

(12) UK Patent Application (19) GB (11) 2 386 813 (13) A

(43) Date of A Publication 01.10.2003

(21) Application No 0306962.2

(22) Date of Filing 26.03.2003

(30) Priority Data

(31) 10214679

(32) 28.03.2002

(33) DE

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(51) INT CL⁷

A01D 34/82

(52) UK CL (Edition V)

A1F FHA

(56) Documents Cited

WO 2002/006212 A1

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US 4738084 A

(58) Field of Search

UK CL (Edition V) **A1F**

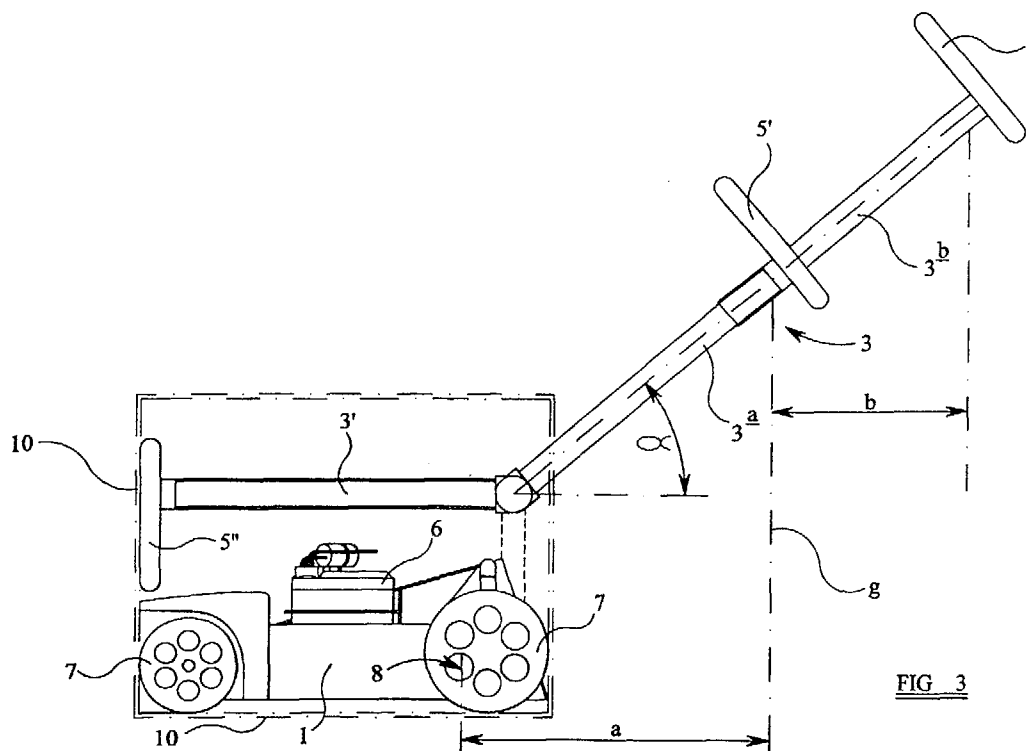
INT CL⁷ **A01D**

Other: On-line: **WPI, EPODOC, JAPIO**

(54) Abstract Title

Adjustable handle for a lawnmower

(57) A ground working machine, particularly a lawnmower is described, which is provided with a handle 5 on a telescopic tube 3 and whose length can be adjusted in order to adapt to operators of different heights. It is consequently possible to bring the position of the handle 5 to different heights, but simultaneously with a higher positioned handle to increase the spacing (a + b) with respect to the lawnmower casing 1. This makes it possible to adapt to the stride of the operator.



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FIG 1

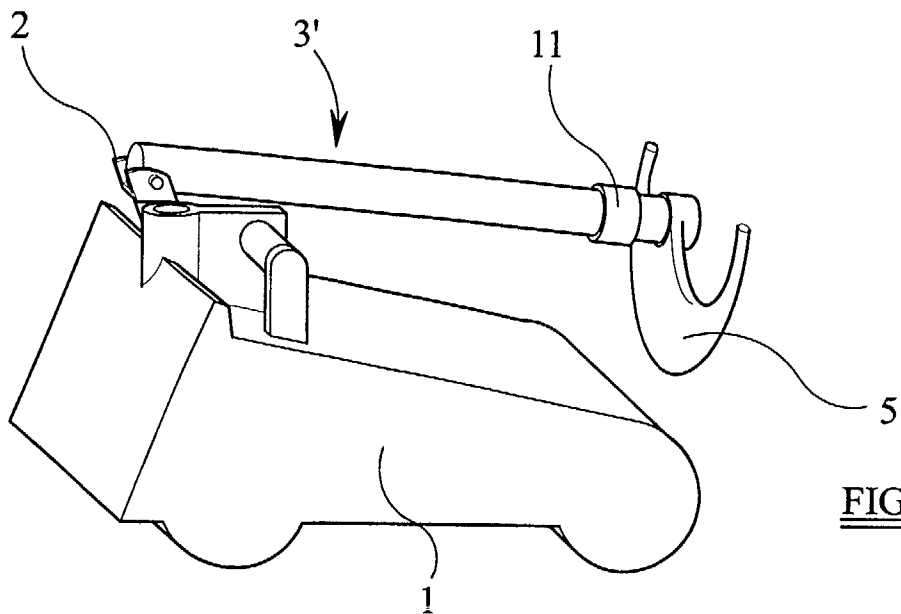
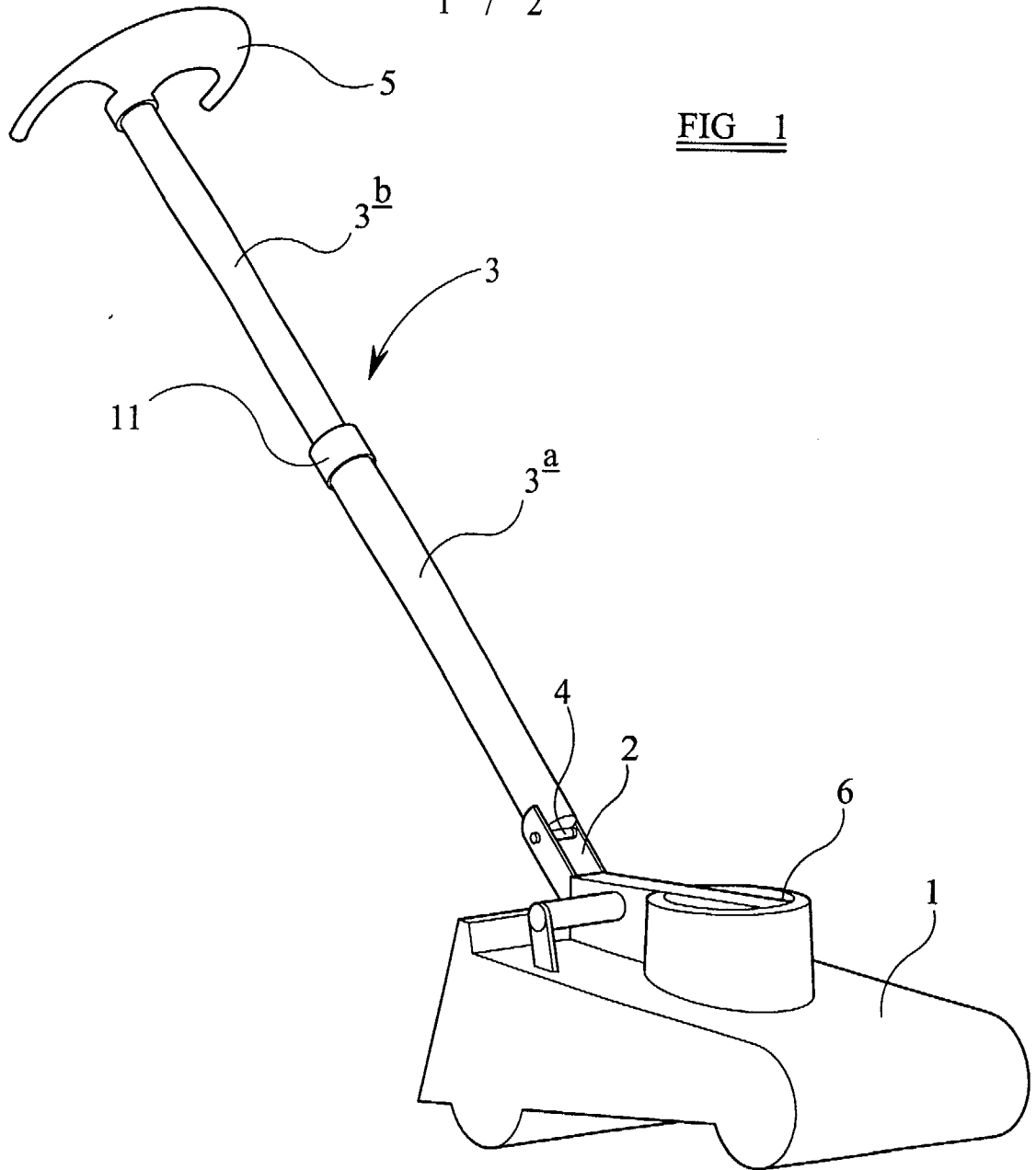


FIG 2

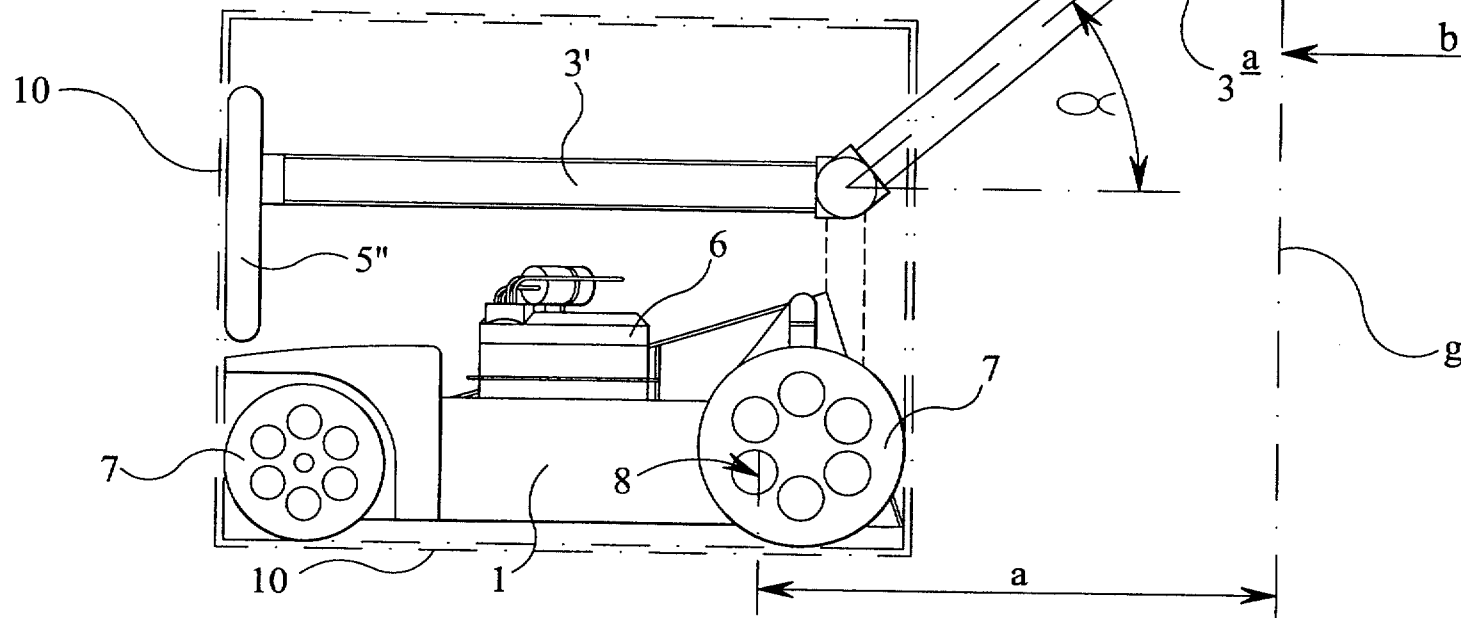
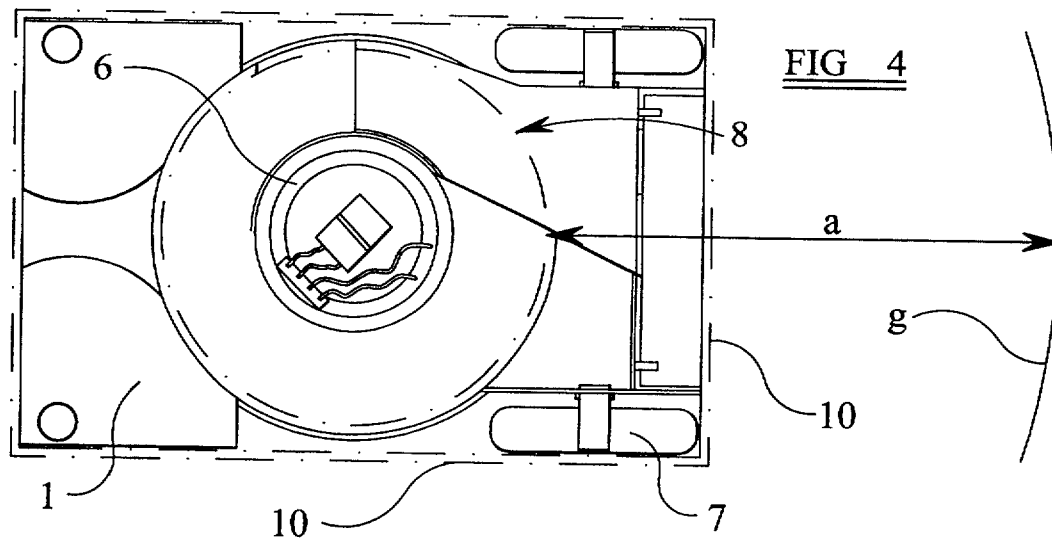


FIG 4

FIG 3

GROUND WORKING MACHINE, PARTICULARLY LAWNMOWER

[001] The invention relates to a ground working machine, particularly a lawnmower having a handle arranged in spaced manner from a machine casing on a linkage and whose position relative to the casing is variable.

[002] It is known that engine-driven ground working machines, particularly lawnmowers, can be pushed and guided by means of a handle, which is fitted to a linkage. In the case of self-propelled lawnmowers the handle can also have different operating elements, which are to be oriented in such a way that the operator can operate the ground working machine in an ergonomic position.

[003] DE 35 32 830 C2 discloses a self-propelled lawnmower, in which a linkage with a handle is pivotable both about a horizontal axis and also about a vertical axis. The aim of the lateral pivotability is to also be able to guide the machine from the side. The vertical pivotability of the linkage is to be utilized in order to offer the handle in a readily accessible height to operators of different heights.

[004] However, in connection with the vertical pivotability about the horizontal axis, with a higher handle position the operator has a reduced horizontal spacing with respect to the mower. This is also the case in another guide rod known from DE 44 28 373 C1. In practice, the handling of mowers with such a pivotable linkage is unfavourable for persons having widely differing body heights and sizes.

[005] The problem of the invention is to provide a ground working machine of the aforementioned type, which can be equally easily handled by persons having different body sizes and heights. The solution according to the invention is described in claim 1.

[006] The inventive correlation of height and horizontal position of the handle advantageously leads to the fact that in the case of taller persons, who generally also have a larger stride, there is also a greater stepping freedom behind the ground working machine, e.g. a mower or a grass collector fitted thereto. Advantageously the pushing angle, i.e. the angle of the connecting line of the handle to the machine casing, remains largely unchanged with respect to the horizontal. Preferably the linkage in the use position is fixed to the casing with a pushing angle orientation independent of the handle position. Thus, for all body heights and sizes a good force introduction can be obtained during pushing.

[007] The handle position change can e.g. be obtained by a swivel connection between the handle and the linkage. However, preferably the length of the linkage, particularly in the case of a constant angular orientation with respect to the casing, is variably adjustable and lockable.

[008] In a preferred development of the invention the linkage comprises in simple manner a telescopically constructed tube, in which the telescoped tube parts are provided with spaced openings for the passing through of locking pins or bolts. It is particularly advantageous to lock the telescoped tube parts by clamping devices in their length and which are operable by a box nut and fix the telescoped tube parts in a positive and/or non-positive manner with respect to one another.

[009] According to a further development of the invention the telescopic tube can be fitted to the machine casing with the aid of an articulation and can be pivoted about the latter from the use position into the non-use position. The articulation and telescopic tube can be advantageously positioned and constructed in such a way that in the telescoped state, the telescopic tube with the handle does not project over the machine casing. If with such a construction the telescopic tube is held on the articulation so as to pivot by at least 130° , there is no need to re-

move the telescopic tube for collapsing onto the machine casing. This construction offers the advantage that the machine casing, together with the telescopic tube and handle can be easily fitted in the preassembled state into a common packing and the space requirement for the machine
5 when not in use is not significantly greater than the dimensions of the machine casing.

[010] According to a further development of the invention in the interior of the telescopic tube can be placed a spiral cable as the electrical con-
10 nection between the machine drive and the operating elements on the handle. As a result of this construction it is possible to shorten the tube without any risk of the cable becoming damaged. According to an advantageous development, the telescopic tube part located on the side of the handle and also the actual handle can be made from electrically in-
15 sulating material, so that a good electrical safety insulation is provided.

[011] The invention is described in greater detail hereinafter relative to embodiments and the attached drawings, wherein show:

20 Fig. 1 The arrangement of a telescopic steering column according to the invention on a lawnmower casing.

Fig. 2 The arrangement according to fig. 1, but with the telescopic steering column reduced to its minimum dimensions when out of
25 operation.

Fig. 3 The side view of a lawnmower similar to fig. 1, but with representations of different handle and linkage positions.

30 Fig. 4 The plan view of the lawnmower of fig. 1 without the guiding telescopic tube.

[012] Figs. 1 and 2 reveal that to the top of the casing 1 of a lawnmower, which is only diagrammatically shown with respect to its contours, is fitted a tongue 2 on which the lower part 3a of a telescopic tube 3 is pivotably placed with the aid of a threaded bolt 4. The engine cowl-
5 ing is designated 6. The bolt 4 passes in a horizontal plane, so that the telescopic tube 3 is also pivoted about a horizontal axis. In the use position, the telescopic tube is preferably connected with a substantially constant angular orientation to the casing. The pivotability of the telescopic tube about the horizontal pivoting axis also makes it possible to pivot
10 from the use position of fig. 1 into a non-use position according to fig. 2 or a not expressly shown parking position with the telescopic tube standing upright over the mower casing. Fig. 2 shows that pivoting can take place over an angle of 135°, if it is assumed that the telescopic tube 3 in the position according to fig. 4 is roughly parallel to the ground and in the
15 position according to fig. 1 is at a angle of e.g. 40° to the ground. Thus, the tube part 3a must be fitted to the tongue 2 in such a way that at least in the position according to fig. 1 it is locked at an angle to the ground and this is possible in known manner by corresponding stop members. As a function of the ground working machine model, the angle can differ
20 from the indicated value.

[013] As will be explained relative to figs. 3 and 4, this construction offers the possibility of adapting the height of the handle 5 to the operator, whilst simultaneously also ensuring that the length of the telescopic tube
25 3 is increased when the handle 5 is positioned higher, so as to give the operator the necessary stepping freedom.

[014] Fig. 3 diagrammatically shows the lawnmower casing 1 with the wheels 7, which may or may not be driven and with an indicated boundary line 8 corresponding to the blade circular path, which is also visible
30 in fig. 4. The minimum spacing a between said blade circular path 8 must also exist in the case when the telescopic tube 3 has its minimum

length and which is indicated in fig. 3 with the handle position 5'. In this position the length of the telescopic tube 3 essentially corresponds to that of the tube part 3a. This ensures that the person then operating the lawnmower, who is consequently relatively short, maintains the necessary minimum spacing a with respect to the blade circular path 8.

[015] If the lawnmower is operated by a significantly taller person, the telescopic tube 3 can be extracted to its full length, the tube length then corresponding to the length of the tube parts 3a and 3b and the handle takes up position 5 with a significantly greater height assuming that the angular arrangement, i.e. the inclined position of the telescopic tube 3 about angle has remained constant. As a result the spacing of the handle 5 in this position is greater by the amount than the spacing a with respect to the blade circular path 8 and naturally also with respect to the casing 1. The taller operator then has the handle 5 available to him at an ergonomic height. Due to the greater distance from the lawnmower casing 1 his stride is not impaired and he can push the lawnmower with a more favourable force introduction.

[016] In this embodiment the length setting of the telescopic tube can be brought about by not shown clamping devices, which come into action through the operation of a box nut 11 and prevent a positive and/or non-positive mutual axial adjustment of the tube parts 3a and 3b. Thus, the tube parts are also secured against mutual relative twisting. It would also be possible to provide the tube parts with transversely directed bores for the insertion of locking pins or bolts, so as to be able to carry out a length setting in this way.

[017] Fig. 4 again shows the position of the minimum spacing 9 with respect to the machine and in dot-dash line form 10 also the dimensions of the outer contour of the lawnmower, without the telescopic tube means being folded out.

[018] Fig. 3 makes it clear that when the telescopic tube 3 is telescoped to its smallest length, i.e. essentially to the length of the outer tube 3a, said tube 3 can be pivoted by an angle of 180°- counterclockwise in order to take up position 3', which is also shown in fig. 2. As is revealed in fig. 3, the construction is such that the telescoped telescopic tube is no longer than the lawnmower casing 1, so that in its position 5" the handle is still within the machine contour 10, which means that the telescopic tube with handle and mower casing in the installed state can be placed in a common packaging carton. Thus, the machine has a very limited space requirement in the non-use position.

[019] Within the telescopic tube it is possible to lay a spiral cable, which passes from the handle 5 and the operating elements located there to the engine 6 or also to a travelling gear as a control cable. This spiral cable is able without difficulty to participate in the length changes of the telescopic tube 3. There is no cable damage risk.

CLAIMS

1. Ground working machine, particularly lawnmower, with a handle (5)
5 arranged in spaced manner from a machine casing on a linkage (3) and
whose position relative to the casing can be variably adjusted, character-
ized in that the height of the handle and its horizontal spacing are simul-
taneously variable in such a way that a greater height is associated with
a greater horizontal spacing.
10
2. Ground working machine according to claim 1, characterized in that
the length of the linkage (3) is adjustable and lockable.
3. Ground working machine according to claim 2, characterized in that
15 the linkage comprises a telescopically constructed tube (3).
4. Ground working machine according to claim 3, characterized in that
the telescoped tube parts (3a, 3b) are provided with spaced openings for
the passage of locking pins.
20
5. Ground working machine according to claim 3, characterized in that
the telescoped tube parts (3a, 3b) can be locked in their mutual length
by clamping devices operable by a box nut (11).
- 25 6. Ground working machine according to one of the claims 1 to 5, char-
acterized in that the linkage (3) is pivotably fitted to the machine casing
(1) with the aid of an articulation (2) and is constructed in such a way
that in the state set to minimum length and pivoted from the use position
about the articulation, it does not exceed the length of the machine cas-
30 ing (1).

7. Ground working machine according to claim 6, characterized in that the linkage (3) is held on the articulation (2) so as to pivot by at least 130°.
- 5 8. Ground working machine according to claim 3, characterized in that in the interior of the telescopic tube (3) is laid a spiral cable in the form of the electrical connection between the machine drive and the operating elements on the handle.
- 10 9. Ground working machine according to claim 8, characterized in that the part of the telescopic tube (3b) located on the side of the handle is made from electrically insulating material.



Application No: GB 0306962.2
Claims searched: 1-9

Examiner: Rhys Williams
Date of search: 8 July 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X, P	1-9	WO 02/062126 A1 (GARDENA) Whole document relevant.
A	-	US 4738084 (OGANO) Whole document relevant.
A	-	DE 4428373 C1 (WOLF) Whole document relevant.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v:

A1F

Worldwide search of patent documents classified in the following areas of the IPC⁷:

A01D

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, JAPIO