(54) Title: ARTIFICIAL TREE HAVING RETRACTABLE PARTS

(57) Abstract: An artificial tree comprising: a base (12); a telescoping trunk comprising a plurality of trunk portions (14a-d), wherein said trunk is retractable to locate in a first of the trunk portions the other one or more of the trunk portions; a plurality of branch means (10b-d) each coupled at an end thereof to the other of the trunk portions and in an outwardly directed position when the trunk is extended, wherein the trunk portions are spaced and the branch means can be moved from the outwardly directed position so that, when the trunk is retracted, each branch means is disposed within the first trunk portion.

FIG. 1A
Designated States (unless otherwise indicated, for every kind of regional protection available): 

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ARTIFICIAL TREE HAVING RETRACTABLE PARTS

Field of the Invention

The invention relates to an artificial tree.

Background

Artificial trees are typically large. Large spaces are needed for their storage and transportation. Such trees, particularly artificial Christmas trees, are often used only for short periods of time and then must be stored during the rest of the year.

An attempt has been made to reduce the volume of space needed for storage. WO2005/023062 discloses an artificial tree having an erectable telescoping centre pole attached to a base. The centre pole can be extended or retracted by a drive mechanism operable by a user. The tree also has multiple curvilinear elements of graduated diameter attached to the top of the centre pole, which are vertically spaced when the centre pole is extended, and where the diameter of the elements graduates in inverse proportion to the distance from the base. Circumferentially spaced branches are attached to the elements and extend radially therefrom. It is an object of the present invention to improve upon the disclosed artificial tree to further reduce the volume of space required for storage and transportation.

Summary of the Invention

In accordance with a first aspect of the present invention, there is provided an artificial tree comprising: a telescoping trunk comprising a plurality of trunk portions, wherein said trunk is retractable to locate in a first of the trunk portions the other one or more of the trunk portions; a plurality of branch means each coupled at an end thereof to the other of the trunk portions and in an outwardly directed position when the trunk is extended, wherein the trunk portions are spaced and the branch means can be moved from the outwardly directed position so that, when the trunk is retracted, each branch means is disposed within the first trunk portion.
Thus, advantageously, the other trunk portions and the branch means can be stored nested in the first trunk portion. Thus, the tree can be reduced in size to the size of the first trunk portion and a base. This facilitates storage and transportation, noting that shipping is typically charged by volume and not by weight. The tree, when retracted, is significantly more compact than the tree described in WO2005/023062. Also, there is no need for curvilinear elements, which are of course not a feature of a natural tree.

The branch means may be fragile. The existence of a trunk portion around the branches when the trunk is retracted protects the branch means from damage during storage or transportation.

The other one or more trunk portion may comprise a last trunk portion, the first trunk portion having a larger diameter than the last trunk portion. The other one or more trunk portion may further comprise at least one intermediate trunk portion, the at least one intermediate trunk portion having a larger diameter than the last trunk portion and a lesser diameter than the first trunk portion and, if the at least one intermediate trunk portion comprises a plurality of trunk portions, each adjacent intermediate trunk portion between the first trunk portion and the last trunk portion having sequentially lesser diameter. Preferably, the diameter of the trunk portions graduates in inverse proportion to their distance from the base. The number and length of trunk portions can be selected in dependence on the desired height of the tree and the length of the branch means.

Preferably, each trunk portion may comprise a first end and a second end, the first end being located remote from the base with respect to the second end, wherein each of the first and the intermediate trunk portions comprises a stopper means located at the first end thereof, and each of the intermediate and last trunk portions comprise a catch means at a second end thereof, wherein the stopper means and the catch means are respectively configured to cooperate to define a maximum extent to which the intermediate and last trunk portions can respectively extend from the first and intermediate trunk portions. Advantageously, the result of this is that lifting of the last trunk portion causes the intermediate trunk portions to sequentially extend from the first trunk portion.
Each stopper means may comprise a first annular flange portion extending inwardly from an inner surface of the respective trunk portion, and each catch means comprises a second annular flange portion extending outwardly from an outer surface of the respective trunk portion.

Preferably, each of the intermediate and last trunk portions comprise tilt limiting means arranged to extend radially outwardly from the intermediate and last trunk portions and to fit substantially flush against an inner surface of an adjacent outer one of the first and intermediate trunk portions. This improves the stability of tree when erected and prevent or limits tilt. Preferably the degree of tilt of the trunk from vertical is less than 2.5 degrees.

The tilt limiting means may comprise first and second spaced flanges arranged to extend radially outwardly from the intermediate and last trunk portions and to fit flush against an inner surface of an adjacent outer one of the first and intermediate trunk portions. Each of the first and second spaced flanges may be annular.

The second annular flange portion and said catch means may advantageously be formed of the same piece.

Each branch means is mounted on its respective trunk portion to permit movement between an outwardly directed position and an upwardly directed position against the respective trunk portion, wherein when the trunk is retracted the branch means are in the upwardly directly position. The retraction of the branch means of a trunk portion into the adjacent lower trunk portion thus avoids any snagging with external objects and with each other.

The branch means are preferably biased to move or fall towards the outwardly directed position. This means that, as the trunk extended, the branch means move to the positions necessary to mimic the appearance of a natural tree. This prevents need to extend the branch means manually.

Preferably, edges of at least one of the intermediate and last trunk portions are
chamfered. Since there may be wobble on movement of the intermediate and last trunk portions out of, respectively, the first and intermediate trunk portions when the trunk is extending, the chamfered edges prevent, or at least reduces risk of, snagging of the first ends on the stopper means.

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The artificial tree may further comprise means for releasably preventing retraction of the trunk when extended.

The artificial tree may further comprise drive means operable to extend said trunk. Said drive means may be operable to extend and to retract said trunk, and to prevent retraction of the trunk when the trunk is at least partially extended other than on operation thereof. Preferably, said drive means comprises a linear actuator operable to lift the last trunk portion, whereby lifting of the last trunk portion causes lifting of the intermediate portions.

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The artificial tree may be in an erected configuration when the trunk is extended and the branch means are outwardly directed, and in a storage configuration when the trunk is retracted. Preferably, the trunk portions are coaxial.

20 Each branch means may comprise a rigid elongate member and a decorative portion extending around said member. Alternatively, the tree may further comprise a sleeve means, wherein each branch means comprises a rigid elongate member and one end of the elongate member is coupled at one end thereof to the other of the trunk portions and is in an outwardly directed position when the trunk is extended. In this case, the sleeve means is locatable over the member and removable therefrom when the member is in the outwardly directed position.

25 One or more branch means may include magnetic material for attracting material in detachable decoration.

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**Brief Description of the Figures**
For better understanding of the present invention, embodiments will now be described, by way of example only, with reference to the accompanying Figures in which:

Figure 1A is a cross-sectional view of the artificial tree in an erected configuration;

Figure 1B is a cross-sectional view of the artificial tree in a collapsed configuration;

Figure 2A is a magnified view of parts of the artificial tree in the erected configuration shown in Figure 1A;

Figure 2B is a magnified view of parts of the artificial tree in the collapsed configuration shown in Figure 1B;

Figure 3A is a cross-sectional view of parts of the artificial tree in the erected configuration as shown in Figure 2A, with Figure 3B being adjacent indicate tolerance required in sizes of parts to avoid undue tilt;

Figures 4A and 4B are cross-sectional views of parts of the artificial tree when the tree is in an erected configuration for better understanding of how undue tilt is avoided; and

Figure 5 is a cross-sectional view of parts of the artificial tree when in the collapsed configuration, including a first end of a last of the trunk segment.

**Detailed Description of Embodiments**

Certain terminology will be used in the following description for convenience and reference only, and is not limiting. For example, a tree has a conventional orientation and the words "vertical", "lower" and "upper" are to be construed in view of that orientation. The words "inward" and "outward" and related adverbs refer to directions towards and away from, respectively, the central axis of the trunk or relevant part of the tree.

Referring to Figures 1A and 1B, in an embodiment an artificial tree comprises a telescoping trunk, a plurality of branches 1Ob-d each attached at one end thereof to the trunk, a base 12, and a drive mechanism. The telescoping trunk comprises a plurality of trunk segments 14a-d. As will be described in detail, the tree is reconfigurable to
an erected configuration, in which the trunk is extended and the branches 10 b-d extend outwardly as shown in Figure 1A, and a collapsed configuration in which the trunk is retracted and the branches 10b-10d are located inside a first, lowermost one of the trunk segments 14a, as shown in Figure 1B.

5 The trunk segments comprise the first trunk segment 14a, intermediate trunk segments, and a last trunk segment 14d. The first trunk segment 14a is fixed to and extends vertically from the base 12. The intermediate trunk segments comprise a second trunk segment 14b sized to fit inside the first trunk segment 14a and a third trunk segment 14c sized to fit inside the second trunk segment 14b. The last trunk segment 14d is sized to fit inside the third trunk segment 14c. The last trunk segment 14d, the branches of the last trunk segment 14d, and parts of the third trunk segment 14c are shown in greater detail in Figure 2A when extended and in Figure 2B when the last trunk segment 14d is retracted in the third trunk segment 14c.

15 It will be appreciated by the skilled person that, while in the present embodiment the trunk comprises two intermediate trunk segments 14b, 14c, the trunk may be modified to comprise greater or fewer trunk segments. For example, in variant implementations, there are between three and six trunk segments, the actual number depending on the desired height of the tree, amongst other factors. The number of intermediate trunk segments can be chosen in dependence on the desired height of the artificial tree. Each trunk segment may be substantially in the form of a cylinder so that when erected the trunk mimics the shape of a natural trunk. Alternatively, each trunk portion may be in the form of a frame, which results in the weight of the tree being reduced.

Each trunk segment 14a-d has first and second ends, the first end being the end located nearer the base 12 and the second end being the end located remote from the base 12. Each of the first and intermediate trunk segments 14a-c has an annular stopper 18a-c located near the second end thereof, extending radially inwardly from an inner surface of the respective trunk segment 14a-c. The annular stopper 18a-c can be formed with the respective trunk segment, for example of a plastics material in an injection moulding process, or can be formed separated and connected to the trunk segment. In the latter case, the trunk segment and the annular stopper 18a-c may be
adapted so that the annular stopper 18a-c can be connected to the trunk segment in a snap-fit action.

Each of the intermediate and last trunk segments 14b-d has a first and a second spaced annular members 20b-d, 22b-d extending outwardly near second ends thereof. The annular stoppers 18 and the first annular members 20b-d are respectively sized to abut against each other when the intermediate and last trunk segments 14b-d are extended from the first and intermediate trunk segments 14a-c, thereby to prevent adjacent trunk segments detaching.

In a variant embodiment, the stopper 18a-c may be in the form of a soft-shouldered ridge, still configured in relation to the first annular member 20b-d to prevent adjacent trunk segments detaching. In another variant embodiment, the stopper 18a-c is in the form of a stud protruding radially inwardly from the inner surface of each trunk segment 14a-c. In another variant embodiment, the stopper 18a-c is in the form of one or more pins protruding radially inwardly from the inner surface of each trunk segment 14a-c. In all these variant embodiments, any snagging of branches on the stopper 18a-c as the trunk is extended may advantageously be avoided.

The first annular member 20b-d also serve a second function together with the second annular member 22b-d. The size and spacing of the first and second annular members prevents undue tilt of the trunk. This is illustrated by comparison of the trunk segments shown in Figures 3A and 3B. In Figure 3A, the size and spacing of the first and second annular members 20c, 22c are sized and spaced to prevent tilt, that is, they each have diameter closely corresponding to the inner diameter of the third trunk segment 20c. In Figure 3B, the tilt is only 2.5 degrees, but is immediately evident visually. The diameters of the first and second annular members 20c, 22c are sufficiently small in diameter relative to the inner diameter of the third step segment 20c that unsatisfactory tilt occurs.

A distance between the outer circumference of each of the first and second annular members 20b-d, 22b-d and the inner surface of the adjacent outer/lower trunk segment must therefore be less than a permitted distance, which takes into consideration the spacing of the first and second annular members 20c, 22c. For
example, where the contact points at indicated at A and B in Figure 3B, an offset between each annular member 20c, 22c and the inner surface is equal to the mean clearance when the trunk segment on which the first and second annular members 20d, 22d are mounted is straight. If the spacing between the annular members 20d, 22d is 50mm, then for to achieve a tilt angle of 2.5 degrees as shown, the mean clearance must not exceed: 50 x TAN(2.5degs) = 2.18mm. Accordingly, preferably the mean clearance is less than 2.18 mm, such that the tilt angle is less than 2.5 degrees.

This distance of mean clearance is indicated at A in Figures 4A and 4B, Figure 4A indicating the distance between the first and second annular members 20d, 22d of the last trunk segment 14d and the inner surface of the third trunk segment 14c, and Figure 4B indicating the distance between the first and second annular members of either of the intermediate trunk segments 14b, 14c and the inner surface of the respective adjacent lower/outer trunk segment 14a, 14b.

As shown in Figure 5, the first end of the last trunk segment 14d may be modified to have chamfered edges 28. This prevents or at least reduces likelihood of snagging of the first end of the last trunk segment 14d on the annular stopper 18c of the third trunk segment 14c. Similarly, the first ends of the intermediate segments 14b, 14c may have chamfered edges.

Each of the intermediate and last trunk segments 14b-d has a set of branches extending from it. Although in the Figures, each of the intermediate and last trunk segments 14b-d has a set of two branches, this is for illustration only - each of these trunk segments 14b-d, and in variant embodiments other intermediate trunk segments, in reality has a greater number of branches to mimic the appearance of a tree. For example, each intermediate trunk segment may have a set of six, seven or eight attached branches extending from it. Preferably, the branches of a set are equispaced around the respective trunk segment.

Each branch 10b-d is mounted on its respective trunk segment, to be moveable between an upwardly directed position in which the branch is located against the trunk segment and an outwardly extended position in which the branch extends
outwardly away from the respective trunk segment. In the outwardly extended position, the branch extends approximately perpendicularly relative to the trunk segment, although as will be appreciated, since the intention is for the branches to mimic in appearance branches of a natural tree, the precise angle of extension is unimportant.

The branches IOb-d are configured to flop towards the outwardly extending position, so that when the trunk is extended, the branches IOb-d move or fall into the outwardly extending position. To this end, each branch is flexibly attached to the respective trunk segment. The flexibly may be achieved by the branches being formed of a soft plastics material, at least at the end attached to the trunk segment. Optionally, fabric or felt may be attached to the plastic for improved aesthetics. The plastics material may be injection moulded. The branches may be formed of plastic sheeting. For example, plastic sheeting, optionally of various shades of green, may be punched or cut into slim pieces or strips and then bundled in a cylindrical wire wrapper. Alternatively, such pieces or strips may be clipped or adhered into injection-molded branch stalks for reduced weight. In variant embodiments, the branches may be formed of other materials.

Angle limiting means in the form of a tether limits the angle to which the branch can flop. The tether is in the form of a thread (not shown) attached at one end to a mid-region of the branch and at another end to an upper part of the respective trunk segment.

In variant embodiments, alternative forms of angle limiting means may be provided. For example, in a variant embodiment, the branches are pivotably attached to the respective trunk segments. This attachment may be achieved by mechanical means, for example by rotatable attachment of each branch to a respective horizontal pin in the corresponding trunk segment near the lower part of the trunk segment. The pin permits movement between the outwardly directed position and an upwardly extending position.

In another variant embodiment, an annular obstructing ring (not shown) extends radially from the trunk segment to which a branch is attached, and the branch rests
upon it when in the outwardly extended position. In a variant embodiment, an annular surface such as is provided by such an obstructing ring is provided by the upper end of the next outer one of the trunk segments to the trunk segment to which a branch is attached. In this case, the position on the trunk segment to which the branch is attached is selected so that the branch rests on said upper end portion.

In a variant embodiment, the branches 10b-d do not move in a flopping action, but are, at least in the vicinity of a join to the respective trunk segment, formed of resilient material and are biased to spring to the outwardly extending position. Such branches are self-supporting and thus a tether is not required.

The first trunk segment 14a does not have any branches extending from it. This reflects the fact that natural trees tend not to have branches near their base. Of course, in variant embodiments the first trunk segment 14a may have branches extending from it.

The drive mechanism comprises an electrically driven linear actuator 24 located in the base 12 connectable for operation to an electric power supply. The actuator comprising an actuating rod 26 having a free end attached to the last trunk segment 14d and operable to lift the last trunk segment 14d. The actuator 26 is arranged to prevent retraction of the trunk when extended other than by operation thereof. In variant embodiments, the drive mechanism may be located in the first trunk segment. In this case, a base may not be included, or may comprise support struts extending radially from the outside of the first trunk segment to abut against the underlying floor and provide support for the erected tree.

The linear actuator may be in the form of an electric motor, a spool and an actuating rod in the form of a nylon rod. The nylon rod is about 2.0-2.5mm in diameter, with sufficient flexibility that it can be wound onto the spool, which coupled to an electric motor. The nylon rod is substantially incompressible. The electric motor includes a worm-drive gear reduction mechanism to reduce the rotary speed at which the spool is rotated relative to a drive shaft of the electric motor. The electric motor drives winding and unwinding of the spool. The nylon rod is effective to push the last trunk
segment 14d, thereby to lift it. Although the nylon rod winds around the spool, it is sufficiently inflexible to not collapse when lifting the last trunk segment.

In an alternative embodiment, a manually operated linear actuator may be provided in place of the electrically driven linear actuator 24, operable to lift the last trunk segment 14d.

In operation, where the artificial tree is initially in a collapsed configuration in which the trunk is retracted and the branches are thus located inside the first trunk segment 14a, the drive mechanism is operated to extend the actuating rod 26. The actuating rod 26 is then caused to extend, thereby lifting the last trunk segment 14d. After the last trunk segment 14d has been lifted to a predetermined extent, the first annular member 20d thereof abuts against the annular stopper 18c of the adjacent one 14c of the intermediate segments. After the set of branches 10d attached to the last trunk segment 14d come free from the restraint of the adjacent intermediate segment 14c, each branch 10d springs from the upwardly directed position to the outwardly extended position.

Continued extension of the actuating rod 26 causes the last intermediate trunk segment 14d to lift the adjacent one 14c of the intermediate trunk segments. After the set of branches 10c attached to this adjacent trunk segment 14c come free from the restraint of the next adjacent intermediate segment 14b, each branch 10c springs from the upwardly directed position to the outwardly extended position.

When this intermediate (third) trunk segment 14c has been lifted to a predetermined extent so that the first annular member 20d thereof abuts against the annular stopper 18b of the next adjacent one (second) 14b of the intermediate segments, continued extension of the actuating rod 26 causes this (third) intermediate trunk segment 14c to lift the adjacent one (second) 14b of the intermediate trunk segments. This (second) intermediate trunk segment is lifted until the first annular member 20b thereof abuts the annular stopper 18a of the first trunk segment 14a.

In embodiments in which there are greater than two intermediate trunk segments, the lifting process continues so that each intermediate trunk segment is lifted until a first
annular member of a one of the intermediate trunk segments adjacent the last trunk segment 14a abuts the annular stopper 18a of the first trunk segment 14a. Since the first trunk segment 14a is attached to the base 12, further extension is prevented. The trunk is thus fully extended.

Tilt of the trunk is limited or prevented by a combination of the first and second annular members 20b-d, 22b-d.

Where the artificial tree is to be collapsed, the drive mechanism is operated accordingly. The actuating rod 26 thus retracts, and draws the last trunk segment 14d towards the base 12. The intermediate and last trunk segments 14b-d are thus retracted into the first trunk segment 14a. As each of the intermediate and last trunk segments 14b-d moves into a respective adjacent one of the intermediate and first trunk segments 14a-c, the set of branches 10b-d of each of the intermediate and last trunk segments 14b-d abuts against the first end of respective adjacent intermediate and first trunk segments 14a-c. The branches 10b-d of each set are then flexed to the upwardly directed position against the trunk segment 14b-d to which they are attached. Each set of branches is drawn into the adjacent intermediate and first trunk segments 14a-c through the respective first end thereof together with the trunk segment 14b-d to which the branches are attached.

When the tree is in a collapsed configuration with the trunk retracted, the trunk segments 14a-d are coaxial with each set of branches located between the trunk segment 14b-d to which set of branches are attached, and an adjacent, outer one of the trunk segments 14b-d.

Although not essential, the trunk segments 14a-d have a circular cross-section. In variant embodiments they may have square, rectangular, oval, triangular or other shaped cross-sections.

The trunk segments 14a-d and the base may be formed of plastics material by injection moulding. In constructing the artificial tree, the branches are attached to the respective trunk segments. The trunk segments are then located within one another,
each trunk segment being inserted through the second end of the adjacent lower/outer trunk segment. The first trunk segment 14a is then attached to the base 12.

It is to be noted that the first and intermediate trunk segments 14a-c form sheaths around the branches of, respectively, the intermediate and last trunk segments 14b-d when the trunk is retracted. The particular material of which the trunk segments is formed is not essential to the invention, but preferably they are formed of a solid material, that is, a material largely without holes, thereby to prevent tangling of different sets of branches.

In another variant embodiment, each branch 10a-d does not have fabric or decoration on. Instead, the branches are simply in the form of rods. After the tree has been erected, separate outer sleeves can be slipped over the branches. One end of the outer sleeves is open to enable slipping over the rods and the other end is preferably closed for the sake of appearance. The sleeves provide the branches with suitable aesthetic appearance. For example, the sleeves may be formed of green fabric, although other materials and colours may be suitable. Each sleeve may be attached to a corresponding branch using a suitable attachment means. For example the outer sleeves may be provided with clips to enable such attachment. Alternatively, the sleeves may be attached using magnets. Alternatively, where the branches are upwardly inclined, the outer sleeves may stay in place once located over the branches under gravity. Before the branches can be retracted, the outer sleeves are removed. An advantage of this variant embodiment is that a potential issue of snagging of the branches when the branches are being retracted is avoided.

In any of the embodiments mentioned above, one or more branches may include magnetic material to enable decoration capable or being attracted by the magnetic material to be attached. Such decoration may include baubles, tinsel attached to wire and lighting. The magnetic material may be in the form of strip extending along the branch.

Preferably, at least one branch includes a scent diffuser. Such a branch includes an outlet to allow the scent to diffuse into ambient air. Many ways to implement a scent diffuser are known in the art. Scent diffusers may be powered or unpowered. Where a
scent diffuser is powered, wiring may be provided extending through the trunk portions to the base, in which a connection is provided to a mains electricity supply. Alternatively, one or more batteries may be located in the same branch as a scent diffuser, to power the diffuser. Whether the scent diffuser is powered or unpowered, the branch may be configured to enable a user to replace scented material such as liquid, powder, gels or capsules, when scented material is used up. The scent diffuser may have multiple scent options and include a switch to enable selection of each option.

Alternatively, rather than being located in a branch, such a scent diffuser may be located in one of the trunk segments 14a-d. The scent diffuser can then be retracted with the segment when the tree is collapsed. Preferably, the scent diffuser may be located in an upper trunk segment, so that it can be easily reached.

It will be appreciated by persons skilled in the art that various modifications are possible to the embodiments. For example, the trunk may be detachably attachable to the base 12.

The applicant hereby discloses in isolation each individual feature or step described herein and any combination of two or more such features, to the extent that such features or steps or combinations of features and/or steps are capable of being carried out based on the present specification as a whole in the light of the common general knowledge of a person skilled in the art, irrespective of whether such features or steps or combinations of features and/or steps solve any problems disclosed herein, and without limitation to the scope of the claims. The applicant indicates that aspects of the present invention may consist of any such individual feature or step or combination of features and/or steps. In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention.
CLAIMS

1. An artificial tree comprising:
   a telescoping trunk comprising a plurality of trunk portions, wherein said trunk
   is retractable to locate in a first of the trunk portions the other one or more of the trunk portions;
   a plurality of branch means each coupled at an end thereof to the other of the trunk portions and in an outwardly directed position when the trunk is extended, wherein the trunk portions are spaced and the branch means can be moved from the outwardly directed position so that, when the trunk is retracted, each branch means is disposed within the first trunk portion.

2. The artificial tree of claim 1, wherein, when the trunk is retracted, each branch means is disposed between the trunk portion to which the branch means is coupled, and a next outer one of the trunk portions.

3. The artificial tree of claim 1 or claim 2, wherein the other one or more trunk portion comprises a last trunk portion, the first trunk portion having a larger diameter than the last trunk portion.

4. The artificial tree of claim 3, wherein the other one or more trunk portion further comprises at least one intermediate trunk portion, the at least one intermediate trunk portion having a larger diameter than the last trunk portion and a lesser diameter than the first trunk portion and, if the at least one intermediate trunk portion comprises a plurality of trunk portions, each adjacent intermediate trunk portion between the first trunk portion and the last trunk portion having sequentially lesser diameter.

5. The artificial tree of claim 4, wherein each trunk portion comprises a first end and a second end, the first end being located remote from the base with respect to the second end, wherein each of the first and the intermediate trunk portions comprises a stopper means located at the first end thereof, and each of the intermediate and last trunk portions comprise a catch means at a second end thereof, wherein the stopper means and the catch means are respectively configured to cooperate to define a
maximum extent to which the intermediate and last trunk portions can respectively extend from the first and intermediate trunk portions.

6. The artificial tree of claim 5, wherein each stopper means comprises a first annular flange portion extending inwardly from an inner surface of the respective trunk portion, and each catch means comprises a second annular flange portion extending outwardly from an outer surface of the respective trunk portion.

7. The artificial tree of any one of the preceding claims, wherein each of the intermediate and last trunk portions comprise tilt limiting means arranged to extend radially outwardly from the intermediate and last trunk portions and to fit against an inner surface of an adjacent outer one of the first and intermediate trunk portions, thereby to limit tilt.

8. The artificial tree of claim 7, wherein the tilt limiting means comprises first and second spaced flanges arranged to extend radially outwardly from each of the intermediate and last trunk portions and to fit against an inner surface of an adjacent outer one of the first and intermediate trunk portions, thereby to limit tilt.

9. The artificial tree of claim 8, wherein each of the first and second spaced flanges are annular, extending circumferentially around the respective trunk portion.

10. The artificial tree of any one of claims 7 to 9 when dependent at least on claim 4, wherein said second annular flange portion and said catch means are formed of the same piece.

11. The artificial tree of any one of the preceding claims, wherein each branch means is moveably coupled to a one of the one or more other trunk portion, to permit movement between an outwardly direction position and an upwardly directed position against the respective trunk portion, wherein when the trunk is retracted the branch means are each in the upwardly directly position.

12. The artificial tree of claim 11, wherein each branch means is biased towards the outwardly directed position.
13. The artificial tree of any one of the preceding claims, further comprising means for releasably preventing retraction of the trunk when extended.

14. The artificial tree of any one of the preceding claims, further comprising drive means operable to extend said trunk.

15. The artificial tree of claim 14 when dependent on claim 13, wherein said drive means is operable to extend and to retract said trunk, and to prevent retraction of the trunk when the trunk is at least partially extended other than on operation thereof.

16. The artificial tree of claim 15 or claim 14, wherein the drive means comprises a linear actuator operable to lift the last trunk portion, whereby lifting of the last trunk portion causes lifting of the intermediate portions.

17. The artificial tree of any one of the preceding claims, wherein each branch means comprises a rigid elongate member and a decorative portion extending around said member.

18. The artificial tree of any one of the preceding claims, further comprising a sleeve means, wherein each branch means comprises a rigid elongate member and one end of the elongate member is coupled at one end thereof to the other of the trunk portions and is in an outwardly directed position when the trunk is extended, wherein the sleeve means is locatable over the member and removable therefrom when the member is in the outwardly directed position.

19. The artificial tree of any one of the preceding claims, wherein one or more branch means includes magnetic material for attracting material in detachable decoration.

20. The artificial tree of any one of the preceding claims, further comprising a scent diffuser.
21. The artificial tree of claim 20, wherein the scent diffuser is connectable to a mains electricity supply through the trunk of the artificial tree.

22. An artificial tree comprising a scent diffuser.

23. The artificial tree of claim 21, wherein the scent diffuser is connectable to a mains electricity supply through a trunk of the artificial tree.

24. The artificial tree of claim 21, wherein the scent diffuser is connected to a battery located within the artificial tree.

25. An artificial tree substantially as hereinbefore described with reference to the accompanying drawings.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47G33/06
ADD. A41G1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47G A41G A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>X</td>
<td>US 2011/198409 A1 (GORMAN) 18 August 2011 (2011-08-18) paragraphs [0031], [0032]; figures 3, 4</td>
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<td>A</td>
<td>US 3 532 874 A (ROSENAST) 6 October 1970 (1970-10-06) column 3, line 40 - line 45; figures</td>
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<td>JP 2002 146613 A (SEIKO EPSON CORP) 22 May 2002 (2002-05-22) figures</td>
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Further documents are listed in the continuation of Box C.

See patent family annex.

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