

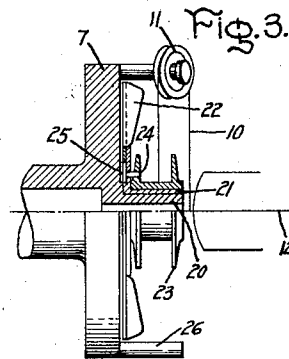
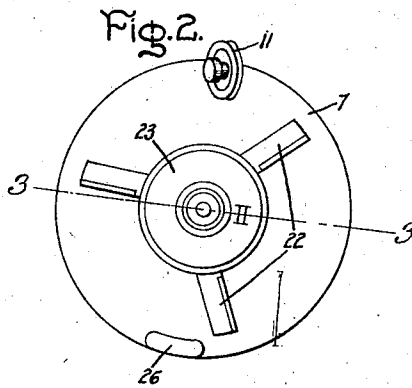
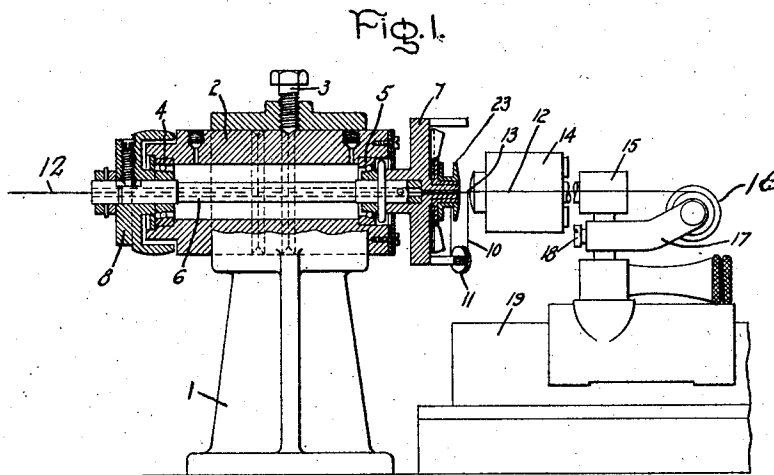
June 19, 1928.

1,674,527

R. SHEPHERD

TENSION DEVICE FOR COILING MACHINES

Filed Aug. 13, 1926



Inventor:
Richard Shepherd,
by *Myron S. Jones*
His Attorney.

UNITED STATES PATENT OFFICE.

RICHARD SHEPHERD, OF EINDHOVEN, NETHERLANDS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TENSION DEVICE FOR COILING MACHINES.

Application filed August 13, 1926, Serial No. 129,066, and in the Netherlands September 18, 1925.

This invention relates to winding machines, and more particularly to a wire-spool with a special device to retard its rotation and thereby tension the winding wire.

5 The invention may be applied in general to apparatus in which a wire is unwound from a rotatable spool, and where, in order to hold the wire taut, precautions must be taken to prevent slipping or jerking of the spool
10 due to the pull of the wire, which would result in slackening the wire and the production of irregularities in the winding. In particular, this invention can be applied to wire-spools in the winding-head of wire
15 coiling machines, in which a winding-wire is wound round a continuously moving mandrel wire and in which it is of the utmost importance that the winding wire be held taut.

20 In well-known devices of this kind the wire spool is braked by supporting it in such a way that hardened pivots are resiliently pressed into corresponding bearings of the wire spool. In this way, sufficient friction
25 will appear in these bearings to cause a uniform braking of the wire spool.

In accordance with this invention, the wire spool is provided with devices for increasing the resistance of the air to rotation
30 of the spool when the wire spool rotates around its longitudinal axis. In addition to being a very simple arrangement, this construction has the advantage that the braking is always very uniform, so that the
35 wire will never be subjected to an irregular or undesirable strain.

In accordance with the invention, the devices on the wire spool are preferably constructed in the shape of vanes, although
40 these devices may be given any other desired shape.

As above mentioned, the invention can be applied particularly to wire spools in the winding heads of wire coiling machines.
45 Such wire coiling machines have a rapidly rotating winding head provided with a spool or similar means to insure an uninterrupted supply of winding wire. As a rule, the construction is such that the mandrel wire
50 on which the winding wire is to be wound is supplied through a hollow shaft in the winding head, while a wire spool of winding wire is mounted on the winding head in such a way that from it the winding wire

is unwound and is wound into a coil or 55 helix on the mandrel wire.

In accordance with the invention, a rotatable winding head for wire coiling machines is provided with a wire spool so constructed that it meets a marked air resistance as it
60 rotates.

In one embodiment of the invention, a wire coiling machine is provided with a rotatable winding head, on which a wire
65 spool for the winding wire is rotatably mounted, and is provided with vanes so disposed as to meet a certain air resistance when the wire spool rotates. Such an embodiment of the invention will be explained
70 in detail by referring to attached drawings, in which Fig. 1 is a side view of a wire coiling machine having a winding head provided with a wire spool braked by means of
75 wings; Fig. 2 is an end view, on a larger scale, of the winding head shown in Fig. 1, and Fig. 3 is a side view partly in section on the line 3—3 of Fig. 2 of the winding head.

In the attached drawings, the coiling head is mounted on a bearing pedestal 1, and comprises a bushing 2 rigidly held in the
80 pedestal by a set screw 3. The bushing 2 contains roller bearings 4 and 5 for centering a tubular drive shaft 6 of a winding head 7. The winding head is rotated by a pulley 8 mounted on the end of the drive
85 shaft and driven by a motor not shown in the drawing. The winding wire 10 is carried on the winding head 7 on a spool, and is conducted over a wire guide 11 mounted on and rotatable with the head 7 to the
90 mandrel wire 12 on which it is coiled as the winding head rotates. The mandrel wire 12, which travels longitudinally and continuously, is guided through a perforated diamond 13, and is kept in motion by a mechanism not shown in the drawing, which
95 draws it through the hollow shaft 6 of the winding head and then through the perforated diamond 13 which centers it. The mandrel wire 12 with the winding wire 10
100 mounted on it then passes successively through a heating device 14 and a guide bushing 15 to a spool 16 on a pedestal 17 fixed by a set screw 18 to the support 19.

In Figs. 2 and 3, the winding head is 105 shown on a larger scale. There, as shown, the winding head 7 has a hollow projecting hub 20, on which rotates a spool holder com-

prising a loose sleeve or bushing 21 having radial vanes 22 transverse to the plane of rotation of the bushing, and of such a size and shape that the resistance of the air to the movement of the vanes acts as a drag or brake to the rotation of the spool holder. The wire spool 23 can be mounted on and rotate with the sleeve 21 of the spool holder, being locked to it by a locking pin 24 which enters a corresponding hole 25 in the sleeve 21. The spool holder and spool rotate as a unit, so that the retarding effect of the vanes 22 is exerted on the spool. If desired, the vanes 22 may be attached directly to the spool with the same result.

The operation of the device is as follows: During the rotation of the winding head 7 the winding wire 10 will be wound in a helix or coil on the mandrel wire 12, which is moved along at a certain speed. During that winding process the winding wire 10 will be unwound from the spool 23, thereby causing the latter to rotate in the same direction as, but somewhat faster than the shaft 6, and also rotating the spool holder comprising the sleeve 21 with its vanes 22 through the pin 24. Owing to the special shape of these vanes they will meet a certain air resistance, which will apply a braking force to the rotating wire spool, keeping the winding wire 10 taut, and thereby preventing its slackening.

Further, when the winding head rotates at high speed, it is desirable to install a counterweight 26 to balance the guide roller 11.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. In a wire coiling machine, the combination of a winding head comprising a rotatable tubular shaft having near one end a wire guide eccentric to and rotatable with

said shaft, means for feeding a mandrel longitudinally through said head to have a wire coiled on it, and a spool holder mounted on said shaft adjacent said guide to rotate freely on said shaft and to overrun said shaft as the wire on said holder is drawn off the holder and through said guide during rotation of said shaft, said holder being shaped to have its rotation retarded by the air sufficiently to maintain a predetermined tension on the wire as it is drawn off the holder.

2. In a wire coiling machine the combination of a winding head comprising a rotatable tubular shaft, a wire holder freely rotatable on said shaft and having transverse to the plane of rotation projecting vanes to cause the air to resist rotation of said holder with said shaft, a wire guide mounted on and eccentric to said shaft in registry with said holder, and means for passing a mandrel longitudinally through said shaft.

3. A winding head for coiling machines comprising a rotatable tubular shaft having near one end a wire guide eccentric to said shaft and a spool holder on said shaft in registry with said guide and comprising a hub freely rotatable on said shaft and having vanes extending radially from said hub and transversely of its plane of rotation to cause the air to resist rotation of said holder.

4. A spool holder for coiling machines comprising a tubular hub constructed to carry a spool and provided with vanes which extend radially from said hub and have portions projecting parallel to the axis of the bore of said hub.

In witness whereof, I have hereunto set my hand this 19th day of July, 1926.

RICHARD SHEPHERD.