Sept. 15, 1970 H. V. LYLE 3,528,621

HOSE REEL

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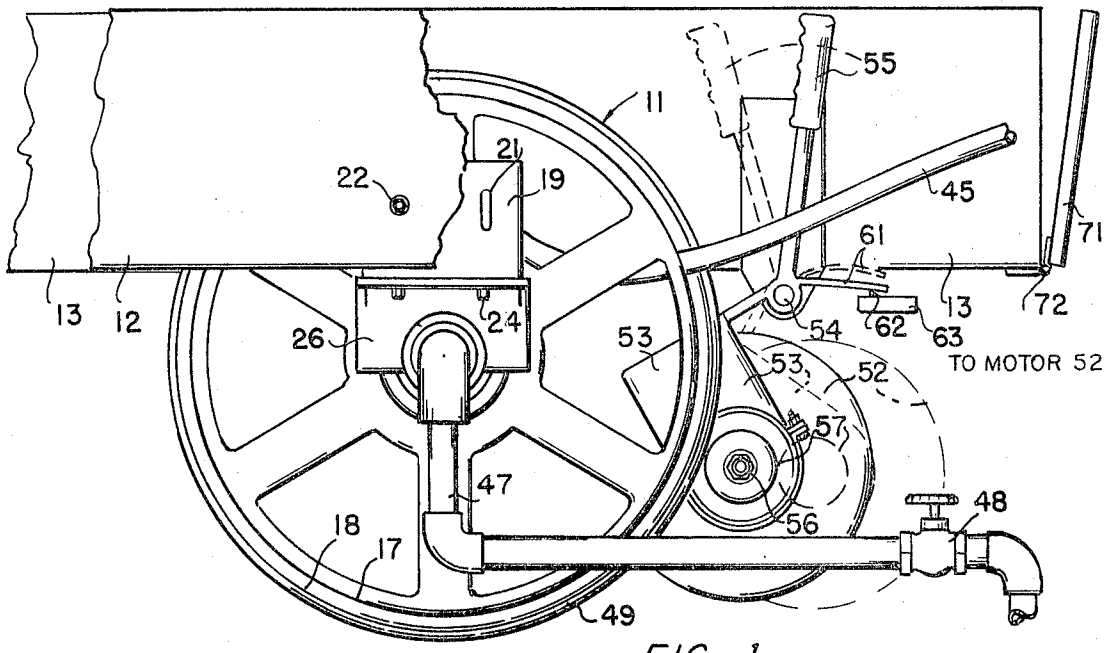


FIG. 1

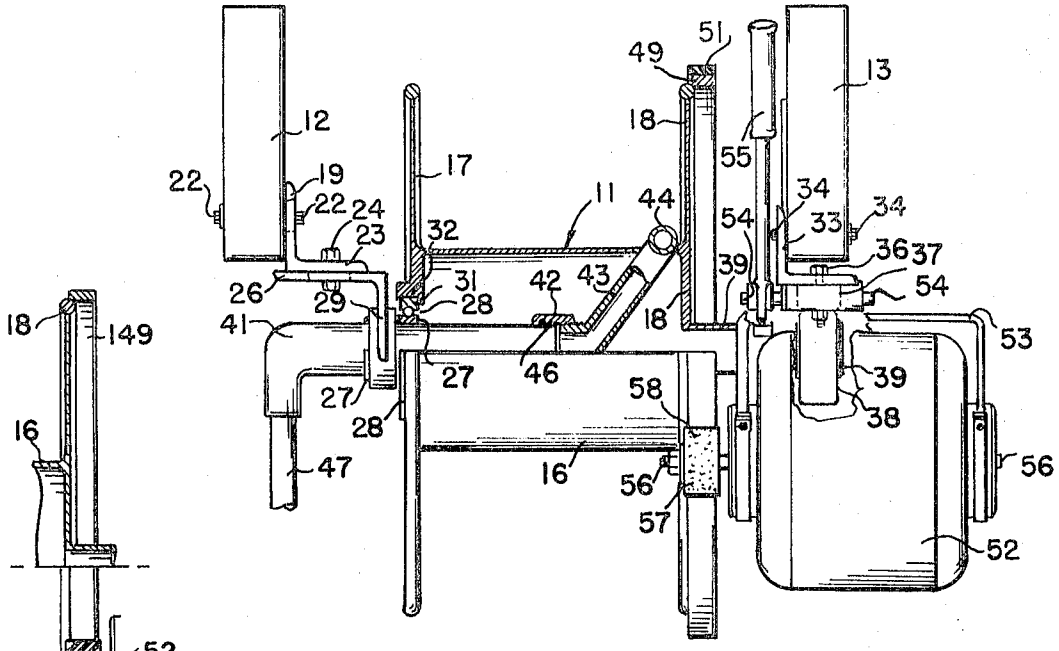


FIG. 2

FIG. 3

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HOSE REEL

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ABSTRACT OF THE DISCLOSURE

A mechanism for retrieving garden hoses and the like by winding the hose on a horizontally disposed drum or reel that has hose retaining end flanges in which a powered retrieving mechanism includes a drive element for selective frictional engagement with one drum flange of said reel to rotate the reel and to retrieve an extended hose. A motor for rotating the drive element is pivotally mounted for retention in an at-rest balanced position with the drive element out of contact with said drum flange but the drive element is selectively moveable to an engaged position. A resilient switch component moves with the motor to engage a switch to initiate hose retrieving operations when the drive element is moved toward engagement with the reel flange. Mounting components adjustably provide for convenient and accurate installation in building structures.

BACKGROUND OF THE INVENTION

The present invention is directed to the provision of a powered hose retracting mechanism that may be conveniently and economically installed in the home to facilitate the retrieval and storage of garden hoses. Previously others have built storage reels or hose receptacles that were to be attached to the side walls of houses, and others have even previously provided powered mechanisms for retrieving hoses of the flexible or garden type. While the desirability of some improved system for the storage or handling of a garden hose has previously been recognized it is believed that most previous systems have not had widespread useage because of problems concerned with the installation of previous mechanisms or with the relatively high cost of such mechanisms. In the belief that previous systems are too costly or cumbersome or not readily adaptable for in-house installation, the present inventor presents an improvement in mechanisms of the foregoing type.

SUMMARY OF THE INVENTION

Briefly stated, this invention presents a hose reel which may be mounted for rotation about a horizontal axis. The reel is to be provided with a conventional type swivel so that water or other fluids may be introduced to the center of the reel to be connected to a hose disposed on the drum of the reel for selective discharge therefrom. The reel is of somewhat conventional construction providing a drum element and end flanges for the retention of the garden hose. Bearings are provided at opposite ends of the reel so that the reel may be mounted between the floor joists or in other similar position in a house construction. Adjustable mounting elements are provided so that the reel may be installed between floor joists that are uneven, out of level or that may be spaced apart an irregular distance. When installed on the floor joists of a house, the reel will

be disposed beneath the floor supported by such joists, and the flanges of the reel will be substantially parallel to the supporting joists. The mechanism could be mounted outside the house but would in most installations be mounted within the house to prevent exposure or freezing. A drive motor is cooperatively mounted so that the drive shaft of the motor and a drive element disposed thereon can be moved into contact with a circumferential surface of one end flange. Frictional engagement between the motor drive element and the flange will cause rotation of the reel so that the hose may be retracted. The drive motor is pivotally mounted in such manner that the drive element will normally be in an at-rest position that is out of contact with the hose reel. Accordingly, the reel can be manually rotated or free-wheeled when the hose is being withdrawn from the reel. An operator handle is provided for manually rotating the motor away from its at-rest position and toward engagement with the reel end flange. A resilient switch engaging element is provided for movement with the operator handle. This resilient element engages a switch or button to initiate powered rotation of the drive element when the motor is being moved toward contact with the reel flange. When the rotation is to be halted, movement of the operator handle and thereby of the motor and the switch element will disengage the drive and turn off the motor.

The described mechanism is intended to satisfy certain important objectives. One such prime objective is to provide a mechanism that can be efficiently constructed for economic sale to the buyers of new homes or to present householders.

A further object is to provide an efficient mechanism that may be conveniently and accurately installed in locations where the level and spacing of construction elements may be non-standard.

Further objects and advantages of the present invention will be apparent from the appended description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation with parts shown in broken section and with certain elements shown in alternate position to illustrate the construction and operation of a preferred embodiment of this invention,

FIG. 2 is a front elevation of the mechanism shown in FIG. 1 with some parts shown in quarter section and with other parts removed; and

FIG. 3 is a partial front elevation of a modified form of the invention showing an alternate drive arrangement.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the preferred embodiment of the invention shown in FIGS. 1 and 2 the hose reel mechanism **11** is mounted between the floor joists **12** and **13** of a building. The hose reel is disposed with the drum **16** in horizontal position and with the end flanges **17** and **18** generally parallel to the floor joists **12** and **13**. The mechanism **11** is supported in such position by adjustable mounts that are attached to the joists **12** and **13**. The left mounts includes an angle element **19** having vertically disposed slots **21** so that the angle may be attached in vertically adjusted position to the joist **12** by through bolts **22** or other fasteners. Openings (not shown) extend through the horizontal leg **23** of the angle **19**, and adjusting bolts

24 passing through such openings engage a horizontal adjusting support 26 which is provided with slots (not shown) that extend transversely or parallel to the axis of the drum 16. The inner race 27 of a bearing 28 is attached to a leg 29 of the hornzontal adjusting support 26. The outer race 31 of bearing 28 is engaged in a bore opening 32 provided by the end flange 17. This combination provides rotating support for one end of the hose reel mechanism 11. The opposite end of the reel is supported from the joist 13. At this end a bracket 33 is bolted to the joist 13 by bolts 34 in position vertically spaced beneath the joist to provide clearance for mount bolts 36. Mount bolts 36 extend through the base 37 of a pillow block self-aligning type bearing 38 that is only partially shown.

The horizontal leg of bracket 33 is provided with elongated slots that are aligned with the length of the joists 13 to provide means for adjusting the fore and aft positioning of the hose reel mechanism 11 to facilitate proper alignment with respect to the bearing 28 and its supports. A stub shaft 39 extending from the end flange 18 is engaged through the bearing 38 to provide support for this end of the reel mechanism 11. The reel is, accordingly, suspended between bearing supports for normally free rotation.

In somewhat conventional manner fluid or water may be introduced through a rotary coupling 41 which extends through the inner race 27 of the bearing 28 and inwardly to a swivel 42. The swivel 42 is connected by a pipe 43 to a hose end 44 positioned at the surface of drum 16. A flexible type garden hose 45 is attached to the hose end 44 to be reeled onto the exterior surface of the drum 16. The pipe 43, accordingly, rotates with the drum while the rotary coupling 41 remains stationary. A liquid tight seal is provided by the swivel 42 and the O ring 46 or other seal elements disposed therein. The rotary coupling 41 is connected to an inlet pipe 47 and to a control valve 48 so that fluid or water may be passed through the coupling 41 and swivel 42 to the hose 45.

Flange 18 is provided with a circumferential and continuous rim 49. The rim 49 may be of metal plastic or natural or synthetic material. In this preferred embodiment it has a substantial face width and it is covered with a drive surface 51 of rubber or neoprene. In other embodiments of the invention coverings might be omitted, or selective coverings of synthetic rubbers, plastics or of fibrous materials may be used.

The rim 49 is provided as an element of a drive mechanism. Such drive mechanism as shown in FIGS. 1 and 2 includes an electric motor 52 having a supporting frame 53 and mounted for pivotal rotation about a pivot 54. An operator handle 55 is connected to the frame 53 so that the drive shaft 56 on the motor 52 and a drive element 57 disposed thereon may be moved toward and away from positions of contact with the rim 49. As illustrated, the drive element 57 is of small diameter when compared with the diameter of the rim 49. Accordingly, a motor 52 of normal speed may be used to provide a relatively slow rotation for the hose reel. In order to assure effiicient frictional contact between the drive element 57 and the rim 49 or any cover 51 disposed thereon, the drive element 57 may have an abraided surface as illustrated by the surface irregularities 58, or the drive element 57 itself may have a high friction face through use of resilient rubber or synthetic compounds or through provision of serrations or teeth.

Through provision of the pivot 54 as a mounting for the motor 52 and the handle 55, the motor 52 may be rotated away from its at-rest or balanced position as illustrated in dotted outline in FIG. 1 to an operative position with the drive element 57 in contact with the rim 49. In the drive position as shown in the full line representation, a resilient switch element 61 which is mounted for movement with the handle 55 is brought into engagement with the operator button 62 of a microswitch 63. Contact of the resilient switch element 61 with the button 62 will cause the motor to be energized to rotate the drive element 57 and consequently the hose reel mechanism 11. When the handle 55 is released, gravitational forces acting on the motor will move the motor will move the motor to an out-of-contact at-rest position. Simutaneously the resilient switch element 61 will be moved to its at-rest position as shown in dotted outline to de-energize the motor 52. The resilient element 61 and microswitch 63 combination is well adapted to the present configuration, since some movement of the motor may be noted as the reel is rotated due to eccentric loadings caused by retrieval of the hose or to other factors related to the resilience of the drive element or rim coverings. The resilient switch arm 61 provides compensaiton for such movements to efficiently maintain a closed electrical circuit as long as the hose retrieving operations are continued. Release of the operator handle will, of course, terminate the hose retrieval operation.

It is intended that the present mechanism will usually be installed inside a house or building structure. For such installations a door 71 may be attached to the floor joist by a hinge 72 to close off access to the hose reel mechanism. When the door is opened, the fluid control valve 48 can be turned on or off as desired. The operator handle 55 is also conveniently accessible through the door 71 when the hose reel mechanism is to be used. For use in colder climates the valve 48 should be of a drain type so that the water retained in the hose may be drained back when the hose is retrieved if the hose is to be stored in a location subject to freezing.

One modification of the invention illustrating the use of a non-resilient rim 149 and a drive element 157 of resilient material is shown in FIG. 3.

Additional combinations are possible as set forth in the previous description. In general it has been noted, however, that at least one element in the drive combination should be resilient and/or roughened, serrated or toothed. As previously set forth, the provision of a resilient element compensates for differences in the rolling resistance presented by an unbalanced hose reel or by changes in the drag resistance exerted by the hose as it is retracted.

While the reel mechanism 11 illustrated is specifically adapted for use for mounting between the joists of a building structure, it is obvious that the units can be conveniently installed in other locations or even at positions outside a house or building. It should also be noted that the mechanism can be used for the retraction and storage of other types of hose and conduit.

I claim:

1. A reel mechanism for the convenient retrieval and storage of hoses and adapted for installations in homes and other buildings comprising stationary support means for engagement to structural elements of a building, such as the floor joists thereof, a reel member having drum and end flange components, means providing rotating support for said reel member with the axis of said drum disposed horizontally, adapter elements adjustably interconnecting said rotary and stationary support means whereby said reel member may be acuately positioned horizontally and vertically to compensate for irregularities in building construction, a driven element on a surface of one end flange of said reel member, a pivotally mounted drive motor, a drive element attached to said motor to be selectively rotated thereby, said pivot mount, motor and drive element being cooperatively positioned with respect to said driven element whereby said drive element may be moved away from an at-rest disengaged position to an operative driving position providing engagement between said drive and driven elements, a motor controlling switch, and a switch actuator member for cooperative movement with said drive element for engaging said switch and energizing said motor as the drive element is moved toward its driving position.

2. Structure as set forth in claim 1 wherein said driven element is disposed on a circumferential surface of one end flange of said reel member.

3. Structure as set forth in claim 1 wherein said switch actuator member is resilient.

4. Structure as set forth in claim 1 wherein said drive and driven elements cooperatively provide a contact interface of high friction characteristics.

5. Structure as set forth in claim 3 wherein at least one of said drive or driven elements is provided with a resilient contact surface.

6. Structure as set forth in claim 5 wherein the resilience of said contact surface permits oscillating movement of said drive element and wherein the resilience of said switch actuator compensates therefor to prevent de-energization of said motor.

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