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MATERIAL UNWINDING DEVICE

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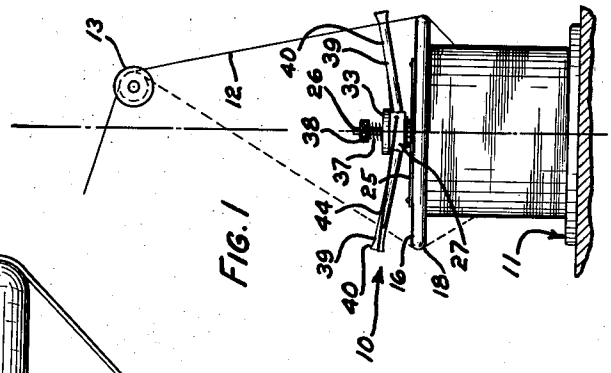


FIG. 1

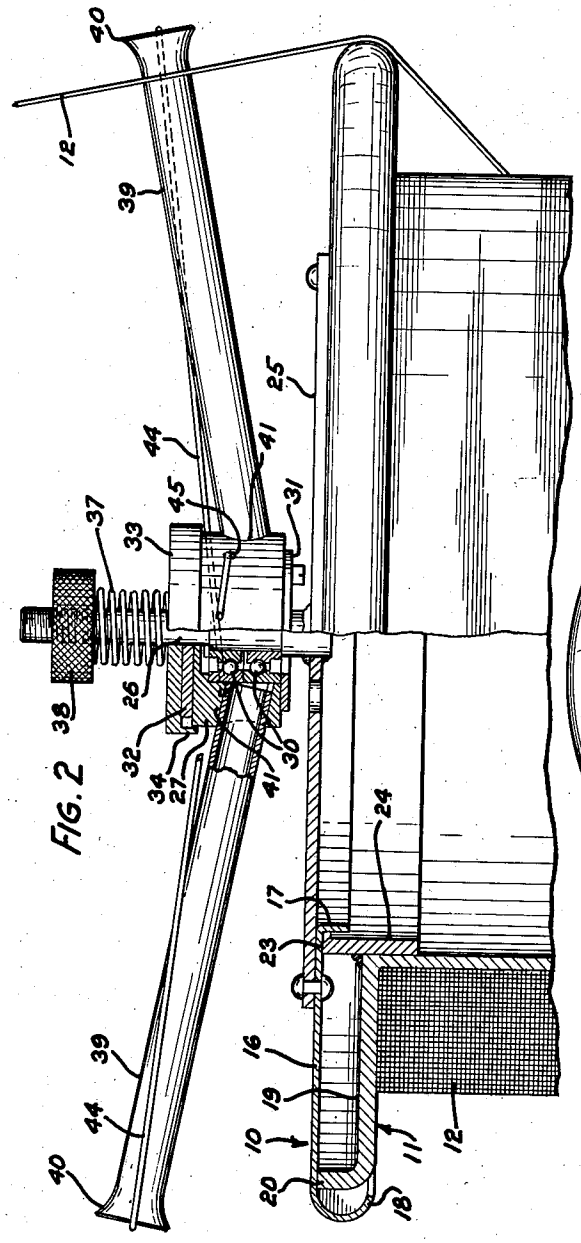


FIG. 2

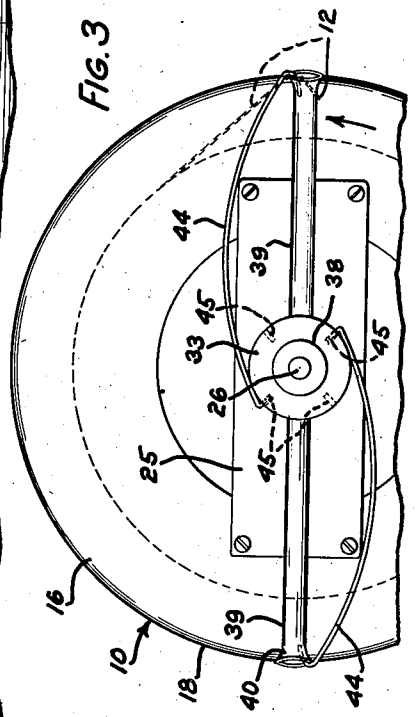


FIG. 3

INVENTOR
V. W. SIEBS
BY Emery Robinson.
ATTORNEY

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MATERIAL UNWINDING DEVICE

Victor W. Siebs, Summit, N. J., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

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6 Claims. (Cl. 242—128)

This invention relates to material unwinding devices and more particularly to a device for unwinding strand from spools.

An object of this invention is the provision of a generally improved, compact and practical device for unwinding strand from a spool.

In attaining this object, there is provided in one embodiment of the invention an annular supporting member having depending outer and inner peripheral flanges, the annular member resting upon the upper head of a stationary vertically arranged strand supply spool. The inner flange of the member extends into the bore of the spool and its outer flange, which is semi-circular in cross-section, surrounds the periphery of the spool head. Rotatably and axially carried on the supporting member above its upper surface is a flier device equipped with an adjustable friction brake for retarding the free rotation thereof. Extending radially from the device at diametrically opposite points are upwardly inclined tubular flier arms having outwardly flared ends for unwinding the strand from the spool and guiding it to a receiving member arranged thereabove. The arms are freely rotatably adjustable about their longitudinal axes to present new bearing surfaces for the strand, as the surfaces become worn. Associated with each arm is a tensioned arcuate wire member extending longitudinally of the arm which serves to retain the arm in its adjusted position.

Other objects and advantages of the invention will be understood by referring to the following specification and accompanying drawing, in which

Fig. 1 is an elevational view of a material unwinding device embodying the features of the invention, shown applied to a wire supply spool;

Fig. 2 is a fragmentary enlarged view thereof, shown partly in section, and

Fig. 3 is a fragmentary top plan view of the device as shown in Fig. 2, upon a reduced scale.

Referring to the drawing, particularly Fig. 1, wherein the improved material unwinding device, indicated in general at 10, is shown applied to the unwinding of wire from a stationary vertically disposed supply spool 11, the wire, indicated at 12, being withdrawn from the spool through a grooved pulley 13 fixedly positioned thereabove and slightly offset from the center line of the spool for delivery to a machine to be served. The device 10 comprises an annular supporting member 16 having an inner peripheral depending flange 17 formed at right angles to the upper surface of the supporting member and extending into the axial bore of the spool 11. At its outer peripheral edge, the supporting member is provided with a depending flange 18 which is semi-circular in cross-section and having a polished peripheral surface over which the wire travels during the unwinding thereof from the spool. The unwinding device 10 rests freely upon the upper circular head of the spool 11, indicated at 19, the under surface of the supporting member 16 engaging an outer upturned peripheral flange 20 of the spool head 19 and the upper circular end surface 23 of a drum wall 24 surrounding the spool bore. The annular space between the flanges 17 and 18 of the member 16 is such that the latter may be freely placed in position upon the spool head, as shown clearly in Fig. 2.

Secured by riveting or otherwise to the upper surface of the supporting member 16 a rectangular plate 25 which extends across the vertical axis of the spool bore. Extending vertically from and secured by welding to the plate 25 in line with the center of the annular supporting member 16 is a stationary shouldered stud shaft 26 upon which a circular flier support 27 is rotatably carried by means of ball bearings 30 to reduce friction in the movement of the support. The bearings 30 are arranged in a recess in the support surrounding the shaft and at their upper and lower surfaces engage annular shoulders on the support and shaft, respectively. To the lower surface of the support 27 is secured a plate 31 which supports the bearings 30 at their outer peripheral portion. Mounted upon the upper surface of the flier support 27 is an annular friction pad 32, upon which non-rotatably rests an annular cap 33 having a depending flange 34 extending slightly below the upper surface of the flier support and spaced from the periphery thereof. Surrounding the stud shaft 26 is a coiled compression spring 37 having its opposite ends bearing against the upper surface of the cap 33 and the lower surface of a knurled adjusting hand nut or collar 38 threaded onto the upper end of the stud shaft 26. By turning the collar 38 upwardly or downwardly upon the shaft 26 the pressure exerted by the spring 37 may be varied and thereby the frictional contact between the friction pad 32 and the cap 33 and the flier support 27 and consequently the free rotation of the latter may be retarded to a desired degree and thereby the tension upon the material as it is withdrawn from the spool 11 is varied.

Extending radially from the flier support 27 at diametrically opposite points are tubular flier arms 39 having outwardly flared outer ends 40,

the extreme ends thereof extending slightly outside the periphery of the annular supporting member 16. The inner ends of the arms 39 are freely rotatably fitted in upwardly inclined apertures 41 provided in the flier support 27 and thus the arms are tilted upwardly relative to the top surface of the supporting member 16. The angle of the upwardly tilted arms 39 is such that, in cooperation with the axially offset guide sheave 13 arranged above the device, the wire in bearing against and moving past the arm, is at an angle to the longitudinal axis thereof which varies somewhat during each revolution. By mounting the flier arms 39 for free rotation on the flier support 27, they may be readily rotated about their longitudinal axes when they show wear on their periphery after extended use from the traveling wire 12 bearing thereon to present new bearing surfaces for the wire in addition to the spreading of the wearing effect by the offset of the sheave 13, thus adding materially to the period the arms may be used without replacement. Each of the flier arms 39 has hooked into its open flared outer end, one end of a tensioned wire member 44, the opposite end of the wire member having a hook which is entered in a radially directed aperture 45 formed in the periphery of the flier support 27, the apertures being provided in diametrically opposite pairs for a purpose to be presently described. The members 44 extend longitudinally of the flier arms 39 and when in place serve to retain the rotatable flier arms 39 in their adjusted positions about their own axes in the apertures 41 of the flier support 27.

In the use of the unwinding device 10 the supply spool 11 of wire 12 is placed in correct position upon the floor or other support and the outer end of the wire is drawn over the semi-circular polished peripheral flange 18 of the stationary supporting member 16 and associated with the drawing means of the machine to be served, the wire as it is withdrawn from the spool and engaged with the flange 18 being also engaged with one or the other of the flier arms 39 on its side opposite the arcuate guide member 44, as shown in Figs. 1 and 3. The device, it will be observed, may be used with either a right hand or left hand spool winding by merely reversing the position of the tensioned guide members 44 from that shown in the drawing wherein they are arranged for the unwinding of a left hand spool winding. To make the change for a right hand spool winding, referring to Fig. 3 the lower member 44 is released from its aperture 45 and swung upwardly and hooked into the upper idle aperture 45, the upper member 44 being released from its aperture 45 and swung downwardly and hooked into the lower idle aperture. In the drawing the spool has a left hand winding and consequently the wire 12 as it travels upwardly engages and bears against the right hand flier arm 39. In being withdrawn from the supply spool 11 the upwardly traveling wire 12 bears against the flier arm 39 and causes it to rotate in the direction of the arrow (Fig. 3) and during such rotation the wire is rapidly unwound from the spool under a suitable tension determined by the setting of the spring 37, in the manner previously described. In case of a sudden release or slackening of this tension on the wire 12 during operation of the device the rotating parts of the device are retarded and thus entanglement of the wire is prevented. The wire passes over pulley 13 which is offset from the spool center line sufficiently to cause the wire to reciprocate along the tubular member as the member rotates around the spool to prevent excessive wear which would result if the wire were maintained in the same spot.

From the foregoing description, it will be apparent that a simple, compact and practical device has been provided for unwinding strand from either a left or right hand wound spool. Furthermore, the device, due to the arrangement of its elements, may be readily associated with a spool by merely mounting it upon the upper head of a vertically arranged spool. By providing tubular flier arms which are freely rotatable on their longitudinal axes, the arms may be readily turned as wear occurs to present new bearing surfaces for the strand.

It is to be understood that the embodiment of the invention herein illustrated and described represents one useful form of the invention which is capable of modification and other applications within the scope of the appended claims.

What is claimed is:

1. In a device for unwinding material from a stationary spool, a flier carried on the upper end of a spool for rotation about the vertical axis thereof, flier arms of circular cross-section mounted on said flier at an angle to said spool axis engaged by the material and rotatable bodily with the flier to unwind the material from the spool as it is withdrawn therefrom, said flier arms being freely rotatably adjustable on said flier for rotation about their longitudinal axes to present new bearing surfaces for the material as wear occurs.

2. In a device for unwinding material from a stationary spool, a flier carried on the upper end of a spool for rotation about the vertical axis thereof, tubular flier arms having flared outer ends mounted on and extending radially and upwardly inclined from said flier engaged by the material and rotatable bodily with the flier to unwind the material from the spool as it is withdrawn therefrom, said flier arms being freely rotatably adjustable on said flier for rotation about their longitudinal axes to present new bearing surfaces for the material as wear occurs.

3. In a device for unwinding material from a stationary spool, a flier carried on the upper end of a spool for rotation about the vertical axis thereof, flier arms of circular cross-section mounted on said flier at an angle to said spool axis, engaged at one side by the material and rotatable bodily with the flier to unwind the material from the spool as it is withdrawn therefrom, said flier arms being freely rotatably adjustable on said flier for rotation about their longitudinal axes to present new bearing surfaces for the material as wear occurs, and tensioned means connected at their opposite ends to the arms and flier extending longitudinally of said arms upon the opposite sides thereof effective for retaining said arms in their said adjusted positions.

4. In a device for unwinding material from a stationary spool over a head thereof, material guide means to guide the material to move laterally of itself in a circle about the axis of the spool, said guide means including a material engaging arm of circular cross-section rotatably adjustable for rotation about the longitudinal axis to present new bearing surfaces for the material as wear occurs, and stationary means offset from the axis of the spool to receive the material from the guide arm to vary the angle of the direction of the longitudinal motion of the material to the axis during each lateral revolution thereof

in the circle and thereby to distribute the wear of the material on the guide arm.

5. In a device for unwinding material from a stationary spool over a head thereof, control means rotatable about the axis of the spool by the lateral pressure thereon of material being drawn thereover from the spool, said control means including a material engaging arm of circular cross-section rotatably adjustable for rotation about its longitudinal axis to present new bearing surfaces for the material as wear occurs, and a stationarily supported guide member offset from the axis of the spool to receive material being drawn from the spool and over the control arm and to vary the angle of the longitudinal direction of motion of the material to the axis during each lateral revolution of the material and thereby to distribute the wear of the material on the control arm.

6. In a device for unwinding a strand from a stationary spool over a head thereof, a flier rotatable about the axis of the spool and driven by the lateral pressure thereon of the strand being unwound, said flier including a material engaging arm of circular cross-section rotatably adjustable for rotation about its longitudinal axis to present new bearing surfaces for the material as wear occurs, and a guide sheave stationarily supported to be offset from the axis of the spool to receive the strand drawn from the spool and over the flier arm and to vary the angle of the strand to the axis to distribute the wear of the strand on the flier arm.

VICTOR W. SIEBS.