United States Patent [19]

Moore

[11] **3,830,445**

[45] **Aug. 20, 1974**

[54] **REEL WITH SPRING THREAD**

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[22] Filed: **Aug. 28, 1972**

[21] Appl. No.: **284,395**

[52] **U.S. Cl.**..... **242/118.4,** 242/71.9, 242/73, 242/115, 242/116, 242/128, 242/129

[51] **Int. Cl.**..... **B65h 75/14,** B65h 49/00

[58] **Field of Search**..... 242/118.4, 118.5, 118.6, 242/118.61, 118.62, 118.7, 118.8, 115, 116, 71.9, 73, 75, 75.4, 76, 71.8, 118, 195, 128, 129

[56] **References Cited**

UNITED STATES PATENTS

1,291,368	1/1919	Bass	242/71.9
2,650,777	9/1953	Robbins	242/116 X
2,864,565	12/1958	Whearley	242/128

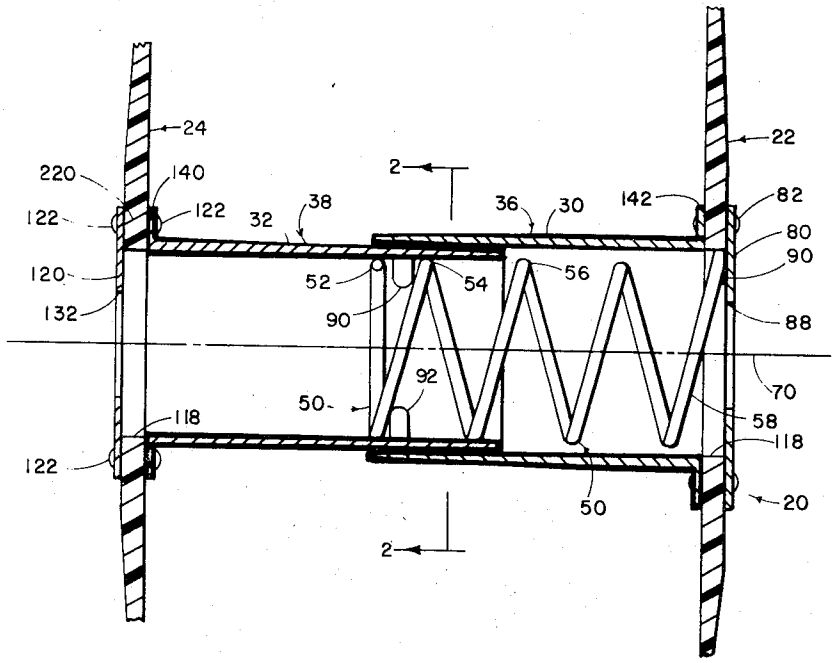
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[57] **ABSTRACT**

A reel having inner and outer telescoping tubular-flanged hub portions pulled toward each other by a coiled spring attached to one side section of the reel and functioning like a threaded member by its engagement with spring-engaging means attached to the other half section of the reel.

5 Claims, 3 Drawing Figures



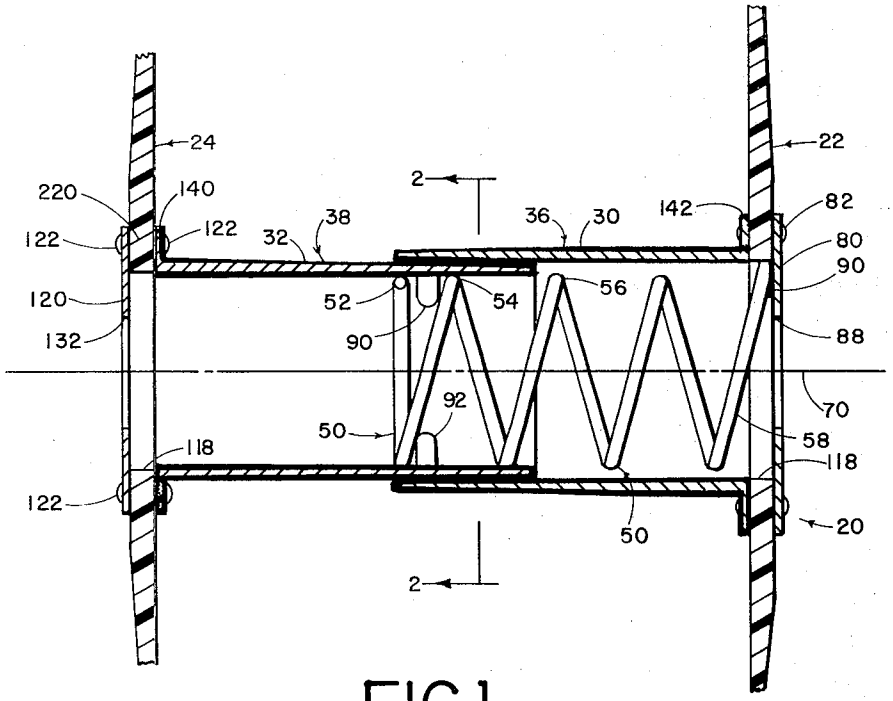


FIG.1

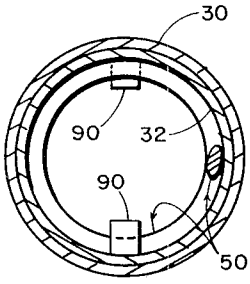


FIG. 2

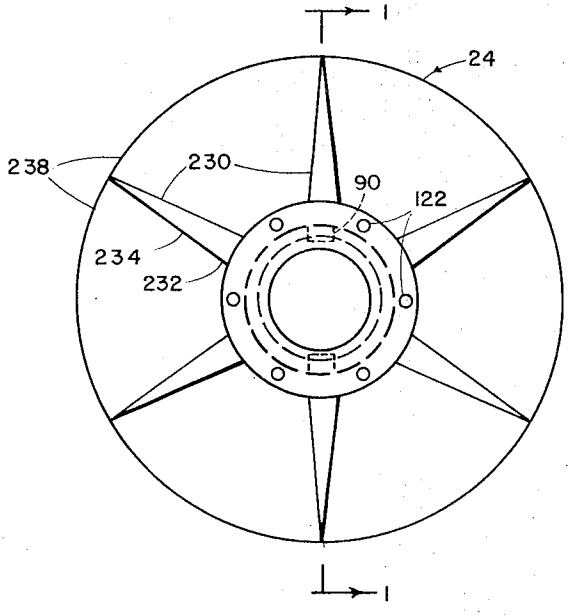


FIG.3

REEL WITH SPRING THREAD

FIELD OF THE INVENTION

This invention is in the field of reels upon which electrical wire can be stored.

DESCRIPTION OF THE PRIOR ART

Coils of wire of the prior art are of a generally cylindrical shape on their outer periphery, having a cylindrical center opening, and with parallel ends. Such coils come in various thicknesses from end to end, therefore, an adjustable reel is desired for receiving such a coil. Such a reel must have a central opening for receiving an axle around which the wheel can turn as the wire is pulled off and in which the total width of the reel is adjustable to accommodate the width of the coil of wire to be received.

The present practice in the prior art is for a coil of wire, having no reel on it, to be delivered from the factory in a cardboard box. There is no reel in the cardboard box to protect the wire from coming out of its place in the coil in which it is delivered by damage occurring from blows against the cardboard box during shipping or working at construction sites where damage can easily occur.

In the present practice, wire is drawn from the coil in the box through a hole in the cardboard box.

However, when the box has been damaged, the coil will have changed its shape and the wire cannot be pulled out through the hole in the box since it can become tangled from the damage and lost its symmetrical coiled relationship leading to high labor costs in untangling wire and handling it.

A further disadvantage of the prior art has been the need to carry many boxes full of wire coils, both new and partially used, from one construction site to another, each box being lifted individually and carried individually without benefit of any mechanization.

It is, therefore, a further object to make it possible to achieve an end which would have been desirable in the prior art which is to be able to mount a coil of wire on a reel having an axial opening which can receive an axle so that the coil can be placed on a carrier containing multiple coils, the carrier having wheels and being easy to move from construction site to construction site.

It may seem that this desirable end should be easily achieved, but first one must realize that these coils are already coiled and the problem is how to place an already coiled wire configuration onto a reel without going through the long, costly and tedious step of unwinding from the coil and winding onto the reel.

It is important that a reel for holding these wire coils do more than simply hold its end flanges in a fixed position. I have perceived that the end flanges must continually press against the sides of the coil. Without such pressing, as the wire is removed from a coil, the coil configuration becomes of smaller width along its axis of rotation and the fixed position end flanges cannot adjust to this change which would, therefore, result in a displacement of the wire from its ideal position in the coil and, therefore, entanglement of the wire leading to need for time-costly disentaglement.

SUMMARY OF THE INVENTION

A reel having inner and outer telescoping tubular hub portions having lapping inner ends and each having a flange on its outer end transversely disposed to the direction of telescoping, the end flanges and their respective attached hub portions forming right and left basic reel sections, a coiled spring, means securing the coiled spring to one of the reel sections with the spring disposed partially on the inside of the innermost one of the hub portions and extending to a point of attachment to the basic reel section of the other of the two hub portions, a spring engaging means attached to the innr side of the inner one of the hub portions and lapping the spring and disposed between the coils of the spring whereby a rotation of the basic reel sections with respect to each other in one direction will cause a mated threadlike inter-relationship between the said spring and the spring-engaging means for causing the bias reel sections to be drawn toward each other during rotation with respect to each other in one direction and to move away from each other during rotation with respect to each other in an opposite direction.

The reel further having flanges made from thermoplastic material for economy of manufacture, but for strength, the thermo-plastic material being reinforced by ribs larger at the center and tapering toward the outer circumference of the reel, all formed of the same piece of the integral plastic material with the remainder of the respective flange, the hub portion attached to each respective flange likewise being formed of plastic and from the same piece of material as the respective flange for high production low-cost manufacture.

The hub portions each tapering to a narrower terminal end from larger portions adjacent the respective flange to which they are attached whereby the net effect of the overlapping hub portions is to provide an external composite surface for receiving wire thereagainst which is a surface as nearly cylindrical as is practically possible inasmuch as the interfitting of the hub portions telescopically is necessary.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a sectional view taken along the line **1—1** of FIG. **3.**

FIG. **2** is a sectional view taken along the line **2—2** of FIG. **1,** but with the left-end flange removed.

FIG. **3** is a side elevation of the reel of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. **1** the reel of this invention is generally indicated at **20** and has right and left end flanges generally indicated at **22** and **24,** each having attached to its inner side a substantially cylindrical tubular hub portion **30** and **32** respectively, the hub portion **30** being outside the portion **32** and snugly and slidably receiving the latter therein.

Each tubular hub portion **30** and **32** projects toward the opposite one of the end flanges **22** or **24,** and the end flanges **22** and **24** are disposed in parallelism for the most part.

Each end flange **22** or **24,** with its hub portion **30** or **32** respectively form one of two basic reel sections **36** and **38** respectively.

The basic reel sections **36** and **36** form the equivalent of a drum of an ordinary reel, which latter would have a cylindrical drum surface.

The end flanges **22** and **24** are urged toward each other by a spring **50** which is a coiled spring having

coils or convolutions shown at **52, 54,** and **56** which are spaced apart along an axis **70** disposed at a right angle to the flanges **22** and **24** and centrally and axially of the cylindrical hub portions **30** and **32.**

One end **58** of the spring **50** is suitably secured to the right section **36** by means of a metal plate **80** which is secured by rivets **82** to the right flange **22.** The metal plate has a central opening **88** through which an axle, not shown, can be disposed for arranging the reel for rotation thereabout during the paying out of wire stored on the reel, the wire not being shown.

The metal plate **80** is disposed on the outer side of the flange **22** and the right end convolution **58** of the spring **50** is welded thereto at **90'**.

The spring **50** extends to the left inside a portion of the left hub **32** and there a pair of spring-engaging members **90** and **92** lap opposite sides of the spring **50** between coils **52** and **54** thereof, as shown.

The right end flange **22** has a right end plate **120** attached thereto and formed of metal for strength and having an opening **132** on its inner side surrounding the axis **70** and for receiving an axle, not shown. The end plates **120** and **80** can be formed of any suitable material, metal not being vital, although it is a convenience that the end plate **80** be made of metal for the strength of the welding at **90'**.

The end plate **120** is likewise secured by rivets **122** to the flange **24.** The same rivets **122** attach the hub **32** to the flange **24** since the hub **32** has an outwardly extending portion **140** disposed in parallelism with the flange **24** through which the rivet **122** extends. The hub **30** has an out-turned portion **142** held by the rivets **82** to the right flange **22.**

The out-turned portions **140** and **142** preferably extend completely around the periphery of the respective hub portion.

Referring to FIG. **3,** a sample end flange can there be seen. The end flange which is shown is the end flange **24,** however, it will be understood that both end flanges are the same since they are both provided with thicker portions **220** closer to the axis **70,** as best seen in FIG. **1,** whereas the end flanges each have outwardly extending ribs **230** peripherally extending outwardly from a thick central portion **220** of the end flange. The ribs **230** extend radially outward and are spaced apart. For example, there might be six ribs, as shown, which taper from thicker inner portions at **232** to thinner outer portions **234** when an end flange is looked at from its outer side, as seen in FIG. **3.** Between the ribs or thicker portions **230,** there are recesses **238** causing the thickness at these parts of an end flange to be lesser than at the ribs **230** to save plastic material, to provide excellent appearance, and to give good strength proportional to the weight of the reel. Weight which is lesser is of advantage both in handling and in shipping costs.

In operation, it will be seen that with the two basic reel sections **36** and **38** separated from one another completely, a coil of wire, not shown, of generally cylindrical shape and having an open center, can be placed on the right reel section **36** with the outer one of the hubs **30** thereby extending up through the central opening of the wire coil, not shown.

Thereafter, the left reel section can be placed so that its hub **32** is disposed inside the hub **30.** Then, a twisting of the left reel section **38** in one direction will cause a thread-like action, as above described, whereby the engagement of the spring-engaging members **90** and **92** with the spring **50** will cause the hub **32** to be drawn inwardly of the hub **30** which can be continued until the flanges **22** and **24** are in engagement with each other. Thereafter, still further rotation is continued so that a tension is placed on the spring by causing it to be somewhat extended so that the end flanges **22** and **24** tend to press very firmly against the sides of the coil so that as the coils of the wire coil, not shown, are drawn off of the reel, any collapsing of the sides of the wire coil, not shown, will be compensated for by a further inward movement of the flanges **22** and **24** under the influence of the spring **50.**

As best seen in FIG. **1,** the hub **30** is cylindrical on its outer surface, whereas its inner surface tapers from an outer end nearest the attached flange which is thicker on all sides to an inner end which is thinner on all sides. Any cross-section of the hub **30** or hub **32** taken at a right angle to the axis **70** shows the inner surface of each hub to be circular and also the outer surface of each hub to be circular.

The inside hub **32** has a thickness through its wall on any side which is greater adjacent its flange **24** than at its inner terminal end.

As thus described, the thickness of any side wall of each hub **30** and **32** tapers gradually from the outer end of the respective hub to the inner end.

The inner surface of any side of the outer hub **30** inclines slightly from being closer to the axis **70** at its outer end, adjacent its flange **22,** to being disposed slightly farther from the axis **70** at its opposite or inner end.

The outer surface of the inner hub **32** inclines also with respect to the axis **70,** being disposed farther from the axis **70** at the outer or flange **24** end of the inner hub **32** to the inner or opposite end of the hub **32.**

The result of this construction is that the outer surface of the outer hub **30** is parallel to the axis **70,** as is desired, and the offset inward from the outer surface of the outer hub **30** the outer surface of the inner hub **32** is lesser because of these taperings which permit the substantially cylindrical configuration of the inner surface of a coil of wire, not shown, to be received against the outer surfaces of the two hubs **30** and **32** with the least distortion of the coiled wire.

I claim:

1. A reel having inner and outer telescoping tubular hub portions having lapping inner ends, spaced right and left end flanges attached to outer ends of said hub portions respectively, said end flanges and their attached hub portions forming right and left basic reel sections, a coiled spring having spaced convolutions being attached to one of said basic reel sections and extending into the hub portion of the other basic reel section, spring-engaging means extending inwardly from the hub portion of the other basic reel section and lapping and extending between convolutions of said spring whereby as said reel sections are rotated with respect to each other the interaction of said spring-engaging means and said spring having an effect similar to mated threads that a rotation of said reel sections in one direction will cause said flanges to be drawn toward each other and the rotation of said reel sections in the opposite direction will cause said flanges to be urged apart.

2. The combination of claim **1** in which each of said hub portions has shoulder means extending outwardly therefrom, and securing means extending through said respective shoulder means and into the respective adja-

cent one of said flanges for securing each of said hub portions to the respective flange.

3. The combination of claim **1** in which each of said end flanges has an opening therethrough, the walls of the latter openings extending around an axis, said axis extending through said respective hub portions, annular members disposed on the outer side of each of said flanges and secured thereto respectively, said annular members having central axle openings having walls of cylindrical shape extending around said axis.

4. The reel of claim **1** in which said end flanges each have a common axis about which their inner sides are generally disposed in planes at right angles thereto, the outer sides of each end flange being provided with radially extending ribs spaced apart about said axis for greater strength, the space between said ribs being empty for the conservation of material.

5. The combination of claim **1** in which said end flanges are formed of thermo-plastic material.

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