May 20, 1941. W. STOKER 2,242,376

MANUFACTURE OF COVERED WIRE

Filed June 18, 1938

Fig.1.

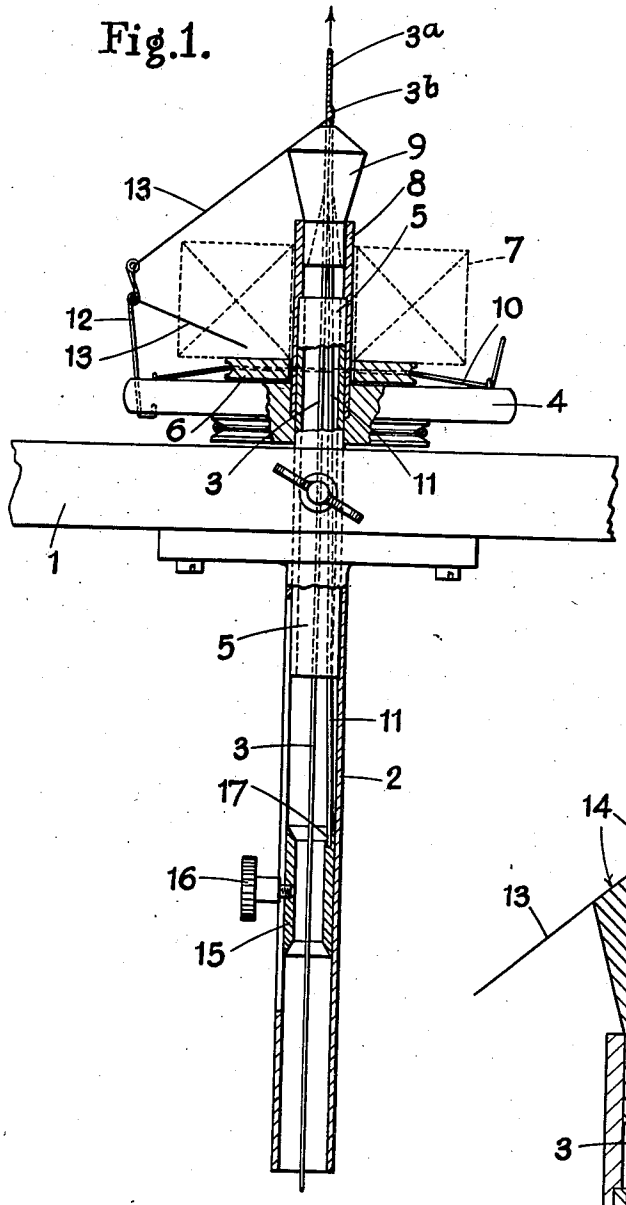
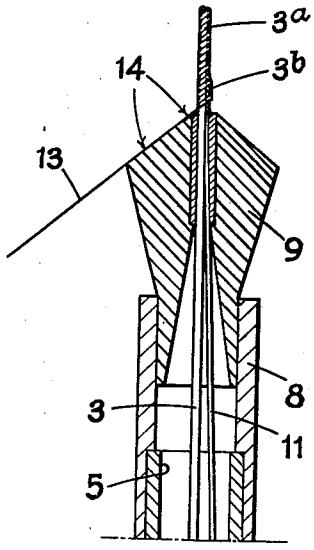


Fig.2.



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MANUFACTURE OF COVERED WIRE

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Application June 18, 1938, Serial No. 214,610
In Great Britain June 18, 1937

1 Claim. (Cl. 57—18)

This invention relates to the manufacture of covered wire, and is more particularly concerned with the manufacture of silk covered electric cable, whether a single conductor or stranded, such as Litzendraht.

It is particularly desirable to use, especially in the construction of wireless and television components, wire or cable which is not springy and will hang limp, and it is the main object of the present invention to provide a method and means of covering wire or cable whereby the finished product has the desired amount of limpness. This can be accomplished, according to the method hereinafter defined, by spinning the covering yarn on to the wire core with a predetermined degree of looseness. A further object is to effect economy by covering a greater area (length) of the wire core with a given length of yarn than is possible by methods hitherto employed. A still further object of the invention is to enable the spinning speed to be considerably increased over maximum speeds at present attainable without leaving any parts of the core uncovered or poorly covered, and without any greater risk of yarn and wire breakages than with known methods.

According to the invention the method adopted for winding yarn coverings (e. g. silk) around a wire core follows broadly known principles wherein the wire core is fed through a spinning head and on emergence at the apex or nib is covered by helically spinning the yarn thereabout, and is characterised by spinning the yarn around the wire core and a temporary core (e. g. a needle) disposed alongside the same with its tip at the spinning point, and then sliding the yarn windings off the said tip as the covered wire core advances past the temporary core. A requisite degree of looseness is thereby obtained without necessarily varying the tension on the yarn, and this degree can be adjusted by using a greater or less length of the temporary core (the tip of which is advantageously gently tapered to a point) at the spinning point. According to a further feature of the invention the yarn is fed to the two cores at an acute angle to the line of travel of the wire, riding and spreading on the exterior surface of the apex of the spinning head prior to winding, said surface being preferably conical or rounded bulls-nose in contour. By this method of operation a greater length of the wire core can be covered per given length of yarn, than by existing methods.

An apparatus constructed to carry out the invention will now be described by way of example with the aid of the accompanying drawing, wherein:

Figure 1 shows a complete spinning head, in part-sectional elevation; and

Figure 2 is a sectional elevation of the apex thereof, or terminal cone, drawn to a larger scale.

Referring to the drawing, 1 is a supporting frame, 2 is a fixed tube through which the wire core 3 is drawn upwardly, 4 is the spinning base rotatably mounted on the fixed tube 5, and 6 is the platform for supporting the cop of silk or other yarn 7. The base 4 carries fixedly a rotatable axle tube 8 which also runs on the tube 5, and in the sleeve 8 is fixedly mounted the terminal cone 9. The platform 6 is loose on the axle tube 8 but caused to rotate therewith by the adjustable tension band 10.

Existing wire covering machines may be adapted to function according to the method of the invention by the use of the following means.

In place of the normal nib in the top of the usual spinner or axle tube 8, there is fitted the cylindrical member 9 having a conical or a rounded bulls-nose end (this member being referred to as the "terminal cone"), and passing up through the spinner and the said terminal cone 9 is a needle 11 (constituting a temporary core additional to the wire core 3), means being provided for adjustably projecting the tip or point of the needle at the emergence and spinning point above the cone. The wire core 3 is fed through the ordinary tubular guide 2 and passes through the axle 8 and the terminal cone 9, so that the needle 11 lies alongside of the wire 3. Upstanding from the spinner base 4 are the usual guides 12 for the covering yarn 13 which is led therefrom across the cone at 14 and spun round the needle point core and the wire core. Prior to meeting the cores 3 and 11, the yarn 13 is caused to ride upon as large an area of the terminal cone as possible to secure yarn-spread; hence a true cone or frustrum is preferred to any other shape to secure this spreading effect to the utmost. The yarn 13 meets the cores at an acute angle to the line of travel of the wire core 3. This angular approach of the yarn directly from a spreading surface enables high spinning speeds to be attained and a good covering capacity for the yarn. At the point of application of the yarn 13 to the wire a predetermined size loop will be formed, the size being determined by the distance the needle point projects from the terminal cone 9. The further the needle point projects the looser will be the covering

and the greater limpness will result in the finished product, whilst the converse will hold as the needle is drawn into the cone.

Any suitable means may be employed for adjusting the needle. For example, there may be fitted to the tube **2** a plug **15** to which the needle **11** is secured so that its point is located in the terminal cone **9** and can be projected the required amount by sliding the plug axially in the tube after which a lock nut **16** is applied to the plug to retain the adjustment. The wire **3** passes through the plug approximately axially, and the anchoring point of the needle **11** at **17** is offset from the centre to avoid liability of the wire wrapping round the needle.

In operation it will be seen that the yarn **13** spreads itself at the surface **14** and meets the wire core **3** at an acute angle, is then spun around the wire core **3** and the tip of the temporary needle core **11** disposed alongside the same, and as the wound wire **3***a* is drawn away, the yarn windings slide off the tip of the core **11** at **3***b*.

In the production of wire having a first covering which may be of silk, cotton or other material and a silk or other outer covering, it will usually be sufficient in order to obtain the required limpness, to wind the outer covering only in accordance with the method of the invention. The adjustment of the tension of the silk before application to the wire should give an even pull, i. e. so that it is just possible to pull the cop of silk against its own weight, without breaking, before threading it through the guides of the spinner from which it passes to the tip of the terminal cone.

I claim:

An apparatus for winding and spreading yarn coverings onto a moving limp wire core, comprising, a stationary supporting tube, a spinning base rotatable about said supporting tube, a yarn guide mounted in a fixed position on the rotatable spinning base, an axle tube carried by and rotatable with said spinning base, and a yarn spreading head carried by and rotatable with said axle tube and spinning base and having a fixed relation to the yarn guide to rotate in synchronism therewith, said yarn spreading head having a central wire core passage surrounded at its exit end by a flat conical yarn engaging surface disposed transversely of the path of the yarn for flattening and spreading the yarn as it is fed to the core without lateral drag.

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