

- [54] **PACKAGING METHOD AND APPARATUS**
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53/124 D, 53/390
[51] Int. Cl... **B65b 63/02, B65b 13/20, B65b 25/02**
[58] Field of Search..... **53/24, 32, 124 C,**
53/124 D, 241, 255, 256, 260, 390; 47/1, 20,
21, 26, 28, 58

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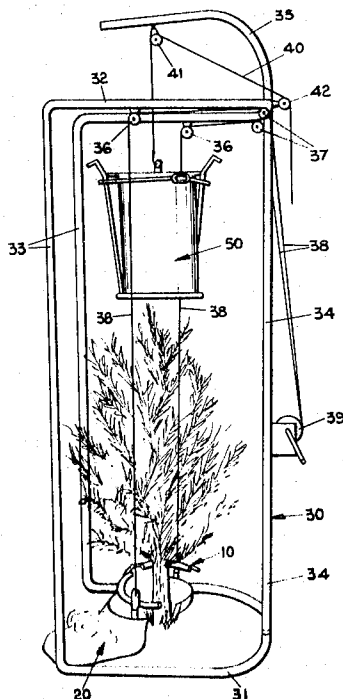
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[57] **ABSTRACT**

A split ring is opened and slipped around the base of a live shrub or tree. A generally rectangular flexible wrap member is secured at one end to the ring and the ring is closed. The wrap member includes closure means along its sides such that it can be closed into the shape of a cylinder. The ring and wrap member are then pulled upwardly and as the wrap member passes onto the tree, the closure means are progressively closed. When the leading edge of the wrap member is generally at the top of the tree and the tree is thereby enclosed, the ring is removed from the wrap member and a packaging sleeve is pulled downwardly from a sleeve dispenser positioned above the shrub. The packaging sleeve is pulled over the wrap and the wrap is then pulled upwardly off of the tree while the packaging sleeve is held in place.

22 Claims, 11 Drawing Figures



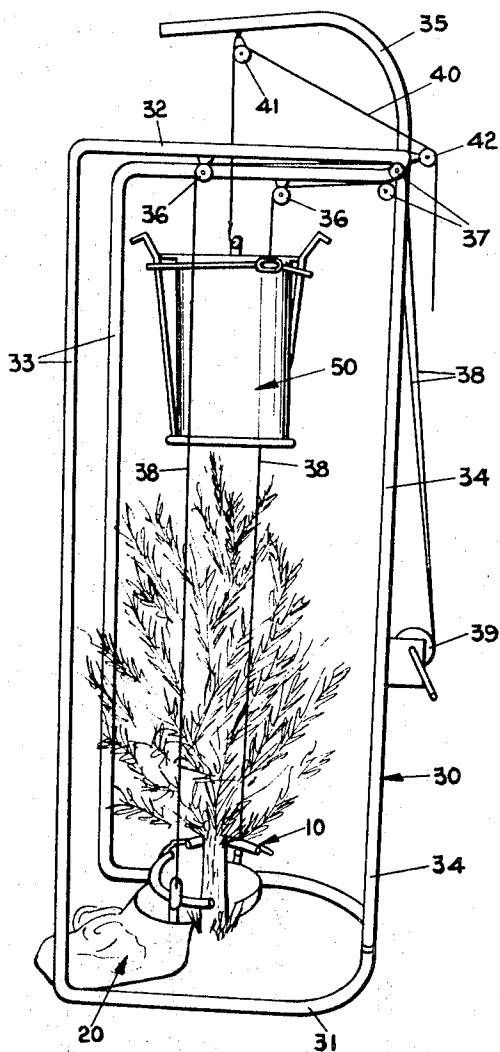


FIG. 1

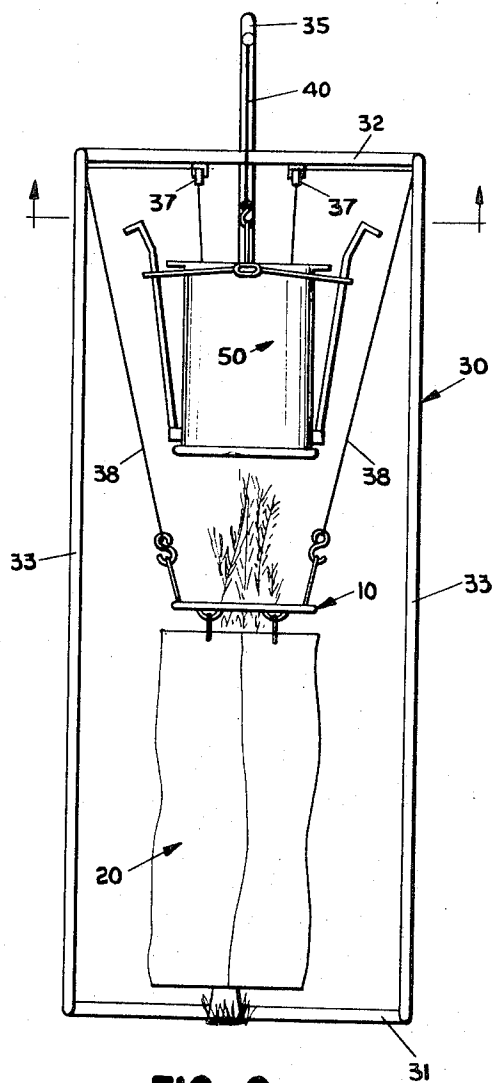


FIG. 2

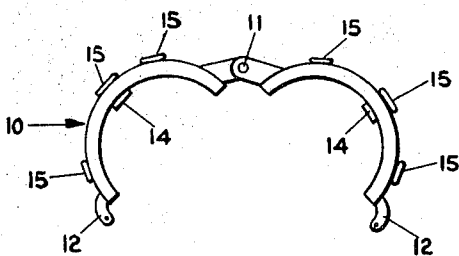


FIG. 3

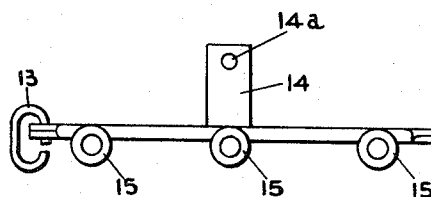


FIG. 4

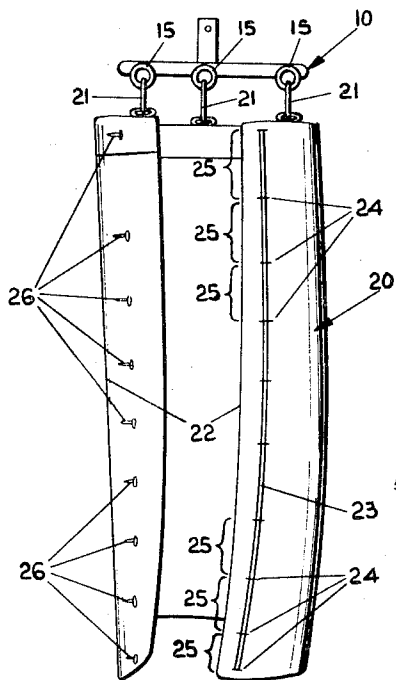


FIG. 5

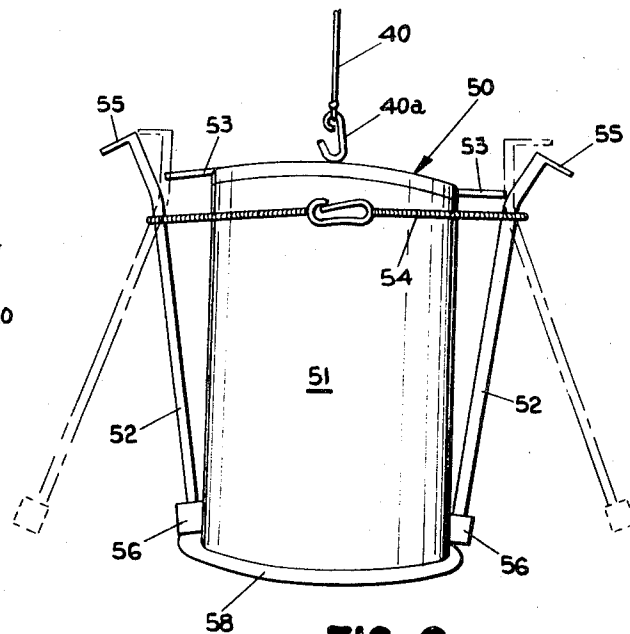


FIG. 6

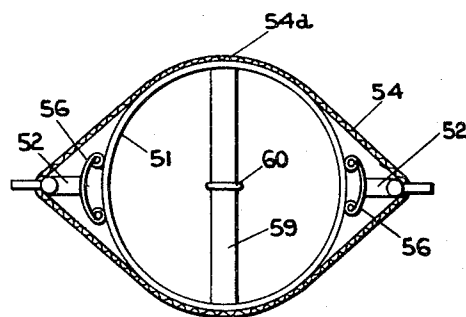


FIG. 7

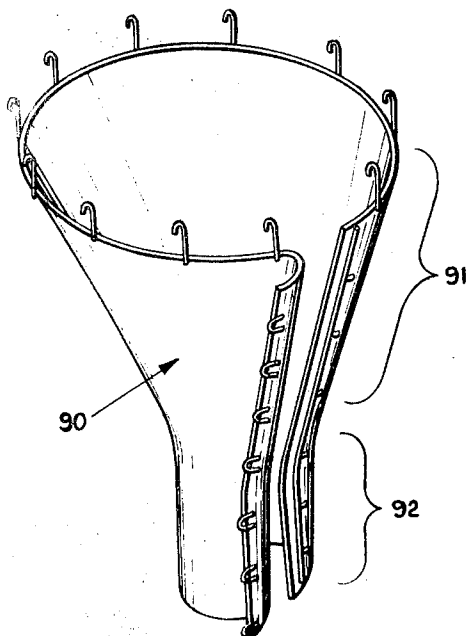


FIG. 11

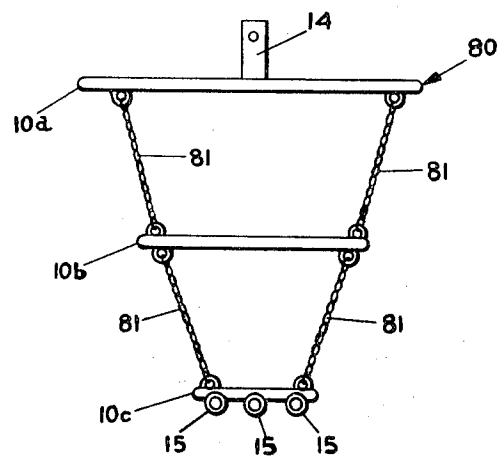


FIG. 10

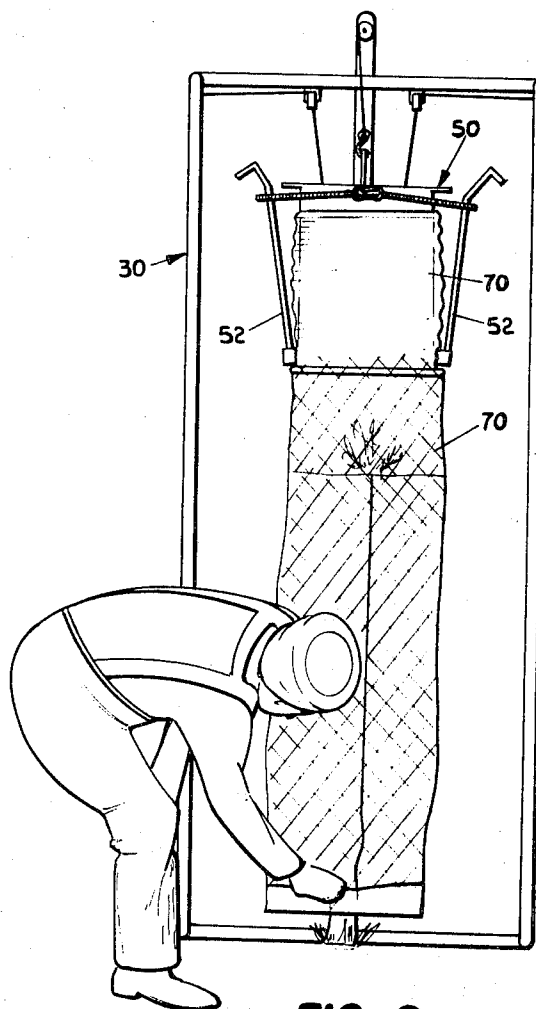


FIG. 8

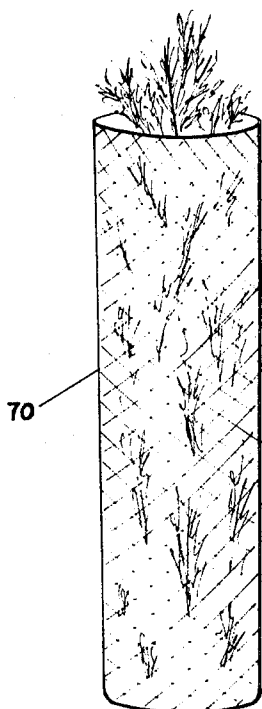


FIG. 9

PACKAGING METHOD AND APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to packaging trees and shrubs. It is particularly useful in packaging trees and shrubs while they are alive and planted in the ground.

Presently, such packaging of live, planted trees is accomplished by using twine to tie back the branches. Once the branches of the shrub are tied back, the shrub is then uprooted and transported. Several lengths of twine must be used, and the process is cumbersome and time consuming at best.

Superior packing means have been provided for packaging trees which are already cut down. In particular, such packaging systems have been developed for packaging cut Christmas trees. These methods involve pulling the cut tree through a funnel and cylinder into a packaging netting which is on the end of the funnel. In one variation of this method, the packaging netting is placed on the tubular stem of a funnel and as the tree passes through the funnel, the netting is pulled off of the stem and onto the tree.

At first blush, it might be thought that such packaging systems could be used for packaging live trees as well as cut trees. However, the use of these methods require that the tree be uprooted prior to packaging. This is impractical for several reasons. First of all, it is generally more difficult to properly uproot a tree unless the branches are somehow tied up. The branches tend to get in the way and may even be damaged. Further, the uprooting of a live tree prior to packaging will mean that the tree has to be moved and handled without first having its branches somehow restrained. The very act of transporting such a live tree to a packaging machine as outlined above could result in damage to the tree or shrub and its branches.

Thus, while apparatus has been provided for packaging cut trees, the present state of the art dictates that it is better to package live trees while they are planted by merely tying back the branches with twine.

SUMMARY OF THE INVENTION

In the present invention, apparatus and a method are provided for packaging a tree or shrub before it is uprooted, without having to tie the branches back with twine. Means defining a lead ring or member is provided which can be opened for passing around the base of the shrub. The ring is then closed about the base of the shrub and a wrap member is secured at one end to the lead ring. The wrap member can be formed into the shape of a cylinder having a part or split extending from one end to the other. The part includes closure means along its length such that when the ring is pulled upwardly from the bottom to the top of the tree, the wrap member can be progressively closed to form an enclosing cylinder about the tree or shrub.

In a narrower aspect of the invention, the wrap member is then covered by a generally tubular packaging sleeve and the wrap member is pulled upwardly off of the tree while the packaging sleeve is held in place. In a preferred embodiment, a packaging sleeve dispensing cylinder is positioned above the wrapped shrub and a packaging sleeve can be pulled off of the cylinder and expanded downwardly over the wrapped shrub.

Another aspect of the invention includes the provision of a unique stand assembly for positioning around the tree. The stand assembly includes a winch and lines

extending downwardly to the ring whereby the ring can be pulled upwardly. Also, the stand includes a means for holding the packaging sleeve dispensing cylinder directly above the shrub, and for raising and lowering the cylinder.

Thus, by using the concepts embodied in the present invention, one can package a live shrub before it has been removed from the ground. With the branches of the shrub properly packaged, the shrub can then be removed without fear of injury to the branches. This method of packaging is far faster than the method involving the use of twine to tie back the branches. The concepts of this invention are applicable not only in the nursery industry, but are also applicable to the preparation of shrubs for winter.

The above aspects of the invention, as well as additional objects and advantages will be more fully appreciated by reference to the written specification and appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side perspective view of the apparatus positioned for packaging a shrub;

FIG. 2 is a front elevation of the apparatus after the wrap has been pulled upwardly and closed about the shrub;

FIG. 3 is a plan view of the split ring in open condition;

FIG. 4 is a side elevation of the split ring in closed condition;

FIG. 5 is a front perspective view of the wrap connected to the ring;

FIG. 6 is a front perspective view of the dispensing cylinder;

FIG. 7 is a plan view of the dispensing cylinder;

FIG. 8 is a front elevation of a packaging sleeve being pulled downwardly over the wrapped shrub;

FIG. 9 is a perspective view of a packaged shrub;

FIG. 10 is a front elevational view of a series of split rings secured together; and

FIG. 11 is a perspective view of a generally funnel-shaped wrap member.

PREFERRED EMBODIMENT

In the preferred embodiment, a split ring 10 is provided which can be opened and slipped about the base of a shrub (FIG. 1). A flexible wrap 20 is secured to ring 10 and ring 10 is then closed. Ring 10 is then hoisted upwardly by means of winch 39 mounted on stand 30 which is positioned about the shrub in an embracing fashion. As ring 10 is pulled upwardly, wrap 20 is progressively closed such that when it reaches a point near the top of the shrub, it is wrapped about the shrub in a generally cylindrical configuration (FIG. 2).

Ring 10 is then disconnected from wrap 20, opened and swung to one side and a dispenser 50 suspended on stand 30 is lowered to a position just above the shrub. A plurality of packaging sleeves 70 are stored on dispenser 50 and one of the packaging sleeves 70 is pulled downwardly off dispenser 50 and over the wrapped shrub (FIG. 8). The packaging sleeve 70 is then held in place while the wrap 20 is pulled upwardly off of the shrub.

As an alternative to the use of a single ring 10, a plurality of rings can be combined to provide a generally funnel-shaped ring assembly 80 (FIG. 10). Wrap 20 would be secured to the bottom ring 10c and the ring

assembly 80 would gradually bend the branches of the shrub upwardly against the tree trunk. Still another alternative would be to use a generally funnel-shaped wrap member 90 (FIG. 11) in conjunction with a single large split ring 10, instead of using the purely cylindrical wrap member 20 (FIG. 11).

Split ring 10 is comprised of two sections hinged together by hinge 11 (FIG. 3). It is important in the preferred embodiment that ring 10 be made of a fairly rigid material, such that it compresses the branches inwardly toward the tree trunk. It is also important that ring 10 can be opened so that it will slip about the base of the tree, and can be closed such that branches will be compressed all the way around the tree. Overlapping closure flanges 12 are provided at the opening in ring 10 and include a hole therethrough such that when ring 10 is closed, closure flanges 12 overlap and a closure bolt or clip 13 can be passed through the mating holes in the overlapping flanges 12. In this manner, ring 10 can be closed and locked in a closed position.

A pair of brackets 14 are welded to ring 10 and extend upwardly therefrom to provide a means for securing lines from winch 39 thereto (FIGS. 3 and 4). One bracket is welded to each ring section and each bracket includes an aperture 14a therein through which a line or clip can be passed. Welded to the outside of ring 10 are a plurality of loops 15 (FIGS. 3 and 4). Loops 15 provide a means for securing wrap 20 to ring 10.

Wrap 20 is preferably made of flexible, durable material such as canvas or the like (FIG. 5). Wrap 20 is a generally rectangular shaped flexible member having clips 21 secured at one end thereof for clipping onto loops 15 or for clipping over ring 10 directly. Wrap 20 can be formed into a generally cylindrical configuration having a part 22 extending from one end thereof to the other. Closure means are provided at part 22 whereby wrap 20 can be progressively closed as it is pulled up over a shrub or tree. The closure means could be a zipper or the like, but a preferable and less expensive closure means comprises a line 23 secured at one side of part 22 and a plurality of hooks 26 secured at the other side of part 22, on the inside of wrap 20 as it is closed into a cylindrical shape. Line 23 is tied down or sewn down to wrap 20 at intervals spaced along its length by appropriate tie downs 24. In order to effectuate closure of part 22, hooks 26 can then be hooked into the intervals 25 between tie downs 24.

Stand 30 comprises basically a generally U-shaped base 31 joined to a generally U-shaped top 32 by means of two front vertical supports 33 and a back vertical support 34 (FIG. 1). The front side of stand 30, defined by front supports 33 and the openings in the generally U-shaped base 31 and top 32, is open such that stand 30 can be positioned about a tree or shrub, thereby embracing the same.

A pair of side pulleys 36 are secured to generally U-shaped top 32, one on each leg of top 32 or in other words one on each side of stand 30. These are positioned towards the open front of stand 30 such that when stand 30 is in place about a shrub, the pulleys 36 will be positioned generally on either side thereof. A line 38 hangs over each side pulley 36 for supporting ring 10, and then extends rearwardly over a rear pulley 37. A pair of rear pulleys 37 are secured to top member 32 at the back of stand 30, or in other words to the base of the generally U-shaped top 32 (FIG. 2). The lines 38 then extend downwardly and are connected to a winch

39 which is mounted on back vertical support 34 (FIG. 1).

Stand 30 also includes a top beam 35 which extends upwardly from back support 34 and then outwardly over the top of stand 30 (FIG. 1). Beam 35 includes a top pulley 31 secured thereto approximately in the same vertical plane as side pulleys 36 such that when stand 30 is in position embracing a shrub, top pulley 31 is approximately above the shrub. A line 40 passes over top pulley 31 and dispenser 50 is suspended from line 40. Line 40 passes rearwardly and downwardly over a lock pulley 42 positioned at the back of stand 30 on top member 32 (FIG. 1). Lock pulley 42 is a conventional pulley having a side tracking arrangement such that line 40 can be pulled to one side thereon and pulley 42 will lock line 40 in place and prevent dispenser 50 from falling.

Dispenser 50 comprises a hollow cylinder 51 which is preferably merely a shell or can (FIG. 6). A pair of arms 52 are pivotally mounted to cylinder 51, one at either side thereof, on pivot mounts 53. Pivot mounts 53 are hinge brackets which preferably extend outwardly from the top of cylinder 51 and include a hinge which is spaced outwardly from cylinder 51. Each arm 52 extends downwardly from pivot mount 53 towards the base of cylinder 51, and a small portion of arm 52 extends upwardly from pivot mount 53. An elongated spring 54 normally biases the lower ends of arms 52 into engagement with cylinder 51 in order that flexible packaging sleeves 70 stored thereon will be prevented from falling off.

Spring 54 is of a type which expands or contracts in an axial direction and is preferably continuous such that it wraps around cylinder 51 and around the outside of arms 52. Preferably, spring 54 is fixed at a point 54a to cylinder 51 (FIG. 7), point 54a being spaced from both arms 52. Spring 54 is free to slide, roll or otherwise move up and down along the length of arms 52, at least from a point below pivot mount 53 to a point above pivot mount 53. Arms 52 each include a tab 55 secured to their upper ends and projecting outwardly away from the axis of cylinder 51. Tabs 55 allow arms 52 to be pivoted outwardly away from the sides of cylinder 51, as shown in phantom in FIG. 6, without having spring 54 slip off the upper ends of arms 52. Because spring 54 is fixed at only one point, 54a, the outward pivoting of one arm 52 will cause spring 54 to slide upwardly on both arms and will thereby automatically pivot the other arm 52 outwardly. When arms 52 are so pivoted outwardly, spring 54 slides upwardly to a point above pivot mounts 53 and thereby holds arms 52 outwardly away from the sides of cylinder 51. Packaging sleeves 70 can then be freely loaded or unloaded from cylinder 51.

The lower ends of arms 52 include shoes 56 secured thereto and projecting laterally to either side thereof (FIGS. 6 and 7) for holding packaging sleeves 70 in place. Shoes 56 tend to wrap around cylinder 51 a short distance. Preferably, they are somewhat flexible and in the preferred form shown in FIG. 7, comprise small pieces of flat spring steel with loops curled into either end thereof. Cylinder 51 also includes a lip 58 at the bottom thereof which tends to prevent sleeves 70 from inadvertently falling off cylinder 51.

Positioned at the top of cylinder 51 and spanning the diameter thereof is a hanger bracket 59 (FIG. 7). An

eye bolt 60 is secured thereto whereby line 40 can be secured to dispenser 50.

The packaging sleeves 70 utilized in this invention preferably are flexible, cylindrically-shaped segments of plastic netting (FIGS. 8 and 9). Of course, other conventional material can be used, such as burlap or the like. Preferably, however, such materials should be flexible such that a plurality of sleeves 70 can be loaded onto dispenser 50 in compressed or collapsed form as shown in FIG. 8. Alternatively, a single long sleeve could be loaded onto dispenser 50 and cut off at an appropriate height after being pulled down over a wrapped shrub.

OPERATION

In operation, dispenser 50, loaded with packaging sleeves 70 is suspended from beam 35 of stand 30 and stand 30 is then positioned about a shrub such that the shrub is embraced thereby (FIG. 1). Lines 38 are lowered by means of winch 39 and secured to open ring 10. The open ring 10 is then slipped about the base of the shrub and is closed and locked by means of closure flanges 12 cooperating with closure clip 13 (FIGS. 3 and 4). Wrap 20 is then clipped to loops 15 of ring 10 by means of clips 21 (FIGS. 1 and 5). These initial steps can generally be performed in any order.

Once wrap 20 is in position on ring 10 as shown in FIG. 1, and ring 10 is closed, one begins to pull ring 10 upwardly from the bottom to the top of the shrub by means of winch 39. As wrap 20 is moved upwardly, it is progressively closed from top to bottom by hooking hooks 26 over line 23 in the intervals 25 along its length. Ring 10 is pulled upwardly and wrap 20 is progressively closed in this manner until the entire shrub is wrapped within cylindrical wrap 20 (FIG. 2). At this point, lines 38 are at least disconnected from ring 10, or preferably ring 10 is completely disconnected from wrap 20, and one line 38 is disconnected from ring 10 such that ring 10 will swing to one side or the other of stand 30.

Dispenser 50 is lowered into position directly above the shrub and a packaging sleeve 70 is pulled off of the bottom end of cylinder 51, downwardly over the wrapped shrub (FIG. 8). In order to start sleeve 70, it may be necessary to pivot arms 52 to their outward position, away from the sides of cylinder 51. If moved back inwardly, the arms 52 will be biased towards the sides of cylinder 51 and will prevent additional sleeves 70 from being accidentally pulled off cylinder 51. Even if arms 52 are left in their outward position, lip 58 on the bottom of cylinder 51 will tend to prevent additional sleeves 70 from falling off cylinder 51.

Once sleeve 70 is in position on the wrapped shrub, dispenser 50 can again be raised out of the way and line 38 can be secured either directly to the top of wrap 20, or can be secured to ring 10 which again can be secured to wrap 20. Using winch 39, wrap 20 is then pulled upwardly while sleeve 70 is held at its bottom in the manner shown in FIG. 8. In this manner, wrap 20 is pulled off the top of the shrub while packaging sleeve 70 is held in place.

In the alternative, once packaging sleeve 70 is in position about the wrapped shrub, the entire stand 30 can be removed from the area and wrap 20 can be pulled upwardly off of the shrub by hand, while packaging sleeve 70 is held in place. Either way, the final packaged product will have an appearance similar to that of

the packaged shrub in FIG. 9. The shrub can now be uprooted without fear of damaging the branches thereof and can be transported to its new location.

VARIATIONS

For larger shrubs or trees, it may be necessary to gradually compress the limbs or branches thereof. Thus, an alternative ring assembly 80 is provided as a substitute for a single ring 10 (FIG. 10). Ring assembly 80 comprises three rings, 10a, 10b and 10c connected one on top of the other by means of interconnecting chains or lines 81. The upper ring 10a is of the largest diameter and the succeeding lower rings become progressively smaller such that the entire ring assembly 80 has a generally funnel shape.

All of the rings, 10a, 10b and 10c are of the split ring variety as shown in FIGS. 3 and 4. At least the top ring 10a must have brackets 14 to which lines 38 can be secured and at least the bottom ring 10c should preferably have loops 15 to which a wrap 20 can be secured. Of course, the clips 21 of wrap 20 could be clipped directly over the bottom ring 10c. Each of the split rings, 10a, 10b and 10c would then be opened, slipped about the base of the shrub and then closed. They would then be pulled upwardly so as to gradually compress the branches of the shrub before the branches were finally enclosed within the closed wrap 20.

Yet, another alternative structure for accomplishing the same result is the alternative wrap 90 which can be used in conjunction with a ring 10 in place of wrap 20 (FIG. 11). Wrap 90 is very similar in construction to wrap 20, except that it includes an upper generally funnel-shaped portion 91 above a cylindrically shaped portion or stem 92. Wrap 90 would be secured to a ring 10 in the same manner as wrap 20 and would be progressively closed as it was pulled over the tree or shrub. Preferably, the stem 92 is sufficiently long that it encloses the entire shrub or tree within its length. In the alternative, a conventional wrap 20 could be secured to the bottom of wrap 90 to provide the enclosing cylinder for the shrub.

Thus, the present invention provides apparatus and a method for packaging a shrub or tree while it is still in the ground. The process of tying the branches with lengths of twine can be completely displaced using the teachings of this invention. The present invention provides not only a more thorough method for packaging the shrub, but also provides a package which is far more attractive in appearance than a conventionally packaged shrub.

Of course, it is understood that the above is merely a preferred embodiment of the invention, and that many changes and alterations can be made to the preferred embodiment without departing from the spirit and broader aspects of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. Apparatus for packaging shrubs and the like comprising: means defining a split ring, capable of being opened, for passing around the base of a shrub; means for closing said ring defining means; a generally flexible wrap means, capable of being shaped into a generally cylindrical form, for wrapping about said shrub; said wrap means including a part therein from one end to the other when shaped cylindrically; means securing one end of said wrap means to said ring defining means;

closure means along said part whereby when said ring defining means is closed and pulled upwardly on said shrub, said closure means can be progressively closed as said wrap means is pulled upwardly from the base of said shrub.

2. The apparatus of claim 1 comprising: a stand having an opening at the front side thereof whereby said stand can be positioned about said shrub; lines for securing to said ring defining means; pulley means mounted at the top of said stand, said lines passing over said pulley means.

3. The apparatus of claim 2 comprising: said stand including a first pair of side members extending along opposite sides of said shrub; at least one first pulley mounted on each said side member; at least one line over each said first pulley and extending downwardly therefrom for securing to said ring defining means.

4. The apparatus of claim 3 comprising: said side members extending from said front side of said stand to the back side of said stand; each of said first pulleys being positioned towards said front side of said stand; a second pair of pulleys being positioned at said back side, spaced more closely together than said first pulleys; a back support member extending up said back side of said stand; winch means mounted on said back support member; each said line passing over one of said first pulleys and one of said second pulleys and being joined to said winch means.

5. The apparatus of claim 2 comprising: said stand including a top member extending over a shrub embraced by said stand; dispensing means suspended from said top member; a flexible packaging sleeve positioned on said dispensing means for transferring from said dispensing means over said wrap means when said shrub is wrapped in said wrap means.

6. The apparatus of claim 5 comprising: top pulley means secured to said top member; a line secured to said dispensing means and extending over said top pulley means whereby said dispensing means can be raised or lowered.

7. The apparatus of claim 6 in which said dispensing means comprises: a cylinder onto which flexible packaging sleeves can be loaded; an arm pivotally mounted at the top of said cylinder and extending downwardly towards the bottom of said cylinder; spring means biasing the lower end of said arm into engagement with said cylinder whereby packaging sleeves cannot fall off said cylinder.

8. The apparatus of claim 7 comprising: said cylinder having a circumferential lip at the bottom thereof over which packaging sleeves must pass when removed from said cylinder.

9. The apparatus of claim 8 comprising: said arm including a shoe on the lower end thereof, said shoe extending laterally from said arm and wrapping partially around said cylinder.

10. The apparatus of claim 7 comprising: said arm extending about its pivotal mounting to said cylinder; a tab projecting laterally from the upper end of said arm away from the axis of said cylinder; said spring means comprising an elongated, axially expanding and contracting spring means; said spring means being operably connected to said cylinder and being wrapped around said arm, and being free to move up and down along said arm.

11. The apparatus of claim 6 in which said dispensing means comprises: a cylinder onto which flexible pack-

aging sleeves can be loaded; a pair of arms pivotally mounted to the top of said cylinder on opposite sides thereof and extending upwardly and downwardly therefrom; each said arms including a tab projecting laterally from the upper end thereof; a continuous spring means, axially extendible and contractible, wrapped around said cylinder and around said arms, being free to move up or down on said arms, whereby the lower ends of said arms are biased into engagement with said cylinder when said spring means is below the pivot points of said arms and away from engagement with said cylinder when said spring means is above said pivot points.

12. The apparatus of claim 11 comprising: said spring means being secured, at least at one point spaced from said arms, to said cylinder.

13. The apparatus of claim 1 comprising: said part closure means including a line secured to said wrap means at spaced intervals along the length of said line along one side of said part; a plurality of hooks secured to said wrap means along the other side of said part for hooking into said line at said intervals.

14. The apparatus of claim 1 in which said wrap means includes a generally funnel-shaped top portion for pulling over said shrub ahead of said cylindrically-shaped portion.

15. The apparatus of claim 1 comprising: a plurality of said split rings; means joining said rings at spaced intervals, one above the other, the top ring having the largest diameter with lower rings becoming progressively smaller.

16. The apparatus of claim 1 in which said ring defining means comprises two sections hingedly joined together.

17. The apparatus of claim 16 in which each said section includes means for securing a line thereto.

18. A method of packaging shrubs and the like comprising the steps of: slipping a split ring around the base of said shrub; closing the split in said ring; securing one end of a flexible, generally rectangular wrap means to said ring; pulling said ring upwardly over said shrub; progressively securing together the sides of said wrap means as it is pulled over said shrub.

19. The method of claim 18 comprising the steps of: pulling a packaging sleeve down over said wrap and said shrub after said wrap has been pulled to approximately the top of said shrub; pulling said wrap off the top of said shrub while holding said packaging sleeve in place.

20. The method of claim 19 in which said step of pulling said ring upwardly over said shrub comprises: securing lines to said ring and pulling on said line; said step of pulling a packaging sleeve down over said wrap including removing said lines from said ring after said wrap has been pulled to approximately the top of said shrub and then pulling said packaging sleeve down over said wrap.

21. The method of claim 20 in which said step of pulling said packaging sleeve down over said wrap further comprises: positioning a packaging sleeve dispensing means above said shrub and pulling said flexible packaging sleeve off of said dispensing means over said wrap and said shrub.

22. A method of packaging shrubs and the like comprising the steps of: encircling the base of a shrub with one end of a flexible, generally rectangular wrap member; securing together the sides of said wrap member at said one end; pulling said wrap member upwardly over said shrub; and progressively securing together the sides of said wrap member as it is pulled over said shrub.