Nov. 15, 1949 H. W. MOORE 2,487,889

UNREELING DEVICE

Filed March 22, 1946

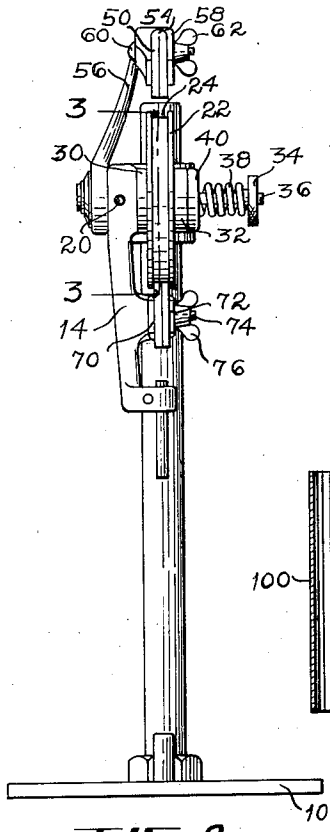


FIG. 2

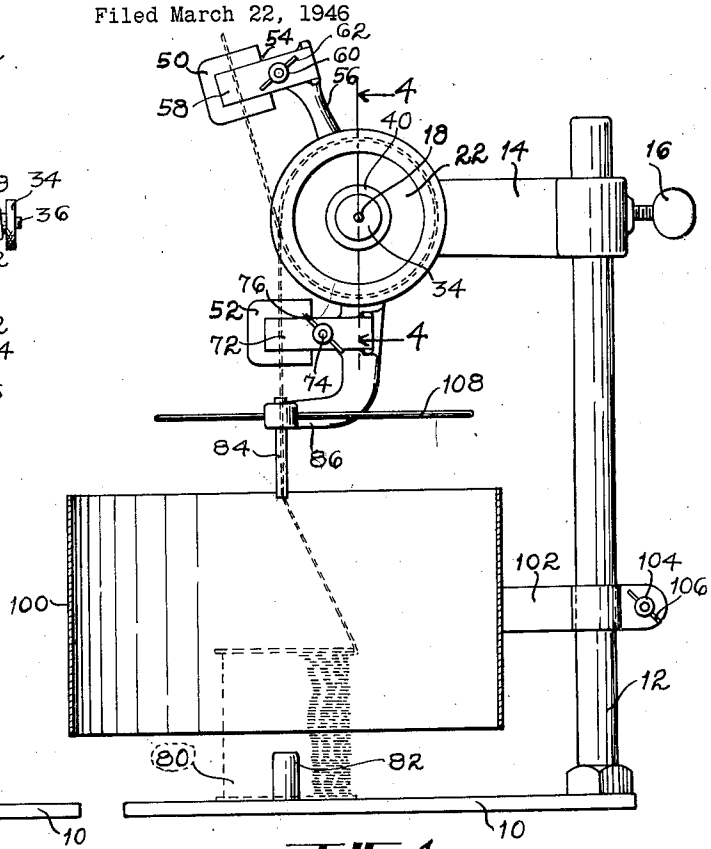


FIG. 1

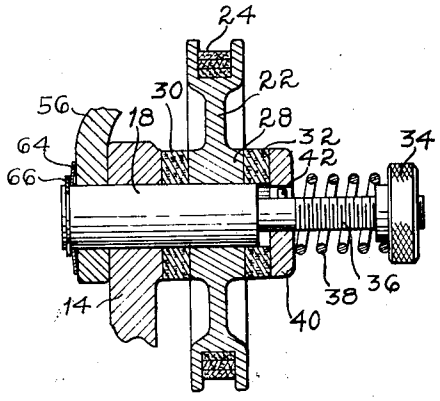


FIG. 4

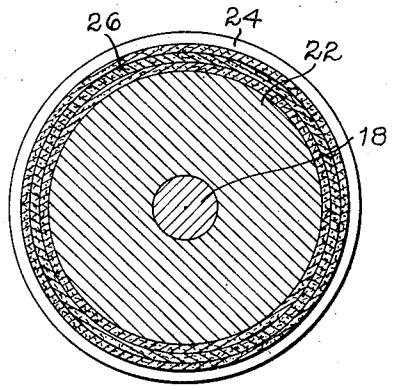


FIG. 3

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UNREELING DEVICE

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8 Claims. (Cl. 242—128)

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This invention relates to an unreeling device and more particularly to an unreeling device for unreeling wire at a high rate of speed.

In industries, in order to obtain high production, it is necessary to unreel wire at a very high rate of speed. In my Patent No. 2,362,920 I have disclosed an unreeling device for unreeling wire at a high rate of speed, wherein the wire is passed between tension rollers. This device is suitable for unreeling wire at high rates of speed; but it has a tendency to flatten the wire, especially if the wire is made from soft material. For some purposes a slight flattening of the wire is not objectionable. However, in winding coils, et cetera, where extreme accuracy is required, a flattening of the wire may be objectionable.

An object of this invention is to provide an reeling device for unreeling wire at a high rate of speed without mutilating the wire.

Another object of this invention is to provide an unreeling device for unreeling fine wire at a high rate of speed without snarling the wire when the unreeling operation is abruptly interrupted.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparent from the following description.

In the drawings,

Figure 1 is a side elevational view of my unreeling device.

Figure 2 is a front elevational view.

Figure 3 is a cross sectional view of the friction drum taken substantially on the line 3—3 of Figure 2.

Figure 4 is a fragmentary cross sectional view taken substantially on the line 4—4 of Figure 1.

The device disclosed herein is well adapted for unreeling fine wire at a high rate of speed. For example, No. 39 wire may be withdrawn at the rate of 8000 feet per minute, more than 90 miles per hour. No. 42 wire, which is much finer, may be withdrawn at the rate of more than 5000 feet per minute, approximately 57 miles per hour. Furthermore, the withdrawal of the wire may be abruptly stopped without snarling and without raveling the wire from the spool. The device for accomplishing these results will now be described.

Referring to the drawings, the base 10 supports a standard 12, which may be a rod or tubular member. A bracket 14 is adjustably mounted upon the standard 12 and held in any

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adjusted position by a suitable set screw 16. The bracket 14 is provided with an aperture receiving a pintle 18, held in position by a set screw 20. The pintle 18 forms the axle for a pulley 22, provided with an annular groove 24. The bottom of the annular groove 24 is lined with felt 26, or any other suitable similar material, as for example, adhesive tape. The hub 28 of the pulley 22 is preferably provided with friction surfaces, engaged by friction discs or washers 30 and 32, providing a braking action upon the pulley. The effectiveness of the braking action may be adjusted by adjusting the knurled nut 34 threadedly engaging the reduced end 36 of the pintle 18 and holding a spring 38 under compression. One end of the spring 38 is engaged by the nut 34 and the opposite end is seated against a non-rotatably mounted clutch member 40, provided with a suitable radially disposed slot, in which is seated a pin 42 fixedly secured in a suitable aperture in the reduced portion 36 of the pintle 18. If it is found desirable to increase the braking action, it is merely necessary to tighten the nut 34. In order to reduce the braking action, the nut 34 is loosened.

The unreeling device is provided with a pair of wire-engaging friction pads 50 and 52. The pad 50, which is folded along the edge 54, is clamped between an extension of a bracket 56 and a clamping member 58 held in position by a bolt 60 provided with a wing nut 62. The lower end of the bracket 56 is mounted upon the outer end of the pintle 18 and is held in position by a spring washer 64 engaging a washer-like key 66 seated in a groove in the outer end of the pintle 18. By tightening the wing nut 62, the sides of the pad 50 are tightened against the wire. The lower pad 52 is clamped between an extension 70 of the bracket 14 and a clamping member 72 held in position by a suitable bolt 74 provided with an adjustable wing nut 76.

As the wire leaves the spool 80, which is properly aligned by an upwardly directed pintle 82 mounted in the base 10, it passes through a tubular member 84 aligned with the axis of the spool 80 and seated in an extension 86 of the bracket 14. The tubular member 84 is tangentially disposed with respect to the wire-engaging surface in the groove 24 of the pulley 22. The friction pad 52, as may be clearly seen in Figures 1 and 2, is located between tubular member 84 and the pulley 22 and aligned with the longitudinal axis of the tubular member 84. After leaving the tubular member 84, the wire passes

between the folds of the pad **52** around the pulley **22**, the wire engaging the friction material **26**, then up between the folds of the pad **50**.

The wire being withdrawn at a very high rate of speed has a tendency to whip outwardly, especially in the event the wire is decelerated. The hoop **100**, supported upon a bracket **102** held in adjusted position upon the standard **12** by a bolt **104** provided with a wing nut **106**, is used in limiting the whipping movement of the wire as it leaves the spool. In other words, the hoop counteracts the centrifugal force acting upon the wire. A transverse rod **108**, exteding part way across and in spaced relation from the loop **100**, prevents convolutions of the wire from jumping upwardly, so as to entangle the parts associated with the tensioning of the wire.

The tension of the wire wrapped around the periphery of the pulley **22** may be adjusted by adjusting the wing nuts **62** and **76**. The braking effect of the pulley **22** may be adjusted by adjusting the nut **34**. By this arrangement, the tension of the wire leaving the spool may be very accurately adjusted, so as to obtain the maximum efficiency. These adjustments are critical, in that the wire withdrawn may have a diameter considerably less than the diameter of a human hair. The speed of the wire being withdrawn is very high. When it is compared to miles per hour, from 57 to 90 miles per hour, it can readily be seen that the velocity of the wire is very great. The device disclosed herein has been found to give excellent results in withdrawing wire at extremely high speeds.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

Having thus described my invention, I claim:

1. An anti-kinking wire unreeling device for unreeling wire axially from a spool at a high speed, said wire unreeling device including supporting means, a tubular member having the bore thereof aligned with the longitudinal axis of the spool and in short spaced relation therefrom, said tubular member being supported upon the supporting means, a pulley tangentially disposed with respect to the longitudinal axis of the tubular member, a pair of friction pads, means for supporting one of the friction pads between the tubular member and the pulley, means for supporting the other friction pad in spaced relation from the pulley so that as the wire is withdrawn from the spool and passes through the tubular member it is engaged by one of the friction pads before being wrapped around the pulley and engaged by the other friction pad while leaving the pulley, and brake means applied to the pulley to thereby tension the wire.

2. An anti-kinking wire unreeling device for unreeling wire axially from a spool at a high speed, said wire unreeling device including supporting means, a tubular member having the bore thereof aligned with the longitudinal axis of the spool and in short spaced relation therefrom, said tubular member being supported upon the supporting means, a pulley tangentially disposed with respect to the longitudinal axis of the tubular member, a pair of friction means for engaging the wire, means for supporting one of the friction means between the tubular member and the pulley, and means for supporting the other friction means in spaced relation from the pulley so that as the wire is withdrawn from the spool and passes through the tubular member it is engaged by one of the friction means before being wrapped around the pulley and engaged by the other friction means while leaving the pulley.

3. An anti-kinking wire unreeling device for unreeling wire axially from a spool at a high speed, said wire unreeling device including supporting means, a tubular member having the bore thereof aligned with the longitudinal axis of the spool and in short spaced relation therefrom, said tubular member being supported upon the supporting means, a pulley tangentially disposed with respect to the longitudinal axis of the tubular member, a pair of friction means for engaging the wire, means for supporting one of the friction means between the tubular member and the pulley, means for supporting the other friction means in spaced relation from the pulley so that as the wire is withdrawn from the spool and passes through the tubular member it is engaged by one of the friction means before being wrapped around the pulley and engaged by the other friction means while leaving the pulley, and brake means applied to the pulley to thereby tension the wire.

4. An anti-kinking wire unreeling device for unreeling wire axially from a spool at a high speed, said wire unreeling device including supporting means, a tubular member having the bore thereof aligned with the longitudinal axis of the spool and in short spaced relation therefrom, said tubular member being supported upon the supporting means, a pulley tangentially disposed with respect to the longitudinal axis of the tubular member, said pulley being provided with an annular groove, friction means positioned in the bottom of the groove, a pair of friction pads, means for supporting one of the friction pads between the tubular member and the pulley, means for supporting the other friction pad in spaced relation from the pulley so that as the wire is withdrawn from the spool and passes through the tubular member it is engaged by one of the friction pads before being wrapped around the pulley and engaged by the other friction pad while leaving the pulley, and brake means applied to the pulley to thereby tension the wire.

5. An anti-kinking wire unreeling device for unreeling wire axially from a spool at a high speed, said wire unreeling device including supporting means, a tubular member having the bore thereof aligned with the longitudinal axis of the spool and in short spaced relation therefrom, said tubular member being supported upon the supporting means, a pulley tangentially disposed with respect to the longitudinal axis of the tubular member, said pulley being provided with an annular groove, friction means positioned in the bottom of the groove, a pair of friction means for engaging the wire, means for supporting one of the friction means between the tubular member and the pulley, and means for supporting the other friction means in spaced relation from the pulley so that as the wire is withdrawn from the spool and passes through the tubular member it is engaged by one of the friction means before being wrapped around the pulley and engaged by the other friction means while leaving the pulley.

6. An anti-kinking wire unreeling device for unreeling wire axially from a spool at a high

speed, said wire unreeling device including supporting means, a tubular member having the bore thereof aligned with the longitudinal axis of the spool and in short spaced relation therefrom, said tubular member being supported upon the supporting means, a pulley tangentially disposed with respect to the longitudinal axis of the tubular member, said pulley being provided with an annular groove, friction means positioned in the bottom of the groove, a pair of friction means for engaging the wire, means for supporting one of the friction means between the tubular member and the pulley, means for supporting the other friction means in spaced relation from the pulley so that as the wire is withdrawn from the spool and passes through the tubular member it is engaged by one of the friction means before being wrapped around the pulley and engaged by the other friction means while leaving the pulley, and brake means applied to the pulley to thereby tension the wire.

7. An anti-kinking wire unreeling device for unreeling wire axially from a spool at a high speed, said wire unreeling device including supporting means, a tubular member having the bore thereof aligned with the longitudinal axis of the spool and in short spaced relation therefrom, said tubular member being supported upon the supporting means, a pulley tangentially disposed with respect to the longitudinal axis of the tubular member, said pulley being provided with an

annular groove, friction means positioned in the bottom of the groove, friction means engaging the wire, means for supporting the friction means between the tubular member and the pulley so that as the wire is withdrawn from the spool and passes through the tubular member it is engaged by the friction means before being wrapped around the pulley.

8. In an anti-kinking wire unreeling device for unreeling wire axially from a spool, the combination including a pulley around which the wire passes, brake means applied to the pulley to prevent overrunning, a pair of wire engaging friction means, means for supporting one of the friction means between the spool and the pulley, and means for supporting the other friction means so as to engage the wire as it leaves the pulley.

HARRY W. MOORE.

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The following references are of record in the file of this patent:

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