

(19)



(11)

EP 2 580 396 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

13.08.2014 Bulletin 2014/33

(21) Application number: **11731478.1**

(22) Date of filing: **08.06.2011**

(51) Int Cl.:

E02D 5/80 (2006.01)

(86) International application number:

PCT/GB2011/051071

(87) International publication number:

WO 2011/154734 (15.12.2011 Gazette 2011/50)

(54) **ANCHOR APPARATUS**

ANKERVORRICHTUNG

DISPOSITIF D'ANCRAGE

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **08.06.2010 GB 201009563**

(43) Date of publication of application:

17.04.2013 Bulletin 2013/16

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Description

[0001] The present invention relates to an anchor apparatus and particularly to a ground anchor apparatus for anchoring an object such as a park bench or a tree root-ball.

[0002] A ground anchor is used to secure an object at a particular location, to prevent theft or vandalism or to prevent the object being dislodged, by high winds for example. Objects such as benches, children's play equipment, litter bins, root-balled trees and outdoor seating are amongst those that might require ground anchoring. A commonly used ground anchor is a metal device with an attachment point for a shaft and an aperture for engaging a drive rod. The drive rod is used to drive the anchor and shaft mechanically into the ground. Once the anchor is in position, a pulling force is applied to the shaft to move the anchor into a locked orientation so that the anchor can apply a restraining force to an aboveground object secured to the shaft. These traditional anchors are formed from metal so that they can withstand the drive forces required to drive the device into the ground.

[0003] A particular disadvantage of traditional metal anchors is that, during installation, they can cause damage to underground utilities, such as water pipes and fibre optic cables. Since the metal anchors are electrically conductive, they also pose a safety risk to personnel during installation. The present invention seeks to provide a ground anchor that is easy to install and, in particular, reduces the risk of damage to underground utilities during installation. An anchor apparatus according to the preamble of claim 1 is disclosed by US 20090041548, which minimizes damage to underground strands.

[0004] According to the present invention there is provided an anchor apparatus for use underground according to claim 1.

[0005] Preferably, the anchor apparatus further comprises an attachment fin.

[0006] According to the invention, the apparatus further comprises a drive collar for receiving a drive rod. The drive collar is a hollow, truncated cylindrical element preferably having a tapered base and a truncating plane oblique to the base.

[0007] In one embodiment, the anchor body comprises four deflecting ribs approximately uniformly spaced with respect to the generally conical nose portion.

[0008] Advantageously, the anchor body is formed from plastics. Optionally, the anchor body is formed from biodegradable plastics.

[0009] The above and other aspects of the present invention will now be described in further detail, by way of example only, with reference to the accompanying figures, in which:

Figure 1 is a perspective view of an embodiment of an anchor body of an anchor apparatus in accordance with the present invention;

Figure 2 is a cross sectional view of the embodiment

of Figure 1;

Figure 3 is a perspective view of an embodiment of a drive collar of an anchor apparatus in accordance with the present invention;

Figure 4 is a partial cross-sectional view of the embodiment of Figure 3 in use with a drive rod;

Figure 5 is cross-sectional view of the embodiment of Figure 1, in use, in a drive orientation with the drive collar of Figure 3; and

Figure 6 is a cross-sectional view of the embodiment of Figure 5 in a locked orientation.

[0010] Figures 1 and 2 show a ground anchor apparatus including an anchor body 10 having four deflector ribs 11, a drive aperture 12, an oblique flange 15 and an attachment fin 13. Anchor body 10 is a generally cylindrical element with a rounded conical segment at one end and drive aperture 12 at an opposite end. Deflector ribs 11 are arcuate elements that project radially outwards from anchor body 10 and intersect at a point adjacent the rounded conical segment of body 10 to form a pointed nose section 14. Ribs 11 are equally spaced around the circumference of anchor body 10 (Figure 2). Attachment fin 13, positioned on the cylindrical part of anchor body 10, has an aperture for connection to a linkage shaft, as will be described below.

[0011] Figure 3 shows a drive collar 16 engagable with flange 15 of anchor body 10. Drive collar 16 is a hollow cylindrical element having a tapered end 17, an obliquely-truncated end 19 and a longitudinal cut-away portion 18. Cut-away portion 18 prevents interference between drive collar 16 and a linkage shaft attached to the apparatus in use. A drive rod 20 is insertable through drive collar 16, as illustrated in Figure 4. In use of the anchor apparatus, drive rod 20 is inserted through drive collar 16 into drive aperture 12 such that obliquely-truncated end 19 of drive collar 16 engages with oblique flange 15 of anchor body 10 and tapered end 17 of drive collar 16 engages with drive rod 20.

[0012] To secure an object using the anchor apparatus of the present invention, a linkage shaft 21 is connected to attachment fin 13 (Figure 5). Drive rod 20 and drive collar 16 are then connected to anchor body 10, via drive aperture 12. A drive force is applied to drive rod 20 to mechanically drive nose portion 14 of the anchor into the ground. During installation, drive rod 20 and linkage shaft 21 are positioned parallel to the longitudinal axis of anchor body 10. Deflector ribs 11 guide anchor body 10 in a generally straight direction through the ground. If anchor body 10 contacts any underground obstructions, such as a sewer pipe, conical nose portion 14 and deflector ribs 11 deflect the apparatus away from the obstruction. Once anchor body 10 is installed underground, drive rod 20 and drive collar 16 are removed from the apparatus and a tensioning force is applied to linkage shaft 21 to pivot anchor body 10 by approximately 90° into a locked orientation. In a locked orientation, linkage shaft 21 is approximately perpendicular to the longitudinal

nal axis of anchor body 10 (figure 6). The linkage shaft is then connected to an aboveground object to secure the object in place. Deflector ribs 11 provide an increased surface area and hence an increased force-loading area. Therefore, ribs 11 enable the apparatus to withstand greater pulling forces from the secured object.

[0013] The configuration of nose section 14 and oblique flange 15 is such that, during installation, drive forces are distributed evenly throughout the whole of anchor body 10. Consequently, the structural integrity of the apparatus is preserved, even at high drive forces. Drive collar 16 acts to further spread drive impact forces evenly throughout the apparatus. Effective force distribution means that, even when formed from plastics, the apparatus of the present invention can withstand high drive forces. Plastic has the advantages that it has a low surface resistance, it does not conduct electricity and it is unlikely to cause significant damage to underground utilities. A plastic ground anchor is also cheap to produce, particularly in the case of an injection moulded anchor. In cases where a ground anchor is to be installed for a limited period of time, such as in the case of an anchor for securing a tree root-ball, the apparatus of the present invention can be formed from biodegradable plastics thereby avoiding the need to remove the anchor, with possible damage to the roots of surrounding plants. Traditional ground anchors on the other hand, must be formed from metal in order to withstand the high drive forces required to drive traditionally-configured anchors into the ground.

Claims

1. An anchor apparatus for use underground, the anchor apparatus comprising:

an anchor body (10), the body being moveable between a drive position and a locked position, the anchor body (10) comprising:

a drive aperture (12) for receiving a drive rod (20) at a first end extending towards a conical nose portion (14) at the opposite end;

an oblique flange (15) at the first end opposite the nose portion (14), and

one or more deflecting ribs (11),

the anchor apparatus being **characterised in that** the anchor body (10) is formed from a plastics material and **in that** the anchor apparatus comprises a separate drive collar (16), the drive collar (16) being a hollow, obliquely-truncated cylindrical element for receiving said drive rod (20),

wherein the oblique flange (15) of the anchor body (10) and the corresponding obliquely truncated end (19) of the drive collar (16) are releasably engageable with each other during use.

2. An anchor apparatus as claimed in claim 1 further comprising an attachment fin (13).
3. An anchor apparatus as claimed in claim 1 or claim 2, wherein the anchor body (10) comprises four deflecting ribs (11) uniformly spaced with respect to the conical nose portion (14).
4. An anchor apparatus as claimed in any one of the preceding claims wherein the anchor body (10) is formed from biodegradable plastics.

Patentansprüche

1. Ankervorrichtung zur unterirdischen Verwendung, wobei die Ankervorrichtung Folgendes umfasst:

einen Ankerkörper (10), der zwischen einer Antriebsposition und einer gesperrten Position beweglich ist, wobei der Ankerkörper (10) Folgendes umfasst:

eine Antriebsöffnung (12) zur Aufnahme einer Antriebsstange (20) an einem ersten Ende, die sich zu einem kegelförmigen Nasenabschnitt (14) am gegenüberliegenden Ende erstreckt;

einen schrägen Flansch (15) am ersten Ende gegenüber dem Nasenabschnitt (14), und eine oder mehrere Ablenkrippen (11), wobei die Ankervorrichtung **dadurch gekennzeichnet ist, dass** der Ankerkörper (10) aus einem Kunststoffmaterial gefertigt ist, und dadurch, dass die Ankervorrichtung einen separaten Antriebsring umfasst, wobei der Antriebsring (16) ein hohles, schräg abgeschnittenes, zylindrisches Element zur Aufnahme der Stange (20) ist, wobei der schräge Flansch (15) des Ankerkörpers (10) und das zugehörige schräg abgeschnittene Ende (19) des Antriebsringes (16) während des Gebrauchs trennbar miteinander verbindbar sind.

2. Ankervorrichtung gemäß Anspruch 1, die ferner eine Befestigungsflosse (13) umfasst.
3. Ankervorrichtung gemäß Anspruch 1 oder Anspruch 2, wobei der Ankerkörper (10) vier Ablenkrippen (11) umfasst, die mit Bezug auf den kegelförmigen Nasenabschnitt (14) gleichmäßig beabstandet sind.
4. Ankervorrichtung gemäß einem der vorangehenden Ansprüche, wobei der Ankerkörper (10) aus biologisch abbaubaren Kunststoffen gebildet ist.

Revendications

1. Dispositif d'ancre destiné à être utilisé dans le sous-sol, le dispositif d'ancre comprenant :

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un corps d'ancre (10),
le corps étant déplaçable entre une position d'entraînement et une position verrouillée, le corps d'ancre (10) comprenant :

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une ouverture d'entraînement (12) destinée à recevoir une tige d'entraînement (20) à une première extrémité s'étendant vers une partie de nez conique (14) à l'extrémité opposée ;

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une bride oblique (15) à la première extrémité opposée à la partie de nez (14) ; et
une ou plusieurs nervures de déflexion (11) ;

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le dispositif d'ancre étant **caractérisé par le fait que** le corps d'ancre (10) est réalisé en un matériau plastique, et que le dispositif d'ancre comprend un collier d'entraînement (16) séparé,

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le collier d'entraînement (16) étant un élément cylindrique creux obliquement tronconique destiné à recevoir ladite tige d'entraînement (20),

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dans lequel la bride oblique (15) du corps d'ancre (10) et l'extrémité obliquement tronconique (19) correspondante du collier d'entraînement (16) peuvent venir en prise de manière amovible l'une avec l'autre pendant l'utilisation.

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2. Dispositif d'ancre selon la revendication 1, comprenant par ailleurs une ailette de fixation (13).
3. Dispositif d'ancre selon la revendication 1 ou la revendication 2, dans lequel le corps d'ancre (10) comprend quatre nervures de déflexion (11) espacées de manière uniforme par rapport à la partie de nez conique (14).

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4. Dispositif d'ancre selon l'une quelconque des revendications précédentes, dans lequel le corps d'ancre (10) est réalisé en matériau plastique biodégradable.

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Figure 1

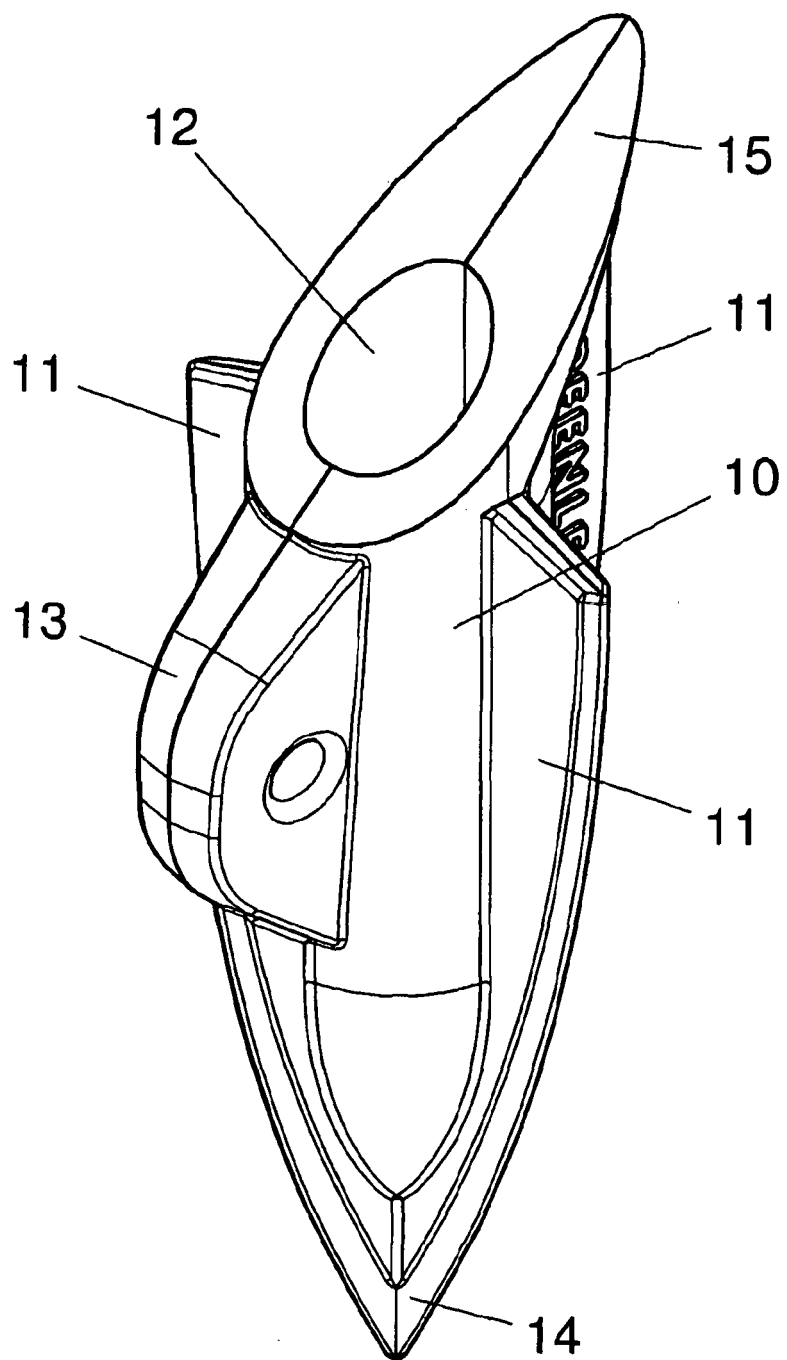


Figure 2

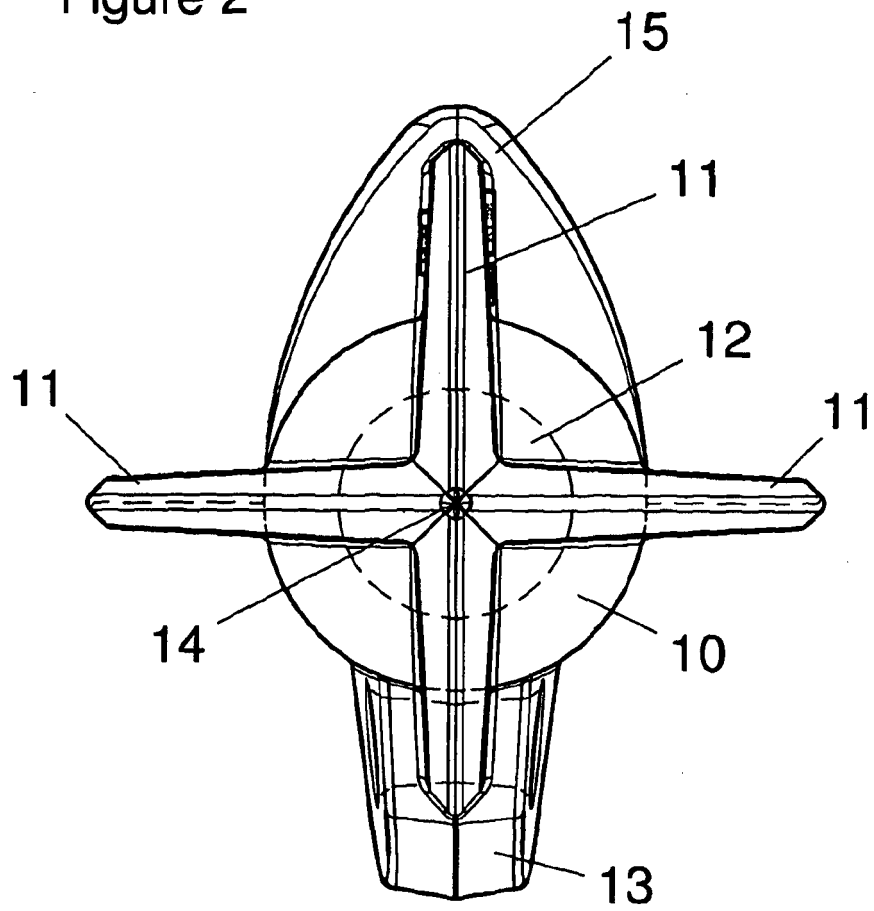


Figure 3

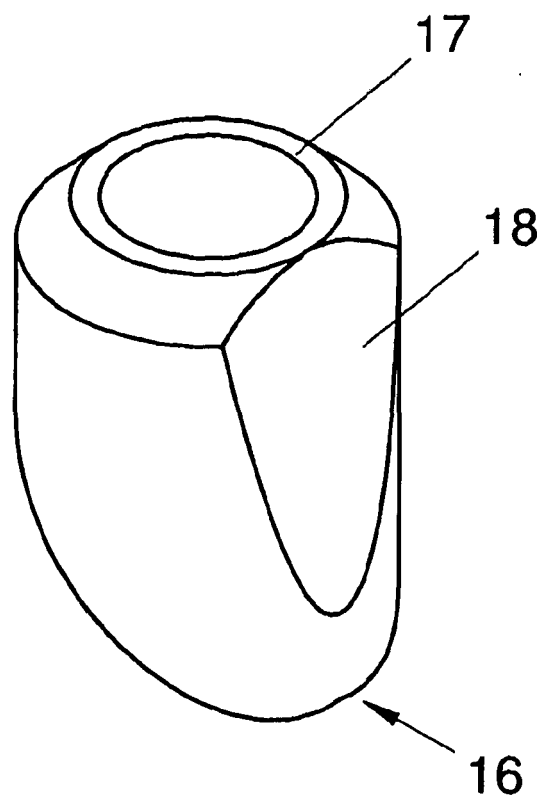
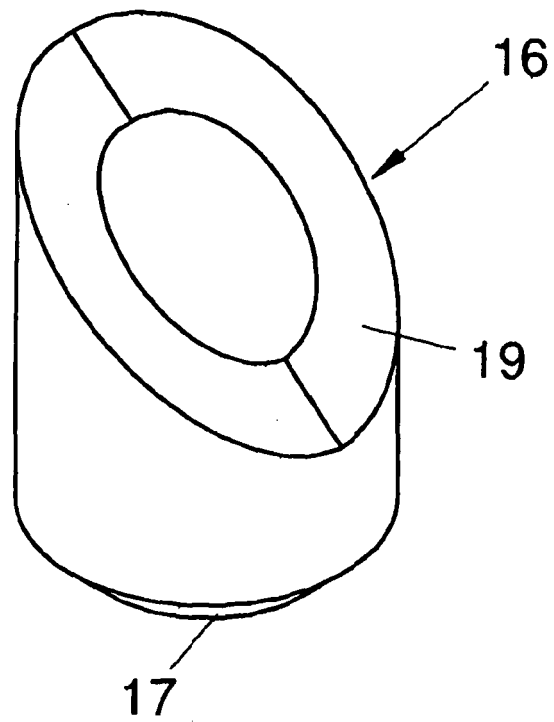


Figure 4

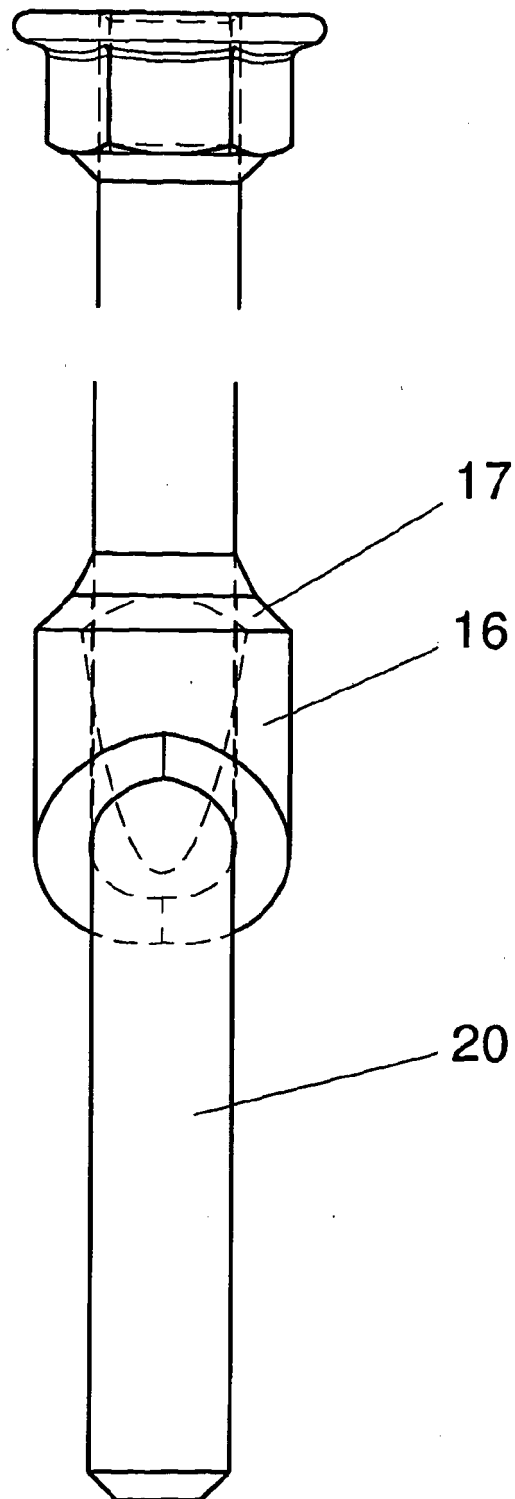


Figure 5

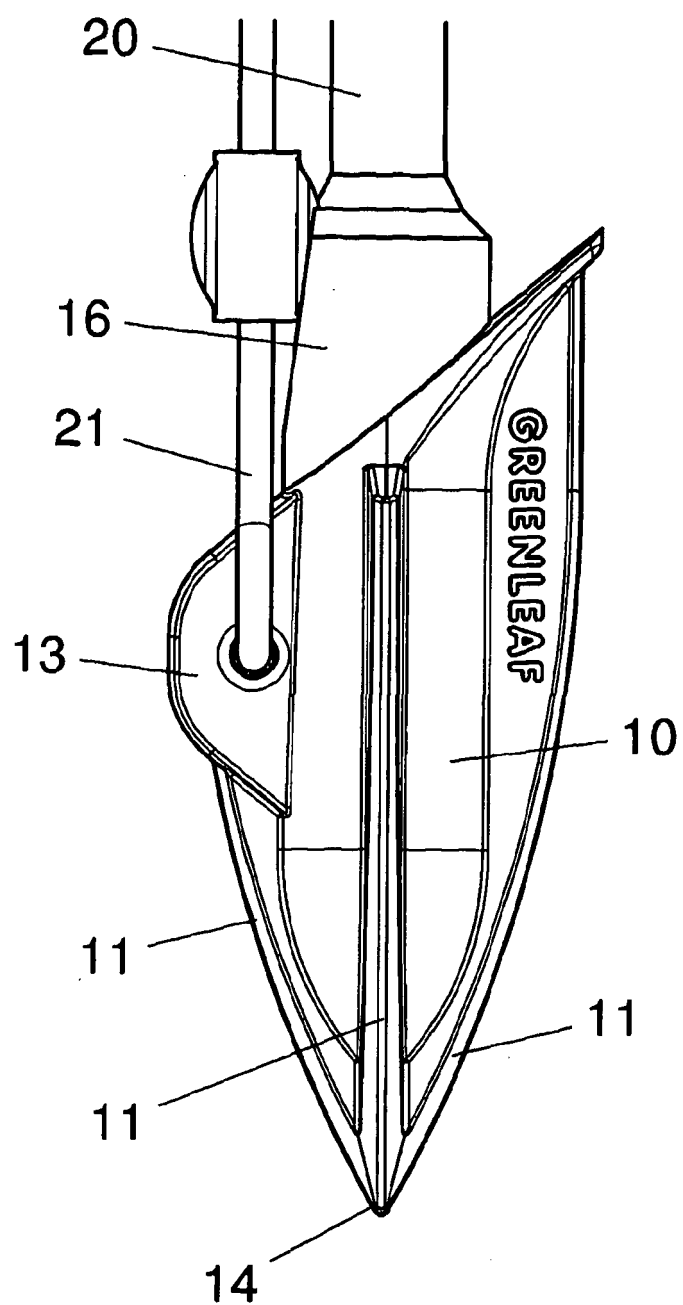
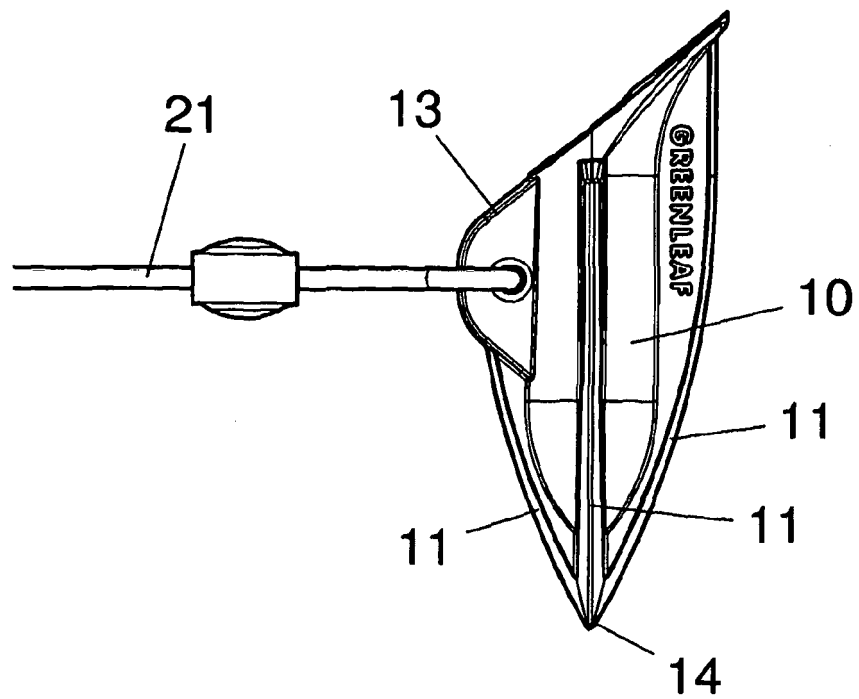


Figure 6



REFERENCES CITED IN THE DESCRIPTION

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