Dec. 25, 1962 K. MACLEOD ETAL 3,069,822

HOSE WINDING MACHINE

Filed Jan. 18, 1960 5 Sheets-Sheet 1

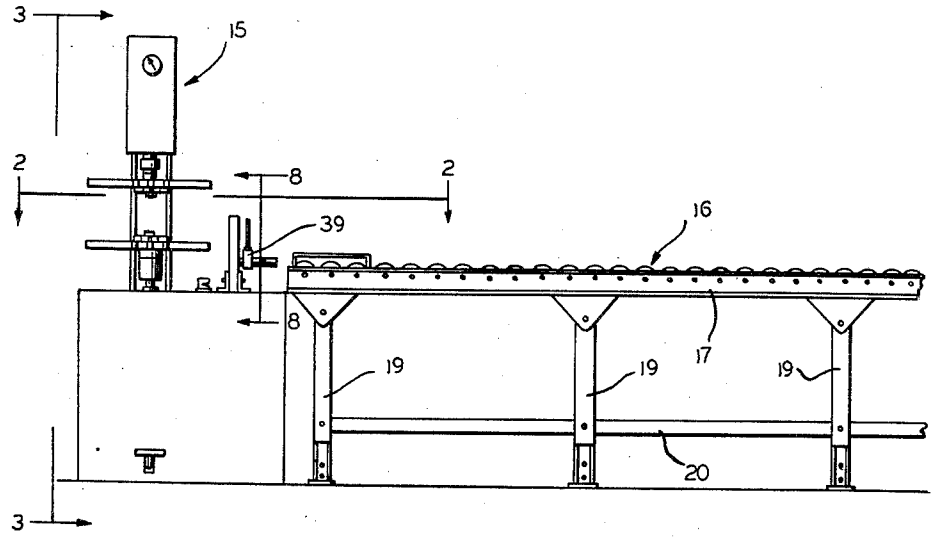


FIG. 1

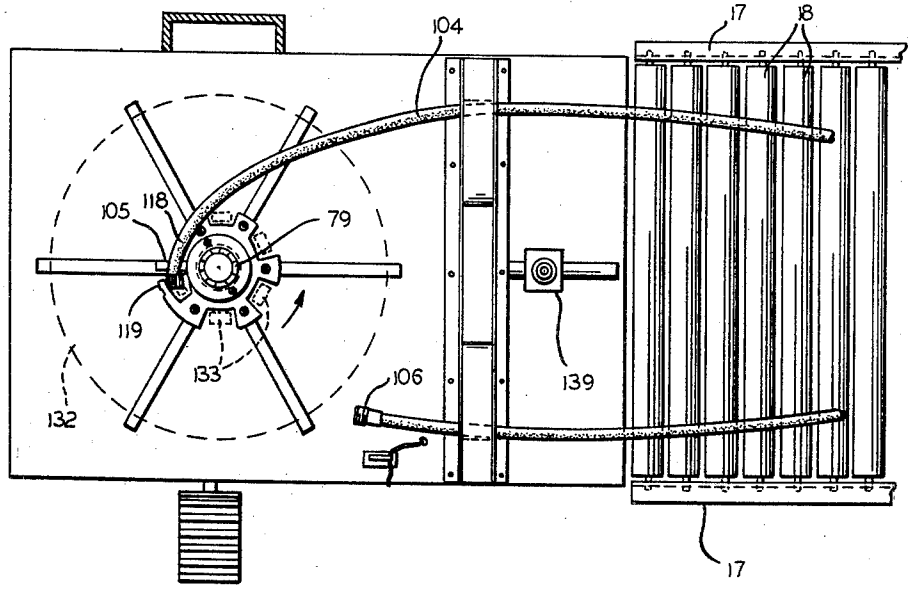


FIG. 2

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HOSE WINDING MACHINE

Filed Jan. 18, 1960 5 Sheets-Sheet 2

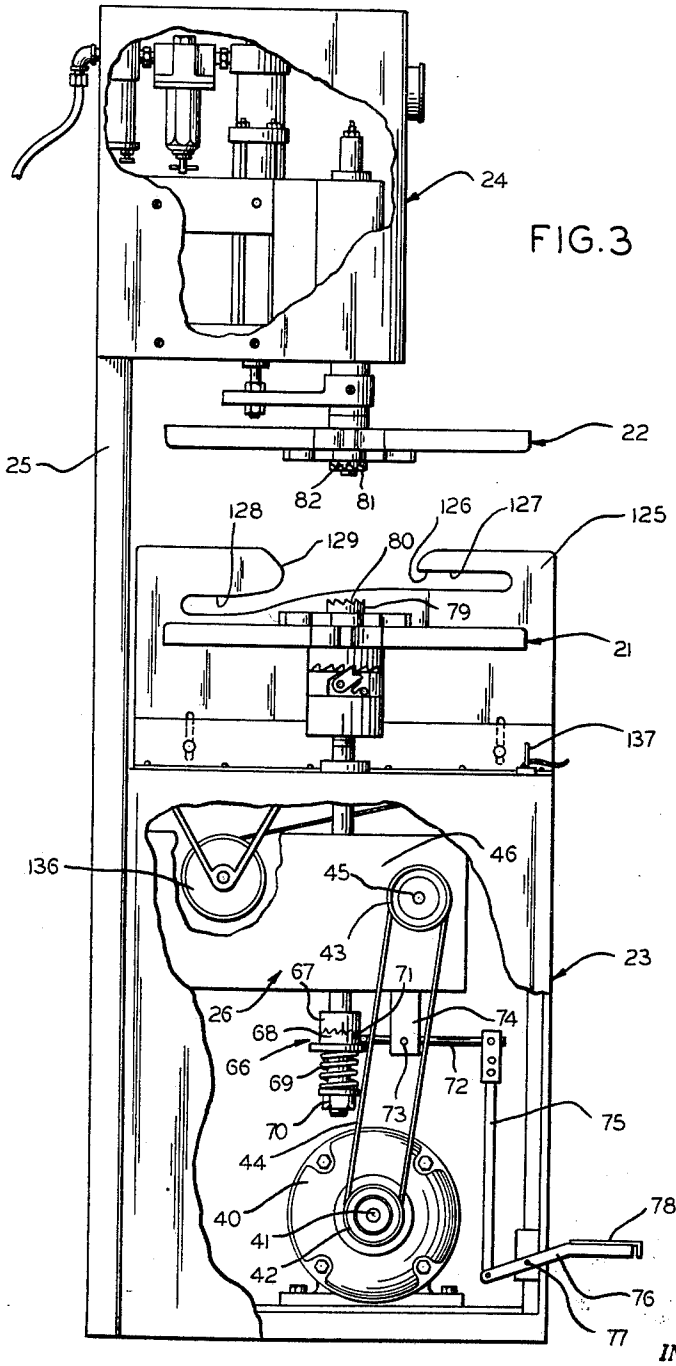


FIG.3

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HOSE WINDING MACHINE

Filed Jan. 18, 1960 5 Sheets-Sheet 3

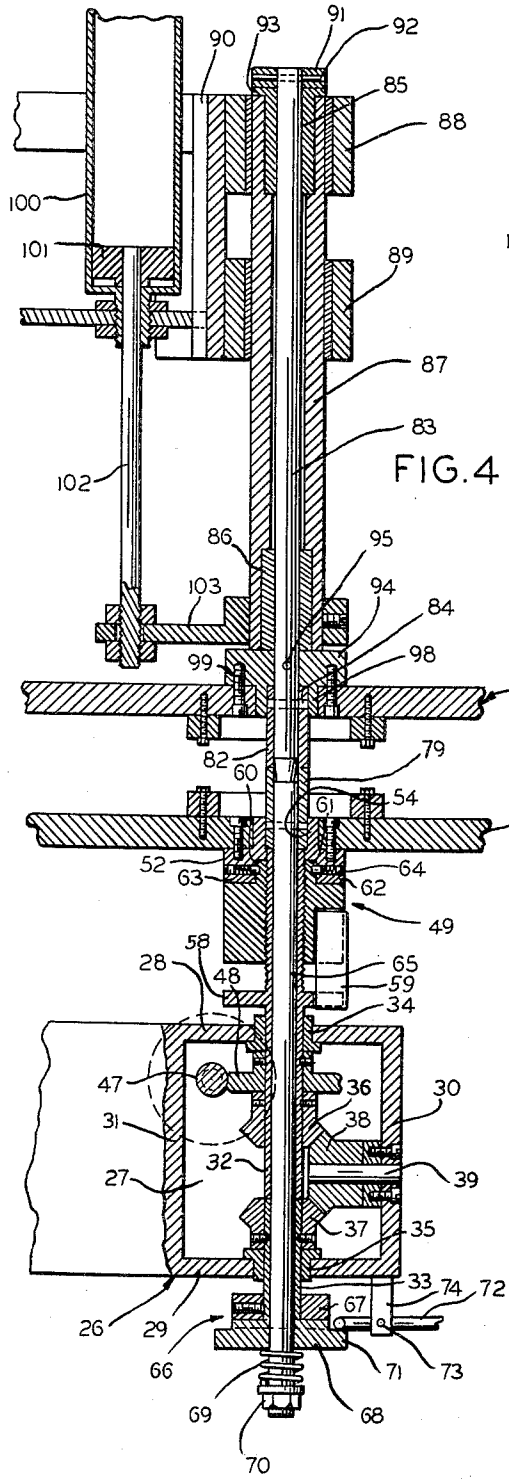


FIG. 4

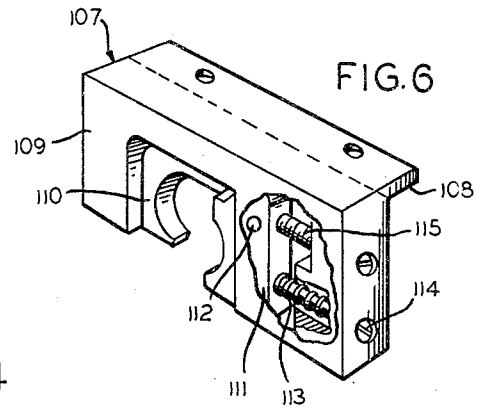


FIG. 6

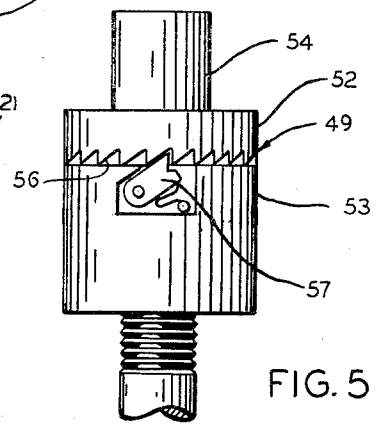


FIG. 5

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HOSE WINDING MACHINE

Filed Jan. 18, 1960 5 Sheets-Sheet 4

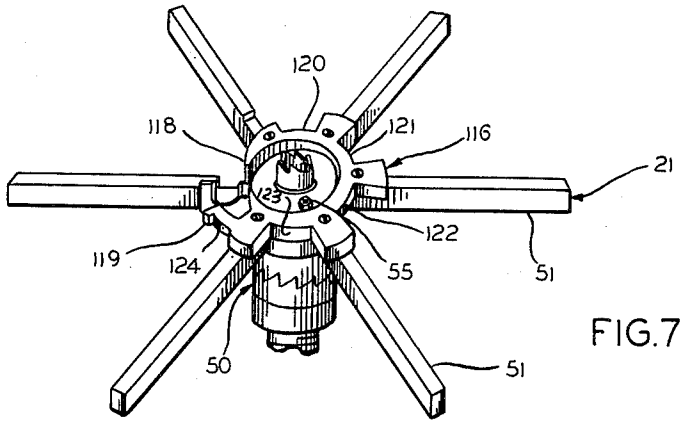


FIG.7

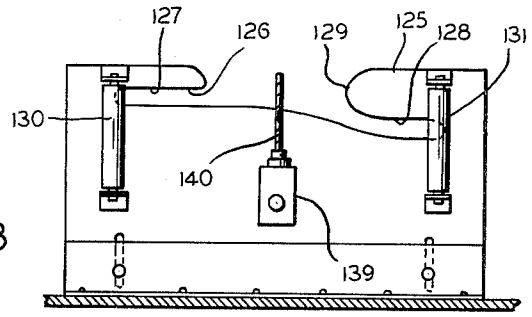


FIG.8

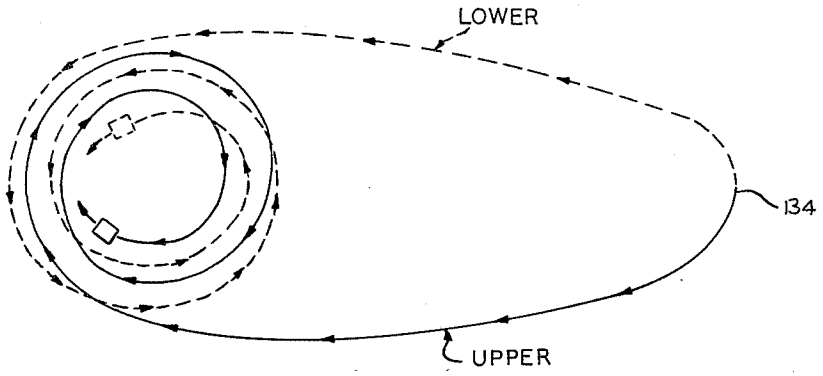


FIG.9

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HOSE WINDING MACHINE

Filed Jan. 18, 1960 5 Sheets-Sheet 5

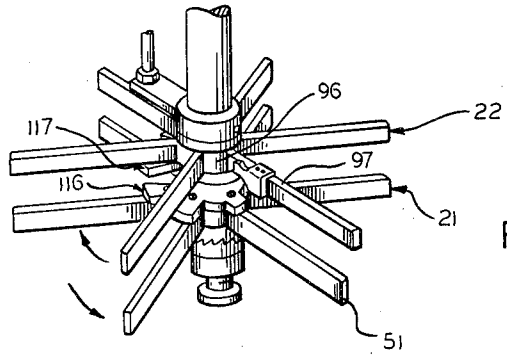


FIG.10

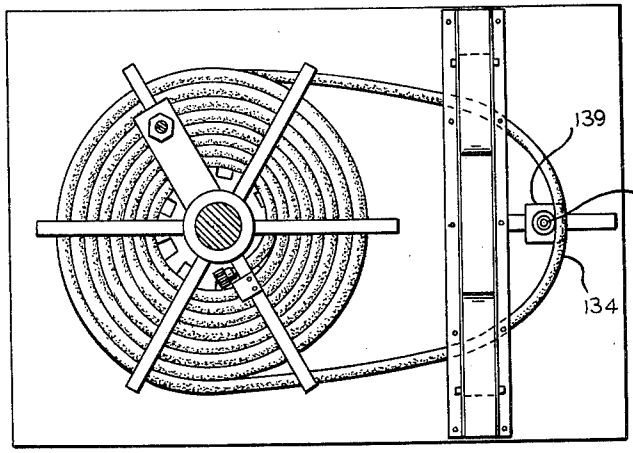


FIG. 11

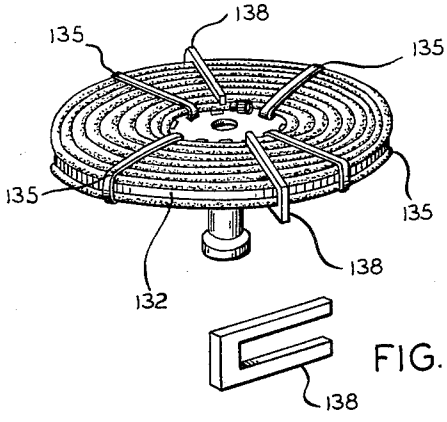


FIG.12

FIG.13

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United States Patent Office 3,069,822 Patented Dec. 25, 1962

3,069,822

HOSE WINDING MACHINE

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Filed Jan. 18, 1960, Ser. No. 3,107
15 Claims. (Cl. 53—21)

This invention relates in general to a hose winding machine and a method of packaging a length of hose, and more particularly to a machine for winding garden hose into coil form to define a package for use in display purposes and for marketing in retail stores.

There are several methods of coiling and packaging garden hose, one of the most common methods comprising the coiling of the hose into juxtaposed tiers so that the couplings are arranged at the center of the tiers. This method eliminates the hazard of damaging the couplings in shipment and handling where the coupling would be otherwise arranged at the outer or peripheral edges of the coiled tiers. Thus, the practice of winding garden hose in juxtaposed tiers with the couplings at the center is widely used, although this method has heretofore required several operations, considerable manpower, and in many cases skilled manpower. A stiffener may be used if desired with the coiled hose for adding to the stiffness of the completed coils and/or to provide labeling and advertising of the completed hose in package form. The stiffener may be arranged between adjacent tiers or on the outer side of any tier, or several stiffeners may be utilized, depending upon the desires of the manufacturer.

Accordingly, it is an object of the present invention to provide a machine for completely winding garden hose into double tiered relationship, with the couplings arranged at the center of the tiers, for packaging thereof and subsequent shipment and marketing.

The hose winding machine of the present invention includes a pair of winding members arranged in opposed relationship and driven in opposite directions, guide means for guiding hose to the winding members, and means for separating the winding members for loading and unloading thereof. Essentially, the winding members are spools about which the hose may be wound, and include at their centers clamping means for initially clamping the ends of the hose thereto. Prior to separation of the hose winding members, tape or string may be applied to the hose and separating member for tying it together. Thus, a single operator can load the machine, operate the machine, tie the hose, unload the machine and maintain good production speed.

Another object of this invention is to provide a hose winding machine for winding a hose into a double tiered arrangement.

Still another object of this invention is in the provision of a hose winding machine that may be operated by a single person, wherein the operator can load the machine, operate the machine to wind the hose into a double tiered arrangement, and tie the hose together and unload the machine.

A further object of this invention is to provide a hose winding machine including a pair of opposed winding members and means for driving the winding members in opposite directions.

A still further object of this invention is to provide a hose winding machine including a pair of opposed winding members, means for driving the winding members in opposite directions, and means for separating the winding members to permit loading and unloading of the hose.

A further object of this invention is in the provision

of a hose winding machine including a pair of opposed winding members, means for driving the winding members in opposite directions, wherein the means for driving the winding members includes a single gear box having two outputs for driving the winding members.

Still another object of this invention is in the provision of a hose winding machine including a pair of opposed winding members capable of being moved apart and together for purposes of loading and unloading the machine, and means for driving the winding members in opposite directions, and means for automatically stopping the driving means when a length of hose has been completely wound.

Another object of this invention is to provide a hose winding machine including a pair of opposed winding members driven in opposite directions and including clamp means for clamping the ends of the hose thereto at the center portions thereof.

A further object of this invention is to provide a method of packaging a length of hose which includes winding the opposite ends of the hose about themselves to define a pair of juxtaposed tiers of coiled hose.

A still further object of this invention is in the provision of a method of packaging a length of hose which includes simultaneously winding each end of the hose about itself in opposite directions to form a package of two juxtaposed tiers of coiled hose.

A still further object of this invention is to provide a method of packaging a length of hose wherein the opposite ends of the hose are wound about themselves in opposite directions and along a common axis to form a package of two juxtaposed tiers of coiled hose.

Another object of this invention resides in the provision of a method for packaging a length of hose which includes simultaneously winding each end of the hose about itself in opposite directions along a common axis and on opposite sides of a stiffening member to form a package of two juxtaposed tiers of coiled hose.

A still further object of this invention is to provide a method of packaging a length of hose that includes the steps of simultaneously winding each end of a hose about itself in opposite directions and on opposite sides of a stiffening member to form a package of two juxtaposed tiers of coiled hose, and securing the tiers and the stiffening member together.

Another object of this invention is in the provision of a method of packaging a length of hose that includes the steps of simultaneously winding each end of the hose about a form in opposite directions and on opposite sides of a stiffening member to define a package of two juxtaposed tiers of coiled hose, and tying the tiers and stiffening member together with a plurality of flexible tying elements, such a string or the like.

Other objects, features, and advantages of the invention will be apparent from the following detailed disclosure, taken in conjunction with the accompanying sheets of drawings, wherein like reference numerals refer to like parts, in which:

FIG. 1 is an elevational view of the hose winding machine of the present invention and illustrating a table adjacent thereto for supporting the hose during the winding operation;

FIG. 2 is an enlarged plan view, taken substantially along line 2—2 of FIG. 1, and illustrating the manner in which the lower winding member receives one end of the hose;

FIG. 3 is an enlarged elevational view, taken substantially along line 3—3 of FIG. 1 and looking in the direction of the arrows, and having portions broken away to show underlying parts for purposes of clarity;

FIG. 4 is a still greater enlarged vertical sectional

view taken through the driving apparatus of the hose winding machine, with some parts in fragmentary and other parts in elevation for purposes of clarity;

FIG. 5 is an enlarged view of the ratchet drive for the lower winding member;

FIG. 6 is an enlarged detail view illustrating the hose clamp which is employed on the upper and lower winding members;

FIG. 7 is a perspective view of the lower hose winding member or spider;

FIG. 8 is an enlarged elevational view of the hose guide and switch member, taken substantially along line 8—8 of FIG. 1;

FIG. 9 is a diagrammatic view illustrating the manner of winding the hose to form the double tiered arrangement;

FIG. 10 is a perspective view of the upper and lower hose winding members in juxtaposed position;

FIG. 11 is a top plan view of the winding members with the hose almost completely wound thereon and illustrating how the loop end of the hose trips the stop switch to shut off the motor for driving the machine;

FIG. 12 is a perspective view of the completely wound hose supported on a lower winding member and showing the manner in which the hose is tied together; and

FIG. 13 is a perspective view of a U-shaped clamp, which may be used to hold the hose together in packaged relationship for removing same from the machine prior to tying the hose and separator sheet together.

Referring now to the drawings, and particularly to FIG. 1, the hose winding machine of the present invention, generally designated by the numeral 15, is shown in association with a supporting table 16 which supports the hose prior to its being wound into a package. The table 16 illustrated is in the form of a roller table, which includes a pair of opposed channel members 17 rotatably supporting parallel arranged rollers 18. The channels are supported by upstanding legs 19, which are provided with an elongated brace 20 for securing them together and rigidifying the structure. Thus, the table 16 may be considered a roller conveyor for supporting the length of hose which may be easily folded thereover and wound into the winding machine 15.

Referring now particularly to FIGS. 3 and 4, the hose winding machine of the present invention includes generally a pair of hose winding members which may be defined as a lower hose winding member 21, and an upper hose winding member 22 that coact to receive the ends of a length of hose and wind the hose into double tiered juxtaposed coils. The hose winding members 21 and 22 are arranged to wind the hose along horizontal planes, but it will be appreciated that they may be arranged to wind the hose along vertical planes. The lower winding member 21 is supported in the base 23 of the machine, while the upper winding member is supported from the head 24 of the winding machine which is arranged above the base and supported therefrom by means of an upstanding supporting member 25. The means for driving both winding members is enclosed in the base 23, while means for raising and lowering the upper winding member 22 is enclosed in the head 24.

In order to drive the winding members in opposite directions, a differential gearing arrangement 26 is provided and mounted in the base 23 which includes generally a chamber 27 enclosed by upper and lower walls 28 and 29 and opposed side walls 30 and 31. Journalled in the upper and lower walls respectively and arranged in end-to-end aligned relationship are hollow shafts 32 and 33. The hollow shaft 32 is journalled in a bearing 34 mounted in the upper wall 28, while the hollow shaft 33 is journalled in a bearing 35 mounted in the lower wall 29.

The differential gearing includes a bevel gear 36 secured to the upper hollow shaft 32, a bevel gear 37 facing the bevel gear 36 and secured to the lower hollow shaft 33 and an idler bevel gear 38 mounted on a shaft 39 supported by the side wall 30 and in meshing engagement with both bevel gears 36 and 37, whereby the shafts 32 and 33 will rotate in opposite directions but in timed relationship. The shaft 32 delivers power to the lower winding member 21 as will be hereinafter more clearly explained, while the shaft 33 delivers power to the upper winding member 22 as will be hereinafter explained.

Driving of the differential gearing arrangement is accomplished by an electric motor 40 mounted within the base 23. The motor 40 is provided with a shaft 41 having mounted thereon a pulley 42 which delivers power to a pulley 43 of the differential gearing arrangement 26 by means of a belt 44, FIG. 3. The pulley 43 is mounted on a shaft 45 extending transversely of the driving gear arrangement 26 and being rotatably supported by a side wall 46 of the housing therefor. Within the driving gear housing and in the chamber 27, a worm 47 is secured to the shaft 45 and in meshing engagement with a worm wheel 48 mounted on the upper hollow shaft 32. Thus, power is delivered to the driving arrangement and initially to the upper shaft 32 and subsequently to the lower shaft 33 through the bevel gear 38.

Carried on the upper hollow shaft 32 above the differential gearing assembly is a one-way clutch or ratchet drive, generally designated by the numeral 49, FIGS. 4 and 5, which, in turn, supports the lower winding member 21. The lower winding member 21 includes a hub 50 having a plurality of circumferentially spaced radial arms 51.

The one-way clutch 49 comprises a driven member 52 and a driving member 53. The driven member 52 is provided with a diametrically reduced portion 54 on its upper end which is fitted into a bore provided in the center of the hub 50 of the lower winding member 21. Fastening members 55 secure the winding member 21 to the driven member 52 of the one-way clutch 49. The lower end of the driven member 52 is provided with a peripheral serrated edge 56 which coacts with a pawl 57 mounted on the driving member 53, FIG. 5, to define a one-way ratchet drive. The driving member 53 is threadedly mounted on the shaft 32 and connected to a collar 58 secured to a shaft by keys 59 which are received in aligned slots in the collar and driving member. Thus, the lower winding member 21 may be adjustably positioned on the hollow shaft 32 by removing the keys 59 and rotating the driving member 53 up or down the threaded portion of shaft 32. This permits accommodating various sizes of hose in the hose winding machine. The driven member 52 is provided with an internal annular shoulder 60 riding against the upper end of the sleeve 58. In order to prevent upward movement of the driven member 52 relative to the driving member 53 and the sleeve 58, an annular groove 61 is provided in the external surface of the sleeve 58 for slidably receiving pins 62 resiliently biased inwardly by springs 63 held in position by set screw 64 threadedly engaged in bores formed in the driven members 52. Thus, relative rotational movement may be effected between the driving member 53 and the driven member 52 in one direction only. This facilitates loading of the hose winding machine.

The lower hollow shaft 33 which drives the upper winding member 22 is selectively connected to a solid shaft 65 extending through the upper and lower hollow shafts 32 and 33 by means of a clutch 66 which includes a first clutching member 67 secured to the hollow shaft 33 and a second clutching member 68 spline connected to the solid shaft 65 and normally resiliently biased into engagement with the first clutching member 67 by a spring 69 embracing the lower end of the solid shaft 65 and tensioned thereon by means of a nut 70. Thus, the tension of the spring 69 may be adjusted by the nut 70 which is

threadedly engaged to the lower outer end of the solid shaft 65. The second clutching member 68 is provided with an annular flange 71. One end of a rock lever 72 engages the upper side of the flange 71. The lever 72 is intermediately pivotally mounted at 73 to a stationary part 74 of the base, and pivotally connected at its other end to the upper end of a push-pull lever 75. The lower end of the push-pull lever 75, FIG. 3, is pivotally connected to one end of an actuating lever 76 which is intermediately pivotally mounted at 77 to a part of the base. Outside of the housing of the base 23, the actuating lever 76 is provided with a pedal 78 for controlling operation of the clutch 66. Thus, depressing of the pedal 78, through the linkage, disengages the clutch 66 to permit free rotation of the solid shaft 65 and free rotation of the upper winding member 22 during certain conditions of the machine.

The solid shaft 65 therefore rotates within the hollow shaft 32 and with the hollow shaft 33 when the clutch 66 is engaged, and relative to the hollow shaft 33 when the clutch 66 is disengaged. The upper end of the solid shaft 65 extends upwardly a predetermined distance above the upper end of the one-way drive 49 and has pinned thereto a hollow clutch member 79, the lower end being received within the upper end of the diametrically reduced portion 54 of the driven member 52 of the one-way drive 49. The upper annular end of the clutch member 79 is serrated at 80 to coact with the lower serrated end 81 of a clutch member 82, FIG. 3. The clutch member 82 is also in the form of a sleeve and telescopically received over the lower end of the solid shaft 83 and pinned thereto by a pin 84. The solid shaft 83 is journalled in upper and lower bearings 85 and 86 which are mounted in opposite ends of a tubular support 87 through which the shaft extends. A pair of vertically spaced guides 88 and 89 slidably carry the tubular support 87. The guides are mounted on a bracket 90 that is rigidly carried in the head 24. A collar 91 is pinned to the upper end of the solid shaft 83 by a pin 92 and the collar is bearingly in engagement with an upper flanged portion 93 of the upper bearing 85. At the lower end of the solid shaft 83, a mounting plate 94 is secured thereto by a pin 95. The upper winding member 22 is identical to the lower winding member 21 and includes a hollow hub 96 having a plurality of circumferentially spaced and radially extending arms 97. The hub is telescopically received over a diametrically reduced lower end 98 of the mounting plate 94 and suitably secured to the mounting plate by a plurality of fasteners 99.

For raising and lowering the upper winding member 22, any type of mechanical means may be provided, and the mode illustrated includes a pneumatic cylinder 100 having a piston 101 slidable therein and connected to a piston rod 102. The outer end of the piston rod 102 is connected to a laterally extending arm 103 which is secured to the lower end of the tubular support 87. Thus, operation of the pneumatic cylinder raises and lowers the upper winding member 22 relative to the lower winding member 21 and engages and disengages the clutch members 79 and 82 to connect and disconnect the upper winding member to the drive from the differential gearing arrangement. When necessary, operation of the clutch 66 may facilitate engagement of the clutching members 79 and 82.

Prior to the winding of the garden hose into package form the hose is received in lengths and couplings are secured to the opposite ends. It is customary to secure a male coupling to one end of each hose length and a female coupling to the other end thereof. As seen in FIG. 2, the hose 104 is provided with a female coupling 105 at one end and a male coupling 106 at the other end.

It is necessary to connect the opposite ends of the hose to the upper and lower winding members, and the couplings as mounted on the ends of the hose effectively define enlarged flanges on the ends of the house which may be easily held by a clamp to the winding members. Each of the winding members is provided with a clamp as generally designated by the numeral 107 and shown most clearly in FIG. 6, which includes a mounting flange 108 that may abut against the under side of one of the arms 51 of the lower winding member and the upper side of one of the arms 97 of the upper winding member. Suitable fasteners secure the flange to the arms. Extending transversely of the flange 108 is a bracket 109 mounting a stationary clamping jaw 110 and a movable clamping jaw 111. The clamping jaws 110 and 111 coact to define a clamp for frictionally clamping the ends of the hose behind the couplings. The movable clamping jaw 111 is pivotally mounted at 112 and resiliently biased toward the stationary clamp 110 by a spring 113 adjustably tensioned by set screw 114. Thus, the tension of the spring 113 can be adjusted by the set screw 114. A set screw 115 spaced from the set screw 114 and on the opposite side of the pivot 112 is adjustable for regulating the opening defined by the stationary and movable clamping jaws. Thus, the clamp 107 is capable of handling various sizes of hose. Further, the clamp 107 frictionally holds the hose in place on the winding members. It will be appreciated that the opening defined by the clamping jaws in the clamp mounted on the upper winding member will be facing downwardly, while the opening on the clamp mounted on the lower winding member will be facing upwardly.

The lower winding member 21 is provided with a form 116 mounted thereon and centrally thereof about which the lower tier or layer of hose is wound, while the upper winding member is provided with a form 117 about which the upper tier or layer of hose is wound. As seen most clearly in FIGS. 2, 7 and 10, the form 116 has a somewhat spiral periphery, wherein the beginning surface adjacent the clamp 107, and generally designated by the numeral 118, is generally aligned with the inner stationary clamping jaw 110, while the terminal surface as indicated at 119 is spaced radially outwardly a distance slightly greater than the diameter of the coupling member held by the clamp. Similarly, the upper form 117 is also more or less spiral in shape, but of an opposite hand than the lower form inasmuch as the upper winding member rotates in an opposite direction. As viewed in FIG. 10, the lower winding member will rotate counter-clockwise, while the upper winding member will rotate clockwise.

The periphery of the form 116 is notched as at 120, 121, 122, 123 and 124 for providing relieved areas to facilitate tying the hose together after it has been wound on the winding members. Similarly, the upper form 117 is peripherally notched. As already explained, operation of the clutch 66 permits free movement of the upper winding member when the clutch members 79 and 82 are in engagement with each other, and this will permit proper alignment of upper and lower notched areas of the forms 116 and 117 to facilitate tying of the hose together.

In order to properly feed the hose to the winding members, a hose guide bar 125, FIGS. 3 and 8, is provided with an elongated generally horizontal curvate slot 126 formed therein. The curvate slot 126 includes a portion 127 spaced slightly higher than a portion 128 at the other end thereof, whereby the portion 128 serves to guide one end of the hose to the lower winding member, while the portion 127 serves to guide the other end of the hose to the upper winding member. An upwardly open slot 129 is provided centrally of the slot 126 to permit loading of the hose within the slot 126. As seen in FIG. 8, vertical idler rollers 130 and 131 may be arranged at opposite ends of the slot 126 for reducing friction at the end of the slot if such friction creates any problem. However, the rollers are not needed in most instances.

Inasmuch as the machine may be used to wind various sizes of hose, which requires adjustability of the spacing between the winding members, the guide bar 125 is adjustably mounted on the base 23 so that it can be raised or lowered with respect to the winding members. Since the winding position of the upper winding member is fixed, while the winding position of the lower winding member

is movable, the end of the guide bar 125 having the slot portion 127 which guides the hose run to the upper winding member will remain in the same position when adjusting the guide bar, thereby only necessitating the adjusting of the end of the guide bar containing the slot portion 128. It should be appreciated that adjustment would align the slot portion 128 with the lower winding member.

During the hose winding operation, a stiffener or separator 132 may be arranged between the layers or tiers of hose to additionally define with the arms of the winding members grooves for receiving the hose during winding thereof. The stiffener 132 is preferably constructed of a relatively stiff material, such as heavy cardboard or the like, and is provided at its center with an opening capable of telescopically fitting over the lower clutch member 79 as seen in FIG. 1. Slots 133 are also provided in the stiffener for purposes of receiving string or tape when tying the hose together.

The stiffener is not necessary, but functions to reduce friction that would normally exist by virtue of the hose runs in each tier moving in opposite directions against each other. Further the stiffener serves to enhance the rigidity of the hose tiers when the hose has been completely coiled and tied, and provides a place for labeling and advertising. However, if no stiffener is needed, but it is desired to reduce the friction when winding the hose, a thin metal plate or a sheet of stiff material may be arranged between the hose runs during winding of the hose and removed therefrom prior to tying the tiers together. It should also be appreciated that the stiffener may be arranged on the outside of either tier rather than between the tiers, or any number of stiffeners may be provided at any or all sides of the hose tiers. Moreover, if a stiffener be only desired on the outer side of a hose tier, and it be desired to reduce the friction between the hose tiers during the winding operation, a removable stiffener may be used between the hose tiers.

As seen in FIG. 9, the lower winding member winds one end of the hose, shown in dotted lines, in counterclockwise fashion, while the other winding member winds the hose, shown in solid lines, in clockwise fashion, and thereby defining an end loop 134 which gradually diminishes and finally provides the connection between the upper and lower layers of the hose when the hose is completely wound.

When the hose has been completely wound into two tiers of coils, as seen in FIG. 12, lengths of string or tape 135 may be applied around the two tiers and through the slots 133 of the stiffener and thereby to hold the tiers together with the stiffener. In order to facilitate use of string for tying the hose together, a spool of string 136 may be rotatably mounted in the base 23, FIG. 3, and brought upwardly through the housing to a cutter 137.

When it may be desired to fully utilize every second for operating the winding machine, the hose may be taken from the machine prior to tying the hose and separator together by using a plurality of U-shaped clamps 138, FIG. 13, which may be applied over the outer periphery to hold the upper and lower tiers against the separator, as seen in FIG. 12. Then, the machine time need not be tied up for purposes of tying the hose with string or tape.

If desired, a motor shut-off or stop switch 139 may be mounted on the base ahead of the hose guide 125, FIGS. 1, 2 and 11, and provided with an elongated pressure-responsive rod 140 that may be engaged by the end loop 134 of the hose prior to its passing through the hose guide 125 to automatically stop the winding members. The switch would be connected to the circuit of the motor 40 for turning the motor off, but the momentum of the hose winding members would complete the winding of the hose.

Since different winding conditions exist for different types and various sizes of hose, and preferences may exist as to how tight the hose should be coiled, the switch 139 is preferably mounted on a rod extending from the guide bar so that it may be adjustably positioned toward or away from the guide bar. When the motor is shut off, the gear drive still has energy or moment of inertia to expend through the winding members. Thus, the tension of the finished hose coils can be regulated by adjusting the positioning of the stop switch 139. The properties of the hose material and the hose diameter determines the amount of energy needed to be expended by the gear drive after the switch is actuated to shut off the motor to obtain the proper winding and shape of the hose coils. For example, the switch 139 would be moved closer to the guide bar when winding hose of larger diameter and less elastic since more friction would develop and the energy would dissipate faster. While smaller diameter hose would create less friction and necessitate having the switch positioned further away from the guide bar and winding members. And a highly elastic hose would not absorb the energy so fast as a less elastic hose thereby necessitating the positioning of the switch closer to the guide bar.

In operation of the machine, the pneumatic cylinder 100 would be operated to position the upper winding member 22 upwardly in greatly spaced relationship from the lower winding member 21 for purposes of facilitating loading of the machine. Then the opposite lengths of hose may be loaded through the slot 129 in the hose guide 125 and separated to the opposite ends of the slot 126. The one end of the hose extending through the lower portion 128 of the slot 126 would then be mounted on the lower winding member 21 by engaging the end with the corresponding clamp 107. The other end of the hose extending through the other portion of the slot 126 would then be clamped to the clamp 107 of the upper winding member. Then the pneumatic cylinder 100 would be operated to lower the upper winding member downwardly to engage the clutch members 79 and 82. Of course, a stiffener may be arranged over the hose after it has been clamped to the lower winding member and prior to clamping of the upper hose and to the upper winding member, or on either side of the upper or lower hose runs. If the teeth on the clutching members 79 and 82 engage properly, the drive to the machine may be started in order to then wind the hose on the respective winding members. Where more automatic operation is desired, a switch may be mounted to respond to the lowering of the upper winding member for starting the winding members. If the automatic shut-off mechanism is employed, when the end loop 134 engages the pressure-responsive rod 140 to trip the switch 139, the motor 40 will automatically be shut off at the end of the winding operation. Then the pneumatic cylinder 100 would be operated to raise the upper winding member 22 and permit tying of the hose tiers together with the separator. Of course, the hose may be tied together to the separator prior to raising of the upper winding member 22 if so desired. After the hose has been properly tied together, it may be lifted off the lower winding member 21 and another winding operation may be commenced.

Controls for operating the machine may be mounted any place on the machine or remote therefrom.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention, but it is understood that this application is to be limited only by the scope of the appended claims.

The invention is hereby claimed as follows:

1. A hose winding machine comprising a pair of opposed winding members, means on each member for connecting a hose end thereto so that both ends of the hose may be wound on said members at the same time, and means for driving said members in opposite directions for winding the hose on said members into double tiered form, and means for separating said members to permit loading and unloading of hose.

2. A hose winding machine comprising a pair of opposed winding members for simultaneously winding a length of hose into two juxtaposed coiled tiers, each winding member including a form about which the hose may be wound and means on one side of the form to guide the hose during winding thereof, a floating guide between said members coacting with the guide means of said members, means for separating said winding members to permit loading and unloading of the hose, and means for driving said members in opposite directions.

3. A hose winding machine comprising a pair of opposed winding members for simultaneously winding a length of hose into two juxtaposed coiled tiers, each winding member including a form about which the hose may be wound and means on one side of the form to guide the hose during winding thereof, a floating guide between said members coacting with the guide means of said members, means on each winding member to clamp a hose end thereto, means for separating said winding members to permit loading and unloading of the hose, and means for driving said members in opposite directions.

4. A hose winding machine comprising a pair of opposed winding members for simultaneously winding a length of hose into two juxtaposed coiled tiers, each winding member including a form about which the hose may be wound and means on one side of the form to guide the hose during winding thereof, a floating guide between said members coacting with the guide means of said members, means on each winding member to clamp a hose end thereto, means for separating said winding members to permit loading and unloading of the hose, means for driving said members in opposite directions, and means for guiding the hose to the winding members.

5. The method of packaging a length of hose which includes the step of simultaneously winding each end of the hose about itself in opposite directions along a common axis to form a package of two juxtaposed tiers of coiled hose.

6. The method of packaging a length of hose which includes the step of simultaneously winding each end of the hose about itself in opposite directions along a common axis and on opposite sides of a separating means to form a package of two juxtaposed tiers of coiled hose.

7. The method of packaging a length of hose which includes the step of simultaneously winding each end of the hose about itself in opposite directions along a common axis and on opposite sides of a stiffening member to form a package of two juxtaposed tiers of coiled hose and securing the tiers to the stiffening member.

8. The method of packaging a length of hose which includes the step of simultaneously winding each end of the hose about itself in opposite directions along a common axis and on opposite sides of a stiffening member to form a package of two juxtaposed tiers of coiled hose and tying the tiers and stiffening member together with a flexible tying element.

9. The method of packaging a length of hose comprising the steps of, clamping one end of the hose to a winding member rotatable about an axis and clamping the other end of the hose to a second winding member rotatable about said axis so that both ends of the hose may be wound on said members at the same time, and rotating said winding members in opposite directions and at a common speed thereby simultaneously winding each end of the hose about itself to form a package of two juxtaposed tiers of coiled hose.

10. The method of packaging a length of hose comprising the steps of clamping one end of the hose to a winding member rotatable about an axis, positioning a stiffening member over said hose end and winding member of a size to completely cover the hose after it has been wound into a coil on said winding member, clamping the other end of the hose to a second winding member rotatable about said axis and positioned adjacent said stiffening member, and rotating said winding members in opposite directions and at a common speed thereby simultaneously winding each end of the hose about itself on opposite sides of the stiffening member to form a package of two juxtaposed tiers of coiled hose.

11. The method of packaging a length of hose comprising the steps of clamping one end of the hose to a winding member rotatable about an axis, positioning a stiffening member over said hose end and winding member of a size to completely cover the hose after it has been wound into a coil on said winding member, clamping the other end of the hose to a second winding member rotatable about said axis and positioned adjacent said stiffening member, rotating said winding members in opposite directions and at a common speed thereby simultaneously winding each end of the hose about itself on opposite sides of the stiffening member to form a package of two juxtaposed tiers of coiled hose and securing said tiers of coiled hose and said stiffening member together.

12. The method of packaging a length of hose comprising the steps of clamping one end of the hose to a winding member rotatable about an axis, positioning a stiffening member over said hose end and winding member of a size to completely cover the hose after it has been wound into a coil on said winding member, clamping the other end of the hose to a second winding member rotatable about said axis and positioned adjacent said stiffening member, rotating said winding members in opposite directions and at a common speed thereby simultaneously winding each end of the hose about itself on opposite sides of the stiffening member to form a package of two juxtaposed tiers of coiled hose and tying said tiers of coiled hose and said stiffening member together with a plurality of tying elements.

13. A hose winding machine comprising a pair of opposed winding members rotatable about a common axis for simultaneously winding a length of hose into two juxtaposed tiers of coiled hose to form a package, each winding member including a form at its axis about which the hose may be wound and guide means on one side of the form extending radially to prevent the successive coils from slipping off each other as the hose is wound, a stiffening member arranged between said winding members to coact with each guide means to maintain the successive coils in stacked relation, means on each winding member to clamp each end of the hose thereto adjacent the periphery of a corresponding form, means for driving said winding members in opposite directions, and means for selectively separating said winding members for loading and unloading the hose therefrom.

14. A hose winding machine comprising a pair of opposed winding members rotatable about a common axis for simultaneously winding a length of hose into two juxtaposed tiers of coiled hose to form a package, each winding member including a form at its axis about which the hose may be wound and guide means on one side of the form extending radially to prevent the successive coils from slipping off each other as the hose is wound, a stiffening member arranged between said winding members to coact with each guide means to maintain the successive coils in stacked relation, means on each winding member to clamp each end of the hose thereto adjacent the periphery of a corresponding form, means for driving said winding members in opposite directions, means for selectively separating said winding members for loading and unloading the hose therefrom, and means for automatically stopping said driving means when the hose is completely wound on said winding members.

15. A hose winding machine comprising a pair of opposed winding members rotatable about a common axis for simultaneously winding a length of hose into two juxtaposed tiers of coiled hose to form a package, each winding member including a form at its axis about which the hose may be wound and guide means on one side of the form extending radially to prevent the successive coils from slipping off each other as the hose is wound, a stiffening member arranged between said winding members

to coact with each guide means to maintain the successive coils in stacked relation, means on each winding member to clamp each end of the hose thereto adjacent the periphery of a corresponding form, means for driving said winding members in opposite directions, means for selectively separating said winding members for loading and unloading the hose therefrom, means adjacent the periphery of said winding members for guiding the hose thereto, and means for automatically stopping said driving means when the hose is completely wound on said winding members.

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