when the wire breaks, the ends of the wire adjacent the breaking point are released by the breaking and spring outwardly from and revolve rapidly in opposite directions around the cylinder.

The lashing about of the uncontrolled freed ends of the broken wire is dangerous to persons in the immediate vicinity, to adjacent parts of the machine, and to the fleece or web being formed and treated on the machine.

The object of the present invention is to provide an improved form of toothed wire which, during and subsequent to the winding thereof on the cylinder, etc., and while the cylinder or roll is in use on the machine, will be securely locked to the face of the cylinder or roll in such a manner that, should the wire break, the ends of the wire adjacent the break will be held rigidly against movement relative to the face of the cylinder or roll.

Another object of the invention is to form the wire in such a manner that after the wire has been flexed around the face of the cylinder or roll and has been placed under lateral compression, such as is commonly applied during the winding operation, with the ends of the wire secured in place on the cylinder or roll, the lateral compression will cause the various convolutions of the wire to lock one with the other and with the abutment rings, to nullify the effects of the longitudinal tension of the wire and thereby prevent the wire from breaking under conditions of use in the Garnett machine.

The construction of the wire forming the subject of the present invention will be fully disclosed hereinafter, reference being had to the accompanying drawing; of which:

Fig. 1 is a fragmentary longitudinal sectional view of one side of a Garnett cylinder or roll clothed with toothed wire made in accordance with the principles of the present invention;

Figs. 2 and 3 are face views of the opposite sides respectively of the toothed wire;

Fig. 4 is an enlarged sectional view of a portion of the cylinder shown in Fig. 1;

Fig. 5 is a transverse sectional view of a modified form of the wire;

Fig. 6 illustrates the wire of Fig. 5 wound on the face of the cylinder or roll;

Fig. 7 is a fragmentary face view illustrating one way of anchoring one end of the wire to the cylinder at the beginning of the winding operation; and

Fig. 8 is a transverse sectional view taken on the line 8—8, Fig. 7.

As shown in Figs. 2 and 3, the improved wire 1 comprises a base portion 2 which, as shown in Figs. 1 and 4, is substantially rectangular in cross section.

The bottom surface 3 of the base wire 2 is preferably flat in order that the wire will seat solidly on the face of the cylinder, etc. Projecting vertically from the top surface 4 of the base wire 2 is a series of fiber-engaging teeth 5. These teeth are of the usual Garnett wire construction, varying in height and pitch on different wires according to the use to which the particular cylinder or roll clothed therewith is to be put.

As shown in Figs. 1 and 4, the teeth 5 are approximately one-half the width of the base wire 2 and extend along one side of the upper surface 4 of the base wire 2, substantially from the longitudinal center of said upper surface to one side edge of the base wire.

The opposite sides 6 and 7 of each tooth 5 and the front and back edges 8 and 9 respectively of the tooth all converge from the base wire 2 out-

wardly to a common point 10, in the present instance. In other instances the tops of the teeth 5 may be flat as is usual in Garnett machines.

As shown in Figs. 2, 3 and 4 the side faces 11 and 12 respectively of the base wire 2 are roughened in any suitable manner. Preferably the side walls 11 and 12 of the base wire 2 are provided with knurling, such as is illustrated at 15. The knurling normally is formed of alternating sharp edge ridges and depressions or channels extending parallel to each other, with one series of ridges and intermediate channels extending at one angle to the plane of the bottom surface 3 of the wire and a second series extending at an opposite or different angle and intersecting the ridges and channels of the first series.

In some instances a single series of alternating ridges and grooves extending parallel to each other in one or the other direction only at an angle to the bottom of the base wire may be employed, or, if desired, parallel to the bottom edge of the base wire 2.

As shown in Fig. 1 and Fig. 4, the clothing wire 1 is arranged to be wound on the peripheral surface 16 of a foundation element in the form of a hollow or solid cylinder or roll 17, which, adjacent the opposite ends 18 and 19 thereof, has been provided with circumferential grooves 20 and 21 respectively. Mounted in the circumferential grooves 20 and 21 are split abutment rings 22 and 23 with a gap 26 between the opposite ends 25 and 26 of each split ring.

As shown in Fig. 4, the inner faces of those portions of the rings 22 and 23 which project beyond the peripheral surface 16 of the roll or cylinder 17 are knurled or roughened, in the same manner as the side walls 11 and 12 of the base wire 2, as illustrated at 27 in Fig. 4.

When applying the toothed wire 1 of the present invention to the cylinder or roll 17 the ring 22, for example, is securely anchored in its groove 20. A portion 1*a*, at and adjacent one end of a continuous strip of the toothed wire 1, is inserted in the groove 20, between the opposite ends 25 and 26 of the ring 22. The end portion 1*a* is rigidly anchored in the groove 20, as by caulking, swaging, sweating, or in any suitable manner commonly employed in the art. The cylinder is then rotated and the wire 1 maintained under relatively high tension during rotation of the cylinder, by which the flat bottom face 3 of the base wire 2 is seated firmly against the peripheral surface 16 of the roll or cylinder. As the rotation of the roll or cylinder continues, with the wire 1 being fed tangentially thereto, under tension, the wire 1 is also placed under lateral compression by a suitable wheel or wheels, shoe, or other means commonly employed in the art to insure firm contact being made between the side walls of the base wire 2 of one convolution with the side walls of the adjacent convolutions, and, in the case of the first convolution, a firm contact between the wall 11 of the base wire 2 and the wall 27 of the ring 22. The lateral compressing operation also insures removal of kinks from the base wire 2 as the convolutions are successively formed on the face of the cylinder or roll. When the peripheral face of the roll is completely clothed, the second ring 23 is forced into the groove 21 to retain the lateral compression of the successive convolutions of the clothing wire 1 and the tail end of the clothing wire 1 is secured in place, for example, in the same manner as the leading end 1*a* of the wire 1 was secured to the cylinder or roll at the beginning of the winding operation.

The lateral compression under which the base wire 2 is placed during winding while the base wire is maintained under relatively high tension causes the ridges of the knurling on one face of the wire 1, in each convolution, to enter the channels or recesses in the adjacent face of the base wire of the next convolution, or the abutment rings 22 and 23. This locks the wire 1 rigidly to the abutment rings at each of its opposite ends and locks each convolution of the wire rigidly to the adjacent convolutions. Should the wire 1 break, for any reason whatsoever, those portions of the wire which are disposed adjacent the break cannot move radially outward from or rotate around the cylinder, due to the interlocking effect of the knurlings of the adjacent convolutions one with another under the lateral compression to which the convolutions are constantly subject and which combined with the interlocking of the knurlings prevents outward movement of any portion of the wire. The interlocked knurlings and the lateral compression of the convolutions combined also nullifies the effects of the tension and resiliency of the wire by which broken ends would normally tend to fly radially outwardly from the face of the cylinder or roll.

The lateral compression combined with the interlocking knurlings also provide for anchoring the wire at all points circumferentially of the cylinder or roll and nullifies the effects of the tension under which the wire is placed, so that breaking of the wire, due to such tension, is practically eliminated.

Fig. 5 illustrates a modified form of wire wherein a groove 30 is formed in the wire below and substantially parallel and immediately adjacent to the top face 4*a* of the base wire 2*a* on one face of the wire, which provides a longitudinally extending rib 31 on the one side of the wire throughout its entire length. The wire of Fig. 5 is adapted to be wound on the face of a cylinder or roll in the same manner as the wire 1 referred to above. After winding, the rib 31 is operated on by a suitable tool to compress said rib radially with respect to the axis of the cylinder or roll. The groove 30 underlying the rib 31 provides for the displacement of the metal of the rib into the knurlings of the adjacent face of the immediately succeeding convolution of the wire. This supplements the interlocking effect produced by the cooperating knurlings of the abutting surfaces of the successive convolutions of the wire heretofore described.

I claim:

1. A Garnett wire comprising a base portion having opposite side walls respectively nurled, and wherein the nurling comprises a multiplicity of relatively low substantially parallel ridges and alternating correspondingly shallow grooves for the purpose described.

2. A Garnett wire comprising a base portion having opposite side walls respectively nurled, and wherein the nurling comprises a multiplicity of relatively low substantially parallel ridges and alternating correspondingly shallow grooves extending at an angle to the bottom edge of said base portion for the purpose described.

3. A Garnett wire comprising a base portion having opposite side walls respectively nurled, and wherein the nurling comprises one series of narrow superficial substantially parallel ridges and alternating grooves extending at an angle to the bottom edge of said base portion and a second corresponding series extending at a different angle to said edge and intersecting the first said series for the purpose described.

4. A Garnett cylinder or roll comprising a foundation element having a cylindrical peripheral face, annular abutments in laterally spaced relation to each other projecting radially from said face, and a toothed wire arranged in laterally abutting convolutions on said face under lateral pressure between opposed inner surfaces of said annular abutments, opposite adjacently disposed side surfaces of said wire and said inner surfaces of said abutments being nurled in a manner to produce angularly intersecting interlocking low ridges and correspondingly shallow recesses to prevent relative movement therebetween.

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