US 20170135511A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2017/0135511 A1**

SCHOOLEY (43) **Pub. Date: May 18, 2017**

(54) **INVERTIBLE CHRISTMAS TREE**

(71) Applicant: **BALSAM INTERNATIONAL UNLIMITED COMPANY**, Dublin (IE)

(72) Inventor: **BRUCE A. SCHOOLEY**, ALAMO, CA (US)

(21) Appl. No.: **15/353,199**

(22) Filed: **Nov. 16, 2016**

Related U.S. Application Data

(60) Provisional application No. 62/256,577, filed on Nov. 17, 2015.

Publication Classification

(51) **Int. Cl.**

A47G 33/06 (2006.01)

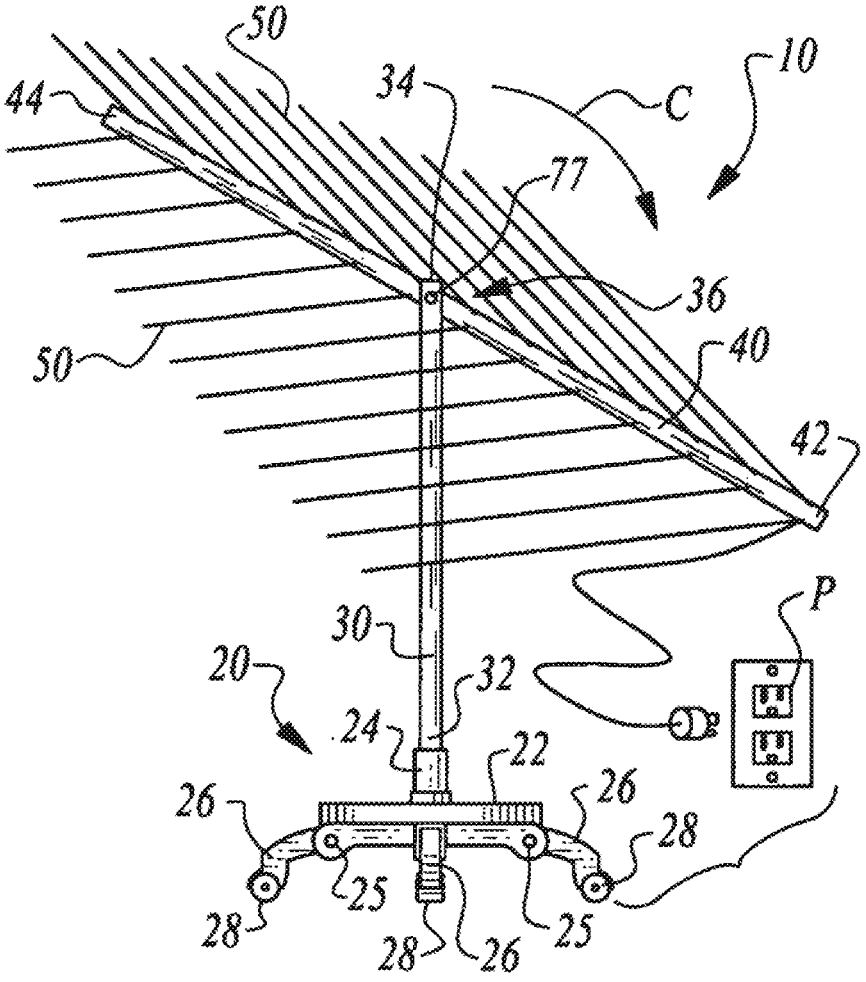
A47G 33/12 (2006.01)

(52) **U.S. Cl.**

CPC ***A47G 33/06*** (2013.01); ***A47G 33/12*** (2013.01); *A47G 2033/1273* (2013.01); *A47G 2033/1266* (2013.01)

(57) **ABSTRACT**

In one example, an artificial Christmas tree is provided which can be readily inverted and which has limbs rotatably attached to a central trunk for automatic deployment of the limbs of the Christmas tree upon such inversion of the Christmas tree. To facilitate such inversion, the trunk includes at least two trunk portions including a first trunk portion adapted to be supported above a floor and at least one second trunk portion rotatably attached to the first trunk portion, at least indirectly, through at least one rotatable coupling. The first trunk portion extends from a lower end to an upper end with the rotatable coupling located closer to the upper end than to the lower end and typically adjacent the upper end.



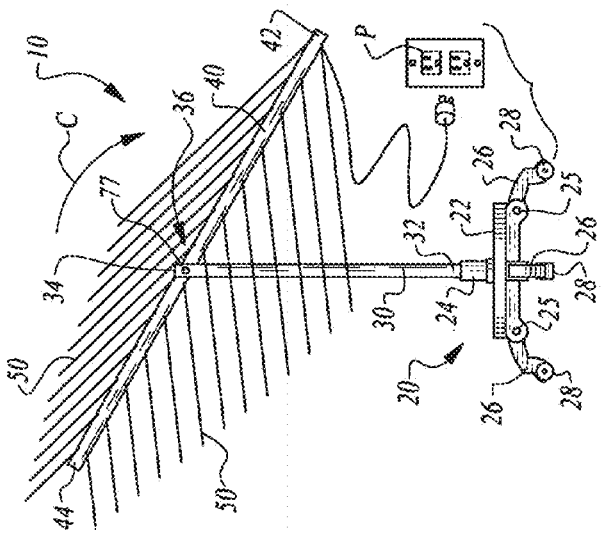


Fig. 4

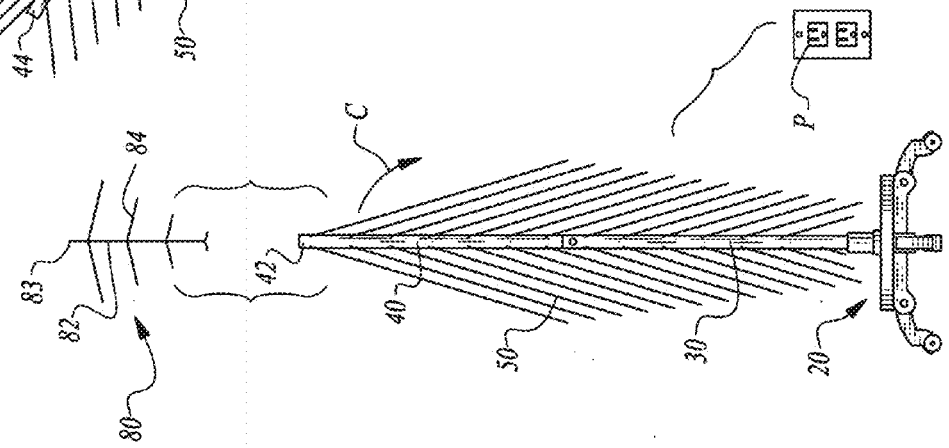


Fig. 3

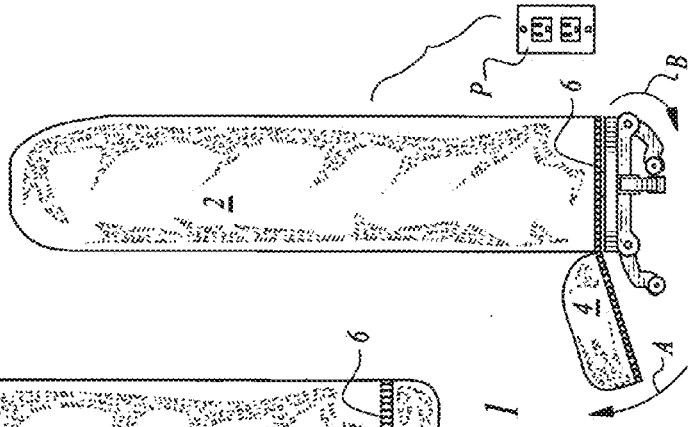


Fig. 2

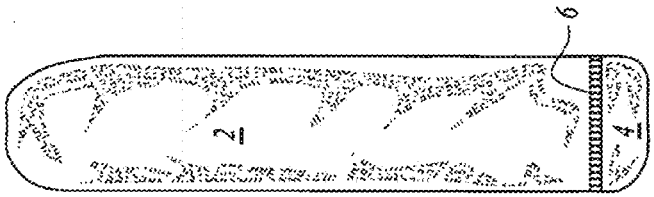


Fig. 1

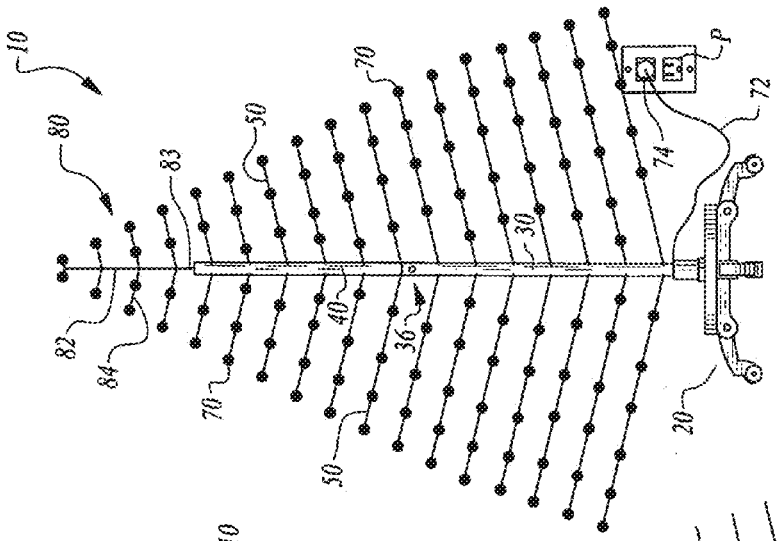


Fig. 7

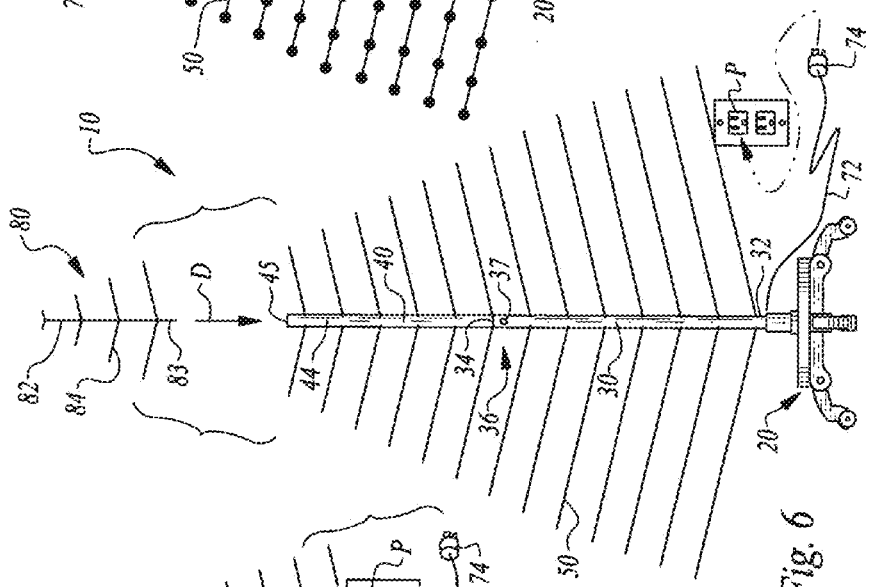


Fig. 6

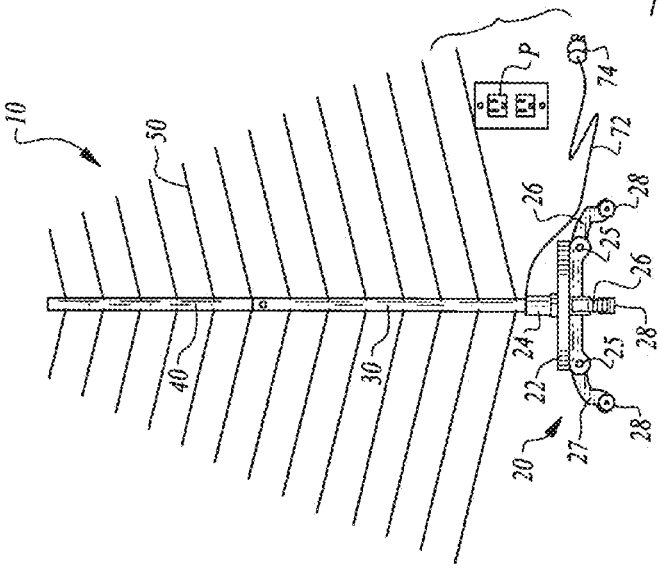


Fig. 5

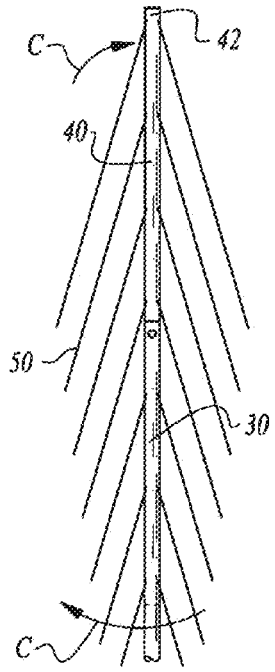


Fig. 8

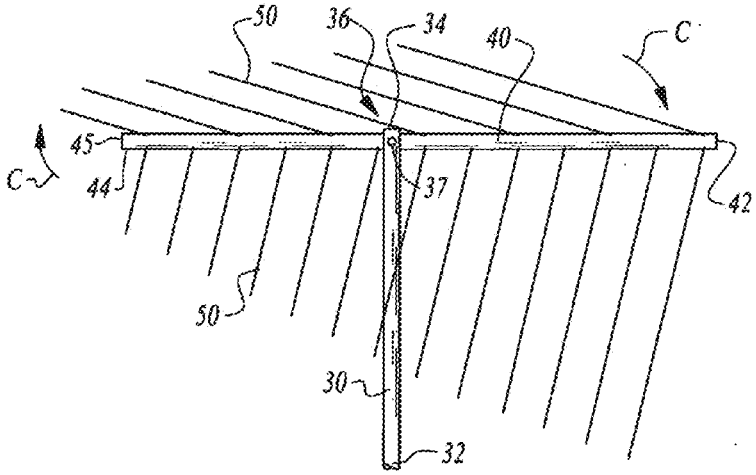


Fig. 9

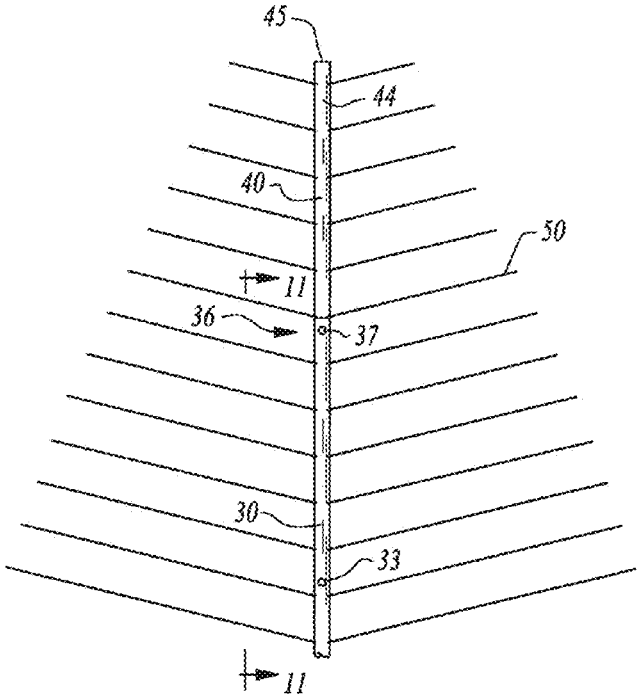


Fig. 10

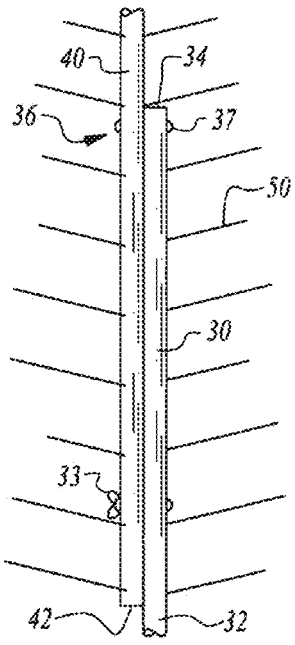


Fig. 11

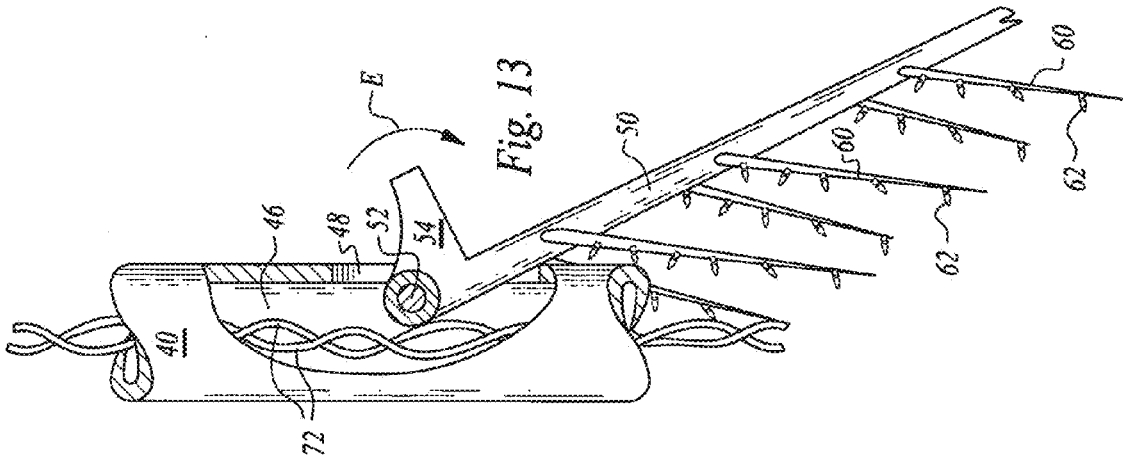


Fig. 13

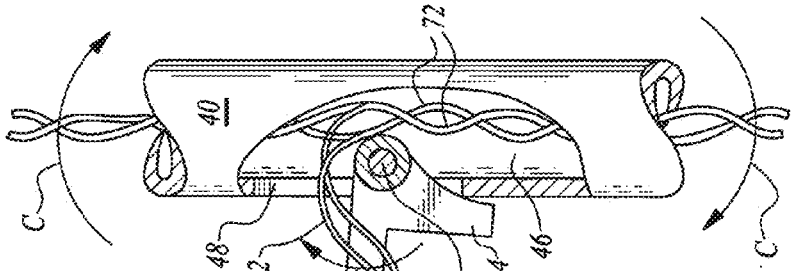


Fig. 12

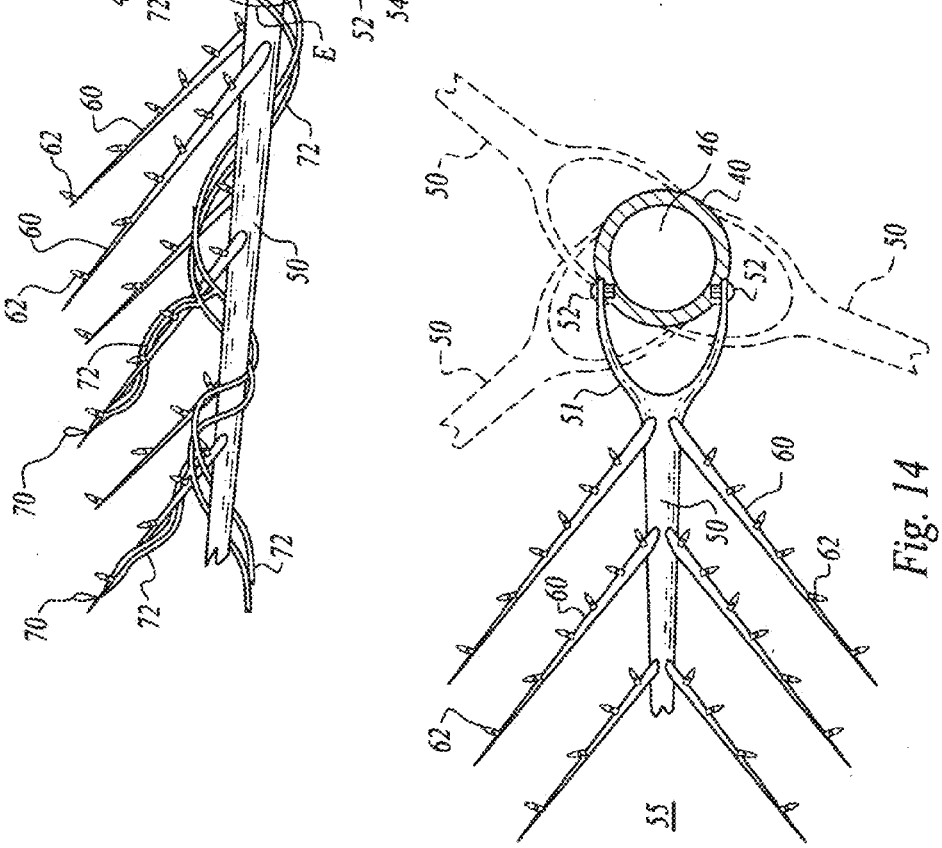


Fig. 14

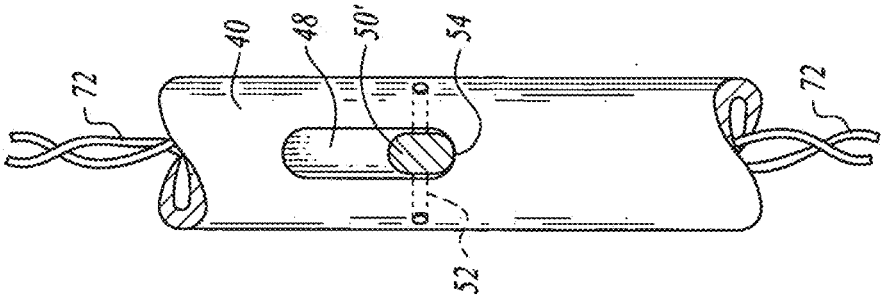


Fig. 16

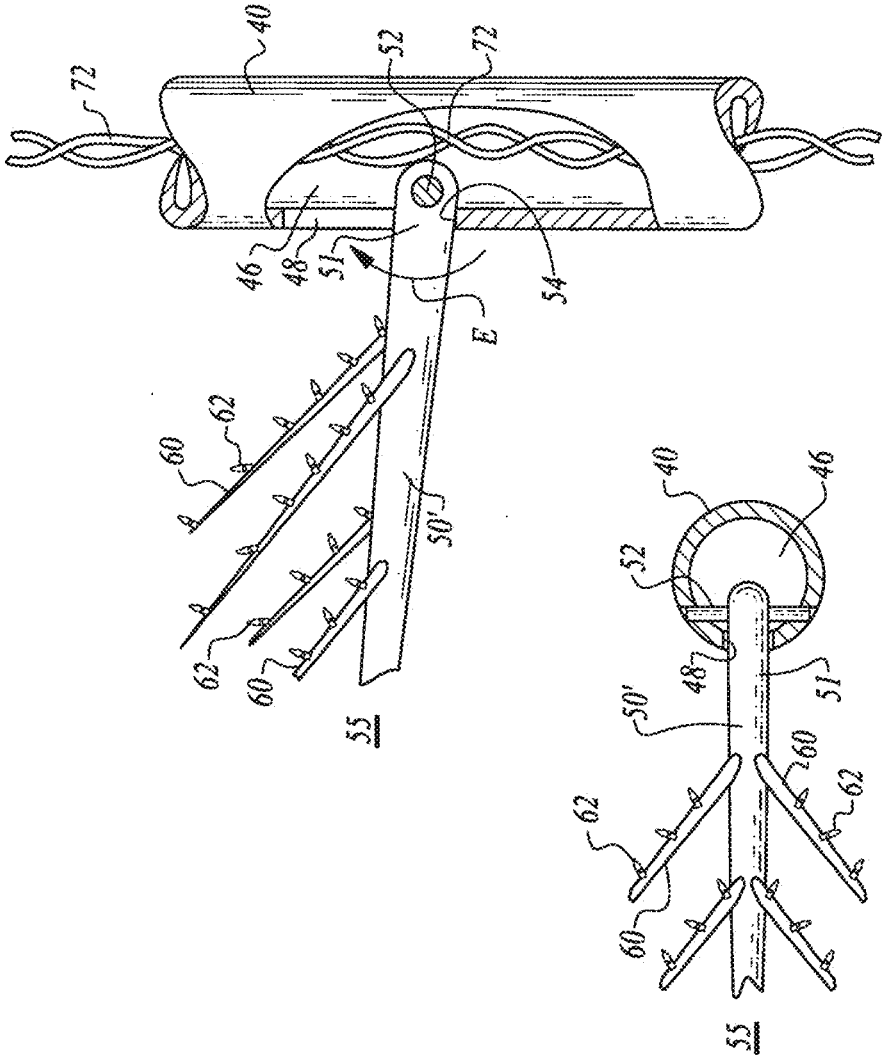


Fig. 15

Fig. 17

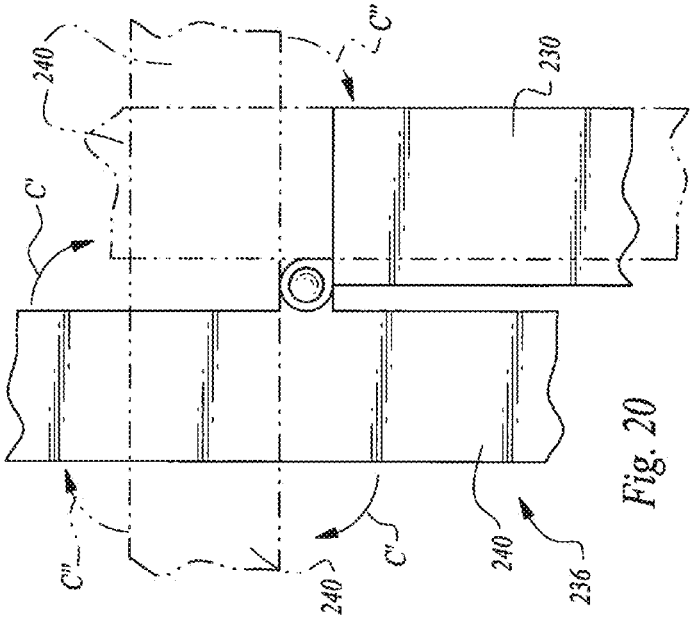


Fig. 20

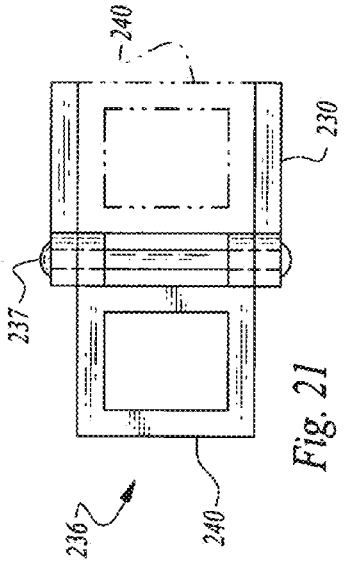


Fig. 21

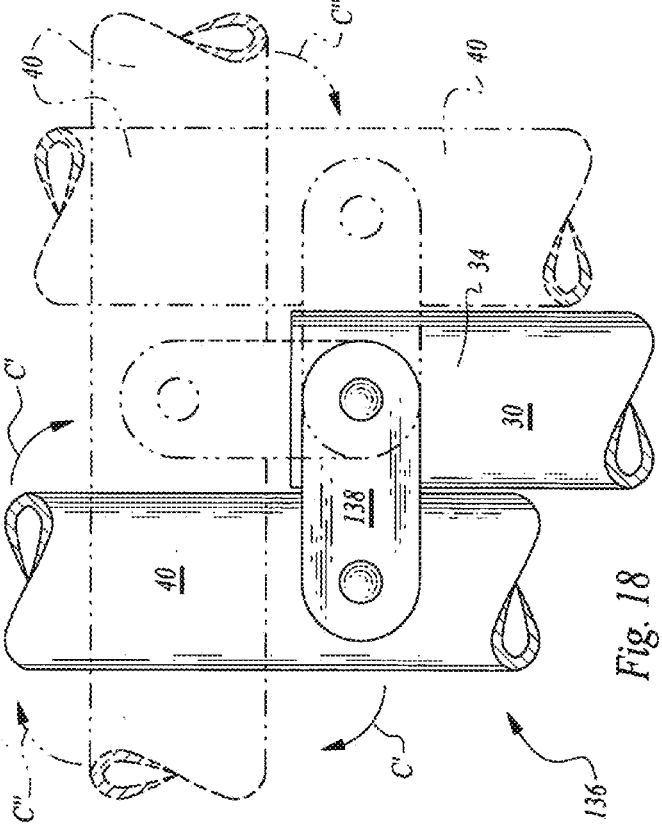


Fig. 18

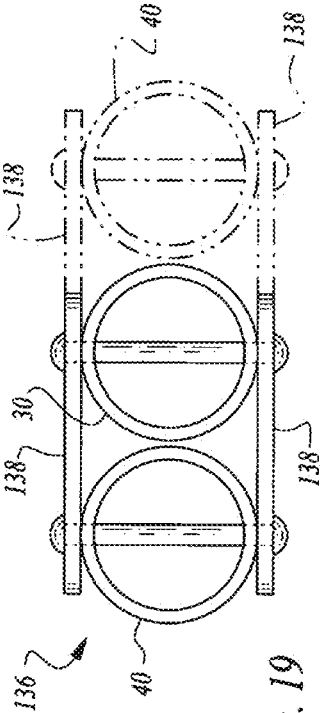


Fig. 19

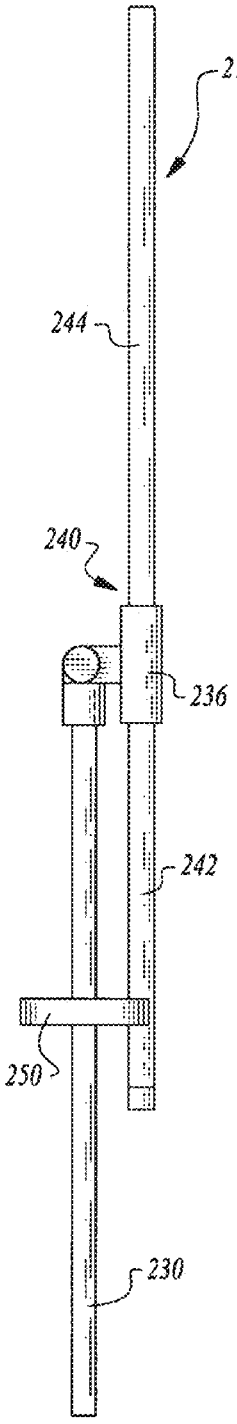


Fig. 22

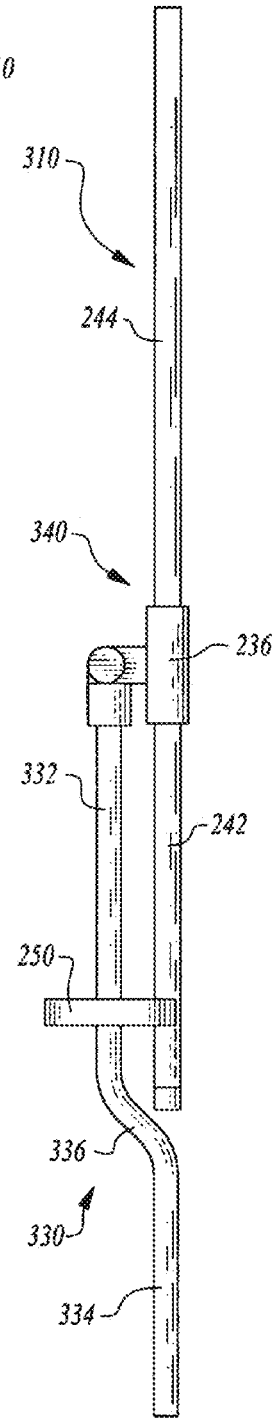


Fig. 23

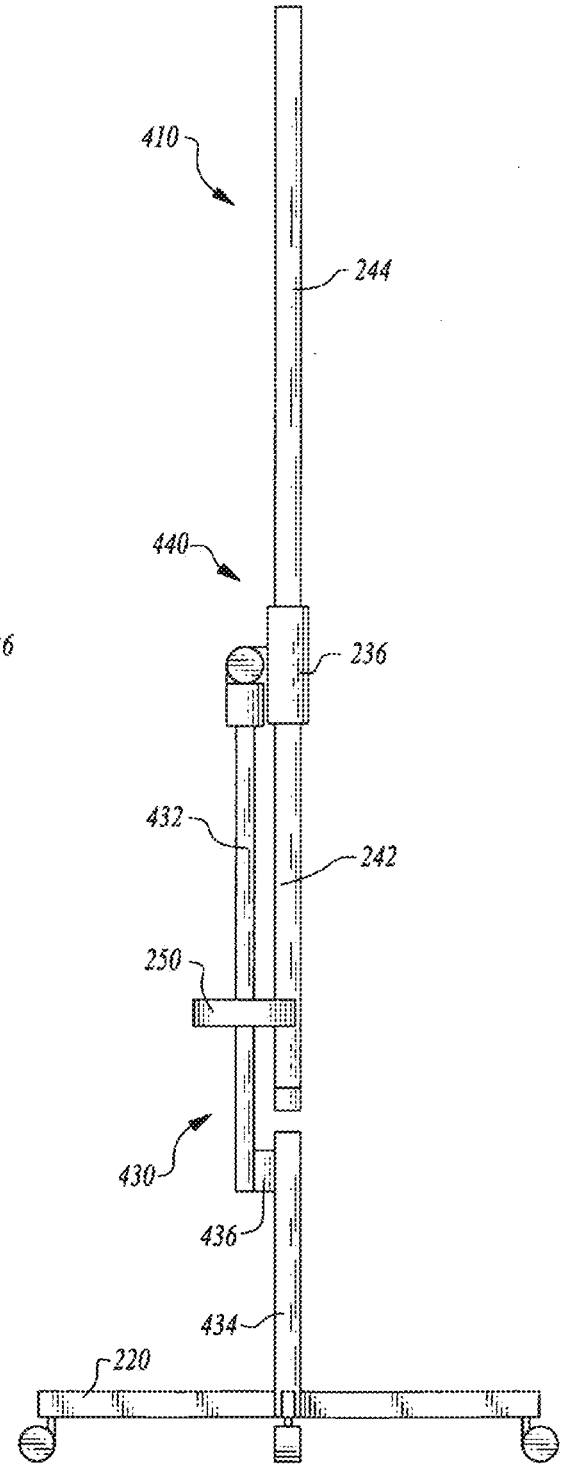
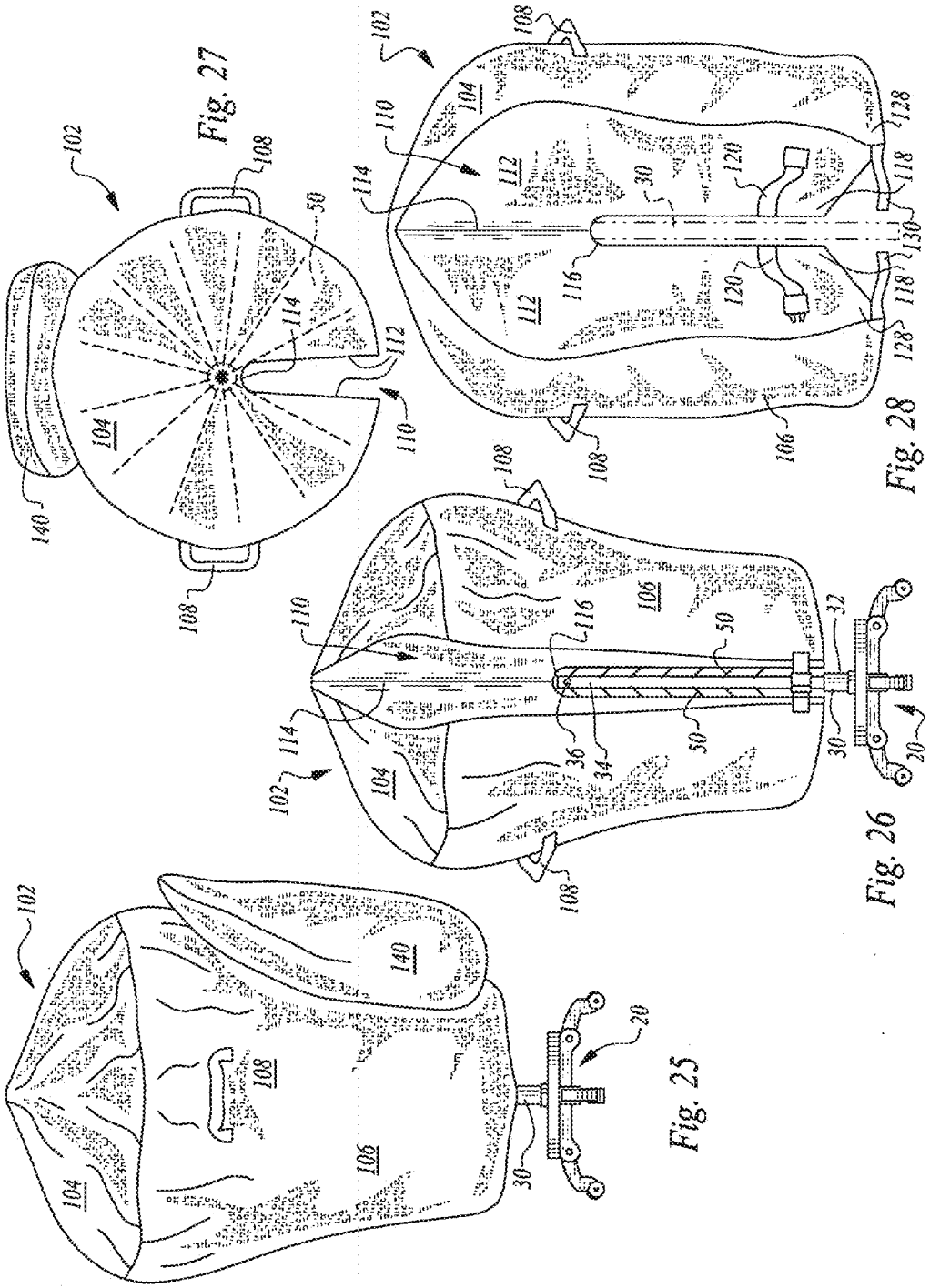
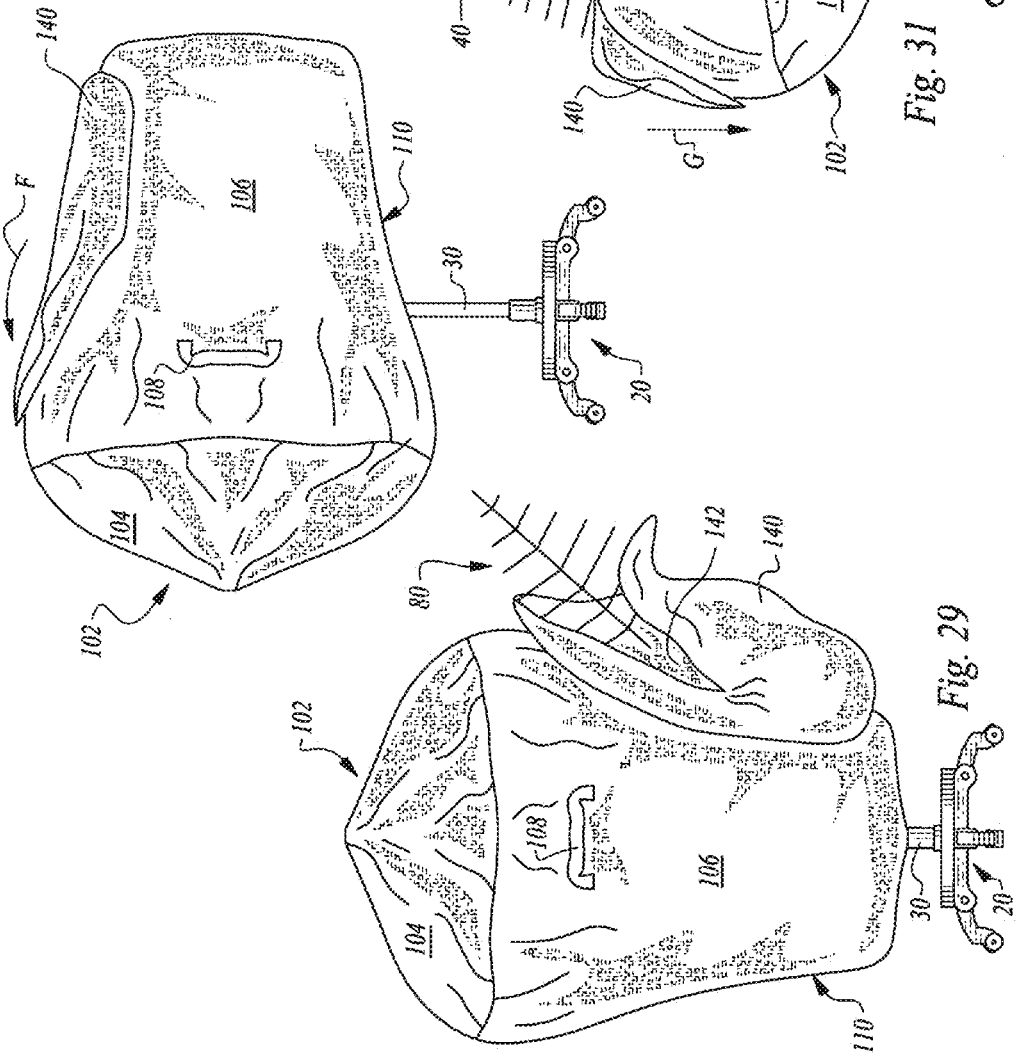


Fig. 24


102
104
106
108
140
20
30
Fig. 25
102
104
106
108
110
112
114
116
20
30
32
34
36
50
Fig. 26
102
104
108
110
112
114
116
118
120
128
130
30
106
Fig. 28
102
104
108
112
114
140
50
Fig. 27


140
F
106
110
30
108
20
104
102
Fig. 30
50
G
110
50
106
30
20
40
104
140
102
G
Fig. 31
80
142
140
102
108
106
30
20
104
110
Fig. 29

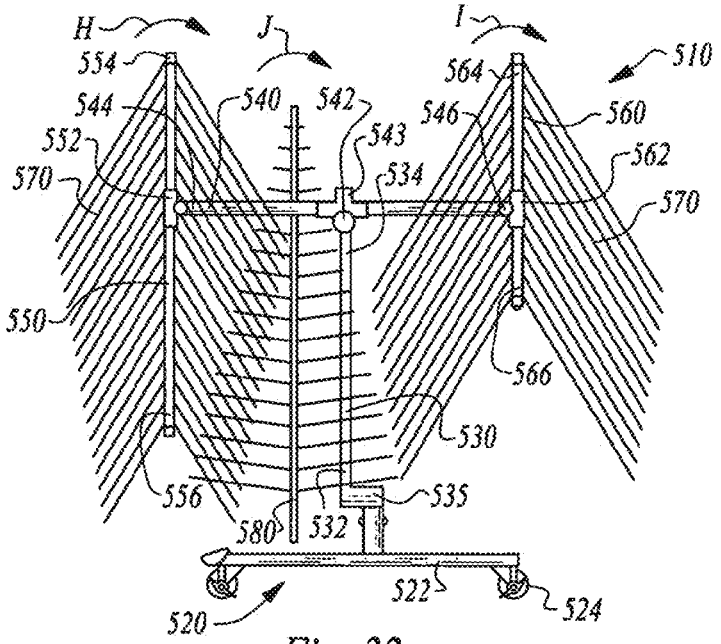


Fig. 32

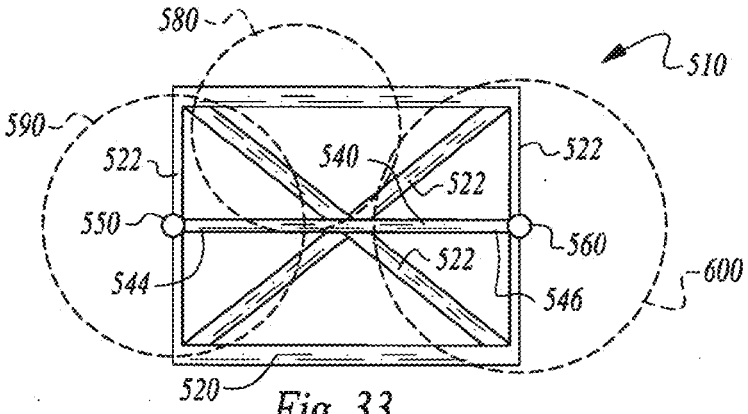


Fig. 33

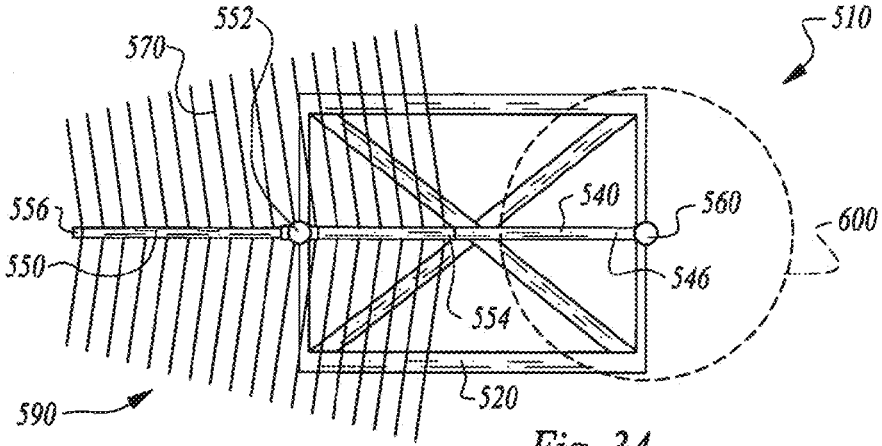


Fig. 34

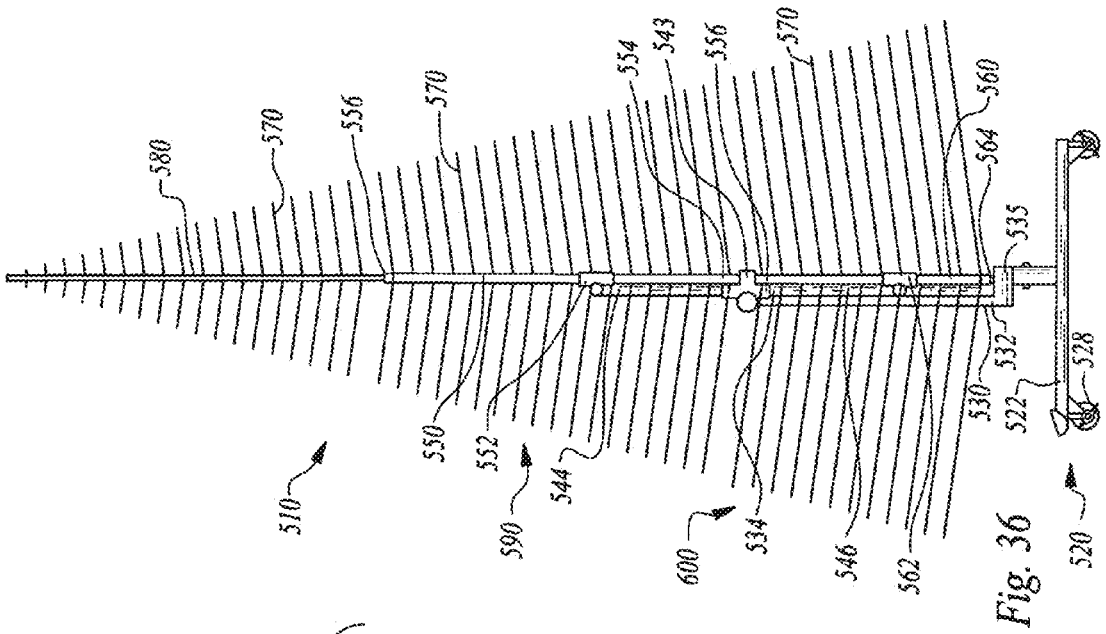

580
570
556
570
554
543
556
570
560
564
535
532
528
522
530
550
552
544
590
534
600
546
562
510
520

Fig. 36

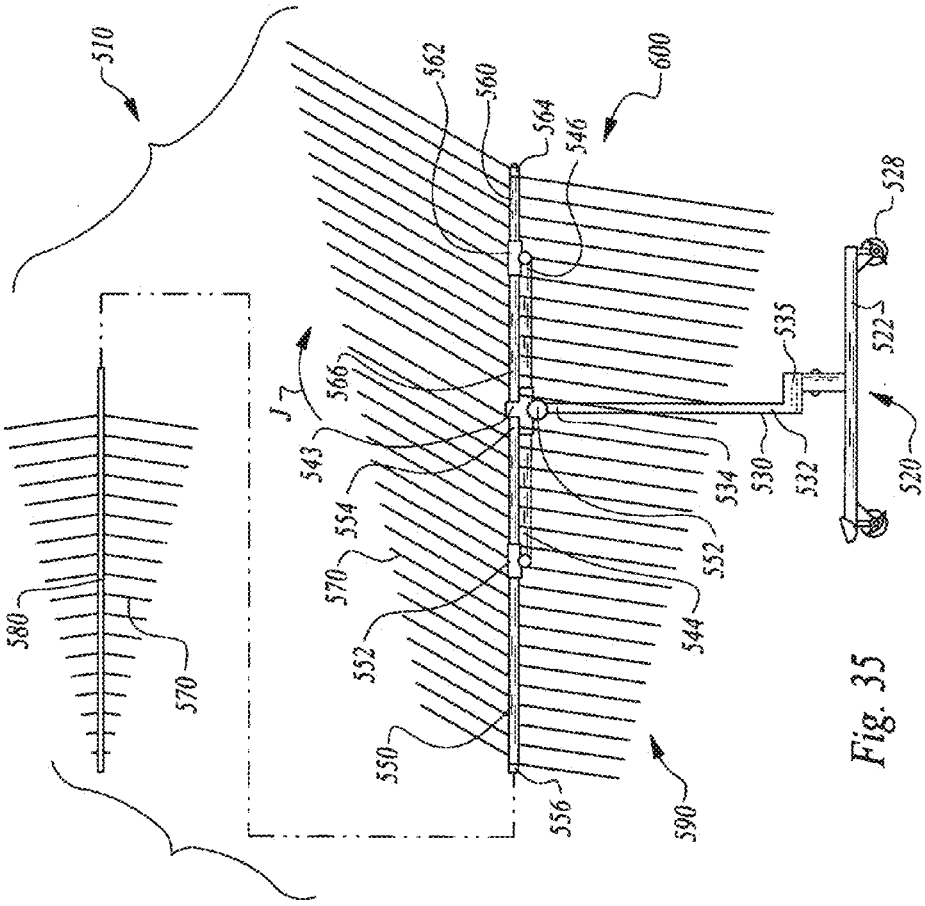

510
562
560
564
546
600
528
535
522
566
543
554
570
552
544
534
530
532
520
580
570
550
556
590

Fig. 35

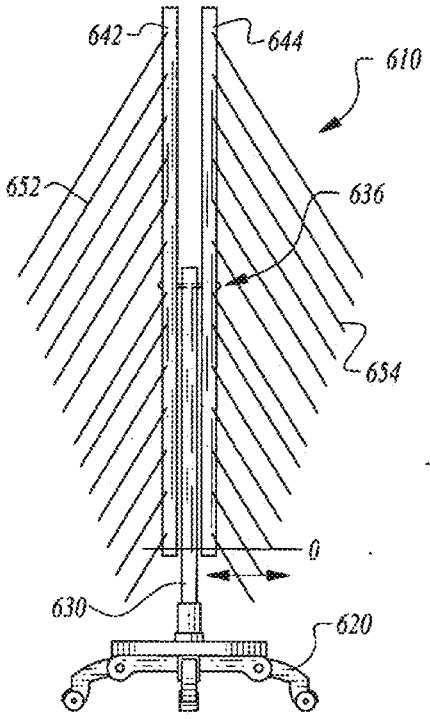


Fig. 37

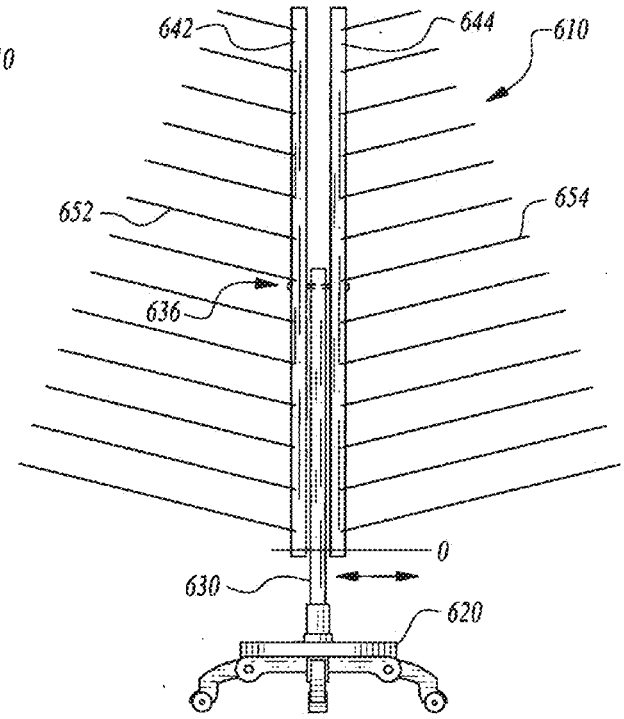


Fig. 38

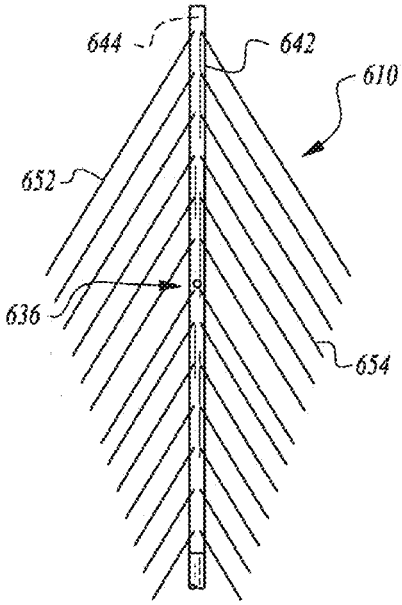


Fig. 39

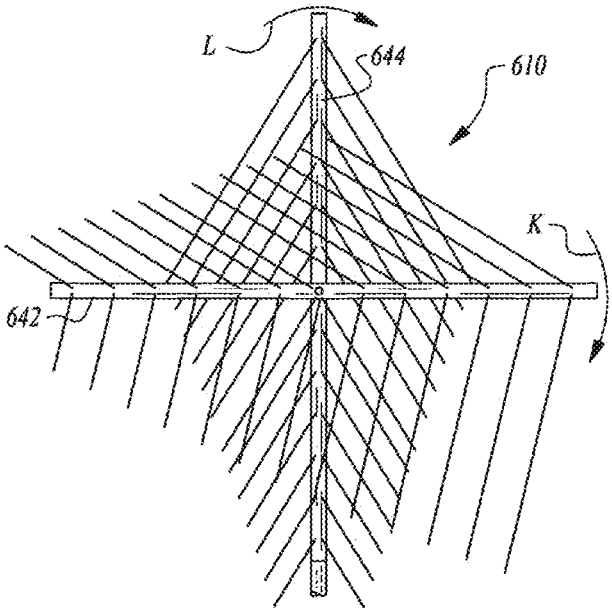


Fig. 40

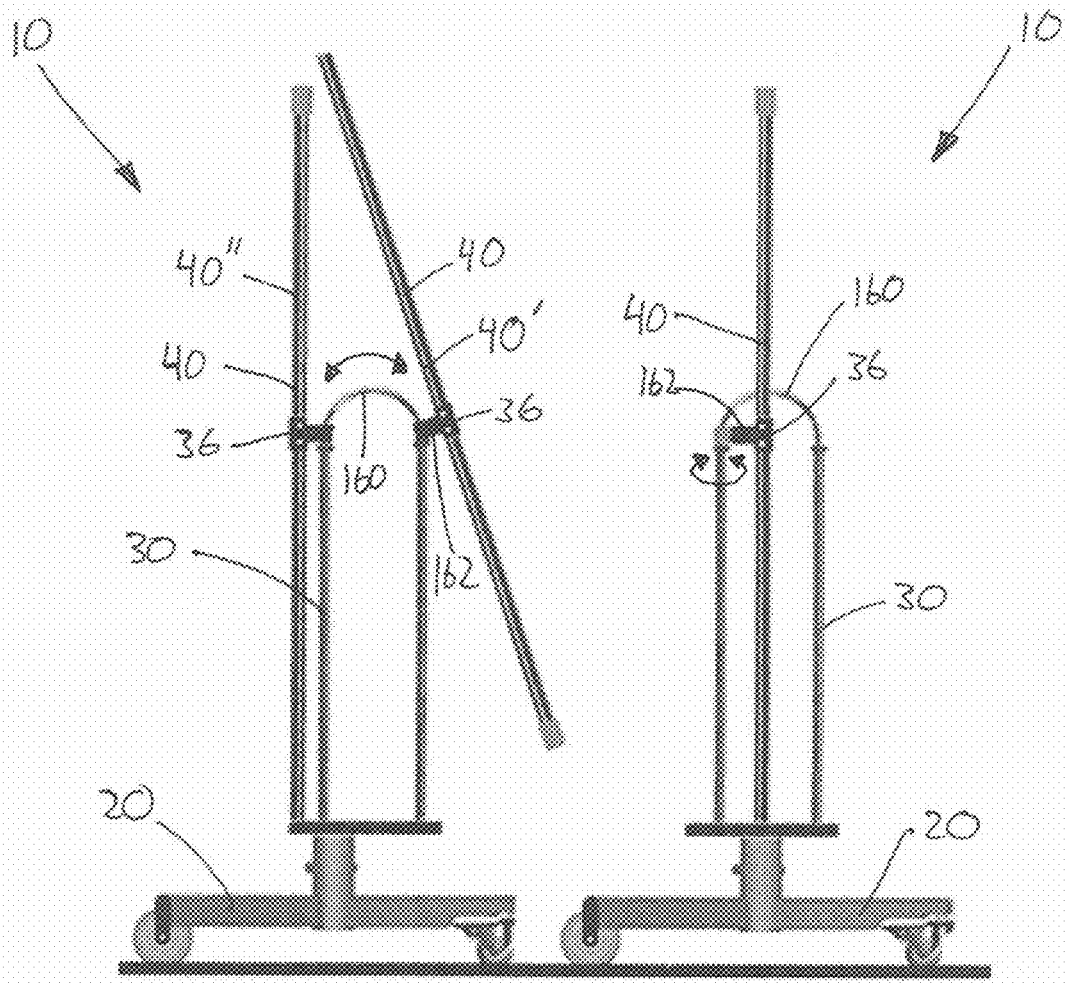


Fig. 41

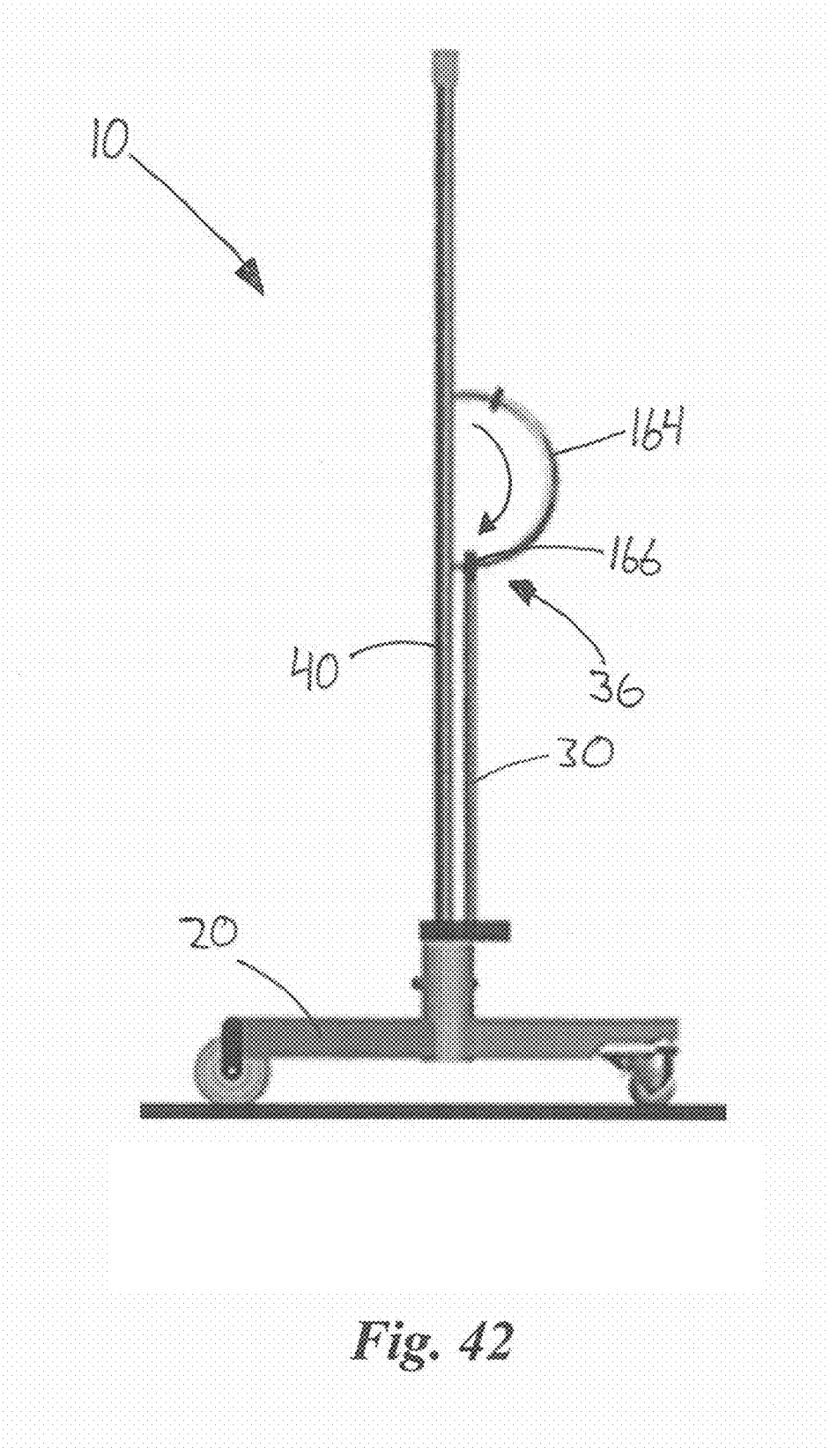


Fig. 42

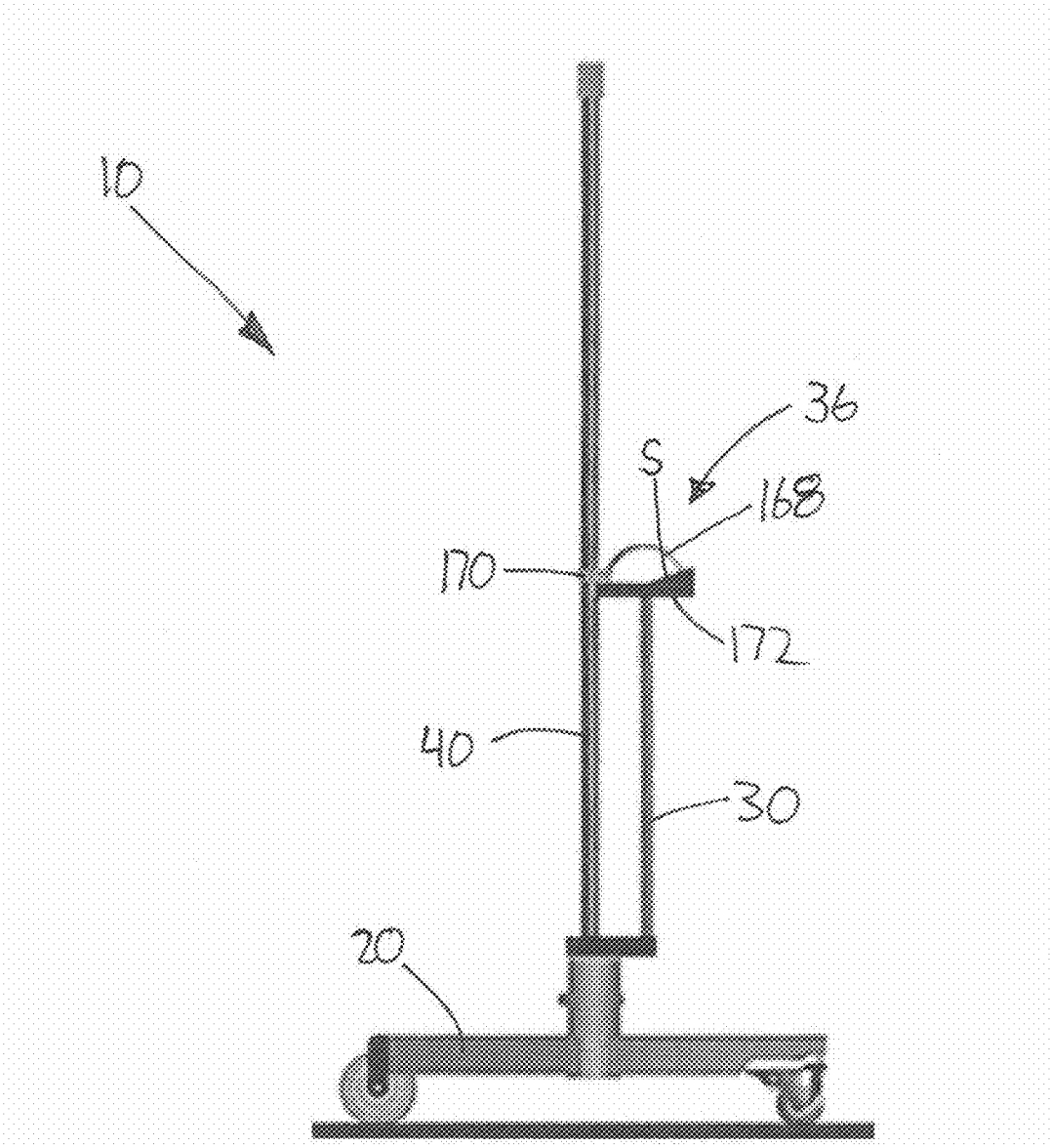


Fig. 43

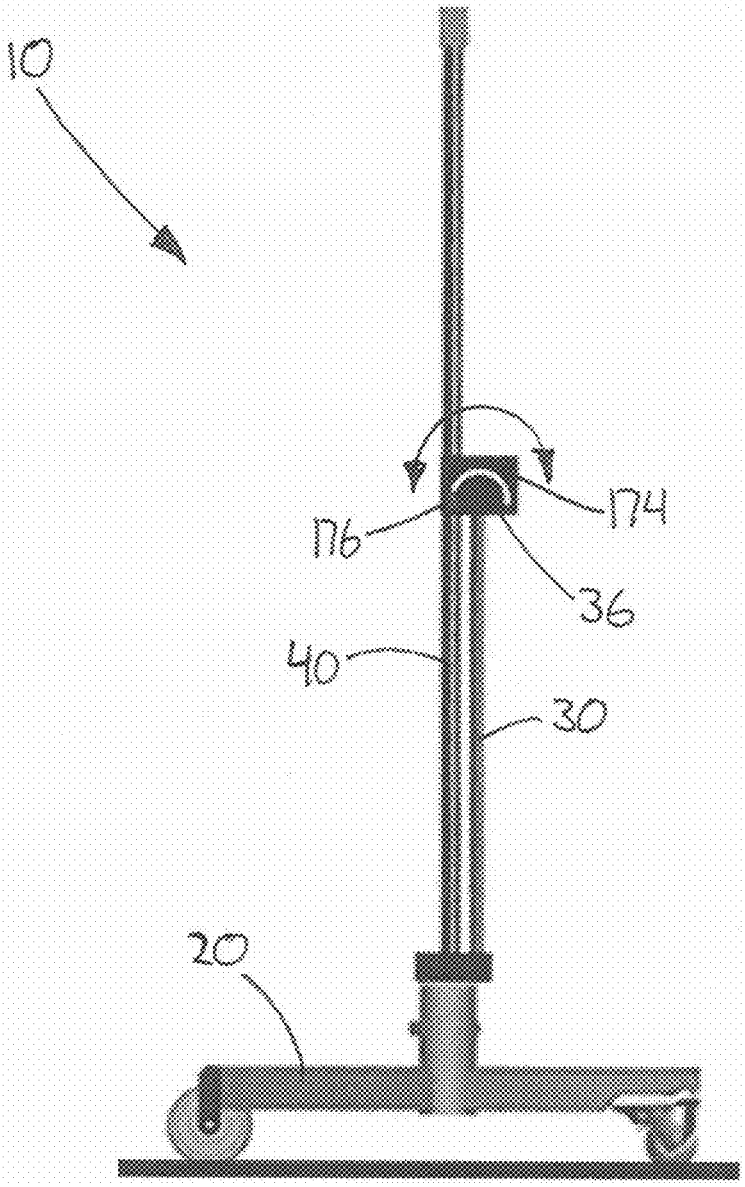


Fig. 44

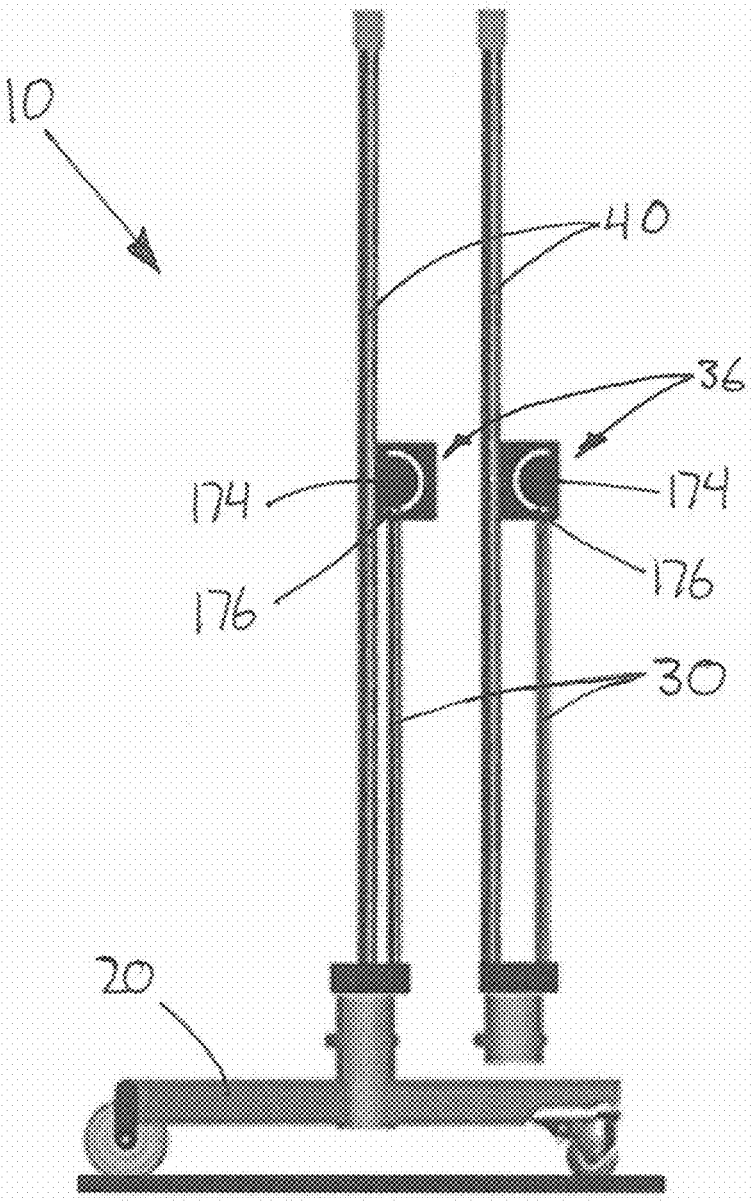


Fig. 45

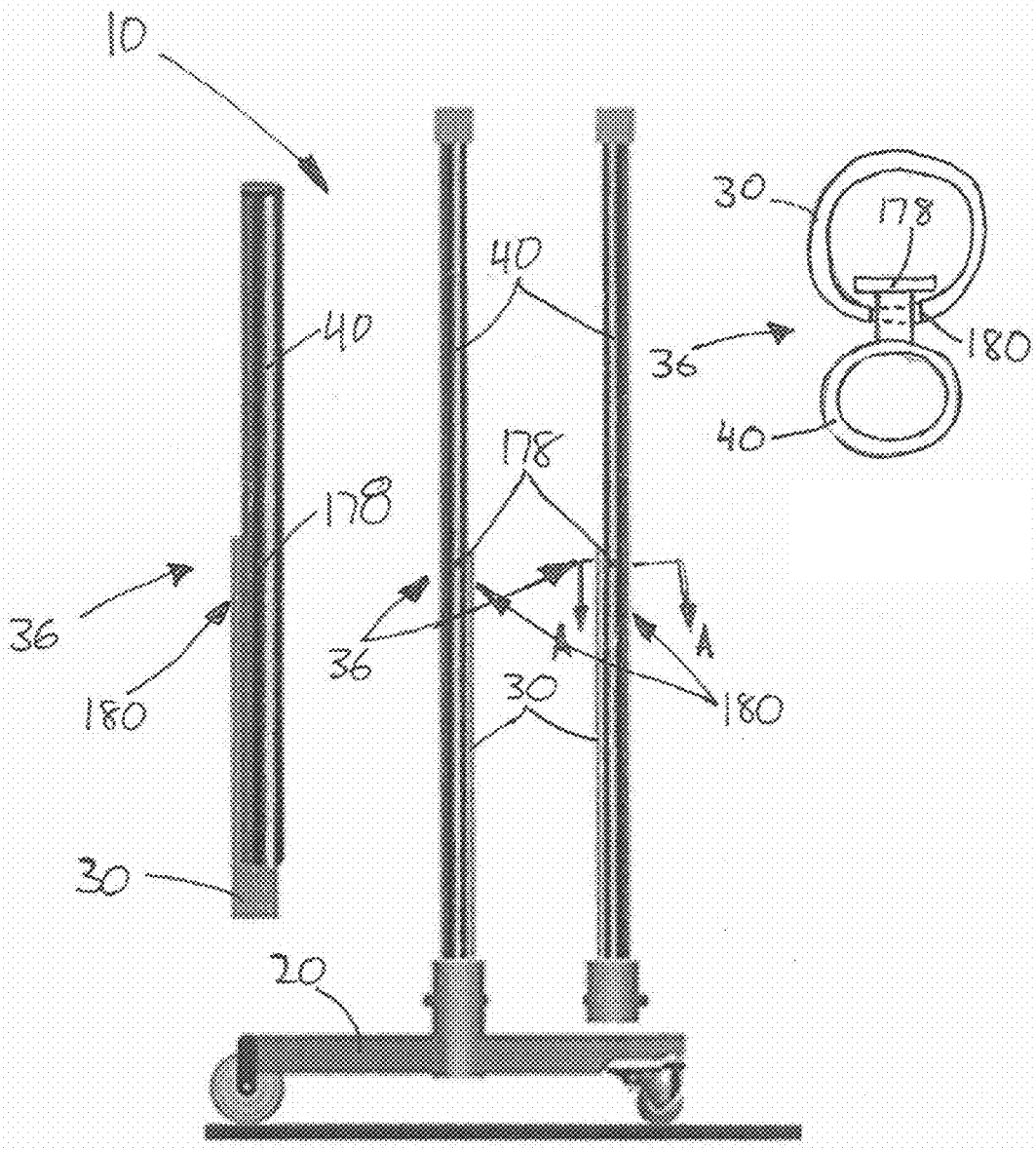


Fig. 46

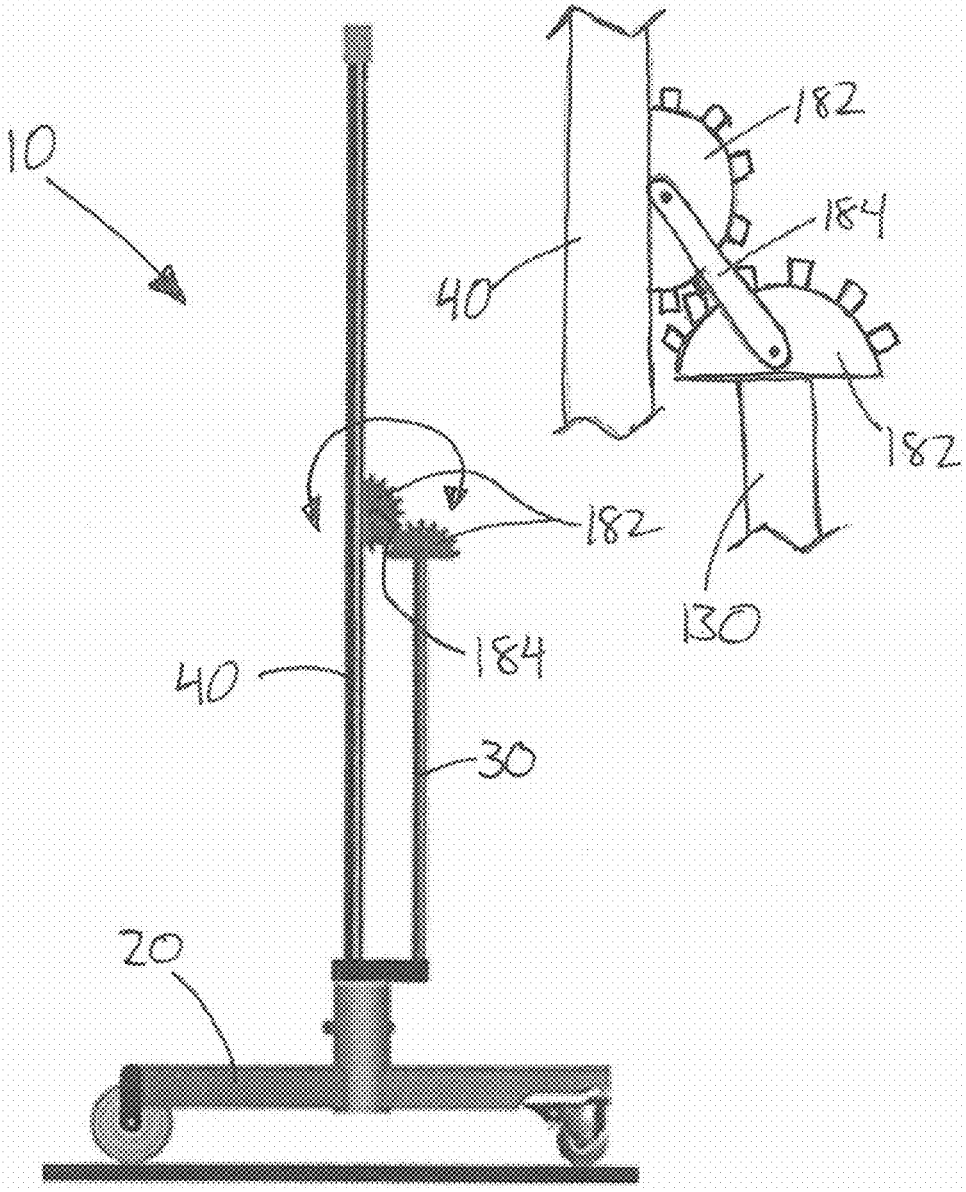


Fig. 47

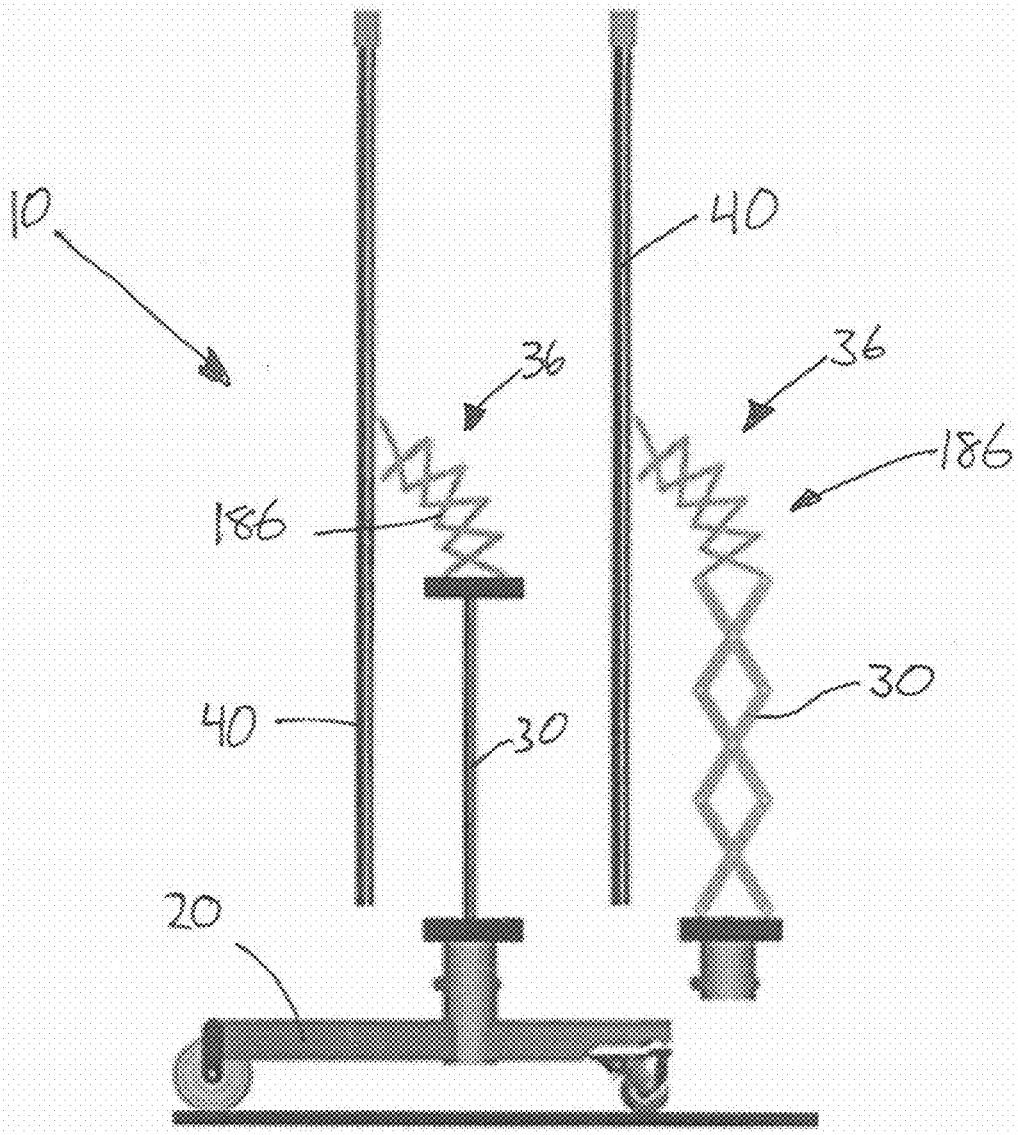


Fig. 48

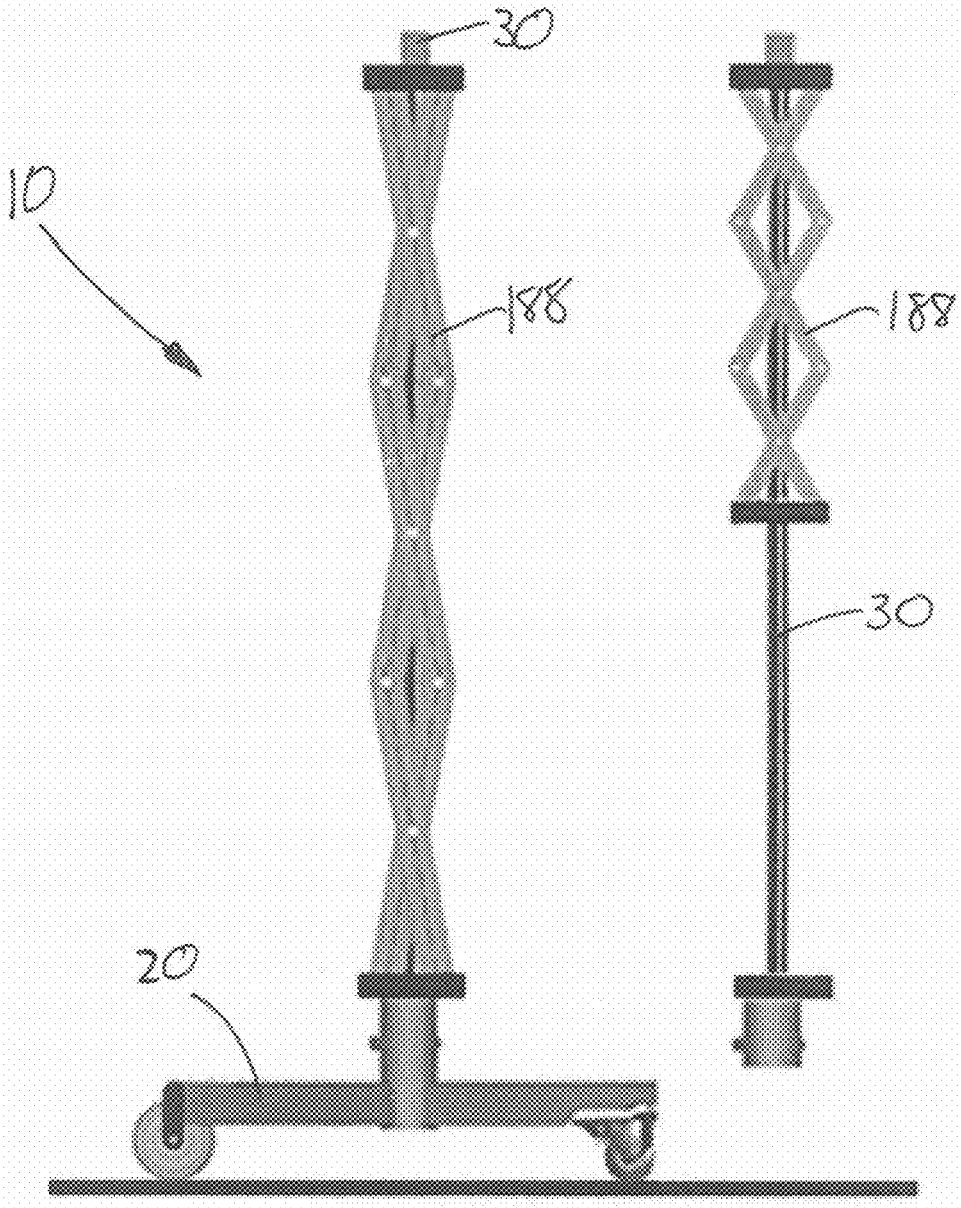


Fig. 49

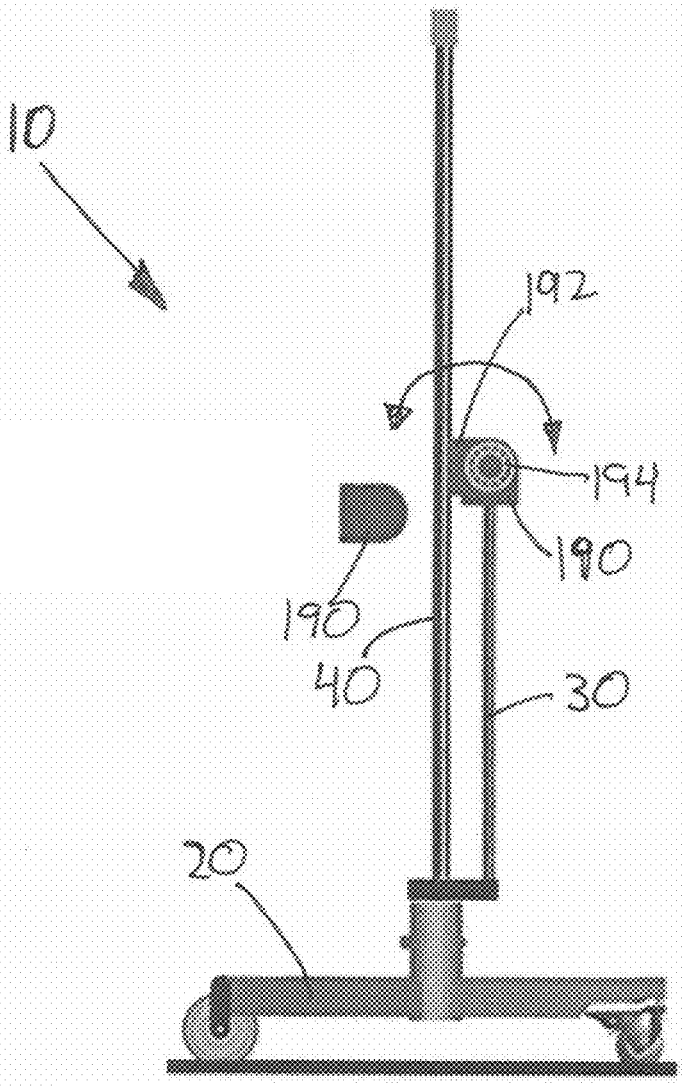


Fig. 50

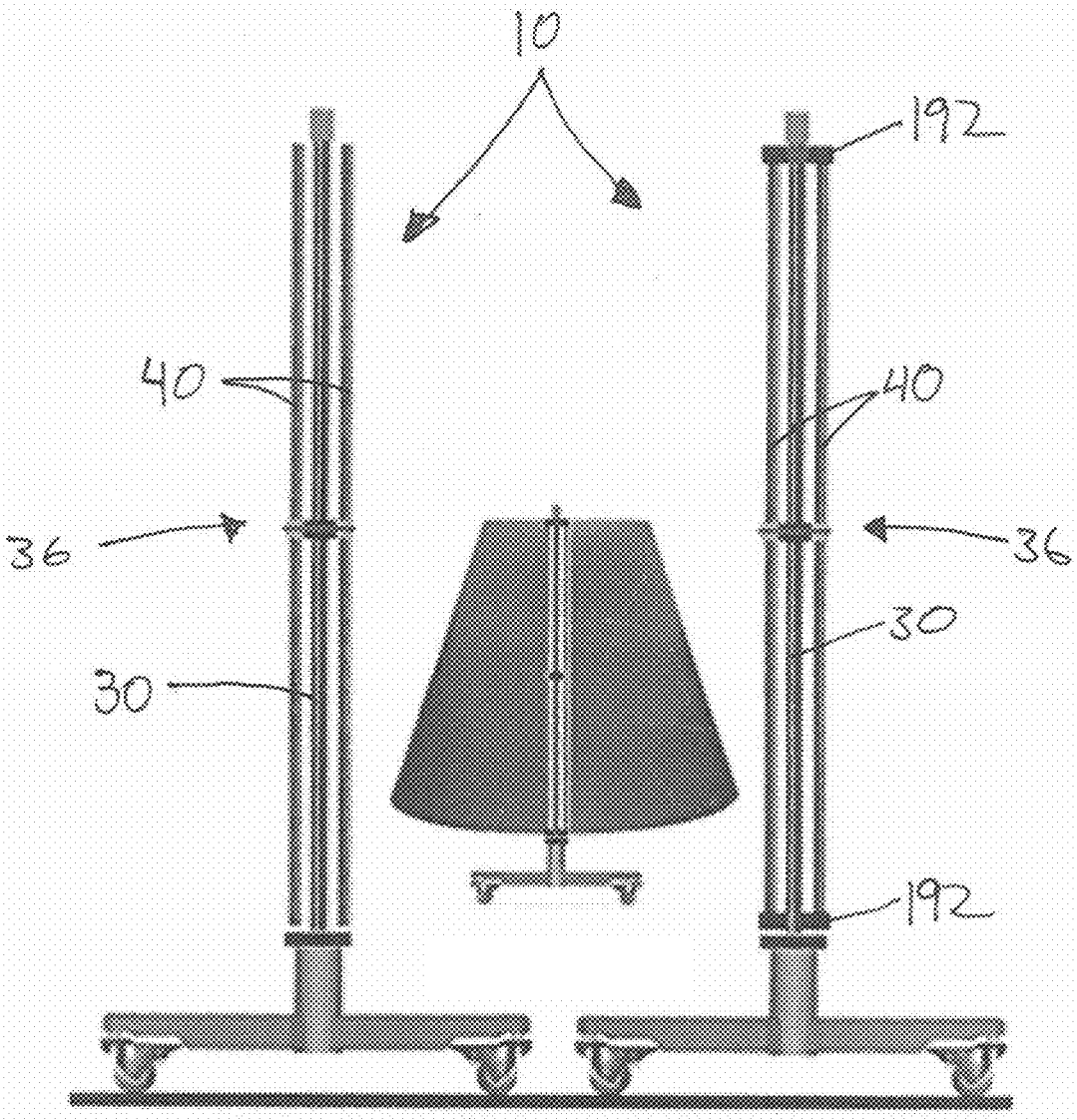


Fig. 51

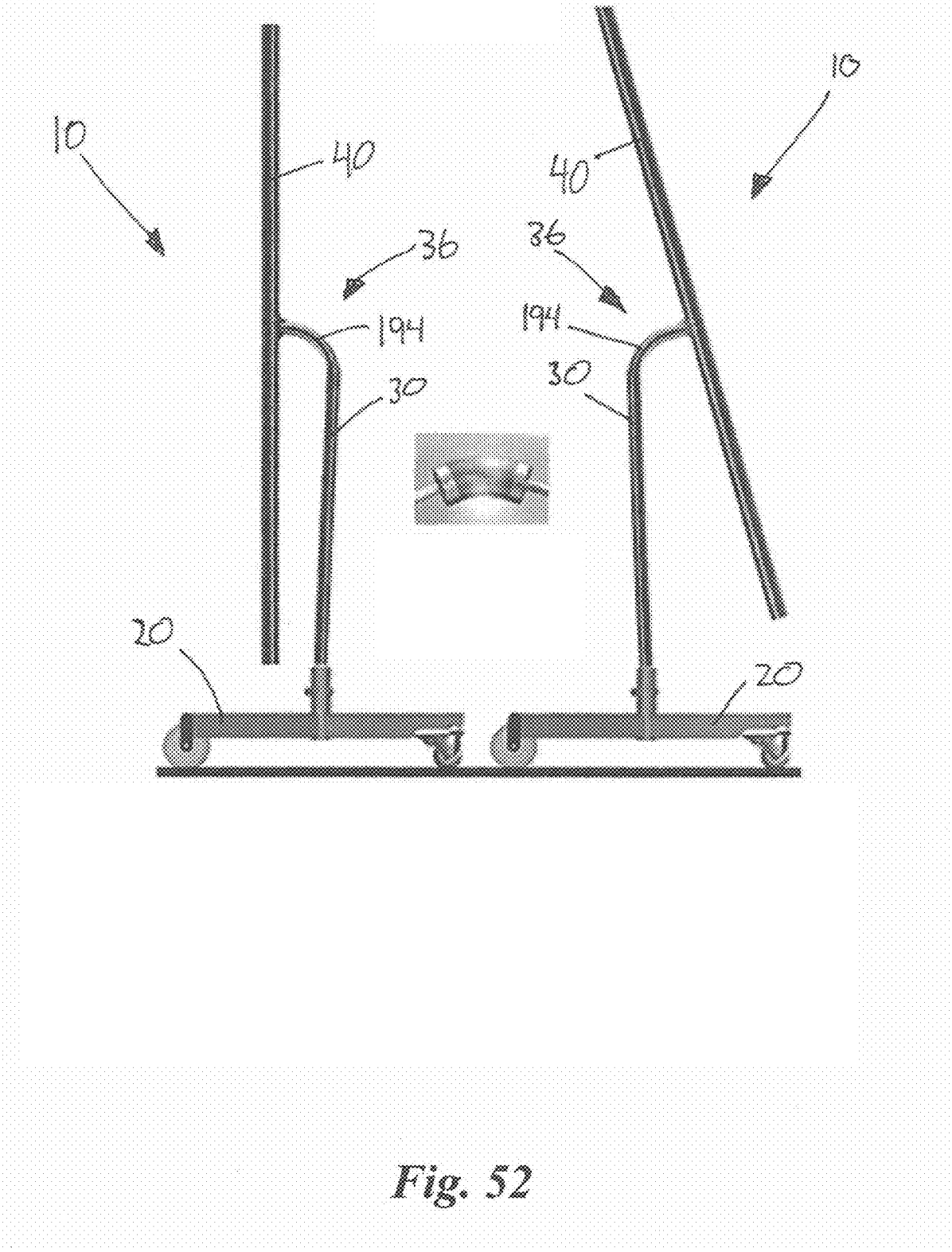


Fig. 52

INVERTIBLE CHRISTMAS TREE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to U.S. provisional patent application No. 62/256,577, filed in the U.S. Patent and Trademark Office on Nov. 17, 2015, and entitled INVERTIBLE CHRISTMAS TREE, the entire contents of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The following disclosure relates to artificial trees and particularly artificial Christmas trees which can be collapsed and stored when not in use and deployed when intended to be used. More particularly, this disclosure relates to collapsible Christmas trees which collapse by rotation of one portion of the Christmas tree relative to a second portion of the Christmas tree, and associated bags to cover such trees when not in use.

BACKGROUND

[0003] When decorating a space, it is often desirable to include trees as part of such decorations. To allow such decorations to last substantially indefinitely without maintenance and allow for repeated cycles of storage and deployment of such decorations, it is desirable to provide artificial trees rather than live trees. An example of such decorations are Christmas trees typically deployed during holiday seasons occurring at the end of each calendar year.

[0004] Such artificial Christmas trees are often configured to be collapsible so that they take up a minimum of space during initial shipping and inventory before being sold, and also to allow the user to store the Christmas tree when not in use in a relatively small space and protected from damage. Some such collapsible Christmas trees or other trees have limbs which are removably attached from a central trunk. The limbs typically include further branches which extend from the limbs which can be formed of wire or other materials with the limbs formed of wood, steel or other relatively rigid materials and the central trunk formed of wood, metal or other materials that are substantially rigid and strong enough to handle the loads encountered by carrying the limbs. Typically, needles of an artificial nature are fastened by wire, adhesive or otherwise to the branches extending from the limbs or directly to the limbs themselves.

[0005] In some cases lighting is permanently fixed to the limbs, such as with lights coupled to cords and with the cords plugging into a central cord running up the trunk. With other collapsible Christmas trees the limbs are not removed from the trunk but rather pivot from a stored orientation to a deployed orientation. With such trees the deployed orientation is genera y perpendicular to the trunk and the stored orientation is somewhere between 45° pivoted away from horizontal to a substantially vertical orientation parallel to the trunk.

[0006] While such pivotable limbs on Christmas trees have the benefit of avoiding the requirement that the limbs be attached to the central trunk, difficulty is encountered in transitioning the limbs from a collapsed orientation to a deployed orientation. Either the limb reorienting process is highly labor intensive as each limb is adjustably positioned, or if deployed by reorienting the trunk, requires that the entire tree be picked up and reoriented in various different ways.

[0007] This tree reorienting procedure is a particularly difficult maneuver in that the tree must be held away from the body of the individual before rotation. Many individuals lack the strength, arm length and dexterity to perform such a maneuver. For others, such a maneuver is dangerous to perform, presenting the possibility of injury or damage to the user or the tree. Accordingly, a need exists for a Christmas tree or other artificial tree which can be easily reconfigured from a collapsed configuration to a deployed configuration with a minimum of strength or dexterity being required for such tree deployment.

SUMMARY

[0008] With this disclosure an artificial Christmas tree is provided which can be readily inverted and which has limbs pivotably attached to a central trunk for automatic deployment of the limbs of the Christmas tree upon such inversion of the Christmas tree. To facilitate such inversion, the trunk includes at least two trunk portions including a first trunk portion adapted to be supported above a floor and at least one second trunk portion pivotably attached to the first trunk portion, at least indirectly, through at least one pivot joint. The first trunk portion extends from a lower end to an upper end with the pivot joint located closer to the upper end than to the lower end and typically adjacent the upper end.

[0009] The at least one second trunk portion has a portion thereof between a first end and a second end of the second trunk portion pivotably attached at least indirectly through the pivot joint to the first trunk portion. This pivot joint allows the at least one second trunk portion to pivot substantially 180° from a collapsed orientation extending substantially vertically to a deployed orientation extending substantially vertically, but with the first and second ends having swapped. In particular, in a collapsed orientation the first end is above the second end. In the deployed orientation the second end of the second trunk portion is above the first end.

[0010] The limbs are pivotably attached to the at least one second trunk portion. These limbs pivot between a perpendicular orientation and a collapsed orientation pivoting toward the second end of the second trunk portion somewhat away from the deployed position. Such pivoting can occur by gravity or through manual movement of the limbs. If by gravity alone, merely rotating the second trunk portion about the pivot joint between the collapsed orientation and the deployed orientation allows the limbs to pivot from their collapsed position to their deployed substantially perpendicular to the second trunk portion position. Thus, in a simplest embodiment of the invention, all one need do is invert the second trunk portion 180° while the entire weight of the second trunk portion is supported by the first trunk portion resting upon a floor or other underlying surface.

[0011] A clasp is preferably provided to selectively secure the at least one second trunk portion in the deployed orientation (and optionally also in the stored orientation) to avoid inadvertently inverting the at least one second trunk portion after deployment thereof. Lights preferably run up the first trunk portion then transition to the second trunk portion at the pivot joint and then toward each end of the second trunk portion and out at least some of the limbs, to provide lights for the Christmas tree or other artificial tree.

[0012] A wheeled base is optionally provided to further facilitate deployment of the artificial tree where desired. A top cap is preferably removably attachable to the second end of the second trunk portion to provide an uppermost portion of the tree. This uppermost portion can also include lights thereon with an appropriate plug to provide electrical connection when the cap is coupled to the second end at the top of the deployed at least one second trunk portion of the deployed Christmas tree.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIGS. **1-7** are front elevation views of the invertible Christmas tree of this disclosure at various different stages from a completely collapsed stored configuration to a completely deployed and illuminated configuration revealing the various steps in a method of deploying the collapsible Christmas tree of this disclosure.

[0014] FIGS. **8-10** are details of FIGS. **3-5** revealing details of the invertible Christmas tree of this disclosure around a central pivot joint which allows a second trunk .portion of the Christmas tree to pivot relative to a first trunk portion of the Christmas tree.

[0015] FIG. **11** is a detail of a portion of that which is shown in FIG. **10** and from a side view taken along lines **11-11** of FIG. **10**.

[0016] FIG. **12** is a detail of a portion of that which is shown in previous figures illustrating how a limb can be pivotably attached to the second trunk portion of the invertible Christmas tree of this disclosure.

[0017] FIG. **13** is a detail similar to that which is shown in FIG. **12**, but after inverting the second trunk portion so that the limb transitions to a stored configuration pivoting away from substantially perpendicular to the second trunk portion.

[0018] FIG. **14** is a top plan view of that which is shown in FIG. **12** further illustrating details of a limb according to one form of this disclosure and illustrating in broken lines how other limbs can be provided in different circumferentially spaced orientations from the second trunk portion of the invertible Christmas tree.

[0019] FIG. **15** is a detail similar to that which is shown in FIG. **12** but for an alternative embodiment limb and limb attachment to the second trunk portion.

[0020] FIG. **16** is a side elevation view of that which is shown in FIG. **15**. FIG. **17** is a top plan view of that which is shown in FIG. **15**.

[0021] FIG. **18** is a front elevation view of an alternative pivot joint for joining the rotating trunk portion to the fixed trunk portion, with the repositioning of the rotating trunk shown in broken lines.

[0022] FIG. **19** is a top plan view of that which is shown in FIG. **18**.

[0023] FIG. **20** is a front elevation view of a second alternative pivot joint for joining the rotating trunk to the fixed trunk, with the rotating trunk shown in broken lines after repositioning.

[0024] FIG. **21** is a top plan view of that which is shown in FIG. **20**.

[0025] FIG. **22** is a side elevation view of an alternative Christmas tree similar to that which is shown in FIG. **11** showing the entire fixed trunk and rotating trunk according to a slightly different embodiment than that shown in FIGS. **1-11**, and with limbs and branches not shown.

[0026] FIG. **23** is a side elevation view similar to that which is shown in FIG. **22** but for an alternative trunk configuration.

[0027] FIG. **24** is a side elevation view similar to that which is shown in FIG. **22** but for a still further alternative trunk configuration, and additionally showing the base thereon.

[0028] FIG. **25** is a front elevation view of the Christmas tree contained within an alternative cover for the Christmas tree, which cover is inverted with the tree during deployment.

[0029] FIG. **26** is a side elevation view of that which is shown in FIG. **25**.

[0030] FIG. **27** is a top plan view of that which is shown in FIG. **25** with limbs of the Christmas tree shown in broken lines as they are positioned contained within the cover.

[0031] FIG. **28** is a side elevation view of that which is shown in FIG. **25** with a gap formed in the cover spread open more than would typically be the case to most clearly show details of portions of the cover within the gap and with portions of the trunk fixed portion of the Christmas tree shown in broken lines.

[0032] FIG. **29** is a side elevation view of that which is shown in FIG. **25** with a side pouch thereof opened and with a cap portion of the Christmas tree in the process of being removed from the side pouch.

[0033] FIG. **30** is a front elevation view similar to that which is shown in FIG. **25**, but after rotation of the Christmas tree half way from a stored position to a final deployed position, and illustrating how the alternative cover can rotate with the Christmas tree, rather than requiring removal of the cover before rotation.

[0034] FIG. **31** is a front elevation view similar to that which is shown in FIG. **25**, but after complete rotation of the Christmas tree with the cover in place, and showing the cover in the process of being removed by pulling downward on the cover.

[0035] FIG. **32** is a front elevation view of a multiple pivot Christmas tree alternative example embodiment of this invention.

[0036] FIG. **33** is a top plan view of that which is shown in FIG. **22** with a contour of separate sections of the tree generally indicated by circles shown in broken lines.

[0037] FIG. **34** is a top plan view similar to that which is shown in FIG. **33**, but with an upper rotating trunk having been rotated 90° according to a first step in transiting the two pivot Christmas tree from its stored position shown in FIG. **32** and a final deployed position shown in FIG. **36**.

[0038] FIG. **35** is a front elevation view of that which is shown in FIG. **32** after the upper rotating trunk and a lower rotating trunk have each been rotated 90° and before final rotation of an intermediate rotating trunk to complete the transition of the multiple pivot Christmas tree from its stored configuration to its deployed configuration, and also illustrating how a cap portion of the Christmas tree is attached to an upper rotating trunk of the Christmas tree before final rotation of the intermediate rotating trunk.

[0039] FIG. **36** is a front elevation view of the two pivot Christmas tree after completion of all rotations and completion of transitions from the stored position to the deployed position.

[0040] FIG. **37** is a side elevation view of a further alternative embodiment artificial tree according to this invention, featuring two pivoting upper trunk portions.

[0041] FIG. **38** is a side elevation view of the alternative trunk of FIG. **37** with the upper trunk portions having been rotated to transition the tree of this embodiment from the stored configuration to the deployed configuration.

[0042] FIG. **39** is a front elevation view of that which is shown in FIG. **37**.

[0043] FIG. **40** is a front elevation view similar to that which is shown in FIG. **37**, but after the beginning of the rotation process for one of the two portions of the upper trunk portion of the tree of this embodiment.

[0044] FIGS. **41-52** illustrate alternative configurations of the pivot used to connect the rotating trunk to the fixed trunk.

DETAILED DESCRIPTION

[0045] Referring to the drawings, wherein like reference numerals represent like parts throughout the various drawing figures, reference numeral **10** is directed to an invertible Christmas tree or other artificial tree. The tree **10** is invertible (FIG. **4**) so that it can transition between an upside down stored orientation (FIG. **3**) with limbs angling downwardly to decrease a width of the collapsed Christmas tree, and a deployed orientation (FIG. **5**) with the limbs pivoted to an orientation substantially perpendicular to the trunk. The user thus need not pick up the Christmas tree **10** at any time to convert it from its stored orientation to its deployed orientation.

[0046] In essence, and with particular reference to FIGS. **3-7**, basic details of the invertible Christmas tree **10** of this disclosure are described according to an example embodiment. The tree **10** includes a base **20** upon which the entire Christmas tree **10** is supported above an underlying floor. A fixed trunk **30** extends vertically up from the base **20**. This fixed trunk **30** extends approximately half of a height of the tree **10**. Near an upper end **34** of the fixed trunk **30** a pivot **36** is provided. This pivot **36** rotatably supports a rotating trunk **40** thereto. The rotating trunk **40** preferably has a length similar to a height of the Christmas tree (less the height of a cap portion **80**), with the rotating trunk **40** pivotably coupled to the fixed trunk **30** through the pivot **36** near a midpoint of the rotating trunk **40**.

[0047] Limbs **50** extend laterally from the rotating trunk **40**. Preferably, these limbs **50** are pivotably connected to the rotating trunk **40** so that the limbs **50** can pivot relative to the trunk between an approximately perpendicular deployed orientation and a collapsed orientation which pivots toward the trunk. Thus, the limbs **50** extend substantially horizontally when the rotating trunk **40** is in a final position for deployment of the limbs **50**, and the limbs **50** pivot toward the rotating trunk **40** when the rotating trunk **40** is rotated to a stored position (FIG. **3**). Branches **60** typically extend from each limb **50**. Lights **70** are typically routed up the fixed trunk **30**, out to each end of the rotating trunk **40** and then out the limbs **50** potentially out onto branches **60** supported by the limbs **50**. The lights receive power such as through a power receptacle P. A cap **80** is preferably provided which attaches to an end of the rotating trunk **40** to provide an uppermost portion of the tree **10** after the rotating trunk **40** has been rotated to a deployed orientation.

[0048] More specifically, and with initial reference to FIGS. **1** and **2**, details of accessories for the invertible Christmas tree **10** are described for use when the invertible Christmas tree **10** is in a stored configuration. These accessories preferably include a substantially cylindrical cover **2** with a diameter sized to fit over the invertible Christmas tree **10** when it is in its stored position (FIG. **3**). Typically the cap **80** can also fit inside this cover **2**. A lid **4** is preferably also provided which can move relative to the cover **2** (such as along arrow A of FIG. **2**) and attach to the cover **2**, such as through a zipper **6**. The lid **4** is particularly useful during shipping or when the invertible Christmas tree **10** is to be stored on its side. Otherwise, the **1** id **4** is not required. With the cover **2** on the invertible Christmas tree **10**, the entire invertible Christmas tree **10** can be rolled into a closet or other storage area and be kept clean and keep the Christmas tree from damaging other objects, such as within the closet.

[0049] With particular reference to FIGS. **2-4**, details of the base **20** of the invertible Christmas tree **10** are described according to an example embodiment. The base **20** provides an example form of means to support the invertible Christmas tree **10** above an underlying ground surface, such as a floor of a residential structure. This base **20** has sufficient width to provide stability for the invertible Christmas tree **10** to prevent it from tipping over. The base **20** also preferably elevates lowermost portions of the invertible Christmas tree **10** somewhat above an underlying surface. This base **20** in this example embodiment is a wheeled base **20** including wheels **28** thereon so that the entire invertible Christmas tree **10** can be rolled about on the underlying surface for easy transportation, such as between a stored location and a deployed location.

[0050] The base **20** includes a plate **22** which is preferably circular or square in form and oriented generally horizontally. A pedestal **24** extends vertically upward from a central portion of the plate **22**. The pedestal **24** is configured to be fixedly attached to the fixed trunk **30** with the fixed trunk **30** preferably extending vertically upward from the pedestal **24**.

[0051] Lateral portions of the plate **22** support joints **25**. These joints **25** preferably have legs **26** pivotably attached to the plate **22** therethrough. Thus, the joints **25** allow the legs **26** to pivot relative to the plate **22** (about arrow B of FIG. **2**). Wheels **28** are preferably provided at the end of each of these legs **26**. The wheels **28** are preferably on casters or other swivel joints.

[0052] With such a configuration, the base **20** can have a deployed configuration with the legs **26** extending radially outwardly for maximum stability, but the legs **26** can be pivoted inwardly (arrow B) to provide a lesser width and to allow the lid **4** to be closed over the base **20** and to completely enclose the invertible Christmas tree **10** within the cover **2** when desired (FIG. **1**).

[0053] While the base **20** shown herein is described according to this example embodiment, other bases **20** could also be utilized. For instance, the base **20** could merely be a fixed structure having sufficient width to resist tipping of the invertible Christmas tree **10**. Also, the base **2** could merely be a hole in an underlying floor into which the fixed trunk **30** of the invertible Christmas tree **10** would be removably mounted. Other forms of Christmas tree stands could also be utilized to support the fixed trunk **30** and dispense with the base **20** altogether.

[0054] With continuing reference to FIGS. **3-7** and **8-10**, details of the fixed trunk **30** of the invertible Christmas tree **10** are described according to this example embodiment. The invertible Christmas tree **10** preferably includes a central trunk formed of two separate trunk portions including a first portion referred to as a fixed trunk **30** and a second portion referred to as a rotating trunk **40**. Also, a top trunk **82** is

provided as a portion of the cap **80** defining a small portion of the overall trunk structure of the invertible Christmas tree **10**.

[0055] The fixed trunk **30** preferably has a height substantially half of that of the invertible Christmas tree **10**. The fixed trunk **30** is elongate in form and can be configured such as in a solid cylindrical form or in the form of a cylindrical tube. The fixed trunk **30** is formed of substantially rigid material and carries loads of the invertible Christmas tree **10** upon the base **20** or other underlying surface.

[0056] The fixed trunk **30** includes a lower end **32** opposite an upper end **34**. A clasp **33** is provided near the lower end **32**. This clasp **33** is configured to be removably attached to a portion of the rotating trunk **40** to secure the rotating trunk **40** in either the stored configuration (FIG. **3**) or in the deployed configuration (FIG. **5**). This clasp structure is further particularly shown in FIGS. **10** and **11**.

[0057] The upper end **34** of the fixed trunk **30** includes a pivot **36** adjacent thereto. This pivot **36** can be as simple as a hole passing laterally through the fixed trunk **30** with an axle **37** passing through this hole. In the embodiment depicted in FIGS. **3-11**, the pivot **36** is in this simple form with the axle **37** providing for pivotable attachment between the rotating trunk **40** and the fixed trunk **30**. The axle **37** has a length similar to twice a diameter of the fixed trunk **30**.

[0058] The rotating trunk **40** has a diameter similar to that of the fixed trunk **30** and the axle **37** passes through both the fixed trunk **30** and the rotating trunk **40** with the rotating trunk **40** alignable parallel with the fixed trunk **30** but just slightly offset laterally from the fixed trunk **30** so that the rotating trunk **40** can rotate freely relative to the fixed trunk **30**. If desired, the fixed trunk **30** can be spaced slightly away from a center of mass of the invertible Christmas tree **10** so that the rotating trunk **40** can have its center of mass more closely aligned with the center of mass of the overall invertible Christmas tree **10** for maximum stability.

[0059] While the embodiment of FIGS. **3-10** is perhaps the simplest embodiment for the pivot **36**, other embodiments of this pivot could be utilized, including those depicted in FIGS. **18-21**. For instance, FIGS. **18** and **19** depict front and top views of an alternate joint **136** with a bracket **138** pivotably attached to the upper end **34** of the fixed trunk **30** and an end of the bracket **138** opposite the upper end **34** of the fixed trunk **30** either fixed or pivotably attached to the rotating trunk **40**. Rotation of the rotating trunk **40** relative to the fixed trunk **30** occurs by first moving along arrow C', then moving along arrow C". 180° of rotation is achieved and the rotating trunk **40** moves from being directly adjacent the fixed trunk **30** on a first side thereof to being directly adjacent the fixed trunk **30** on a second side opposite the first side.

[0060] In FIGS. **20** and **21** another embodiment is provided in the form of a second alternative joint **236**. An axle **237** is provided to allow the rotating trunk **240**, having a square cross-section, to rotate relative to the fixed trunk **230** in the form of a generally square cross-sectioned structure having one open side opposite the side bearing the axle **237**. In this embodiment, the rotating trunk **40** has a size slightly smaller than that of the fixed trunk **30** so that the rotating trunk **40** can rotate to nest inside the fixed trunk **30** when in one position, but pivot out of this nested configuration when in the second configuration after 180° of rotation (along arrow C' and then arrow C" (FIG. **20**)). Other embodiments of joints or pivots could also be resorted to, to allow for pivotable attachment of the rotating trunk **40** to the fixed trunk **30**.

[0061] With continuing reference to FIGS. **3-11**, details of the rotating trunk **40** are described according to this example embodiment. The rotating trunk **40** preferably supports all of the limbs **50** of the invertible Christmas tree **10** thereon. As an alternative, multiple rotating trunks can be provided, such as upper and lower rotating trunks pivoting from an intermediate rotating trunk to the fixed trunk (see for instance FIGS. **32-36**). This simple rotating trunk **40** has an elongate rigid form similar to that of the fixed trunk **30**. However, the rotating trunk **40** preferably has a length similar to a height of the invertible Christmas tree (minus a height of the cap **80** and minus a height of the base **20** up to a top of the pedestal **24**).

[0062] This rotating trunk **40** has a first end **42** opposite a second end **44** (FIGS. **4** and **9**). The first end **42** is configured to be below the second end **44** when the rotating trunk **40** is in its deployed configuration. The rotating trunk **40** is configured to have the first end **42** above the second end **44** when in the stored configuration (FIG. **3**). A port **45** is provided at the end of the second end **44** which can receive and support the cap **80** thereon.

[0063] A core **46** passing through an interior of the rotating trunk **40** is preferably hollow. Such a hollow core **46** minimizes weight of the rotating trunk **40** while maintaining strength for the rotating trunk **40** and also optionally provides a pathway through which electric equipment for the lights **70** can be routed. Slots **48** (FIGS. **12-17**) are formed in the rotating trunk **40** through which limbs **50** can interface in a rotating fashion relative to the rotating trunk **40**.

[0064] The rotating trunk **40** preferably has a center point or a point near the center point of the rotating trunk **40** which is pivotably attached (at least indirectly, and in this embodiment directly) to the fixed trunk **30** through the pivot **36**. This midpoint is also preferably a center of mass of the rotating trunk **40**. Thus, the rotating trunk **40** can be freely rotated 180° to move the first end **42** from directly above the second end **44** and directly above the fixed trunk **30**, to a second position with the first end **42** adjacent the fixed trunk **30** and directly below the second end **44**; with a center of mass of the rotating trunk **40** always remaining substantially aligned with the fixed trunk **30**. Thus, the rotating trunk **40** can be "spun" without causing instability in the invertible Christmas tree **10** resting upon the base **20** or other support above a floor. Preferably, near each end **42**, **44** of the rotating trunk **40** holes are provided which can interface with the clasp **33**, so that the rotating trunk **40** can be secured to the fixed trunk **30** in both the collapsed configuration and the deployed configuration.

[0065] With particular reference to FIGS. **12-17**, details of the limbs **50** and branches **60** of the invertible Christmas tree **10** are described according to an example embodiment. The limbs **50** could be attached to the rotating trunk **40** in many different ways including in fixed fashion or in a fashion which is removable but not pivotable. However, most preferably the limbs **50** are pivotably attached to the rotating trunk **40**. Such pivoting preferably allows for rotation of the limbs **50** between a perpendicular orientation (actually substantially perpendicular but preferably slightly angled upwardly, when the rotating trunk **40** is oriented vertically)

and a collapsed configuration closer to the angle of the rotating trunk **40** centerline than to perpendicular to the rotating trunk **40** centerline.

[0066] Most preferably, this collapsed angle for the limbs **50** is 70° away from the deployed configuration for the limbs **50**. Such rotation of the limbs **50** is depicted by arrow E (FIGS. **12**, **13** and **15**). While the limbs appear to pivot upward, they in fact pivot downward after the rotating trunk **40** has rotated (about arrow C (FIG. **12**)) so that the limbs **50** actually rotate downward by gravity forces, but only when the rotating trunk **40** has been rotated from the deployed configuration to the stored orientation. When this action is reversed and the rotating trunk **40** is rotated from the stored orientation to the deployed orientation, the limbs **50** pivot in an opposite direction to the deployed configuration approximately perpendicular to a centerline of the rotating trunk **40**.

[0067] Each of the limbs **50** is preferably an elongate rigid structure with a plurality of such limbs **50** radiating from the rotating trunk **40**. Most preferably, the limbs **50** extend in many different directions radially from the rotating trunk **40** (FIG. **14**) when a complete symmetrical genera y conical busy invertible Christmas tree **10** is to be provided. The limbs **50** genera y each include a root **51** defining an end thereof closest to the rotating trunk **40** and a tip **55** opposite the root **51**. A hinge **52** is located at the root **51** to pivotably attach the limbs **50** to the rotating trunk **40**. A stop **54** is provided to prevent the limbs **50** from rotating either past substantially horizontal and perpendicular to the rotating trunk **40** when in the deployed configuration or past a collapsed angle, such as 70°, away from the deployed orientation.

[0068] In the embodiment of FIGS. **12** and **13** this stop **54** is in the form of a flange of material extending substantially perpendicularly from the extent of the limbs **50** from the root **51** to the tip **55**. In the embodiment of FIGS. **15** and **16** the root **51** of the limbs **50** merely passes through a slot **48** in the rotating trunk **40** and a lower portion of this slot **48** acts as the stop **54**. The hinge **52** generally includes at least one axle **52** or axle-like structure about which the limbs **50** can pivotably move relative to the rotating trunk **40**.

[0069] Branches **60** optionally but preferably radiate from the limbs **50** in a pattern which mimics at least some natural tree or otherwise has a desirable form. Typically, needles **52** also extend from the branches **60**. These needles **62** can be actual natural needles such as pine needles, but most typically are synthetic structures such as attached by wire or adhesive to the branches **60**. It is also conceivable that needles **62** can also be directly attached to the limbs **50**. The branches **60** can have a generally planar form such as might exist on a noble fir, or might have a more bushy cylindrical form which might be provided on many different types of pines. Needles **62** can also be long or short depending on the design characteristics desired for the invertible Christmas tree **10**.

[0070] With particular reference to FIGS. **7** and **12-14**, details of the lights **70** are described. Most preferably, the invertible Christmas tree **10** is also permanently wired with lights **70**. A plug **74** is provided which is removably attachable to a power receptacle P. A cord **72** extends from the plug **74** and extends up the fixed trunk **30** to the rotating trunk **40**. At the joint **36**, this cord **72** preferably splits into two separate cords, one of which extends towards the first end **42** of the rotating trunk **40** and the other of which extends towards the second end **44** of the rotating trunk **40**.

[0071] As these cords pass the limbs **50**, the cords are routed out the limbs **50** and terminate at various different locations with lights **70**. Various different controllers can be provided and various different lights can be provided if desired so that a variety of different light displays can be provided through the lights **70**. The cord **72** can be routed through an interior of the fixed trunk **30** and through an interior of the rotating trunk **40** (and also conceivable through an interior of the limbs **50**). Perhaps in its simplest form, the cord **72** can merely be wrapped around an exterior of the fixed trunk **30** and an exterior of the rotating trunk **40**. The cord **72** can be camouflaged to have a color similar to that of the fixed trunk **30**, rotating trunk **40** and limbs **50** (i.e., green) to help hide the cords **72**.

[0072] With particular reference to FIGS. **3**, **6** and **7**, details of the cap **80** are described, according to this example embodiment. Most preferably, to minimize an overall length of the rotating trunk **40** and height of the invertible Christmas tree **10** when in a stored configuration, an uppermost portion of the invertible Christmas tree **10** is configured as a separate cap **80**. This separate cap **80** preferably includes a top trunk **82** which fits into the port **45** in the second end **44** of the rotating trunk **40**. The cap **80** can thus be attached with the top trunk **82** co-linear with the rotating trunk **40**. To simplify attachment, it can occur when the rotating trunk **40** has been rotated half way, or just a little more (see FIG. **9**).

[0073] Top limbs **84** radiate from the top trunk **82** with a configuration similar to the limbs **50**. A bottom end **83** of the cap **80** is sized to fit inside the port **45** for secure but removable attachment of the cap **80** to the rotating trunk **40**. Lowermost portions of the cap **80** typically have a diameter similar to that of the invertible Christmas tree **10** when the limbs **50** are in their collapsed configuration (FIG. **3**). Thus, the top limbs **84** of the cap **80** need not pivot relative to the top trunk **82**. However, such pivoting could take place.

[0074] Also, most preferably a plug is provided and lights are provided on the cap **80** with the plug attachable to a plug in the second end **44** of the rotating trunk **40** so that the lights **70** on the cap **80** can be coupled to lights **70** on the rotating trunk **40** so that all of the lights **70** on the invertible Christmas tree **10** can be simultaneously powered from a single power receptacle P. Attachment of the cap **80** to the rotating trunk **40** is depicted along arrow D of FIG. **6**.

[0075] With particular reference to FIGS. **22-24**, further details of the trunk of this disclosure are described and according to slightly different alternative embodiments for the trunk, including alternatives to the fixed trunk **30** and rotating trunk **40** (FIGS. **1-11**). In FIG. **22** an alternative Christmas tree **210** is shown including a fixed trunk **230** and a rotating trunk **240**. A joint such as the alternative joint **136** is provided and marked as alternative joint **236** joining the rotating trunk **240** to the fixed trunk **230**.

[0076] Also, a releasable fastener **250** is shown for securing the rotating trunk **240** to the fixed trunk **230** both when in the deployed orientation and in the stored orientation. This releasable fastener **250** would typically have two sides which are similarly configured to grip either the upper portion **244** of the rotating trunk **240** or the lower portion **242** of the rotating trunk **240**. The fastener **250** could, in one embodiment, be a pair of similar "C-shaped" clamps formed of a resilient material to releasably hold the rotating trunk **40** in one of the two pairs of clamps.

[0077] In this alternative Christmas tree **210**, the rotating trunk **240** is shown with an asymmetrical configuration with the upper portion **244** longer than the lower portion **242**. In such a configuration the joint **236** can be spaced away from a center of mass of the rotating trunk **240**, or the positioning of limbs of different lengths and weights on the two portions **242**, **244** can be provided so that the rotating trunk **240** is still balanced about the joint **236**.

[0078] With the alternative Christmas tree **210**, the rotating trunk **240** is shown displaced laterally relative to the fixed trunk **230** slightly when the rotating trunk **240** has been to the stored position, the rotating trunk **240** is also slight" laterally from the rotated to the deployed configuration. Similarly, when the rotating trunk **240** is rotated displaced fixed trunk **230**, but on an opposite side of the fixed trunk **230**. With this alternative embodiment Christmas tree **210**, such an offsetting of the rotating trunk **240** from the fixed trunk **230** is merely accepted as part of the design of the alternative Christmas tree **210** and the base **220** (FIG. **24**) is configured to accommodate any potential offsetting of the center of gravity of the overall alternative Christmas tree **210** to maintain stability.

[0079] Alternatively, limbs and branches can be configured with a slightly greater length on one side than on the other side to balance the alternative Christmas tree **210** laterally even though the rotating trunk **240** is offset laterally relative to the fixed trunk **230** somewhat. As another alternative, the fixed trunk **230** could be attached to the base **220** (FIG. **24**) at a location slightly spaced from a center of the base **220**, or the base **220** can be configured to be asymmetrical to balance the alternative Christmas tree **210** to prevent any tipping propensity.

[0080] A further alternative Christmas tree **310** is depicted in FIG. **23**. This alternative Christmas tree **310** includes a fixed trunk **330** pivotably attached to the rotating trunk **340** through a joint **236**. The rotating trunk **340** is similar to the rotating trunk **240**, such that it includes an upper portion **244** and lower portion **242** which in this embodiment are shown having slightly different lengths.

[0081] Uniquely with the further alternative embodiment Christmas tree **310**, the fixed trunk **330** is configured to include three separate parts: an upper part **332**, a lower part **334** and a bend **336** between the upper part **332** and the lower part **334**. This bend **336** includes upper and lower curves so that the upper part **332** and lower part **334** remain parallel to each other but are offset laterally relative to each other an amount similar to the lateral offset provided by the joint **236**. In this way, the rotating trunk **340** is aligned with the lower part **334** of the fixed trunk **330** when the rotating trunk **340** is in the deployed configuration. The releasable fastener **250** is coupled to the upper part **332** and is similar to the releasable fastener **250** provided with the Christmas tree **210** (FIG. **22**). The further alternative Christmas tree **310** is configured so that the trunk is balanced and symmetrical when in the deployed configuration, aligned with both the lower part **334** of the fixed trunk **330** and the base **220** (FIG. **24**) to which the lower part **334** of the fixed base **330** is attached.

[0082] When the rotating trunk **340** is rotated to the stored position, in this embodiment a somewhat less balanced configuration would result, or the base **20** could be appropriately modified to provide stability both when the further alternative Christmas tree **310** is in the deployed configuration or in the stored configuration. Other techniques for balancing the further alternative Christmas tree **310** when in the stored configuration could also be resorted to, including adding masses to portions of the tree **310** when in the stored configuration to achieve balance, or limiting rotation of some of the limbs coupled to the tree **310** so that balance is maintained when the limbs pivot because some of the limbs pivot more than other limbs. Also, it is conceivable that the cover **2** (FIGS. **1** and **2**) could be weighted and provided with a specified orientation so that the cover **2** would provide necessary balancing of a tree **310** when in the stored configuration.

[0083] With particular reference to FIG. **24** an additional further alternative embodiment of the Christmas tree **410** is disclosed. With the tree **410**, an offset similar to that provided with the alternative Christmas tree **310** (FIG. **23**) is provided. However, rather than utilizing the bend **336** (FIG. **23**) a coupling **436** is provided to join the upper part **432** of the fixed trunk **430** to a lower part **434** of the fixed trunk **430**. In this embodiment, the upper part **432** and lower part **434** can each be entirely linear, but the offset is still provided similar to that provided with the tree **310** (FIG. **23**). Other details of the tree **410** are similar to that disclosed in the tree **310** of FIG. **23**.

[0084] The tree **410** is also shown coupled to the base **220** which would typically be similar for each of the embodiments of FIGS. **22-24**. This base **220** is similar to the base **20** (FIGS. **1-11**) except that it is shown in a simplified form without collapsibility and clearly depicting the wheels as caster wheels which can rotate about a vertical axis to swivel and allow the tree **410** to be rolled on a flat surface easily in a variety of different directions.

[0085] The alternative trees **210**, **310**, **410** shown in FIGS. **22-24** can have details thereof selectively combined with details of the joints shown in FIGS. **18-21** and also selectively combined with details of the tree **10** of FIGS. **1-11**. Also, various different limbs and branches and lights can be coupled to trees such as the alternative trees **210**, **310**, **410** to configure a tree according to this disclosure to meet the desires of a particular consumer.

[0086] With particular reference to FIGS. **25-31**, details of an alternative cover **102** for the Christmas tree **10** are described. This alternative cover **102** generally is wider than the cover **2** of the previously described embodiment, such as to accommodate Christmas trees **10** which have limbs **50** which rotate less than those depicted in the previous embodiment discussed above. The cover **102** generally includes a top panel **104** and a side panel **106**. The top panel **104** is generally circular but can be configured to be semi-spherical or semi-conical in form so that it can take on a somewhat domed configuration. This top panel **104** preferably is substantially complete in form except where a gap **110** forms a break in the top panel **104** (FIG. **27**).

[0087] The side panel **106** is generally cylindrical in form, except that the side panel **106** preferably has a slightly lesser diameter at a lower end than at an upper end adjacent the top panel **104**. The side panel **106** is preferably open at a lower end and otherwise substantially continuous except where the gap **110** causes a break in the side panel **106** (FIGS. **26** and **28**). Handles **108** are preferably attached to the side panel **106** on a front and rear side of the cover **102**. These handles **108** assist in moving the tree under the cover **102** and rotating the cover **102** and included Christmas tree upon the wheeled base **20**.

[0088] The gap **110** is somewhat in the form of a pie shaped cutout extending from upper to lower ends of the cover **102**. This gap **110** is primarily defined by two substantially planar side walls **112** which almost face each other but preferably are angled slightly (perhaps 5° to 15°) away from each other. These side walls **112** are joined together at an inner joint **114** close to a central vertical axis of the cover **102**. The gap **110** is configured so that it can fit between two adjacent limbs **50** (FIG. **27**) and to allow the cover **102** to remain on the tree **10** as the tree **10** is rotated (FIG. **30**) between a stored orientation and a deployed orientation. After transitioning to the deployed orientation (FIG. **31**), the cover **102** is then removed.

[0089] The gap **110** provides clearance to allow the fixed trunk **30** of the Christmas tree **10** (FIGS. **1-24**) to transition from one orientation relative to a remainder of the Christmas tree to another orientation relative to the entire Christmas tree, associated with rotation of portions of the Christmas tree relative to the fixed trunk **30**. Such rotational clearance can perhaps best be seen with reference to FIG. **26** or **28** where an upper portion of the cover **102** and contained Christmas tree rotate toward the viewer out of the page with lower portions of the cover **102** and associated Christmas tree rotating away from the viewer and into the page. This rotation can also be seen in FIG. **30** where the gap **110** is illustrated by an arrow to indicate where it is actually located (also in FIG. **29**).

[0090] The inner joint **114** of the gap **110** includes an arch **116** which defines a break in the inner joint **114** so that the inner joint **114** only joins the side panels **112** on an upper half of the gap **110**. A lower half of the inner joint **114** below the arch **116** is open between two inside edges of the side walls **112**. This open portion of the inner joint **114** below the arch **116** is beneficial in facilitating removal of the cover **102** after completion of the rotation process (along arrow G of FIG. **31**).

[0091] To keep portions of the cover **102** within the gap **110** properly positioned in spite of this open portion of the inner joint **114** below the arch **116**, inner corners **118** of the side walls **112** preferably include an inner fastener **120**. This inner fastener **120** is initially wrapped around the fixed trunk **30** and coupled together to keep the inner corners **118** of the side walls **112** of the gap **10** positioned where desired and to resist any tendency of the cover **102** to rotate prematurely. When the cover **102** and included tree are to be rotated, this inner fastener **120** would typically be manipulated into a detached configuration to then allow free rotation of the cover **102** and included Christmas tree (along arrow F of FIG. **30**). If desired, an outer fastener **130** can be provided at outer corners **128** of the gap **110** to help keep the gap **110** substantially closed. A similar outer fastener **130** could optionally be provided at corners of the side walls **112** adjacent the top panel **104**. These outer fasteners **130** would also be attached when the cover **102** is in a stored configuration and then detached before rotation but before removal of the cover **102**.

[0092] The alternative cover **102** is beneficial for larger trees, where a shorter user might have difficulty in lifting the cover **2** of the previous embodiment up off of the tree after rotation. With this alternative cover **102**, the cover **102** is pulled down (along arrow G of FIG. **31**) after rotation of the cover **102** and included Christmas tree, so that the user need not be required to lift the cover **102** up off of the Christmas tree. The cover **102** can later be repositioned on the Christmas tree, either by reversing the cover **102** removal steps or by first inverting the tree to the stored position and then pulling the cover **102** down over the top of the inverted Christmas tree.

[0093] The alternative cover **102** includes a side pouch **140** sized to receive the cap **80** of the Christmas tree therein. An access opening **142** is provided, typically with a zipper thereon or other closure. The inside pouch **140** is sized sufficiently large to allow the cap portion of the Christmas tree to be replaceably positioned within the side pouch **140**.

[0094] With particular reference to FIGS. **32-36**, details of a two pivot Christmas tree **510** defining an alternative embodiment of the Christmas tree **10** described above are described. This two pivot Christmas tree **510** utilizes the same basic principle of one fixed trunk and at least one rotating trunk, but adds to the principle by providing multiple separate rotating trunk portions. With such a configuration, trees of increased height can be readily managed by a single user without requiring a step ladder or excessive strength. Also, a size of the collapsed tree can be minimized, such as to accommodate transport through standard doorways and other standard building area dimensions.

[0095] The entire two pivot Christmas tree **510** rests upon a base **520** which consists essentially of a rigid frame **522** having various different elements to provide rigidity to the base **520**. Wheels **528** support the base **520** above ground and allow for simple and easy rolling movement of the two pivot Christmas tree **510** to a desired position before transitioning of the Christmas tree **510** from its stored configuration (FIGS. **32** and **33**) to its final deployed configuration (FIG. **36**).

[0096] The two pivot Christmas tree **510** includes four basic trunk portions including a fixed trunk **530**, an intermediate rotating trunk **540**, an upper rotating trunk **550** and a lower rotating trunk **560**. The fixed trunk **530** is generally similar to the fixed trunk **30** of the Christmas tree **10** described in detail above. Specifically, in this embodiment the fixed trunk **530** includes a lower end **532** opposite an upper end **534** and is rigid and elongate in form extending vertically up from the base **520**. Preferably, an offset **535** is formed in the fixed trunk **530** near the lower end **532** to assist in balancing the different portions of the two pivot Christmas tree **510** over a center point of the base **520**.

[0097] The intermediate rotating trunk **540** is pivotably attached through a middle pivot **542** to the upper end **534** of the fixed trunk **530**. This intermediate rotating trunk **540** is similar to the fixed trunk **530** in that it does not have limbs extending directly therefrom. The intermediate rotating trunk **540** is distinct from the fixed trunk **530** in that it is capable of rotating relative to the fixed trunk **530** at least 90° about the middle pivot **542**.

[0098] The middle pivot **542** is preferably at a center of the intermediate rotating trunk **540** to maintain balance and thus simplicity of rotation of the intermediate rotating trunk **540**. As an alternative, the middle pivot **542** could be placed at different locations along the intermediate rotating trunk **540**. A clasp **543** is preferably provided as part of the middle pivot **542** which can secure the upper rotating trunk **550** and lower rotating trunk **560** in deployed configuration relative to the intermediate rotating trunk **540** after rotation thereof (along arrows H and I of FIG. **32**). In one example, the clasp **543** can be in the form of an open "C" clamp with the upper

and lower rotating trunks **550**, **560** having a circular cross-section which can snap into the C-clamp configured clasp **543**.

[0099] The intermediate rotating trunk **540** includes a high end **544** opposite a low end **546**. In the stored position, each of these ends **544**, **546** are at a common height as the intermediate rotating trunk **540** is configured to extend horizontally (FIGS. **32** and **35**). In a final rotating step (about arrow J of FIGS. **32** and **35**) the intermediate rotating trunk **540** is rotated relative to the fixed trunk **530**, and about the middle pivot **142** ninety degrees until the high end **544** is directly above the low end **546**.

[0100] The upper rotating trunk **552** is pivotably coupled to the high end **544** of the intermediate rotating trunk **540**. In particular, a middle pivot **552** is interposed between the high end **544** of the intermediate rotating trunk **540** and the upper rotating trunk **550** at a point between a first end **554** and a second end **556** of the upper rotating trunk **550**. The first end **554** of the upper rotating trunk **550** is that portion of the upper rotating trunk **550** which is configured to have longer limbs than limbs extending from the second end **556**. When completely deployed, the upper rotating trunk **550** defines a middle portion of the two pivot Christmas tree **510**. The middle pivot **552** facilitates ninety degrees of rotation between the upper rotating trunk **550** and the intermediate rotating trunk **540**.

[0101] The lower rotating trunk **560** is pivotably attached to the low end **546** of the intermediate rotating trunk **540**. In particular, a middle pivot **562** is interposed between the low end **546** of the intermediate rotating trunk **540** and a portion of the lower rotating trunk **560** between a first end **564** and a second end **566** of the lower rotating trunk **560**. The first end **564** of the lower rotating trunk **560** is configured to have limbs **570** which are longer than limbs **570** extending from the second end **566** of the lower rotating trunk **560**. The middle pivot **562** facilitates ninety degrees of rotation between the lower rotating trunk **560** and the intermediate rotating trunk **540**. After transition to the deployed configuration, the lower rotating trunk **560** defines a lowermost portion of the two pivot Christmas tree **510**.

[0102] The limbs **570** are generally similar to those described above for various different alternative embodiments of the Christmas tree **10** (FIGS. **1-24**). Branches would also typical **1** extend from the limbs **570** and lights can optionally be provided on the limbs **570** and/or branches. Electric wiring for such lights is preferably routed up the fixed trunk **530** to the intermediate trunk **540** at the middle pivot **512**. The wiring can then split into two paths, one extending to the high end **544** and one extending to the low end **546**. At these joints, the wiring again splits to extend on to first ends **554**, **564** and second ends **556**, **566** of the upper rotating trunk **550** and lower rotating trunk **560**. Lights are then coupled to the wiring lanes adjacent where the limbs **570** couple to the trunks **550**, **560**.

[0103] A cap **580** is preferably provided which is attachable to the second end **556** of the upper rotating trunk **550** to define an uppermost portion of the two pivot Christmas tree **510**. This cap **580** would typically be attached to the upper rotating trunk **150** after rotation of the upper rotating trunk **550** and lower rotating trunk **560** relative to the intermediate rotating trunk **540** (along arrows H and **1** of FIG. **32**) but before final rotation of the intermediate rotating trunk **540** (along arrow J of FIGS. **32** and **35**). Typically the cap **580** merely includes a lower tip which can be telescopically received into a hollow bore formed coaxially within the second end **556** of the upper rotating trunk **550**. If required, electrical connections can also be made adjacent this interface so that lights on limbs **570** of the cap **580** can receive power.

[0104] As best seen in FIGS. **32-34**, the two pivot Christmas tree **510** has a relatively short and compact form when in the stored position. A general outline of tips of the limbs **570** are depicted in top plan views (FIGS. **33** and **34**) by circular broken lines generally defining an upper tree portion **590** supported upon the upper rotating trunk **550** and a lower tree portion **600** defined by the limbs extending from the lower rotating trunk **560**.

[0105] In one embodiment, a final deployed Christmas tree (FIG. **36**) of approximately sixteen feet tall can be collapsed into an approximately six foot tall compact package which can be readily handled and transported by a single user. Not only does this two pivot Christmas tree **510** facilitate the simple deployment of an exceptionally large Christmas tree in a simple and fast manner, but also decorations can conceivably be at least partially attached to the two pivot Christmas tree **510** before final rotation of the intermediate rotating trunk **540** (along arrow J of FIG. **35**) so that a user can more easily place ornaments on the Christmas tree before final rotation when at least upper portions of the two pivot Christmas tree **510** on the cap **580** and upper tree portion **590** are not as readily accessed. At a minimum, the cap **580** can be entirely decorated before attachment to the upper rotating trunk **550** and then a single short ladder can be utilized for decoration of the upper tree portion **590** and lower tree portion **200**.

[0106] When re-storage of the two pivot Christmas tree **510** is desired, the steps in deployment are reversed until the two pivot Christmas tree **510** has been transitioned again to its stored configuration (FIG. **32**). Typically, a cover is provided to protect the tree **510** in this collapsed orientation. Handles can also extend up from the base **520** to a convenient height so that a user can maneuver the tree **510** on the wheeled base **520** without pushing directly on the limbs **570** of the tree **510**. Such handles are preferably either removable or collapse down to the base **520** when not in use after the tree **510** is deployed at a particular location.

[0107] FIG. **37** is a side elevation view of a further alternative embodiment of the artificial tree of this disclosure. In this alternative embodiment, an artificial tree **610** is shown. The tree **610** includes a base **620** with a fixed trunk **630** extending vertically up from the base **620**. At an upper end of the fixed trunk **630** a pivot **636** is provided. Uniquely, with this tree **610**, two upper trunks **642**, **644** are provided. Each of the two upper trunks **642**, **644** each rotate about the common pivot joint **636** to attach the upper trunk **642**, **644** to the lower trunk **630**. The first upper trunk **642** includes limbs **652** extending therefrom similar to limbs of previous embodiments. The second upper trunk **644** includes limbs **654** pivotably attached thereto in a manner similar to limbs in embodiments discussed above. Each of the upper trunks **642**, **644** are configured to rotate 180° about the pivot **636**. When in the stored orientation, as shown in FIG. **37**, the upper trunks **642**, **644** are inverted and in an upside down vertically extending orientation.

[0108] The first upper trunk **642** includes a lower end **643** which is elevated in this orientation and an upper end **641** that is lowered in this orientation (FIG. **37**). The second

upper trunk **644** includes a lower end **647** which is elevated in this orientation and an upper end **645** that is lowered in this orientation (FIG. **37**).

[0109] As depicted in FIG. **38**, after rotation of each of the upper trunks **642**, **644** by a full 180°, the limbs **652**, **654** extend outwardly somewhat and the upper ends **641**, **645** of the upper trunks **642**, **644** are at the uppermost position on the tree. FIG. **39** depicts the same tree **610** but from a front view. The two upper trunks **642**, **644** are lined up with the trunk **642** in front of the trunk **644** so that only the trunk **642** can be seen.

[0110] Note that the limbs **652**, **654** are configured with branches extending therefrom. As with previous embodiments described above. With the limbs **652**, **654** and branches in place the upper trunks **642-644** are obscured so that the tree does not appear to have a dual trunk character. Also, a cap would typically be provided with a single central trunk portion. This cap would attach to one of the upper ends **641**, **645** of the upper trunks **642**, **644** or both.

[0111] In FIG. **40** the beginning of the rotation process has begun, with the upper trunk **642** rotated 90° (about arrow K) and half way from its stored position to its deployed position. The upper trunk **644** has not yet been rotated. After the upper trunk **642** has been rotated 180° (along arrow K of FIG. **40**) it will be in its deployed configuration, such as that shown in FIG. **38**. The upper trunk **644** is rotated about arrow L by a full 180° to transition from its stored position to its deployed position, as depicted in FIG. **38**. Typically some form of latch (e.g. C-clamps, straps, cotter pins, etc.) would be provided along the lower trunk **630** to secure the upper trunks **642**, **644** in both the stored and deployed configurations. Other details of this tree **610** can be similar to those described above with previous embodiments.

[0112] This disclosure is provided to demonstrate example embodiments of the invention and modes for practicing the invention. Having thus described the invention in this way, it should be apparent that various different modifications can be made to the example embodiment without departing from the scope and spirit of this invention disclosure. For example, it will be appreciated that the example rotatable coupling **36**, **138** facilitates rotation of the rotating trunk **40** relative to the fixed trunk **30**. But there are many devices capable of providing this relative rotational movement, examples of which are illustrated in subsequent Figures, which are described in the following paragraphs.

[0113] Referring to FIG. **41**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk. The tree **10** illustrated on the left in FIG. **41** shows that the rotating trunk **40** is movable via the pivot **36** from a stored condition **40'** to a deployed condition **40"**.

[0114] In the embodiment illustrated in FIG. **41**, the fixed trunk has a two-pole construction with an arcuate connector portion **160** positioned opposite the base **20**. The pivot **36** includes a T-shaped bracket **162** having one leg that connects to the rotating trunk **40** and another portion that connects to the connector portion **160**. The connection between the bracket **162** and the connector portion **160** permits the bracket to slide along the length of the connector portion and also to rotate about the connector portion. In this manner, the bracket **162** can slide along the connector portion **160** to cause rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**. The bracket can also rotate about the connector portion **160** to move the rotating trunk to a central position relative to the two poles of the fixed trunk, which can lend to the stability of the tree **10**.

[0115] The connector portion **160** can have a round cross-section, in which case the bracket **162** would comprise a simple cylindrical sleeve that permitted both the sliding and rotational movement. The connector portion **160** can also have a shaped cross-section (e.g., polygonal), in which case the bracket **162** would have a mating internal surface (e.g., polygonal) for sliding along the connector portion and also would include some sort of bearing or rotational mechanism (e.g., a sleeve within a sleeve) for permitting the bracket to rotate relative to the connector portion.

[0116] Referring to FIG. **42**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0117] In the embodiment illustrated in FIG. **42**, pivot **36** includes an arcuate connector portion **164** with opposite ends connected to the rotating trunk **40** and a slide element **166** affixed to the end of the fixed trunk **30**. The connector portion **164** extends through the slide element **166** and can slide through the slide element to cause rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**. The connector portion **164** can have a shaped cross-section (e.g., polygonal), in which case the slide element **166** would have a mating internal surface (e.g., polygonal). This way, the connector portion **164** can slide through the slide element **166** but not rotate within the slide element.

[0118] Referring to FIG. **43**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0119] The embodiment of FIG. **43** is similar to the embodiment of FIG. **42** in that the pivot **36** includes an arcuate connector portion **168** and a slide element **170**. In the embodiment of FIG. **43**, the slide element **170** is connected to the rotating trunk **40** and the connector portion **168** is connected to a bracket **172** that is fixed to the upper end of the fixed trunk **30**. The connector portion **168** extends through the slide element **170**, and the slide element can slide along and over the connector portion to cause rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**. The connector portion **168** can have a shaped cross-section (e.g., polygonal), in which case the slide element **170** would have a mating internal surface (e.g., polygonal). This way, the connector portion **168** can slide through the slide element **170** but not rotate within the slide element. The bracket **172** can include a surface S that is angled or otherwise oriented so that a predetermined orientation of the rotating trunk can be selected.

[0120] Referring to FIG. **44**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas

tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0121] In the embodiment of FIG. **44**, the pivot **36** includes a bracket **174** with an arcuate channel that receives a pin **176** connected to the rotating trunk **40**. The arc of the channel is oriented concavely downward. Other orientations, such as upward or sideways could also be implemented. The pin **176** can slide in the channel of the bracket **174**, to cause rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**.

[0122] Referring to FIG. **45**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0123] The pivot **36** of the embodiment of FIG. **45** is similar to the embodiment of FIG. **44**, except that the bracket **174** is connected to the rotating trunk **40** and the pin is fixed to the upper end of the fixed trunk **30**. As shown in FIG. **45**, the arcuate channel of the bracket **174** can be oriented concavely to the left or right. Other orientations, such as upward or downward could also be implemented. The pin **176** can slide in the channel of the bracket **174**, to cause rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**.

[0124] Referring to FIG. **46**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0125] The pivot **36** of the embodiment of FIG. **46** a simple construction including a pin **178** fixed to the rotating trunk **40** that is received in a slot **180** in the fixed trunk **30**. As shown in section A-A in FIG. **46**, the pin **178** can include a shaft and a head that forms an interference with the slot **180** to retain the pin in the slot. In this configuration, the pin **178** can rotate in the slot **180** to facilitate rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**. The pivot **36** can include a locking device, such as a C-shaped, deflectable plastic clamp, that the rotating trunk **40** can be forced into in order to retain the tree **10** in the stored or deployed condition.

[0126] Referring to FIG. **47**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0127] The pivot **36** of the embodiment of FIG. **47** includes a pair of engaging semi- circular gears **182**, one fixed to the fixed trunk **30** and one fixed to the rotating trunk **40**. A rigid link **184**, such as a metal bar or bracket, connected the respective centers of the gears **182**. The gear **182** on the rotating trunk **40** can roll over the gear on the fixed trunk **30**, with the link **184** maintaining the engagement between the gears to cause rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**.

[0128] Referring to FIG. **48**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to and extends vertically from the base. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0129] The pivot **36** of the embodiment of FIG. **48** includes a scissor mechanism **186** that connects the rotating trunk **40** to the fixed trunk **30**. To facilitate movement of the rotating trunk **40** relative to the fixed trunk **30** via the scissor mechanism **186** may require that the connection(s) between the mechanism and the trunks be articulated in some manner, such as a pin and slot connection. In one implementation (to the left in FIG. **48**), the scissor mechanism **186** connects the fixed trunk **30** to the rotating trunk **40**. In another implementation (to the right in FIG. **48**) the scissor mechanism **186** is connected directly to the base **20**. In this instance, a portion of the scissor mechanism **186** forms the fixed trunk **30**. Operation of the scissor mechanism **186** can facilitate rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**.

[0130] Referring to FIG. **49**, the scissor mechanism concept can be used in a different manner. In FIG. **49**, the Christmas tree **10** includes a base **20** and a fixed, non-rotating trunk **30** that is connected to and extends vertically from the base. The Christmas tree **10** also includes a scissor mechanism **188** that is configured to telescope up and down the trunk **30** to thereby raise and lower the lower limbs of the tree so that they can clear the base **20** and floor so that they can be collapsed. Alternatively, the scissor mechanism **188** could be configured to raise and lower the entire tree **10** to make room for placing presents under the tree.

[0131] Referring to FIG. **50**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0132] The pivot **36** of the embodiment of FIG. **47** includes a fixed plate **190** attached to the upper end of the fixed trunk **30** and a rotating plate **192** connected to the rotating trunk **40**. A bearing **194** connects the plates and facilitates rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**. A second fixed plate **190** could be spaced from the first fixed plate, sandwiching the rotating plate **192** and bearing **194** between.

[0133] Referring to FIG. **51**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0134] In the embodiment of FIG. **51**, the fixed trunk **30** and the rotating trunk **40** are about the same length. The rotating trunk **40** is actually two trunks, each including limbs for half of the tree, divided vertically along the fixed trunk line. The rotating trunks **40** can be linked to each other at opposite ends by brackets **192** that form a snap connection

with the fixed trunk. In this manner, the bracket can maintain the tree **10** in the stored or deployed condition, whichever is selected by the user.

[0135] The pivot **36** of the embodiment of FIG. **51** can be any pivot capable of providing rotational movement of the rotating trunk **40** relative to the fixed trunk. In FIG. **51**, the pivot **36** can include a shaft that extends through a bearing or bushing mounted centrally on the fixed trunk **30**. The rotating trunks **40** can be connected to opposite ends of the shaft to facilitate rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**.

[0136] Referring to FIG. **52**, the Christmas tree **10** includes a base **20** and a fixed trunk **30** that is connected to the base and extends vertically therefrom. The Christmas tree **10** also includes a rotating trunk **40** that is connected to the fixed trunk **30** by a pivot **36** that facilitates rotational movement and inversion of the rotating trunk relative to the fixed trunk from a stored condition to a deployed condition.

[0137] In the embodiment of FIG. **52**, the pivot **36** comprises a flexible elastic member **194**, such as a coil spring, leaf spring, an elastomeric polymer, or natural rubber. In this embodiment, the elasticity of the member **194** facilitates rotational movement and inversion of the rotating trunk **40** relative to the fixed trunk **30**. In a rubber or elastomeric polymer construction, the member could have a T-shaped construction configured to include sleeves for receiving the trunks **30**, **40**. In a spring construction, the member **194** can include mechanical connectors, such as brackets and threaded fasteners that connect the trunks **30**, **40** to the spring.

[0138] In view of the foregoing, the trees and methods herein provide an artificial tree which can be easily transitioned from a collapsed orientation to a deployed orientation. For example, this disclosure provides a Christmas tree which is easy to store in a collapsed form and easy to deploy when to be used. This disclosure also provides a Christmas tree which can be transitioned from a collapsed form to a deployed form without requiring high strength or dexterity. This disclosure also provides a Christmas tree which can be transitioned between a collapsed and a deployed configuration without damage to the Christmas tree. This disclosure also provides a Christmas tree which can be readily transitioned between a collapsed and a deployed position with lights associated with the Christmas tree remaining coupled to various different portions of the Christmas tree both in the collapsed and the deployed configuration.

[0139] This disclosure also provides a Christmas tree which can be set up quickly, including a method for transitioning an artificial Christmas tree from a collapsed configuration to a deployed configuration. The artificial tree can be inverted between an upside down storage position and a right side up deployed position.

[0140] This disclosure also provides a cover for an artificial Christmas tree that can be inverted with the Christmas tree during set-up of the tree. This disclosure also provides an artificial tree with one fixed trunk portion extending up from a base on the ground and multiple rotating trunk portions that rotate at least somewhat independently to provide multiple levels of a large artificial tree when rotated into a deployed position.

[0141] What have been described above are examples. It is, of course, not possible to describe every conceivable combination of components or methodologies, but one of ordinary skill in the art will recognize that many further combinations and permutations are possible. Accordingly, the invention is intended to embrace all such alterations, modifications, and variations that fall within the scope of this application, including the appended claims. As used herein, the term "includes" means includes but not limited to, the term "including" means including but not limited to. The term "based on" means based at least in part on. Additionally, where the disclosure or claims recite "a," "an," "a first," or "another" element, or the equivalent thereof, it should be interpreted to include one or more than one such element, neither requiring nor excluding two or more such elements.

What is claimed is:

1. An artificial Christmas tree comprising:

a trunk comprising at least two trunk portions including a first trunk portion adapted to be supported above a floor by a base and at least one second trunk portion rotatably attached to the first trunk portion, at least indirectly, through at least one rotatable coupling, the first trunk portion extending from a lower end to an upper end with the rotatable coupling located closer to the upper end than to the lower end and typically adjacent the upper end;

limbs rotatably attached to the first trunk for automatic deployment of the limbs of the Christmas tree upon inversion of the Christmas tree from a collapsed orientation to a deployed orientation; and

a clasp to selectively secure the at least one second trunk portion in the deployed orientation to avoid inadvertently inverting the at least one second trunk portion after deployment thereof.

2. The tree of claim **1**, wherein the rotatable coupling further comprises:

an arcuate connector portion first to the first trunk portion and positioned opposite the base; and

a T-shaped bracket having one leg that connects to the second trunk and another portion that connects to the connector portion.

3. The tree of claim **1**, wherein the rotatable coupling further comprises:

an arcuate connector portion with opposite ends connected to the second trunk and a slide element affixed to the end of the first trunk,

the connector portion extends through the slide element and can slide through the slide element to cause rotational movement and inversion of the second trunk relative to the first trunk.

4. The tree of claim **1**, wherein the rotatable coupling further comprises:

an arcuate connector portion and a slide element, the slide element is connected to the second trunk and the connector portion is connected to a bracket that is fixed to the upper end of the first trunk, the connector portion extends through the slide element, and the slide element is slidable along and over the connector portion to cause rotational movement and inversion of the second trunk relative to the first trunk.

5. The tree of claim **1**, wherein the rotatable coupling further comprises:

a bracket with an arcuate channel that receives a pin connected to the second trunk, the pin is slidable in the channel of the bracket to cause rotational movement and inversion of the second trunk relative to the first trunk.

6. The tree of claim **1**, wherein the rotatable coupling further comprises:

a pin fixed to the second trunk that is received in a slot in the first trunk, the pin can include a shaft and a head that forms an interference with the slot to retain the pin in the slot, the pin is rotatable in the slot to facilitate rotational movement and inversion of the second trunk relative to the first trunk.

7. The tree of claim **1**, wherein the rotatable coupling further comprises:

a pair of engaging semi-circular gears, one fixed to the first trunk and another fixed to the second trunk, a rigid link connected the respective centers of the gears.

8. The tree of claim **1**, wherein the rotatable coupling further comprises a scissor mechanism **186** that connects the second trunk to the first trunk.

9. The tree of claim **1**, wherein the rotatable coupling further comprises:

a fixed plate attached to the upper end of the first trunk and a rotating plate connected to the second trunk; and

a bearing connects the plates to facilitates rotational movement and inversion of the second trunk relative to the first trunk.

10. The tree of claim **1**, further comprising a wheeled base is to further facilitate deployment of the artificial tree.

11. The tree of claim **1**, further comprising a top cap removably attachable to the second end of the second trunk portion to provide an uppermost portion of the tree.

* * * * *