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MANUFACTURE OF COVERED FLEXIBLE CORDLIKE BODIES

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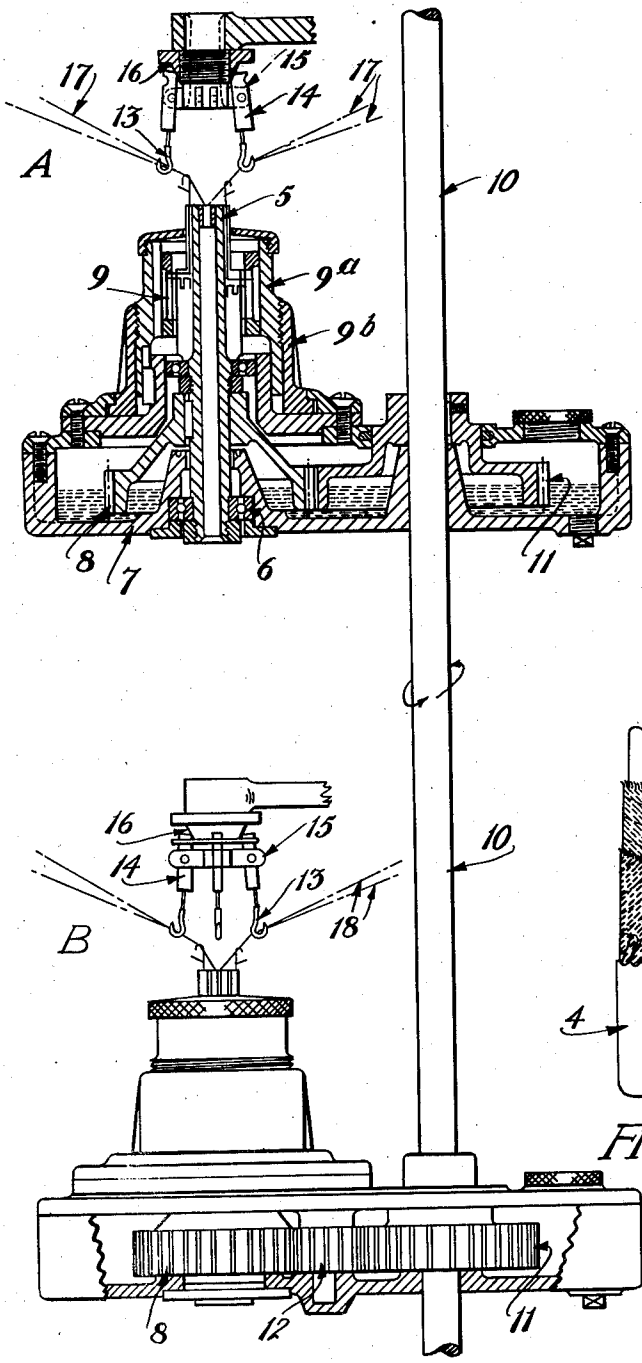


FIG. 2.

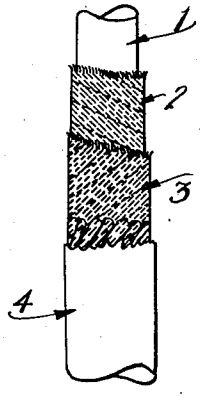


FIG. 1.

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MANUFACTURE OF COVERED FLEXIBLE CORDLIKE BODIES

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2 Claims. (Cl. 66—9)

This invention refers to flexible cord-like bodies provided with knitted tubular envelopes or sheaths, one example of such bodies being an electrical conducting wire, the insulation of which includes or is covered by a knitted tubular sheath, such sheath in most cases being then impregnated with and covered by a paste or compound.

The objects of the present invention are to provide an improved form of flexible cord-like body with knitted tubular envelope, of such construction that neither bending of the body causes rupture of the envelope, nor twisting of the body causes damage to the envelope; and to provide mechanism for producing the said improved bodies.

According to this invention, the flexible cord-like body is provided with a double knitted sheath, the wales of at least one being spirally disposed; and preferably the wales of both being spirally disposed and in opposite directions.

A machine according to the invention, suitable for producing the improved covering, comprises two co-axially arranged knitting heads of known form, each having a needle holder with reciprocating needles, a cam to operate the needles, and a reel plate or carrier to support the yarn spools, and one or both of such needle holders is or are caused to rotate during the knitting operation.

Preferably, and for producing a covering having oppositely-twisted spiral wales, both needle heads rotate, one in the opposite direction to the other.

In the accompanying drawing:

Fig. 1 is a broken view of a length of an electrical conductor to which the invention has been applied; and

Fig. 2 is a vertical section through the knitting mechanism of a machine for making the conductor shown in Fig. 1.

The drawing illustrates the preferred form of the invention in which the two coverings have spiral wales, those of one covering being disposed in the opposite direction to those of the other covering. As shown, 1 is the core of the conductor to be covered, 2 is the inner covering having the wales in a left-hand spiral, 3 is the outer covering having the wales in a right-hand spiral, and 4 is the completed article in which the coverings are impregnated with and obscured by an insulation and protective compound.

Referring to Fig. 2, the machine for producing the improved covering, has two knitting heads A and B arranged co-axially, one immediately above the other, and the core passes down through one head A and then immediately through the next B. The inner envelope 2 is knitted by the upper head A which rotates in a clockwise direction (in plan) whilst the outer envelope is knitted by the lower head, which rotates in an anti-clockwise direction (in plan).

Each knitting head comprises a rotary needle holder 5 mounted in bearings 6 in a frame 7, a gear wheel 8 being secured to such needle holder and running in an oil bath formed in the frame 7. Surrounding the upper part of the needle holder is a cam 9 in a cam box 9a, these last-named parts being non-rotary, although the cam box is capable of screw adjustment in its support 9b.

The two heads are driven from a common shaft 10 which carries a gear wheel 11 in each head, these also running in the oil bath, and whilst the wheel 11 of the upper head engages directly with the wheel 8 of the needle holder, that of the lower head engages an intermediate wheel 12 which in turn engages the wheel 8.

Above each knitter is an adjustable thread guide comprising the eyes 13 on members 14 pivoted to a stationary block 15, the upper ends of the members 14 engaging a conical surface 16 on a screwed collar, the rotation of the collar causing it to move axially and move the eyes 13 towards or away from the axis of the machine.

In use, the shaft is driven in the direction of the arrow shown, which causes rotation of the two needle holders 5 but in opposite directions. The core 1 is fed downwards through the upper block 15 and then through the upper needle holder 5, where the inner sheath or cover is formed on it from the threads 17. The covered core now passes through the lower block 15 and then through the lower needle holder 5 where the outer sheath or cover is formed on it from the threads 18.

The means for driving the shaft 10, for feeding and tensioning the threads 17 and 18, and for feeding and winding the core 1, will be according to the known art and may include any known automatic stop devices controlled by the threads 17 and 18 or otherwise.

Should the operator require to vary the tension of the wales in one or other of the sheaths, this can be done by rotating the respective cam box 8 so as to raise or lower the cam, and thereby lengthen or shorten the wales.

One or both the needle holders may have means for varying its speed of rotation, so as to vary the pitch of the spiral, and one or both may be arranged so as to be convertible from either a rotary knitting head to a stationary head, or

vice-versa, if it is desired to have the wales of one envelope straight in some cases.

In a machine having knitting arrangements as illustrated, the reel plates and cops are stationary, and the core would have no rotary movement. If desired, however, the invention could be incorporated in a machine having a rotating reel plate and (normally) stationary needle holder, in which case the needle holder would be given a slight rotational movement, sufficient to cause the wales to be spiral.

What we claim is:

1. A machine for covering flexible cord-like bodies comprising a pair of frames disposed one over the other vertically, a rotary needle-holder in each frame, the two needle-holders being arranged co-axially with each other, knitting needles reciprocable in the needle-holders, a stationary cam encircling each needle-holder and engaging the needles in the respective holders, a driving shaft passing through the two frames, toothed gearing on one frame, connecting the driving shaft to one needle-holder for rotation in one direction, toothed gearing in the other frame connecting the driving shaft to the other needle holder for rotation in the opposite direction, and stationary thread guides above each needle holder to guide threads to the needles.

2. A machine for covering flexible cord-like bodies comprising a pair of frames disposed one over the other vertically, a needle-holder rotatably mounted in each frame, the needle-holders each having a central through opening and the openings being co-axially arranged, knitting needles reciprocable in the needle-holders, a stationary cam box on each frame, encircling the needle-holder, a cam encircling each needle-holder and screwed into the cam box for axial adjustment therein, the cam engaging the needles of the encircled needle-holder, a driving shaft passing through the two frames, toothed gearing in one frame, connecting the driving shaft to one needle-holder for rotation in one direction. toothed gearing in the other frame connecting the driving shaft to the other needle-holder for rotation in the opposite direction, and stationary thread guides above each needle-holder to guide threads to the needles.

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