ABSTRACT: A hose reel is provided with a mechanism for positively stopping the reel from turning and playing out the remainder of the hose and for absorbing the shock as the hose is stopped near its end. The mechanism comprises a spring-loaded finger which engages a spring-biased plunger prior to complete unwinding of the hose.
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Hose Reel with Positive Stop

Background of the Invention

This invention relates to hose reels and more particularly to reels of the type used in the automotive industry for automatically storing hoses in a wound condition and for allowing the hoses to be played out freely.

It is desirable to provide some means for preventing excessive strain on the end of the hose which is fixedly connected to the hose reel. Further, it is particularly desirable to absorb the shock when the hose is fully played out.

Summary of the Invention

My invention comprises a positive stop means mounted on the frame of a hose reel and actuated by the hose itself, said stop engaging an energy absorption means and coating therewith so that the stop not only prevents further rotation of the reel but also transmits the resultant forces due to stopping to the energy absorption means and thereby relieves the shock and strain on the hose.

An object of this invention is to provide a simple, effective means for positively stopping the rotation of a hose reel prior to the point at which the hose is fully unwound and to absorb the energy in stopping whereby the strain and shock on the hose is alleviated.

This and other objects of my invention will become apparent from the following description with reference to the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is a side elevation partially broken away of a hose reel in accordance with the preferred embodiment of my invention having alternate positions shown in phantom; Fig. 2 is a view taken as indicated by the lines and arrows 2–2 in Fig. 1 showing portions of the apparatus in phantom; alternate positions; and Fig. 3 is a view taken as indicated by the lines and arrows 3–3 in Fig. 1.

Description of the Preferred Embodiments

Although specific forms of the invention have been selected for illustration in the drawings, and the following description is drawn in specific terms for the purpose of describing these forms of the invention, this description is not intended to limit the scope of the invention which is defined in the appended claims.

In Fig. 1 a reel designated generally 10 is supported by the external mounting designated generally 12 and is fixedly attached thereto by U-bolts and nuts as shown. An external flange 14 extends outwardly from the rim 16 of the reel 10. The flange supports a plurality of rollers 18, 19 and 20, through which the hose 22 is fed. The rollers merely supply a guide means for the hose 22. The reel 10 is preferably of the type which has a spring motor 24 Fig. 2 for rewinding the hose on the reel automatically.

In wound condition, the hose is lapped upon itself as shown in phantom in Fig. 2. By a comparison of Figs. 1 and 2 note that the first wrap of the hose 22 on the reel is positioned on the inner side of the bars 26 (not shown in section) while the remaining wraps of the hose (as shown in phantom) are positioned on the outer side of the bar 26. This arrangement permits the hose to automatically actuate the positive stop and shock absorber means as will more fully explained.

The positive stop comprises a spring-loaded finger 30 mounted on the rim 16 which engages the plunger 34 of the shock-absorbing means designated generally 36 in Fig. 3. The finger is mounted for sliding movement parallel to the rim 16 between two bars 40 and 42 which are welded to the rim 16. The finger is flat and has a beveled edge 44 of one end. The finger is retained on the rim 16 by means of a threaded stud 50 the end of which abuts one side of the rim 16 and the shank of which passes through a hole in the rim 16 and an elongated hole in the finger 30. The other end of the stud has a washer 52 disposed about the shank and a nut 54 threaded on to the end thereof. A small plate 56 retains a bearing 58 against one face of the finger 30 and a similar bearing 60 is disposed between the other face of the finger 30 and the face of the rim 16. The nut is run up tight enough to retain the finger in its position between the bars 40 and 42 but still allow it to slide vertically (as viewed in Fig. 1) between the bearings 58 and 60.

The upper end of the finger is connected to the rod 26 by a press fit or by welding or other suitable means. The rod passes through a slot 62 in the rim 16 and a similar slot 64 in the rim 17. The slots are elongated and clear the rod for a sliding fit. The rod is spring-biased upwardly by the spring 66 which is connected at one end to the rod near its juncture with the finger 30, and at the other end to the rim 16 by means of the cotter pin 70.

By this arrangement the spring acting upon the rod 26 will cause the finger 30 to be raised vertically to the position shown in the phantom in Fig. 1. That is, the beveled edge 44 of the finger 30 will be retracted when in the circumference of the rims 16 assuming that no other force is directed against it.

As shown in Fig. 1, the hose 22 is fixedly connected at its terminus to a pipe arrangement designated generally 72 by means of a coupling 74. It is this connection which experiences shock when the hose is fully played out and it is at this juncture that the hose experiences a great deal of strain. Accordingly, to alleviate this shock and strain, I have positioned the hose on its first wrap beneath the rod 26 as shown in Fig. 6. It is further noted that there is also provided a roller 78 to alleviate friction as the hose plays across the rod 26. As will be seen from the relative positions of the coupling 74 and the rollers 18, 19 and 20, the hose will be angled downwardly as this wrap is unwound. The effect of this is to move the rod 26 from the position shown in phantom designated A in Fig. 2 to the position shown in full lines designated B in Fig. 2. When this happens the finger moves from the position shown in phantom to the position shown in full lines Fig. 1 and 2. The end of the finger is thereby extended beyond the circumference of the rim 16.

It will be apparent that the reel could turn further in Fig. 1 were not for this positive stop. Thus the stop is incorporated in the device before the hose is fully unwound.

The finger engages the plunger 34 which is disposed in a sliding fit within the cylinder 37. One end of the plunger has a circumferential flange 39 thereon which is engaged by a spring 41. The spring 41 is under compression between the end of the cylinder 37 and the flange 39 thereby tending to drive the plunger outwardly from the cylinder. The cylinder is fixedly attached by any suitable means such as the screw shown to the flange 14. Thus when the finger 30 engages the plunger 34 it drives the plunger in the direction of the arrow shown in Fig. 3 against the force of the spring 41 thereby dampening and absorbing the shock load. The size of the spring 41 can be varied to take into account the expected momentum of the hose reel as it reaches the end of its unwind cycle and the pull which can be expected to be exerted on the hose by one using it.

When the hose is released so that the spring motor 24 automatically re winds it, the reel will move in a direction counterclockwise as shown in Fig. 1 and the hose 22 will again be wrapped about the hub of the reel. As the hose is so wrapped, the first wrap moves closer to the center of the reel and allows the spring 66 to pull the finger 30 back to its phantom position shown in Fig. 1. In this position it will clear the plunger 34 and cylinder 37 as the reel continues to wind. Should the spring 66 become weakened through continued use or should the finger be otherwise unable to fully retract, the beveled surface 44 will engage the plunger 34 or cylinder 37 and it travels around the mechanism will be forced upwardly to prevent obstruction of the operation of the apparatus.

It will be understood that various changes in the details, materials and arrangements of parts which have been herein
described and illustrated in order to explain the nature of this invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the following claims.

It will further be understood that the Abstract of the Disclosure set forth above is intended to provide a nonlegal technical statement of the contents of the disclosure in compliance with the Rules of Practice of the United States Patent Office, and is not intended to limit the scope of the invention described and claimed herein.

What is claimed is:

1. In a rotatable hose reel having a hose thereon, the improvement comprising: a stop means for stopping the rotation of the reel as the hose is being unwound therefrom, when a predetermined amount of hose has been unwound, said stop means comprising a retractable finger means mounted on said reel and coacting with said hose to engage a mechanical energy absorption means to stop said reel; said retractable finger means comprising a finger slidably mounted to said reel and means for positioning said finger connected thereto comprising a rod extending therefrom engaging and coacting with said hose as said hose is unwound to drive said finger outwardly with respect to said reel to a position wherein said finger will strike said energy absorption means as said reel rotates, and means engaging said last mentioned means to retract said finger when said hose is rewound.

2. The invention of claim 1 wherein said retraction means comprises a spring connected to said rod at one end and at the other end connected to said reel.

3. The invention of claim 1 wherein said finger has a beveled edge thereon at the end thereof extending from said reel.

4. The invention of claim 1 wherein said energy absorption means comprises a plunger extending from a cylinder, said cylinder retaining a spring engaging said plunger to force said plunger outwardly from said cylinder, said plunger being positioned to engage said finger means.

5. The invention of claim 1 wherein said finger means is positioned to engage said energy absorption means at a point just prior to full unwinding of the hose from said reel.

6. The invention of claim 1 wherein the first wrap of the hose on said reel is positioned on one side of said rod and the remaining wraps are positioned on the other side of said rod.

7. The invention of claim 1 wherein said rod is provided with a friction roller, engaging said hose.

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