June 6, 1933. H. SCHWEITER 1,913,292

BRAIDING MACHINE FOR COVERING WIRES

Filed Oct. 29, 1931 2 Sheets-Sheet 1

Fig. 1.

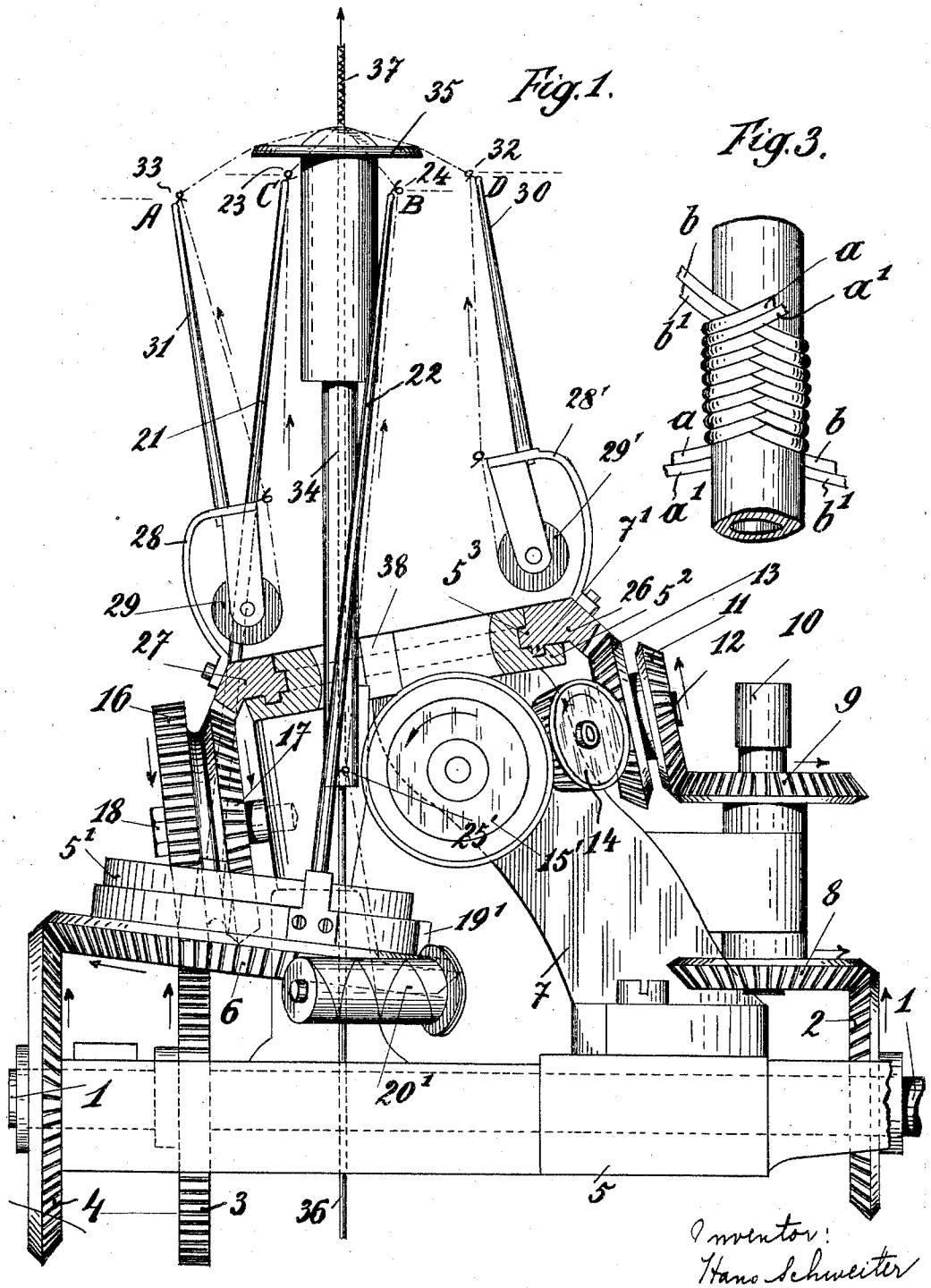


Fig. 3.

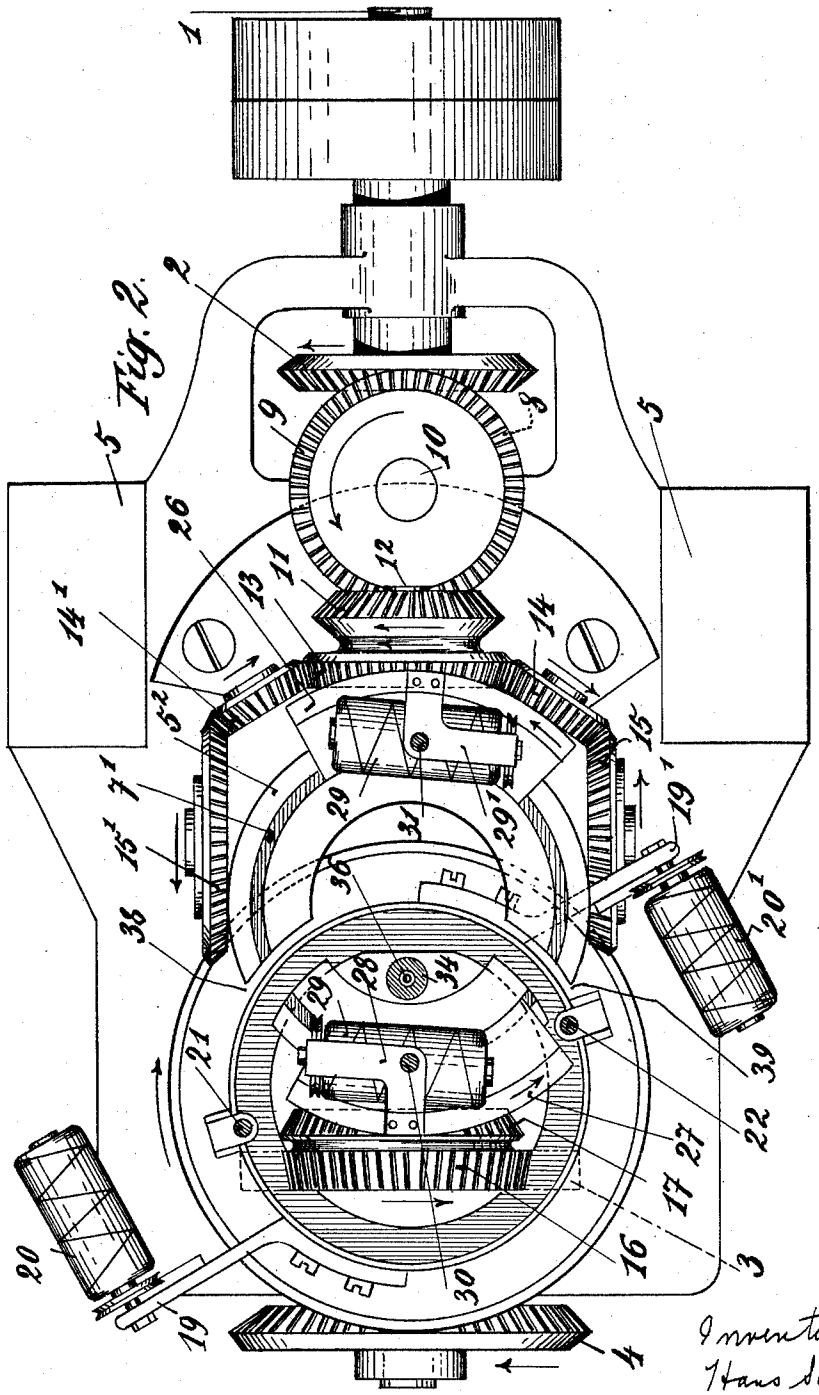
Inventor:
Hans Schweiter
By Knight Bros.
Attys.

June 6, 1933. H. SCHWEITER 1,913,292

BRAIDING MACHINE FOR COVERING WIRES

Filed Oct. 29, 1931 2 Sheets-Sheet 2

Fig. 2.



Inventor:
Hans Schweiter
By Knight Bros.
attys.

Patented June 6, 1933 1,913,292

UNITED STATES PATENT OFFICE

HANS SCHWEITER, OF HORGEN NEAR ZURICH, SWITZERLAND

BRAIDING MACHINE FOR COVERING WIRES

Application filed October 29, 1931, Serial No. 571,878, and in Switzerland November 4, 1930.

My invention relates to a cover for electric wires, textile products and the like and to a machine for making this cover.

It is well-known to provide electric wires, cables and similar articles with a cover which not only serves as a protection to the wire, cable or the like, and for decorative purposes, but also acts as a carrier for insulating material.

Such an insulating and protecting cover is usually applied by means of braiding machines of different types. The results obtained by the use of braiding machines of the older type have proved unsatisfactory, so that frequently they have been replaced in previous years by high speed round braiding machines. Though these machines afford many advantages, the results possible thereby are not commensurate with the great amount of attention and supervision demanded by them and their high initial costs. Owing to the fact that the number of bobbins has been maintained in these machines, in order to obtain an appearance of the braided cover similar to that produced by said old machines, these high speed round braiding machines have the drawback that the paths of both the upper and lower bobbins are comparatively much too large. By this large path, however, the peripheral speed of the bobbin carriers is limited. In addition, the braided cover produced by means of these machines suffers from the drawback of having the pitch of the bobbin yarn rather high, so that the cover can easily be pushed back on the core wire or cable. This is very troublesome in installing electric wires and the like, as careful securing of the cover at its ends is desired and sometimes necessary.

In the braided cover forming the subject-matter of my present invention all these drawbacks are overcome. This object is achieved by the fact that two cover layers having opposite winding direction are made to interlace only at two diametrically opposite places.

Only a small number of bobbins is required for the production of this braided work and only a very small path for the bobbins is necessary. The machine adapted for the production of my new cover has an upper path for an upper pair of bobbins, which are disposed diametrically opposite, which path is inclined relatively to the braiding axis, and a lower path for a lower pair of diametrically disposed bobbins which path is oppositely inclined to the braiding axis, a guide member for the wire or the like to be covered extending through these two paths which intersect with each other at two points.

In order that my invention may be clearly understood and readily carried into effect, an embodiment of the same is illustrated by way of example in the accompanying drawings in which

Figure 1 is an elevation, partly in section, of the parts under consideration of a braiding machine adapted for the production of my new cover,

Figure 2 is the corresponding top view, and

Figure 3 shows the braided cover on an enlarged scale.

Referring first to Figures 1 and 2, 5 denotes the support of the machine in which is mounted the driving shaft 1 which in turn has rigidly fixed on it two bevel wheels 2 and 4 and a spur wheel 3. An annular superstructure 5^1 is further provided on the support 5 and has a cylindrical groove serving to guide a bevel wheel 6 in mesh with bevel wheel 4. The superstructure 5^1 further carries two oppositely disposed carriers or holders 19 and 19^1 having mounted on each a rotary yarn bobbin 20 and 20^1, respectively. The bevel wheel 6 has further fixed on it two diametrically opposite yarn guides 21 and 22 with eyes 23 and 24 respectively. The groove guiding bevel wheel 6 is slightly inclined to the vertical braiding axis.

A carrier 7 is mounted on support 5 and at the top forms a segment 5^2 or piece having a guide groove 7^1. By a continuation of segment or piece 5^2, likewise having a guide groove 5^3, this segment is completed to a circular member which is interrupted only at two places 38 and 39, see Figure 2. The guide

grooves 7^1 and 5^3 serve to guide and secure in position two diametrically disposed toothed segments 26 and 27 which are driven by bevel gears 8, 9, 11, 13, 14, 15, 14', 15', 16 and 17 mounted on carrier 7 and piece 5^2. The gears 8 and 9 being fixed on a common vertical shaft 10. The gears 14, 15 and 14', 15' are disposed symmetrically with respect to their common driving gear 13. The bevel gear 17 is made in one piece with a spur wheel 16 in mesh with spur wheel 3 mounted on the driving shaft 1. The lengths of the toothed segments 26 and 27 are so designed that each of these segments are always in mesh with one of the bevel gears 13, 15, 15', or 17. Each toothed segment 26, 27 carries a bobbin carrier or holder 28 and 28^1, respectively, with a rotary yarn bobbin 29 and 29^1 thereon, and a yarn guide 30, 31, respectively with guide eyes 32, 33.

The braiding axis is formed by a vertical tubular member 34 having a disc-shaped top piece 35. A suitable feeding device (not shown) serves to feed the wire 36 or other filamentary core to be covered at the required speed from below in an upward direction through the tubular piece 34. The place 37 where the yarn is applied to the core is the point of intersection of the axis of the path controlled by guide grooves 7^1 and 5^3 with the axis of the path controlled by the structure 5^1. Now the ideal length of the yarn guides 21 and 22 and 30 and 31 for the guide eyes 23, 24 and 32, 33 would be such that the field of motion of the eyes would coincide in a common plane passing through the above point of intersection. As this is impossible, owing to the eyes interfering with one another, care has to be taken that this ideal condition is fulfilled at least approximately, in order to obtain as far as possible a constant length of the yarn between point 37 and the revolving yarn guide eyes. Since the segment or piece 5^2 has the above-described gaps 38, 39, the yarn guides 21 and 22 are allowed to pass through them in their circular path. When the driving shaft 1 revolves to the right or left, the bevel wheel 6 with the yarn guides 21, 22 thereon revolves always oppositely to the two segments 26, 27 with the yarn guides 30, 31 thereon.

With my new machine described hereinbefore the braiding operation is as follows:

The two bobbins 29, 29^1 of the upper circular path 5^2, 7^1 and the two bobbins 20, 20^1 of the lower path 5' revolve in opposite directions of rotation. As the wire 36 or the like is fed and as a result of the inclined position of the bobbin paths relatively to the wire the two yarns a, a^1, Figure 3, of the two upper revolving bobbins are applied to the wire in right-hand direction while the yarns b, b^1 coming from the lower oppositely revolving bobbins are wound in left-hand direction. As the yarn guide eyes of the two lower bobbins 20, 20^1 cross the path of the two upper bobbins 29, 29^1 on diametrically opposite places, an interlacing of the two yarns is produced at these places in such a manner that the two windings come to lie alternately on the wire 36 and on the opposite side of the yarns or windings of the upper or lower bobbin group. Figure 3 clearly shows these interlacing places of the yarns a, a^1 and b, b^1.

In consequence of the slight pitch of the individual yarns and their diametrical interlacing the cover cannot be pushed away on the wire and can be removed only by removing the individual yarns therefrom. Any securing of the cover at the ends is therefore not necessary. Furthermore, due to the cover being interlaced only at two diametrically opposite places yarn material is saved, since the many former crossing places are dispensed with.

It may still be noted that the described cover may be used not only as an insulating layer but also for many other purposes occurring in the textile industry.

What I claim and desire to secure by Letters Patent is :—

1. A machine for producing a braided cover upon a filamentary core comprising an upper pair of bobbin holders disposed diametrically oppositely, means for rotating said holders in a path inclined relatively to the axis of said core, a lower pair of bobbin holders disposed diametrically oppositely, means for rotating said last-mentioned holders in a direction opposite to said first-mentioned holders and in a path inclined oppositely to the path of said first-mentioned rotating holders relatively to the axis of said core, a yarn guide associated with each of said bobbin holders, and means for guiding the filamentary core to be covered substantially transversely through both of said paths.

2. A machine for producing a braided cover upon a filamentary core comprising an upper pair of bobbin holders disposed diametrically oppositely, means for rotating said holders in a path inclined relatively to the axis of said core, a lower pair of bobbin holders disposed diametrically oppositely, means for rotating said last-mentioned holders in a direction opposite to said first-mentioned holders and in a path inclined oppositely to the path of said first-mentioned rotating holders relatively to the axis of said core, yarn guides associated with each of said bobbin holders terminating approximately in a common plane, and means for guiding the filamentary core to be covered substantially transversely through both of said paths.

3. In a machine for producing a braided

cover upon a filamentary core, a lower pair of bobbin holders, yarn guides associated with said bobbin holders, a frame for supporting said lower pair of bobbin holders and yarn guides, means for rotating said frame and yarn guides thereon in a path slightly inclined relatively to the axis of said core, an upper pair of bobbin holders, yarn guides associated with said last-mentioned bobbin holders, a second frame for supporting said upper pair of bobbin holders and yarn guides, means for rotating said bobbin holders and yarn guides in a direction opposite to said first-mentioned holders and in a path inclined oppositely to the path of the first-mentioned frame and yarn guides, said second frame furthermore having two gaps therein for the passage of said first-mentioned yarn guides therethrough, and means for guiding the filamentary core to be covered substantially transversely through both of said paths.

4. In a machine for producing a braided cover upon a filamentary core, a lower pair of bobbin holders, yarn guides associated with said bobbin holders, an annular frame for supporting said lower pair of bobbin holders and yarn guides, means for rotating said frame and yarn guides thereon in a path slightly inclined relatively to the axis of said core, an upper pair of bobbin holders, yarn guides associated with said last-mentioned bobbin holders, rotatable segments each carrying a bobbin holder and appurtenant yarn guide, a second frame for supporting said rotatable segments, means for continuously rotating said segments with said bobbin holders and yarn guides thereon in a direction opposite to said first-mentioned holders and in a path inclined oppositely to the path of the first-mentioned frame and yarn guides, said second frame furthermore having two gaps therein for the passage of said first-mentioned yarn guides therethrough, and means for guiding the filamentary core to be covered substantially transversely through both of said paths.

The foregoing specification signed at Zurich, Switzerland this sixteenth day of October 1931.

HANS SCHWEITER.