

Nov. 14, 1944.

H. W. MOORE  
UNREELING DEVICE

2,362,920

Filed Jan. 8, 1943

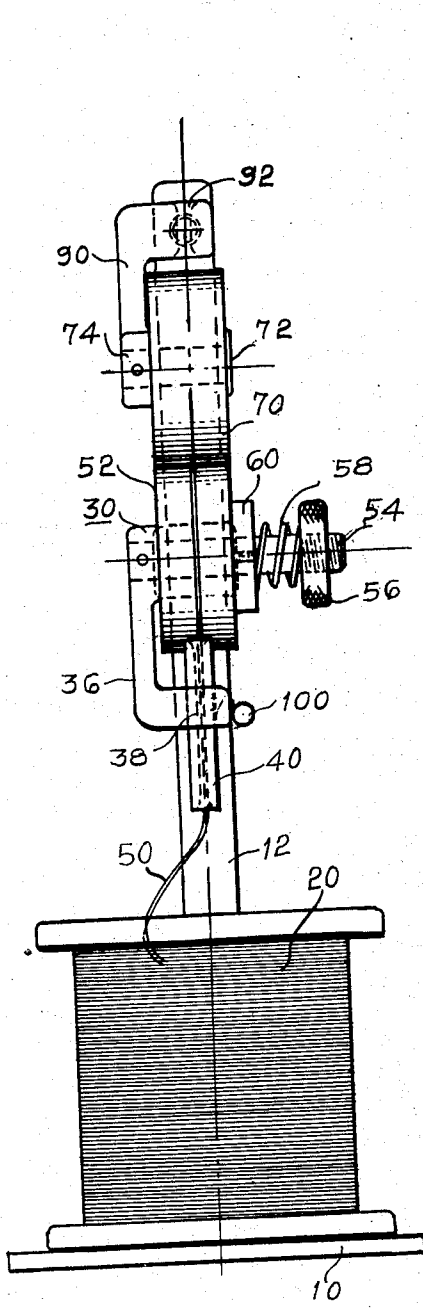


Fig. 1

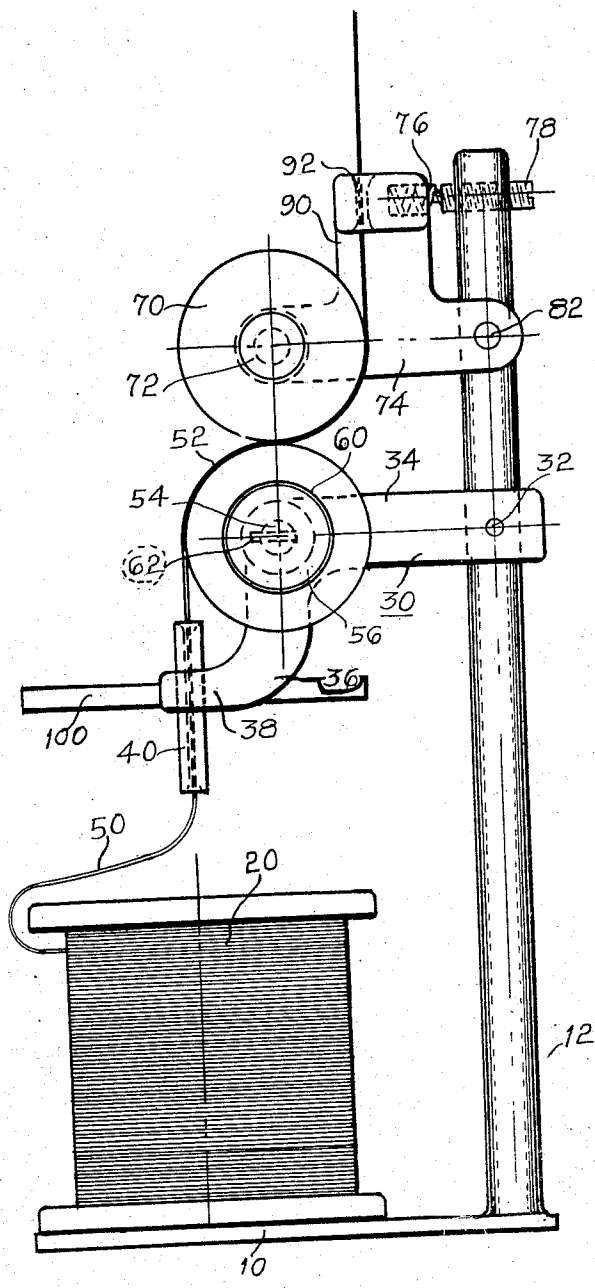


Fig. 2

INVENTOR.  
*Harry W. Moore*  
BY *Henry S. Dylvoig*  
ATTORNEY.

## UNITED STATES PATENT OFFICE

2,362,920

## UNREELING DEVICE

Harry W. Moore, Dayton, Ohio

Application January 8, 1943, Serial No. 471,779

1 Claim. (Cl. 242—155)

This invention relates to an unreeling device and more particularly to an unreeling device adaptable for unreeling wire and other semi-rigid materials.

Numerous attempts have been made to produce devices for unreeling wire and the like. For some purposes this is a comparatively simple matter; but great difficulty is experienced in intermittently unreeling fine wire at a high rate of speed, for the reason that wire is easily kinked and the insulation, if any, is easily injured. Broadly, two methods have been used. In the one, the spool or reel is rotated. When large spools are rotated at a high rate of speed and the unreeling operation stopped almost instantly, it can readily be seen that there will be a tendency for the spool or reel of wire to continue rotation, thereby snarling the wire, resulting in kinks. Furthermore, extremely sensitive and delicate devices are then required for the mounting of the spool. It can readily be seen that if wire having a thickness less than the thickness of human hair is unwound from a spool rotating at 5000 or 6000 R. P. M., extremely sensitive bearings are required for supporting the spool. Furthermore, the application of brakes to arrest the movement of the spool rotating at several thousand R. P. M., especially if the spool is a comparatively large spool wound with much wire, presents numerous complicated problems.

Another method of unreeling wire from spools or reels consists in the withdrawal of the wire endwise from a stationary spool. Similar problems are encountered in so doing, in that in spite of the fact that the spool is stationary, some type of mechanism is ordinarily required to rotate in synchronism with the unwinding operation. When the withdrawal of the wire is stopped, some type of brake mechanism is required to arrest the movement of the unreeling mechanism. Again, this presents problems that are difficult to solve.

An object of this invention is to provide a device for unreeling wire wherein the wire is unreeling at a high rate of speed without raveling and without kinking of wire.

Another object of this invention is to provide a brake mechanism that, instead of operating upon moving parts of the apparatus used in unreeling the wire, is applied directly to the wire.

Another object of this invention is to provide brake mechanism and tensioning mechanism adapted to be adjusted into optimum position for any type of unreeling material.

Another object of this invention is to provide

a device for unreeling wire and the like, wherein the wire is not kinked and does not buckle during the unreeling operation in spite of the fact that the wire is intermittently unwound at high speeds.

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 drawing,

Figure 1 is a front elevational view of the wire unreeling device.

Figure 2 is a side elevational view of the device shown in Figure 1.

Referring to the drawing, the base 10 supports a pintle or stud, not shown, having mounted thereon a spool or reel of wire 20. In the event the end of the spool 20 is not smooth or round, a circular plate may be mounted on top of the spool, which plate may have a rounded and polished edge and may be held in symmetrical relation with respect to the spool 20 by a pintle or stud seated in the aperture in the end of conventional spools. A suitable mechanism for unwinding or unreeling the wire from the spool will now be described.

A standard 12 supports an L-shaped bracket 30 provided with a suitable aperture for receiving a screw or pin 32 that is used in holding the bracket 30 in position on the standard 12. This bracket 30 includes an arm 34 provided with a downwardly extending projection 36 terminating in a supporting portion 38, having welded thereto or otherwise attached thereto a tubular member 40. The bore or opening of the tubular member 40 is aligned with the center axis of the spool 20, so as to provide a passage for the wire 50 withdrawn from the spool or reel 20 around the edge of the spool, through the aperture or opening in the tubular member 40 aligned with the longitudinal axis of rotation of the spool. The wire is drawn upwardly by the device using the wire, whether this be a coil winding device, an armature winding machine or any other device utilizing the wire. As the wire leaves the tubular member 40, it is drawn over a tension roller or brake drum 52 journaled upon a pintle 54, having one end threaded so as to threadedly receive a tension nut 56 engaging a tension spring 58 seated against a collar or washer-like member 60, exerting a pressure against the side of the roller 52. The opposite end of the pintle 54 is fixedly attached in any suitable manner in the arm 34 of the bracket 30.

The collar 60 is provided with a key-way hav-

ing seated therein the end of the pin 82 extending into the pintle 54. This key-way permits sliding movement of the collar 80 on the pintle without rotary movement. From this it may be clearly seen that the roller 52 functions as a brake drum. The braking mechanism may be adjusted by adjusting the tension nut 56.

A roller 70 journaled upon the pintle 72 fixedly attached in a bracket 74 is spring urged against the roller 52. The pressure of the roller 70 against the roller 52 is supplied by a spring 76, the tension or compression of which may be adjusted by a set screw 78 threadedly engaging the standard 12. This bracket 74 is pivotally mounted at 82 upon the standard 12. From this it may readily be seen that the pressure of the roller 70 upon the roller 52 may be adjusted or regulated by the adjusting screw 78. When pressure has been properly adjusted, the screw 78 may be locked in position by a lock nut, not shown. The bracket 74 is provided with an upwardly extending projection 90 provided with a wire passage 92.

In tracing the path of the wire from the tubular member 40, the wire passes over one quadrant of a roller or brake drum 52, then it passes between the rollers 52 and 70. After passing between these rollers, the wire passes and contacts one quadrant of the pressure roller 70. From this it may readily be seen that the wire passes through the wire passage 92 in an offset position with respect to the longitudinal axis of the spool. This offset position is equal to the sum of the radius of the roller 52 and the radius of the roller 70. As the wire is withdrawn, the roller 52 functions as a brake drum, so that whenever the withdrawal of the wire ceases, the roller 52 arrests the movement of the wire. Due to the centrifugal force of the portion of the wire looped around the edge of the rim of the spool 20, it may readily be seen that in the absence of a braking mechanism, the wire will continue to flow. However, this has no effect upon the wire extending beyond the roller 70. Some of the wire may unwind from the spool 20 after the withdrawal has ceased. In order to prevent this surplus wire whipping up into the mechanism, a pipe or rod 100 is fixedly attached in any suitable manner to the supporting portion 38 of the bracket 30. Furthermore, in order to prevent the wire withdrawing from the spool from whipping outwardly an excessive distance, a cylindrical sheet material member is preferably mounted in spaced relation from the spool, so as to completely surround the spool, as is well known to those skilled in the art.

The anti-kinking unreeling device disclosed herein has two critical adjustments. First, the roller or the brake drum 52 must be properly adjusted, so as to supply the proper braking action upon the wire on the reel. Whenever the braking mechanism is adjusted, the tension roller 70 must also be adjusted for proper operation of the device. This tension roller is so adjusted that the wire will pass between the roller without slippage of the wire on the brake drum and without slippage between the rollers. By properly adjusting these two adjustments, it is possible to unwind coarse wire either with or without insulation, and extremely fine wire, either with or without insulation. If the wire has delicate insulating material protecting the surface of the wire, it may be unreeled without marring or mutilating the wire and the insulating material and without kinking the wire. As the wire is

withdrawn, the action of the device removes the coiling action from the wire and removes any tendency for the wire to snarl and twist, in spite of the fact that the wire is drawn from the end of the spool or reel 20, so as to put into the wire one revolution of a twist for each convolution on the spool or reel. When shifting from one grade or weight of wire to another, it is merely necessary to adjust the braking mechanism controlling the roller or brake drum 52 and to adjust the tension or pressure exerted by the roller 70 against the roller 52, so as to properly unreel the wire.

The distance from the tubular member 40 to the reel 52 should be sufficiently short to prevent the wire extending from the end of the tubular member 40 to the roller 52 from forming a loop, which would constitute a potential source of a kink. By having a short distance between the tubular member 40 and the roller 52, the chances of kinks forming between the end of the tubular member and the roller is thereby eliminated. This tubular member functions as a straightening guide for the wire.

Although the wire enters and leaves the wire unreeling device in parallel paths, the device could be constructed to permit the withdrawal of the wire in a path that is in non-parallel relation with respect to the path of the incoming wire.

Throughout the specification and claims, the unreeling device has been described in connection with wire. It may be used for other material, as for example, twine, cord or cable made from other materials than wire.

Although the preferred modification 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 claim.

Having thus described my invention, I claim:

1. An anti-kinking wire unreeling device for unreeling wire axially from a spool, 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 said supporting means, a pair of rollers the first of which is supported upon said supporting means and tangentially arranged with respect to the longitudinal axis of said tubular member, braking mechanism for the first roller, a bracket pivotally mounted upon said supporting means, the second roller being mounted upon said bracket, the axes of the two rollers being mounted in a plane parallel to the longitudinal axis of said tubular member, tensioning means engaging said pivotally mounted bracket for causing said second roller to engage the first roller to exert a pressure upon the wire as it passes between the two rollers, guide means supported upon the bracket for guiding the wire as it leaves the second roller, and a rod mounted upon said supporting means in close proximity to the tubular member, the longitudinal axis of the rod extending in a direction normal to the longitudinal axis of the tubular member, said rod limiting whipping movements of the wire beyond the tubular member when the unreeling device suddenly stops.

HARRY W. MOORE.