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(54) MOBILE DEVICE FOR THE MAINTENANCE OF LAND COMPRISING A FASTENING ELEMENT AND PROCEDURE FOR MOUNTING SUCH A DEVICE

(57) The present invention relates to a mobile device (1) for the maintenance of land, comprising movement means (2) configured to allow a movement of the mobile device within a work area, a frame (3) comprising a work tool configured to perform maintenance operations on the work area, a drive handle (4) configured to allow an operator to drive the mobile device within the work area, a fastening element (5) interposed, in a constraint condition, between the drive handle (4) and the frame (3) and a coupling portion (11) carried by the drive handle (4) or by the frame (3). The fastening element (5) comprises a main body (6), a first groove (7) extending from an inner area of the main body (6) to a peripheral area of the main body (6) itself where a first opening (7a) for access to the first groove (7) is defined, and a second groove (8) distinct and spaced from the first groove (7), the second groove (8) extending from the inner area of the main body (6) towards the peripheral area of the main body (6) itself where a second opening (8a) for access to the second groove (8) is defined. The coupling portion (11) is removably engageable to the fastening element (5), between the constraint condition in which the fastening element (5) is engaged to the coupling portion (11) and a release condition in which the fastening element (5) is disengaged from the coupling portion (11). The coupling portion (11) has a first and a second locking pin (12, 13) respectively configured to insert inside the second groove (8) and the first groove (7). According to the invention, the coupling portion (11) has an elongated body extending along a predetermined extension direction.

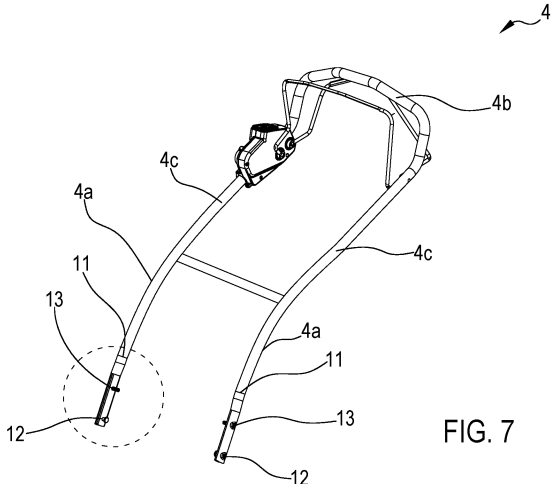

FIG. 7

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a mobile device for the maintenance of land, for example gardens, turfgrasses or agricultural land. In particular, the mobile device can be a lawnmower having a work unit constrained to a handle by means of a fastening element, for example a bracket. The present invention further relates to a procedure for mounting the work unit with the handle using the fastening element.

BACKGROUND ART

[0002] The use of mobile devices is known in the field of land maintenance, in particular gardening, such as lawnmowers, soil tillers, soil aerators, etc., having a work unit manually moved or directed by a handle constrained to the work unit by means of a bracket. In particular, the engagement between the handle and the work unit occurs by inserting bolts carried by the handle, inside the respective holes defined on the bracket, the latter carried by the work unit itself.

[0003] Although the solution described above allows to effectively constrain a work unit to a handle, the Applicant has found that such a solution highlights limitations and drawbacks. In particular, the coupling by means of a perforated bracket cannot be performed by a single user independently, thus making the coupling process complex and impractical.

[0004] The state of the art comprises in particular technical solutions of a lawnmower device in which the handlebar is constrained to the frame by means of an element comprising a pair of grooves, which are however not used for fastening the handlebar, but exclusively for adjusting the inclination. Document US2,965,386 relates to a lawnmower device comprising a structure for mounting the handlebar to the frame. The mounting structure comprises an arm integral with the frame to which the handlebar is rotatably constrained. On the upper wall of the arm there are two notches to which two protrusions are selectively engaged, forming part of a plate associated with the handlebar. Document US2014/0260157A1 relates to a lawnmower comprising means for adjusting the inclination of the handle with respect to the frame. A plurality of notches are obtained on an arcuate element integral with the frame, so as to selectively house a dentil integral with the handlebar. The inclination of the handlebar therefore varies depending on the notch in which the dentil is inserted.

[0005] Document US2005/0188664A1 relates to a lawnmower device comprising a system which allows a fastening of the handlebar which is releasable by means of a manually operated lever.

OBJECT OF THE INVENTION

[0006] Therefore, the object of the present invention is to solve at least one of the drawbacks and/or limitations of the previous solutions.

[0007] A first object of the present invention is to provide a mobile device comprising a fastening element capable of facilitating and minimizing the mounting times of the mobile device.

[0008] A further object of the invention is to offer a solution for fastening the handle to the work unit of a mobile device for the maintenance of land such as gardens which ensures a stable and efficient engagement between the parts.

[0009] The object of the present invention is also to provide a mobile device comprising a fastening element having a simple and compact structure, achievable by known industrial processes and with low implementation costs.

[0010] These and other objects, which will appear more clearly from the following description, are substantially achieved by a mobile device and a mounting procedure of the mobile device in accordance with one or more of the appended claims and/or the following aspects.

SUMMARY

[0011] Aspects of the invention are described here below.

In a 1st aspect, a mobile device is included for the maintenance of land, in particular turfgrasses or gardens or agricultural land, comprising:

- movement means (2) configured to allow a movement of the mobile device within a work area,
- a frame (3) comprising at least one work tool configured to perform maintenance operations on the work area,
- a drive handle (4) configured to allow an operator to drive and optionally move said mobile device within the work area,
- at least one fastening element (5) interposed, at least in a constraint condition, between the drive handle (4) and the frame (3), said fastening element (5) comprising:
  - ◦ at least one main body (6);
  - ◦ at least a first groove (7) extending from an inner area of the main body (6) to a peripheral area of the main body (6) itself where a first opening (7a) for access to the first groove (7) is defined,
  - ◦ at least a second groove (8) distinct and spaced from the first groove (7), said second groove (8) extending from the inner ar-

ea of the main body (6) towards the peripheral area of the main body (6) itself where a second opening (8a) for access to the second groove (8) is defined.

In a 2nd aspect according to the preceding aspect the main body (6) has:

- at least a first and a second side (6a, 6b) opposite each other,
- a head portion (6c) connecting the first and the second side (6a, 6b),

in which the first opening (7a) of the first groove (7) faces the head portion (6c) of the main body (6). In a 3rd aspect according to the preceding aspect, the second opening (8a) of the second groove (8) faces at the first or second side (6a, 6b) of the main body (6), at a predetermined distance from the first opening (7a).

In a 4th aspect according to any one of the preceding aspects, the first groove (7) extends from the first opening (7a) for at least a first stretch, along a straight trajectory (X).

In a 5th aspect according to any one of the preceding aspects, the second groove (8) has:

- at least a first stretch extending from the second opening (8a), transversely to a/the trajectory (X) of the first groove (7),
- at least a second stretch extending in continuation of the first stretch, along a direction parallel to, or coinciding with, the trajectory (X).

In a 6th aspect according to any one of the preceding aspects 2 to 5, the first and the second side (6a, 6b) of the main body (6) are substantially straight and parallel to a/the extension trajectory (X).

In a 7th aspect according to any one of the preceding aspects in which the first opening (7a) is delimited by a respective first and second lead-in stretch (6c', 6c"), preferably arcuate.

In an 8th aspect according to any one of the preceding aspects, the second opening (8a) is delimited by a respective first and second lead-in stretch (8c', 8c"), preferably arcuate.

In a 9th aspect according to any one of the two preceding aspects, the first opening (7a) of the first groove (7) divides the peripheral area of the head portion (6c) of the main body (6) into:

- said first lead-in stretch (6c'), which is interposed between the first side (6a) and the first opening (7a) of the first groove (7),
- said second lead-in stretch (6c"), which is interposed between the second side (6b) and the first opening (7a) of the first groove (7).

In a 10th aspect according to any one of the three preceding aspects, the first lead-in stretch (6c') protrudes externally, parallel to said extension trajectory (X), with respect to the second lead-in stretch (6c") to define a support lip (20).

In an 11th aspect according to any one of the preceding aspects 2 to 10 when using the mobile device, the first side (6a) of the main body (6) faces the land to be maintained.

In a 12th aspect according to any one of the preceding aspects 2 to 11 when using the mobile device, the second side (6b) faces away with respect to the land to be maintained.

In a 12bis aspect according to any one of the preceding aspects, the fastening element (5) comprises at least one constraining portion (9) extending from the main body (6) and extending along an extension direction (D) which is inclined with respect to the trajectory (X), optionally by an internal angle between 50° and 70°.

In a 13th aspect according to any one of the preceding aspects, the device comprises at least one coupling portion (11) carried by the drive handle (4) or by the frame (3).

In a 14th aspect according to the preceding aspect, the coupling portion (11) is removably engageable to the fastening element (5) of the mobile device (1), at least between:

- the constraint condition in which the fastening element (5) is engaged to the coupling portion (11),
- a release condition in which the fastening element (5) is disengaged from the coupling portion (11).

In a 15th aspect according to the previous aspect in the release condition, the fastening element (5) is carried by the frame (3), while the coupling portion (11) is carried by the drive handle (4).

In a 16th aspect according to any one of the preceding two aspects, the coupling portion (11) has at least a first and a second locking pin (12, 13) respectively configured to be inserted in the second groove (8) and the first groove (7).

In a 17th aspect according to any one of the preceding three aspects, the coupling portion (11) has an elongated, optionally tubular, body extending along a predetermined extension direction, in which the first and the second locking pin are aligned along said extension direction.

In an 18th aspect according to the preceding aspect, the first and the second locking pin (12, 13) have a respective stretch (12a, 13a) emerging transversely, optionally orthogonally, with respect to the elongated body of the coupling portion (11), each of said stretches (12a, 13a) being respectively engageable within the first and the second groove (7, 8).

In a 19th aspect according to any one of the three preceding aspects, the first locking pin (12) carries a terminal body (16) extending transversely, optionally orthogonally, to the stretch (12a) of the first locking pin (12), said terminal body (16) being configured, in the constraint condition of the fastening element (5) in which the first locking pin (12) is inserted in the second groove (8), to prevent the extraction of the first locking pin (12) from the second groove (8) along a direction parallel to the locking pin itself and thus allowing the extraction of the first locking pin (12) from the second groove (8) only through the second access opening (8a).

In a 20th aspect according to any one of the preceding aspects 15 to 18, the second locking pin (13), in particular said stretch (13a) of the second locking pin (13), has at least one threaded portion.

In a 21st aspect according to the preceding aspect, the mobile device (1) comprises at least one locking knob (17) configured to engage the threaded portion of the second locking pin (13) and to constrain the coupling portion (11) to the fastening element (5).

In a 22nd aspect according to any one of the preceding aspects 13 to 21, the mobile device comprises a plurality of coupling portions (11) respectively carried by distinct ends of the drive handle (4), in particular two coupling portions (11) carried by respective distinct ends of arms of the drive handle (4).

In a 23rd aspect according to any one of the preceding aspects 13 to 21, the mobile device comprises a plurality of fastening elements (5) carried by the frame (3) and respectively configured for engaging respective coupling portions (11) carried by the drive handle (4), in particular two fastening elements (5) carried by the frame (3) and respectively configured for engaging respective two coupling portions (11) carried by the drive handle (4).

In a 24th aspect according to any one of the preceding aspects, each fastening element (5) is a bracket, in particular metallic, fastened to the frame (3).

In a 25th aspect, a procedure is included for mounting a mobile device in accordance with any one of the preceding aspects.

In a 26th aspect according to the preceding aspect comprising a step of constraining the drive handle (4) to the frame (3) by exploiting said first and said second groove (7, 8) present on the fastening element.

In a 27th aspect according to the preceding aspect, the step of constraining the drive handle (4) to the frame (3) includes engaging the coupling portion (11) to the fastening element (5) by exploiting said first and said second groove (7, 8) present on the fastening element itself.

In a 28th aspect according to any one of the two preceding aspects, the step of constraining the drive handle (4) to the frame (3) comprises the sub-steps of:

- inserting the first locking pin (12) inside the first stretch of the second groove (8),
- arranging the second locking pin (13) at the first opening (7a) of the first groove (7),
- inserting the first locking pin (12) inside the second stretch of the second groove (8) and simultaneously inserting the second locking pin (13) inside the first groove (7).

In a 29th aspect according to the preceding aspect, the sub-step of arranging the second locking pin (13) at the first opening (7a) includes resting such a second pin on a/the support lip (20), discharging the weight of the handle (4) on the frame (3).

In a 30th aspect according to any one of the preceding two aspects, following the sub-step of inserting the second locking pin (13) inside the first groove (7), an engagement step is included between the threaded portion of the second locking pin (13) and the knob (17).

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Some embodiments and aspects of the invention will be described hereinafter with reference to the accompanying drawings, given merely for illustrative, non-limiting purposes in which:

- Figures 1 and 3 show perspective views of a mobile device in accordance with a first embodiment of the present invention;
- figure 2 is a detailed view of a second embodiment of the mobile device in accordance with the present invention;
- figure 4 is a detailed view of the mobile device of figure 3;
- figures 5 and 6 are perspective views of a fastening element of the mobile device in accordance with the present invention;
- figure 7 is a perspective view of a drive handle of the mobile device in accordance with the present invention;
- figure 8 is a detailed view of the drive handle of figure 7;
- finally figure 9 shows a third embodiment related to the handle-drive fastening of the mobile device work unit in accordance with the present invention.

DEFINITIONS AND CONVENTIONS

[0013] It should be noted that in the present detailed description, corresponding parts illustrated in the various figures are indicated with the same numerical references. The figures could illustrate the object of the invention through non--scale depictions; therefore, the parts and components illustrated in the figures related to the object of the invention could exclusively relate to schematic depictions.

DETAILED DESCRIPTION

Mobile device 1

[0014] A mobile device 1 configured to perform maintenance operations, for example cutting turfgrasses, within a work area of a land, for example a turfgrass, a garden or an agricultural land, has been indicated as a whole with 1.

[0015] The mobile device depicted in figures 1 and 3 can be a user-driven device or a user-driven and pushed device. In particular, the mobile device 1 can comprise a work unit 1a provided with movement means 2, for example one or more wheels, or one or more rollers, or one or more motorized tracks or still other members, adapted to determine the advancement of the mobile device (for example, the work unit 1a can comprise one or more motors for the operation of the movement means and of the work tool(s)), or the mobile device can for example comprise wheels or rollers or idle tracks moved as a result of the thrust exerted by the user.

[0016] The mobile device 1 and in particular the work unit 1a further comprises a support frame 3 carrying the movement means 2, and one or more work tools (such as blades, tools for trimming the land or other tools which are motorized or not motorized and known per se and therefore not illustrated) configured to perform the maintenance operations within the work area.

[0017] Furthermore, the mobile device 1 can comprise a drive handle 4 constrained to the frame 3 of the work unit 1a and configured to allow an operator to move and/or direct the mobile device within the work area. The drive handle 4 extends behind the frame along an inclined direction transverse to the frame 3, between a first end 4a constrainable to the frame and a second end 4b configured to allow gripping by an operator. The drive handle 4 can be made of metal material, for example steel, iron or aluminium, or plastic or composite material.

[0018] As shown in the accompanying figures, the drive handle 4 is constrained to the frame 3 by means of a fastening element 5 interposed between the frame 3 and the same drive handle 4. In particular, the coupling between the drive handle 4 and the frame 3 is obtained as a result of the engagement between the fastening element 5 and a coupling portion 11 of the handle 4.

[0019] It should be noted that in the accompanying figures, a fastening element 5 carried by the frame 3 and a coupling portion 11 carried by the drive handle 4 have been shown. However, an embodiment of the invention in which the fastening element 5 is carried by the drive handle 4 is not excluded, while the coupling portion 11 is carried by the frame 3 (see figure 9 in this regard).

[0020] The fastening element 5 comprises at least one main body 6 having, for example, an elongated shape. The body 6 is laterally delimited by at least a first and a second side 6a, 6b opposite each other. The main body 6 further comprises a head portion 6c, which delimits one end of the main body itself and connects the first and the second side 6a, 6b. For example, the head portion 6c can have a curvilinear shape, which connects respective ends of the first and the second side 6a, 6b. In particular, the head portion 6c has a first and a second lead-in stretch 6c', 6c" separated from each other by a first groove 7 penetrating in the body 6 and detailed hereinafter. In particular, as for example shown in figures 5 and 6, the first lead-in stretch 6c' is interposed between the first side 6a and the first groove 7, while the second lead-in stretch 6c" is interposed between the second side 6b and the same first groove. It should be noted how the first and the second stretch 6c', 6c" are offset along a straight trajectory X of the first groove 7. In fact, the first lead-in stretch 6c' protrudes externally with respect to the second lead-in stretch 6c", in the direction of the trajectory X, to define a support lip 20 configured to guide an element associated with the coupling portion in insertion inside the first groove 7, as will be further explained below.

[0021] As previously mentioned, the first groove 7 extends from an inner zone of the main body 6 to a peripheral area of the main body 6 itself where a first opening 7a for access to the first groove 7 is defined; in other words, the first groove is delimited by an open peripheral profile. In particular, the first opening 7a of the first groove 7 faces at the head portion 6c of the main body 6, spacing the first and second lead-in stretches 6c', 6c" from each other. As for example shown in figure 5, the first groove 7 is substantially defined in the peripheral area of the main body 6 at the head portion 6c, and extends from the first opening 7a for at least a first straight stretch along the trajectory X. In the examples illustrated the first groove 7 is in fact entirely straight from the first opening to a bottom of the groove 7 itself.

[0022] The fastening element 5 further comprises a second groove 8, which cooperates with the first groove 7, to removably engage the coupling portion 11 of the handle 4 with the frame 3, obtaining a constraint condition of the same fastening element 5. The second groove 8 is distinct and spaced from the first groove 7, and extends from an inner area of the main body 6 towards the peripheral area of the same main body where a second opening 8a is defined for access to the second groove 8. The second groove 8 is defined by an open peripheral profile defined on the main body 6. As can be seen for example from figure 5, the second opening 8a of the second groove 8 is spaced from the first opening 7a of the first groove 7: the first and the second groove 7, 8 are thus completely distinct and spaced from each other. In other words, the second opening 8a of the second groove 8 faces at the first or second side 6a, 6b of the main body, at a predetermined distance from the first opening 7a. Under the geometric profile, the second groove extends along a first and a second stretch which are transverse to each other. In particular, the first stretch extends from the second opening 8a transversely to the trajectory X of the first groove 7, while the second stretch extends in continuation of the first stretch, along a direction parallel

to, or coinciding with, the trajectory X of the first groove 7: in the example shown, the second groove 8 has a substantially "L" shape and the second stretch of the second groove is straight and of equal extension to the extension of the first groove.

[0023] Under the structural profile, the fastening element 5 can be a bracket, for example plate-shaped, engaged (for example welded or fastened by screws or other) to the frame and for example made of metallic or plastic material.

[0024] Figures 1 to 4 show the mobile device in use conditions, in which the drive handle 4 is constrained to the frame 3 by means of the fastening element 5. In this condition, the second groove 8 faces away from the land, so that the engagement of the coupling portion 11 of the handle 4 with the groove 8 of the fastening element 5 is facilitated by the action of the force of gravity.

[0025] According to a first embodiment, for example shown in figures 5 and 6, the fastening element 5 comprises a constraining portion 9, extending from the main body 6 along an extension direction D which is inclined with respect to the trajectory X by an internal angle α between 50° and 70°. The constraining portion 9 in turn has a plurality of holes 10, not aligned with each other (for example three holes arranged in a triangle), each of which is configured to allow the insertion of a bolt or a screw adapted to constrain the fastening element 5 to the frame 3.

[0026] In accordance with a second embodiment of the invention shown in figure 2, the constraining portion 9 emerges, for example laterally, from the main body 6 starting from the first or the second side 6a, 6b and is configured to engage, for example by interference, a tubular sleeve carried by the frame 3. In fact, according to the latter embodiment, the constraining portion 9 is free of holes 10 and has a cylindrical or tubular shape adapted to receive in insertion the sleeve (or adapted to insert into the sleeve) carried by the frame 3.

[0027] As previously mentioned, the drive handle 4 of the mobile device 1 comprises the coupling portion 11, which is engageable to the fastening element 5 at least between a constraint condition (which ensures the stable engagement of the two parts 5 and 11 thus allowing the locking of the drive handle 4 with respect to the frame 3) and a release condition (which allows the disengagement of the handle 4 from the frame 3). In particular, in the constraint condition, the fastening element 5 is engaged to the coupling portion 11, while in the release condition, the fastening element 5 is disengaged from the coupling portion 11. As shown in figures 7 and 8, the coupling portion 11 has an elongated body, for example of tubular shape, extending along a predetermined extension direction, on which at least a first and a second locking pin 12, 13 are engaged, respectively configured to insert inside the second groove 8 and the first groove 7. In particular, the first and the second locking pin 12, 13 are aligned with each other and, in the illustrated example, are in particular along the extension direction of the elongated body of the coupling portion 11, so as to be able to be positioned inside the first groove 7 and the second stretch of the second groove 8.

[0028] The first and the second locking pin 12, 13 have a respective stretch 12a, 13a (figure 8) emerging transversely with respect to the elongated body of the coupling portion 11: each stretch 12a, 13a is respectively configured to insert inside the first and the second groove 7, 8. Even more in detail, the stretch 12a of the first locking pin 12 terminally carries a body or terminal expansion 16, having a radial dimension greater than the radial dimension of the stretch 12a and configured to prevent the extraction of the first locking pin 12 from the second groove along a direction parallel to the axis of the first pin 12. In other words, by virtue of the body or expansion 16, the first locking pin 12 can be inserted into the second groove 8 or removed from the second groove 8 only through the second access opening 8a since the stretch 12a has a radial dimension such as to slide in the second groove, while the body or expansion 16 has a minimum radial dimension greater than the maximum width of the second groove. The stretch 12a of the first locking pin 12, in the constraint condition of the fastening element 5, is thus inserted inside the second groove, while the body or expansion 16 remains outside the second groove acting in abutment on one of the opposite side surfaces of the main body.

[0029] With regard to the second locking pin 13, it has a respective stretch 13a of radial dimensions such as to insert and slide into the first groove (in practice, the second pin has a maximum radial dimension smaller than the width of the second groove).

[0030] The coupling portion 11 further comprises a locking knob 17 configured to engage a threaded portion made on the stretch 13a of the second locking pin 13 and configured to constrain the coupling portion 11 to the fastening element 5. The stretch 13a of the second locking pin 13, in the constraint condition of the fastening element 5, is thus engaged within the first groove 7, while the main body of the coupling portion 11 and the locking knob 17 act in abutment on surfaces of the main body 6 opposite each other. In other words, the locking knob 17 is configured to permanently constrain the second locking pin 13 to the first groove, preventing any clearance between the coupling portion 11 and the main body 6 of the fastening element or plate 5.

[0031] It should further be noted that the device can comprise a plurality of coupling portions 11 and respective fastening elements 5 identical to what is described above; for example, in the illustrated embodiments, the drive handle 4 comprises a horizontal manoeuvring stretch at the second end 4b of the handle itself on which the user can act when he must push and/or direct the mobile device 1; the handle 4 comprises two distinct arms 4c extending, for example parallel or mirrored with each other, from the second end 4b towards the work unit 1a and each terminating in a respective coupling portion 11. In this case each coupling portion 11 of each arm 4c

engages a respective fastening element 5 (in the case illustrated in the drawings there are therefore two fastening elements 5, one for each of the arms 4c of the handle 4) each of which is carried by the frame 3.

Mounting procedure

[0032] A further object of the present invention is a procedure for mounting the mobile device in accordance with the description above and/or in accordance with any of the attached claims.

[0033] The procedure comprises the steps of constraining the drive handle 4 to the frame 3 using the first and the second groove 7, 8 present on each of the fastening elements (or on the fastening element in the event of a handle 4 with only one arm 4c).

[0034] In particular, the procedure includes constraining the coupling portion 11 of each arm 4c to the or to a respective fastening element 5.

[0035] In detail, for each arm 4c, the constraining step comprises the sub-steps of:

- inserting the first locking pin 12 inside the first stretch of the second groove 8,
- arranging the second locking pin 13 at the first opening 7a of the first groove 7,
- inserting the first locking pin 12 inside the second portion of the second groove 8 and simultaneously inserting the second locking pin 13 inside the first groove 7.

[0036] In particular, the step of arranging the second locking pin at the first opening includes resting such a second pin on the lip 20, thereby discharging the weight of the handle 4 on the frame 3 and thus on the ground.

[0037] Finally, the procedure includes, following the step of inserting the second locking pin 13 inside the first groove 7, and after bringing both the first and the second pin at a bottom of the respective grooves, an engagement step between the threaded portion of the second locking pin 13 and the knob 17. Modifications and variations to the described device and procedure can be included, within the scope of protection of one or more of the appended claims.

[0038] For example, figure 9 shows an example in which the fastening element 5, comprising the first and the second groove 7 and 8 as described above, is carried by the drive handle 4, while the coupling portion 11 is carried by the frame 3 (see figure 9 in this regard). In this case, it should be noted how the second access opening, during mounting, is facing downwards and how the lip 20 is positioned so as to facilitate the mounting operations and the discharge of the weight of the handle 4 on the frame 3 and thus on the ground.

Claims

1. Mobile device (1) for the maintenance of land, in particular turfgrasses or gardens or agricultural land, comprising:

- movement means (2) configured to allow a movement of the mobile device within a work area,
- a frame (3) comprising at least one work tool configured to perform maintenance operations on the work area,
- a drive handle (4) configured to allow an operator to drive and optionally move said mobile device within the work area,
- at least one fastening element (5) interposed, at least in a constraint condition, between the drive handle (4) and the frame (3), and
- at least one coupling portion (11) carried by the drive handle (4) or by the frame (3),

wherein said fastening element (5) comprises:

- at least one main body (6);
- at least a first groove (7) extending from an inner area of the main body (6) to a peripheral area of the main body (6) itself where a first opening (7a) for access to the first groove (7) is defined,
- at least a second groove (8) distinct and spaced from the first groove (7), said second groove (8) extending from the inner area of the main body (6) towards the peripheral area of the main body (6) itself where a second opening (8a) for access to the second groove (8) is defined,

wherein said coupling portion (11) is removably engageable to the fastening element (5), at least between:

- the constraint condition in which the fastening element (5) is engaged to the coupling portion (11),
- a release condition in which the fastening element (5) is disengaged from the coupling portion (11) and

wherein the coupling portion (11) has at least a first and a second locking pin (12, 13) respectively configured to insert inside the second groove (8) and the first groove (7),

characterised in that the coupling portion (11) has an elongated body extending along a predetermined extension direction,

wherein the first and the second locking pin (12, 13) are aligned along said extension direction and wherein the first and the second locking pin (12, 13) have a respective stretch (12a, 13a) emerging transversely with respect to the elon-

gated body of the coupling portion (11), each of said stretches (12a, 13a) being respectively engageable within the first and the second groove (7, 8).

2. Device (1) according to claim 1, wherein the first groove (7) extends from the first opening (7a) for at least a first stretch, along a straight trajectory (X), and wherein the second groove (8) has:

- at least a first stretch extending from the second opening (8a), transversely to the trajectory (X) of the first groove (7),
- at least a second stretch extending in continuation of the first stretch, along a direction parallel to, or coinciding with, the trajectory (X).

3. Device (1) according to claim 2, wherein the first and the second side (6a, 6b) of the main body (6) are straight and parallel to the trajectory (X).

4. Device (1) according to any one of claims 1 to 3, wherein, in the release condition, the fastening element (5) is carried by the frame (3), while the coupling portion (11) is carried by the drive handle (4).

5. Device (1) according to any one of claims 1 to 4, wherein the elongated body of the coupling portion (11) is a tubular body.

6. Device (1) according to any one of claims 1 to 5, wherein said stretches (12a, 13a) emerge orthogonally with respect to the elongated body of the coupling portion (11).

7. Device (1) according to any one of claims 1 to 6, wherein said fastening element (5) comprises:

- at least one main body (6);
- at least a first groove (7) extending from an inner area of the main body (6) to a peripheral area of the main body (6) itself where a first opening (7a) for access to the first groove (7) is defined and
- at least a second groove (8) distinct and spaced from the first groove (7), said second groove (8) extending from the inner area of the main body (6) towards the peripheral area of the main body (6) itself where a second opening (8a) for access to the second groove (8) is defined,

wherein the first groove (7) extends from the first opening (7a) for at least a first stretch, along a straight trajectory (X),
wherein the second groove (8) has:

- at least a first stretch extending from the second opening (8a), transversely to the trajectory (X) of the first groove (7),
- at least a second stretch extending in continuation of the first stretch, along a direction parallel to, or coinciding with, the trajectory (X) and

wherein the first and the second side (6a, 6b) of the main body (6) are straight and parallel to the trajectory (X).

8. Device (1) according to claim 7, wherein the fastening element (5) comprises at least one constraining portion (9) extending from the main body (6) and extending along an extension direction (D) which is inclined with respect to the trajectory (X), optionally by an internal angle between 50° and 70°.

9. Device (1) according to claim 7 or claim 8, wherein the main body (6) has:

- at least a first and a second side (6a, 6b) opposite each other,
- a head portion (6c) connecting the first and the second side (6a, 6b),

wherein the first opening (7a) of the first groove (7) faces the head portion (6c) of the main body (6) and wherein the second opening (8a) of the second groove (8) faces at the first or the second side (6a, 6b) of the main body (6), at a predetermined distance from the first opening (7a).

10. Device (1) according to claim 9, wherein the first opening (7a) is delimited by a respective first and second lead-in stretch (6c', 6c"), preferably arcuate, wherein the second opening (8a) is delimited by a respective first and second lead-in stretch (8c', 8c"), preferably arcuate.

11. Device (1) according to claim 10, wherein the first opening (7a) of the first groove (7) divides the peripheral area of the head portion (6c) of the main body (6) into:

- said first lead-in stretch (6c'), which is interposed between the first side (6a) and the first opening (7a) of the first groove (7), and
- said second lead-in stretch (6c"), which is interposed between the second side (6b) and the first opening (7a) of the first groove (7).

12. Device (1) according to claim 11, wherein the first lead-in stretch (6c') protrudes externally, parallel to said trajectory (X), with respect to the second lead-in stretch (6c") to define a support lip (20).

13. Procedure for mounting a device (1) according to any one of claims 1 to 12, comprising a step of constraining the drive handle (4) to the frame (3) by ex-

ploiting said first and said second groove (7, 8) present on the fastening element,

wherein the coupling portion (11) of said device (1) has at least a first and a second locking pin (12, 13) respectively configured to insert inside the second groove (8) and the first groove (7) and
wherein the step of constraining the drive handle (4) to the frame (3) comprises the sub-steps of:

- inserting the first locking pin (12) inside the first stretch of the second groove (8),
- arranging the second locking pin (13) at the first opening (7a) of the first groove (7),
- inserting the first locking pin (12) inside the second stretch of the second groove (8) and simultaneously inserting the second locking pin (13) inside the first groove (7).

14. Procedure according to claim 13, wherein arranging the second locking pin (13) at the first opening (7a) includes resting such a second pin on a support lip (20), discharging the weight of the handle (4) on the frame (3).

15. Procedure according to claim 13 or to claim 14, wherein following the step of inserting the second locking pin (13) inside the first groove (7), an engagement step is included between the threaded portion of the second locking pin (13) and a knob (17).

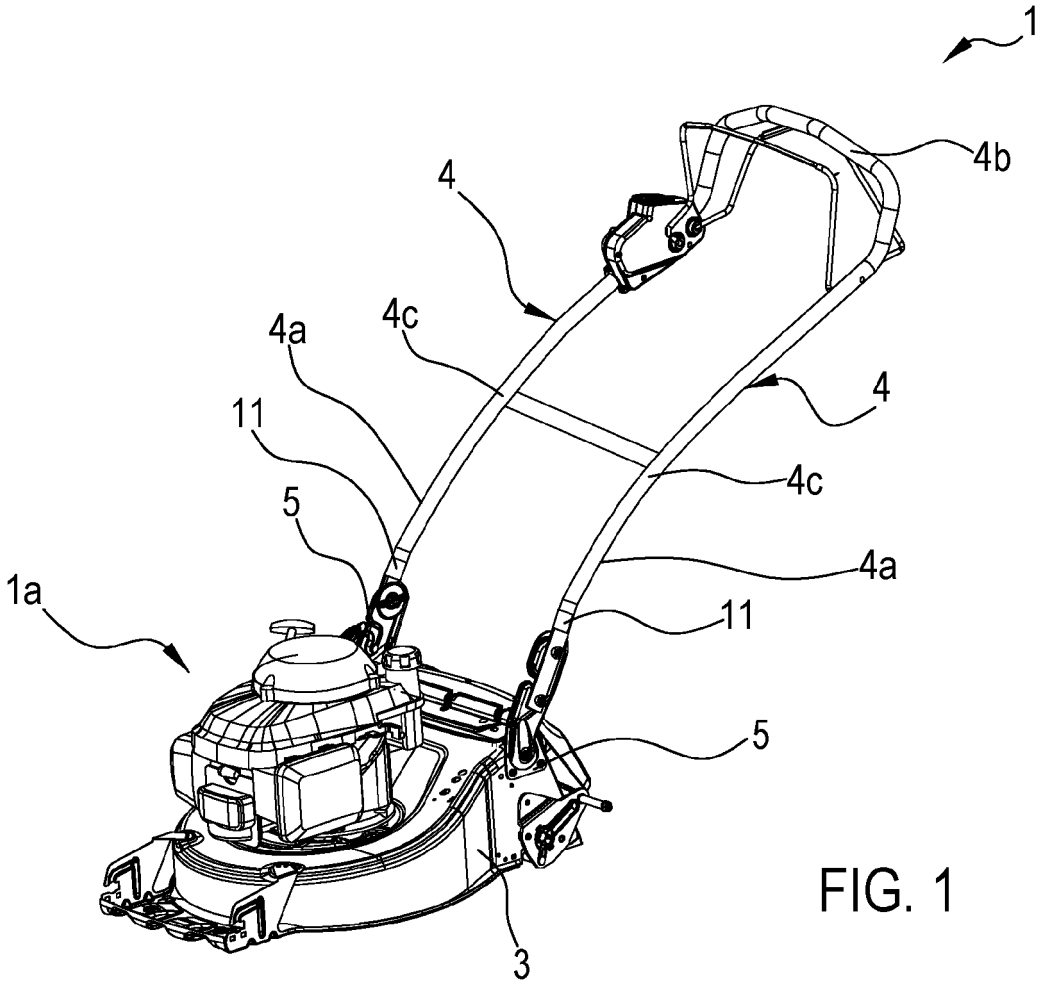

FIG. 1

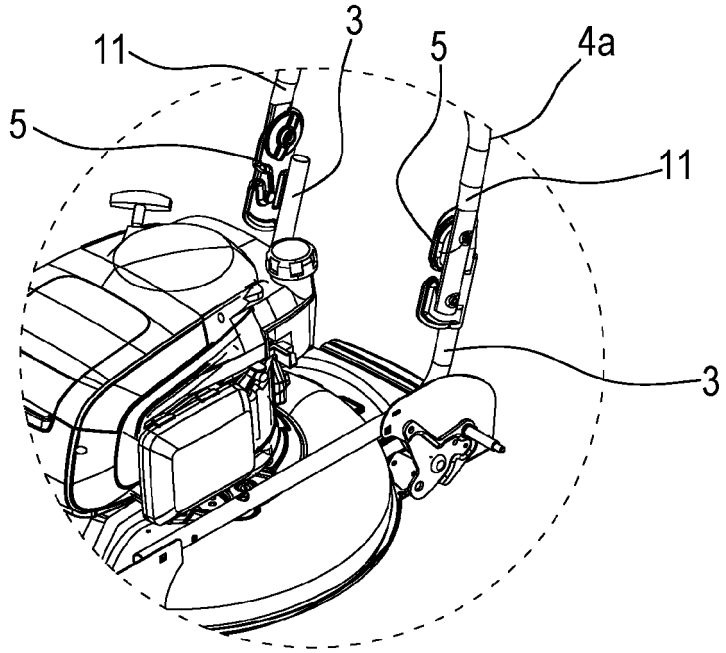

FIG. 2

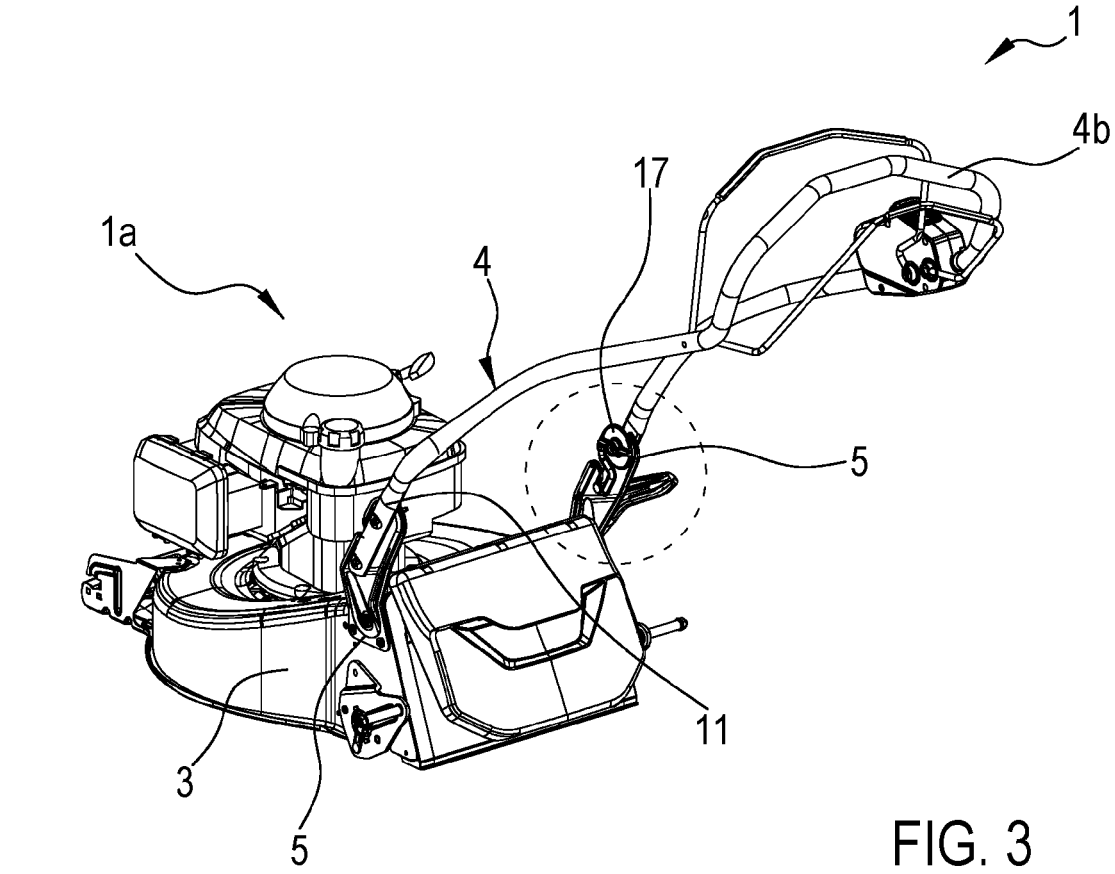

FIG. 3

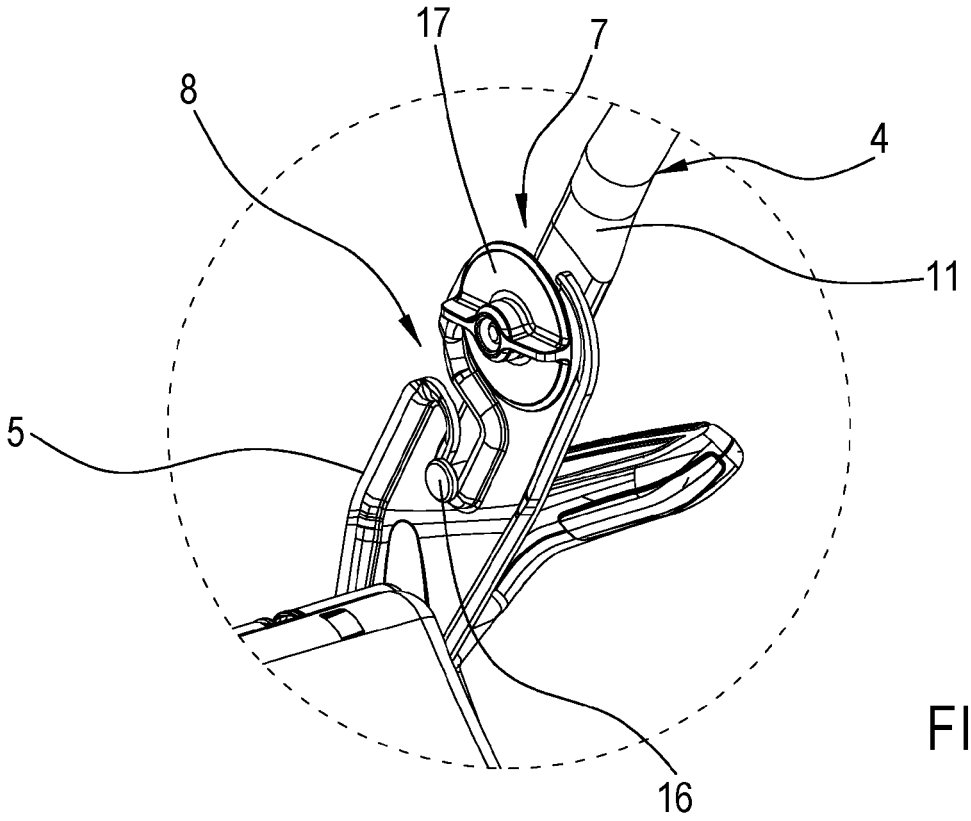

FIG. 4

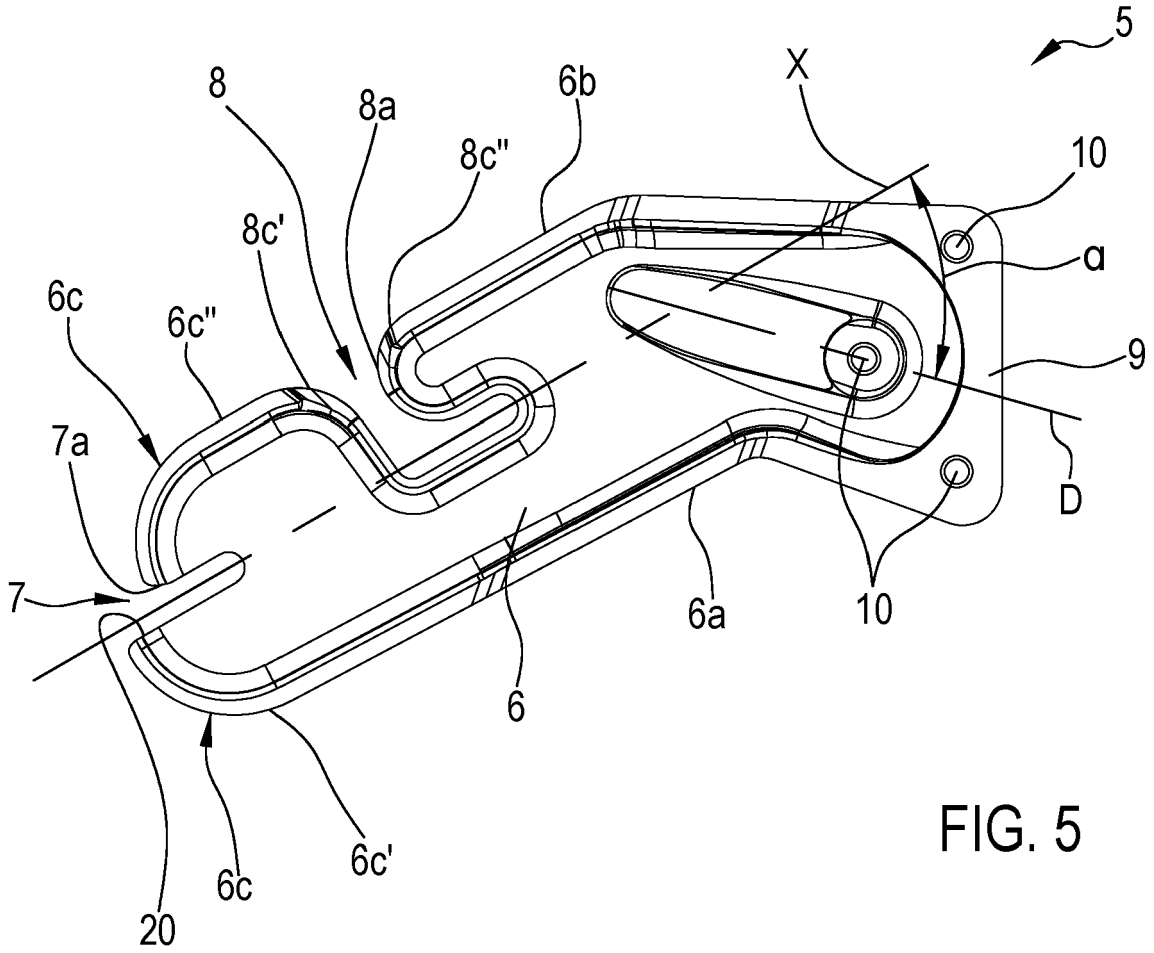
5
8
8a
6b
X
8c"
10
8c'
α
6c
6c"
9
7a
D
7
6a
10
6
6c'
6c
20

FIG. 5

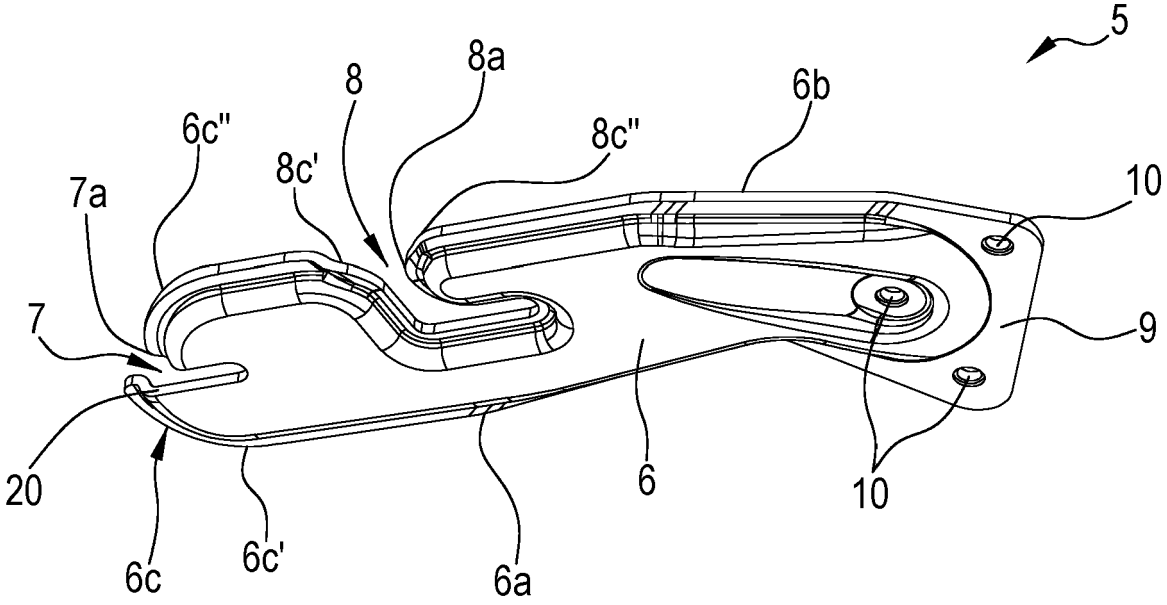
5
8a
8
6b
6c"
8c"
8c'
10
7a
7
9
20
6
10
6c
6c'
6a

FIG. 6

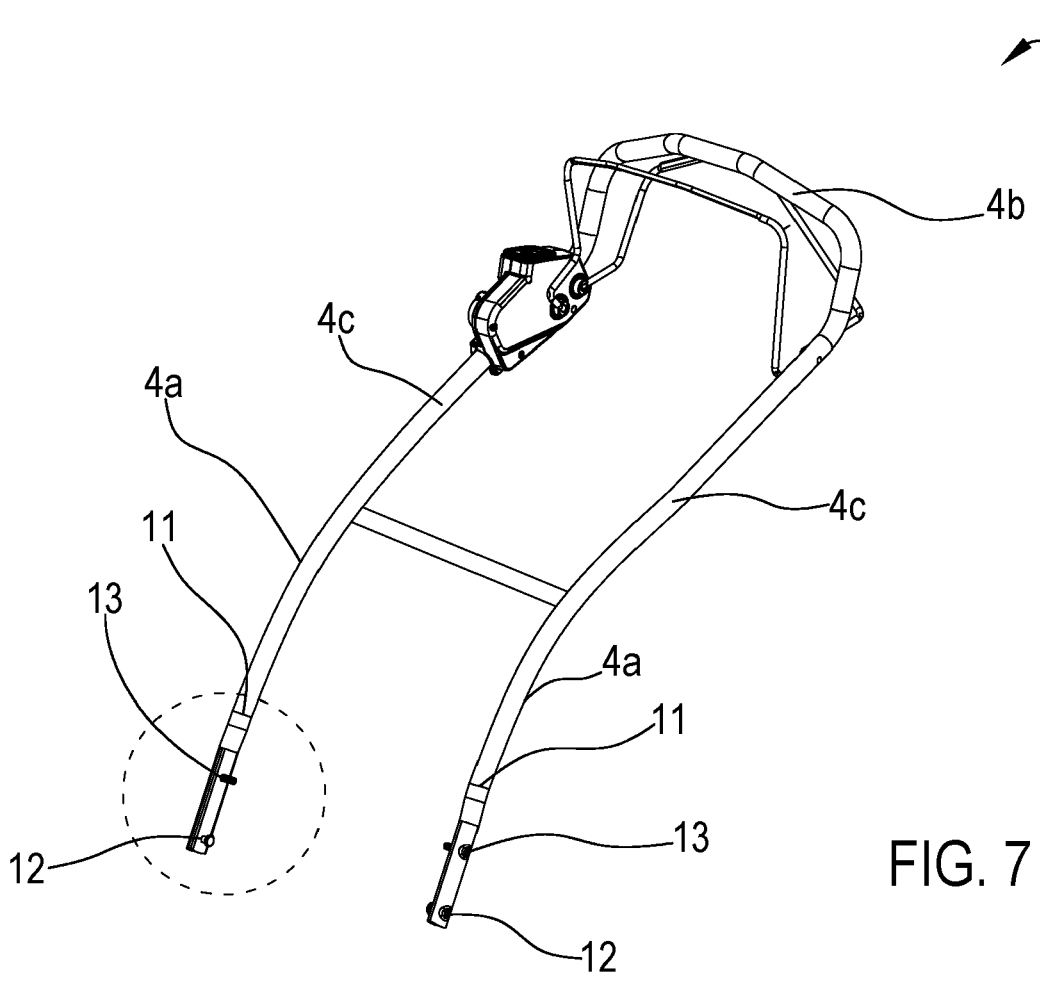

FIG. 7

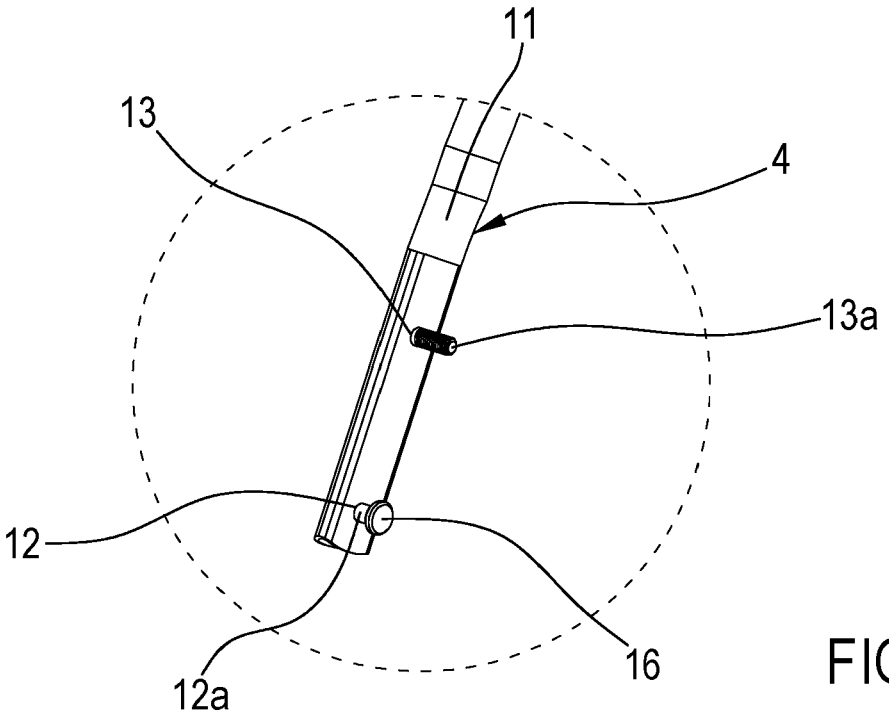

FIG. 8

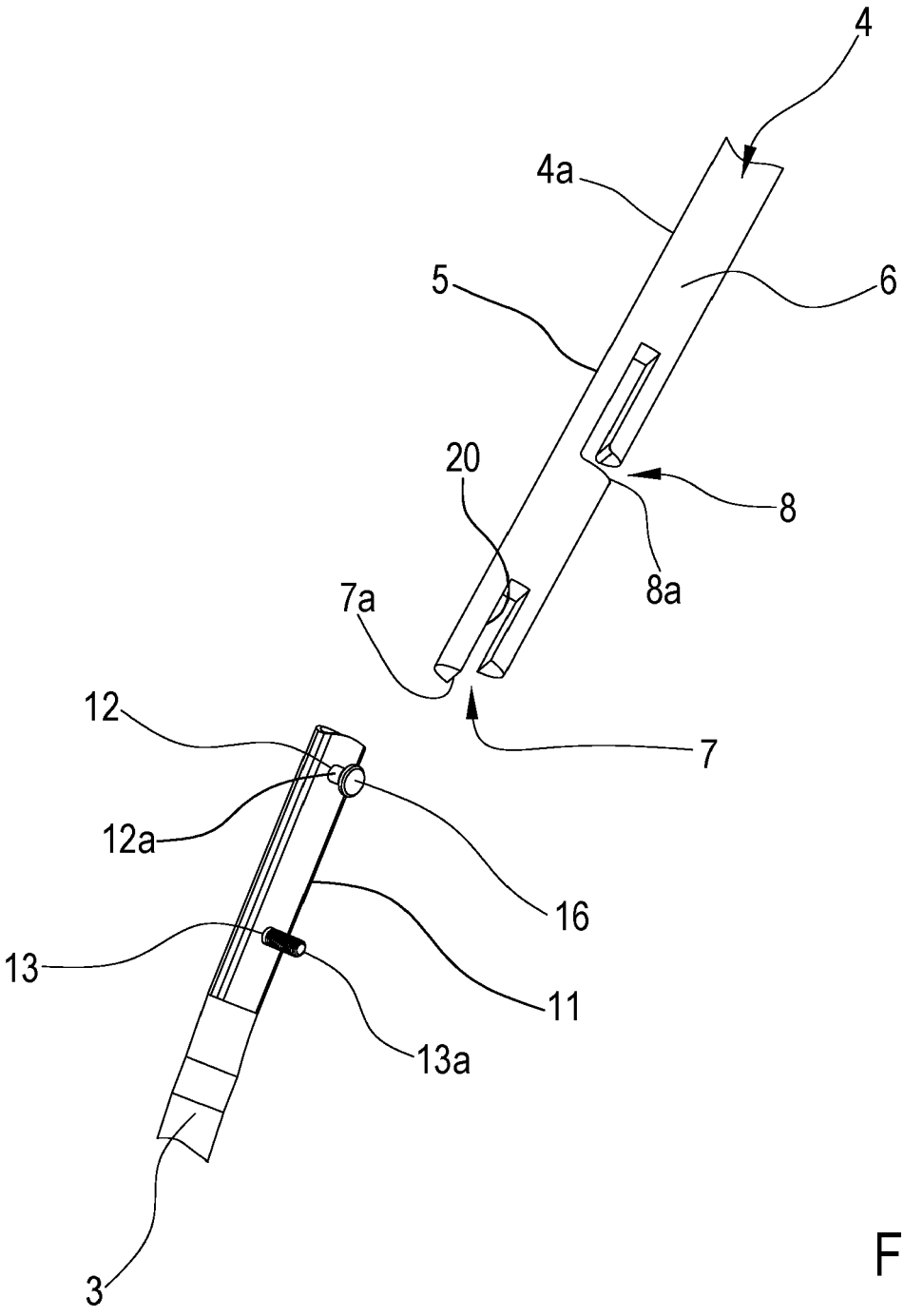

FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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