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(71) Applicant: **CAMPAGNOLA - SOCIETA' A
RESPONSABILITA' LIMITATA**
40069 Zola Predosa (BO) (IT)

(72) Inventor: **MARAFIOTI, Massimo**
40069 ZOLA PREDOSA BO (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

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(54) **LOCKING ASSEMBLY FOR BLADES FOR MOTORIZED SCISSORS AND RELATED
MOTORIZED SCISSORS**

(57) A locking assembly (1) for blades for motorized scissors (2), of the type comprising a main body (3) which defines a grip and houses respective movement elements and an actuation motor, a fixed blade (4) which is integral with the body (3), and a moving blade (5) which is pivoted to the body (3) in substantial juxtaposition with the fixed blade (4) and is functionally associated with the movement elements. At the pivoting axis of the moving blade (5) to the main body (3) and to the fixed blade (4), it comprises: a pivot (7) provided with an externally threaded end portion (8) and with a threaded longitudinal

internal channel (9), in which the internally and externally threaded hollow end portion (8) is slotted by a through transverse cut (10) arranged on a diametrical plane of the pivot (7); a tightening element (11) provided, in a through hole thereof, with a female thread with shape and dimensions complementary to those of the threaded end portion (8) for screwing thereon; a locking screw (12) matching the internal threading of the longitudinal channel (9) of the end portion (8) of the pivot (7) for screwing therein.

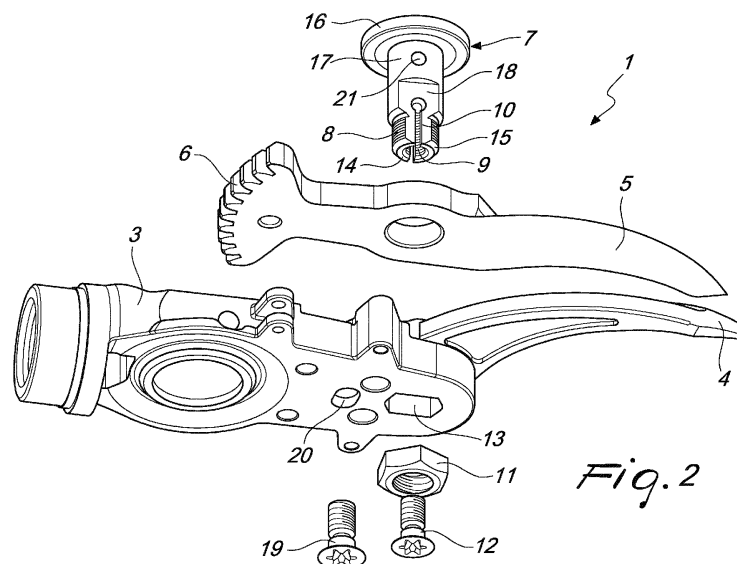


Fig. 2

Description

[0001] The present invention relates to a locking assembly for blades for motorized scissors (be they of the electrically-actuated type, or pneumatically-actuated or hydraulically-actuated), and to any motorized scissors that incorporate the above-mentioned locking assembly.

[0002] In any case the term "motorized scissors" includes any shears, nippers and/or pincers in which two blades, or two clamps, are brought into contact with each other in order to clamp and/or sever an element interposed between them.

[0003] A brief description will be given below of the prior art, centering mainly on scissors for pruning, even though these constitute, as explained above, just one of the possible applications of the present invention.

[0004] Motorized scissors for pruning comprise a fixed blade on a main body and a moving blade pivoted to the main body and driven by a respective motor.

[0005] A typical problem of the prior art lies in the difficulty of correctly pivoting the moving blade (with respect to the fixed blade) and, in particular, in the contrivances designed to prevent the rotations of the blade from resulting in the fixing element coming unscrewed.

[0006] Furthermore, in order to ensure that the movement elements of the moving blade with respect to the fixed blade are not subjected to accelerated wear, it is necessary to perform a periodic lubrication which is normally done by way of grease guns, oil cans, or by resorting to the disassembly and reassembly of various components of the scissors. This operation is therefore not easily controllable in terms of the amount of lubricant used and/or it needs fairly lengthy times for its execution, if disassembly and subsequent reassembly are necessary, requiring periodic outages of the device.

[0007] The aim of the present invention is to solve the above-mentioned drawbacks, by providing a locking assembly for blades for motorized scissors which enables a stable positioning of the moving blade with respect to the fixed blade.

[0008] Within this aim, an object of the invention is to provide a locking assembly for blades for motorized scissors, in which the lubrication operations are simplified with respect to the prior art and are more precise.

[0009] Another object of the invention is to provide a locking assembly for blades for motorized scissors which allows an easy and rapid lubrication of the movement elements of the moving blade.

[0010] Another object of the invention is to provide a motorized scissors which allows an easy adjustment of the pivoting position of the moving blade with respect to the fixed blade.

[0011] Another object of the invention is to provide a motorized scissors in which the moving blade is stably positioned with respect to the fixed blade.

[0012] Another object of the invention is to provide a motorized scissors in which the adjustment of the pivoting position of the moving blade with respect to the fixed

blade is easy.

[0013] Another object of the invention is to provide a motorized scissors in which the lubrication and adjustment operations are simple.

5 **[0014]** Another object of the invention is to provide a motorized scissors in which the lubrication and adjustment operations are rapid.

[0015] Another object of the present invention is to provide a locking assembly for blades for motorized scissors and a motorized scissors which are of low cost, easily and practically implemented and safe in use.

10 **[0016]** This aim and these and other objects that will become more apparent hereinafter are achieved by a locking assembly for blades for motorized scissors, of the type comprising a main body which defines a grip and houses respective movement elements and an actuation motor, a fixed blade which is integral with said main body, and a moving blade which is pivoted to said main body in substantial juxtaposition with said fixed blade and is functionally associated with said movement elements, characterized in that, at the pivoting axis of said blade that is movable with respect to said main body and to said fixed blade, it comprises:

- 25 - a pivot provided with an externally threaded end portion and with a threaded longitudinal internal channel, said internally and externally threaded hollow end portion being slotted by a through transverse cut arranged on a diametrical plane of said pivot;
- 30 - a tightening element provided, in a through hole thereof, with a female thread with shape and dimensions complementary to those of said threaded end portion for screwing thereon, said through hole having an inner volume corresponding to the correct volume of lubricant to be periodically introduced during maintenance operations;
- 35 - a locking screw matching the internal threading of said longitudinal channel of said end portion of said pivot for screwing therein.
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[0017] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the locking assembly for blades for motorized scissors and of the respective motorized scissors, which are illustrated by way of non-limiting example in the accompanying drawings wherein:

Figure 1 is a schematic perspective view of a possible embodiment of a motorized scissors according to the invention;

Figure 2 is a schematic exploded perspective view of the scissors of Figure 1.

45 **[0018]** With reference to these figures, the reference numeral 1 generally designates a locking assembly for blades for motorized scissors 2.

[0019] The locking assembly 1 according to the inven-

tion is adapted to be installed on motorized scissors 2 comprising a main body 3 which defines a grip and houses respective movement elements and an actuation motor.

[0020] A fixed blade 4 and a moving blade 5 will be installed on this main body 3.

[0021] The moving blade 5 can be pivoted to the main body 3 in substantial juxtaposition with the fixed blade 4, so that the moving blade 5 is functionally associated with the movement elements (according to the example shown by way of non-limiting example in the accompanying figures this association could occur through a toothed band 6 protruding from the end opposite to the sharpened end defining the cutting edge of the blade 5).

[0022] At the pivoting axis of the moving blade 5 to the main body 3 and to the fixed blade 4, the assembly 1 according to the invention comprises a pivot 7 provided with an externally threaded end portion 8 and with a threaded longitudinal internal channel 9.

[0023] The hollow and (internally and externally) threaded end portion 8 is slotted by a through transverse cut 10, which is arranged on a diametrical plane of the pivot 7.

[0024] The assembly 1 further comprises a tightening element 11 provided, in a through hole thereof, with a female thread with shape and dimensions complementary to those of the threaded end portion 8 for screwing thereon. The inner volume of this through hole corresponds to the correct volume of lubricant to be periodically introduced in maintenance operations: by virtue of this dimensional choice, the operator responsible for maintenance can perform the lubrication operations in a simple and precise manner, without needing special calibrated dosage units (which, in the known art, ensure that the correct amount of lubricant is introduced).

[0025] The assembly 1 according to the invention finally comprises a locking screw 12, which matches the internal threading of the longitudinal channel 9 of the end portion 8 of the pivot 7 for screwing therein.

[0026] Basically the pivot 7, once it is inserted into the pivoting holes of the moving blade 5 and of the fixed blade 4 and in a respective slit of the main body 3, can be coupled using the tightening element 11 (the screwing force of which will also determine the extent of the forcing of the moving blade 5 on the fixed blade 4).

[0027] Once the correct and complete adjustment of the tightening is determined (and, therefore, once the ideal position of the tightening element 8 with respect to the pivot 7 is defined), it will be possible to proceed with screwing the screw 12 into the channel 9 in order to stably lock the tightening element 8 onto the pivot 7 and, therefore, in order to define all the necessary degrees of restriction of the moving blade 5 with respect to the fixed blade 4 (the moving blade 5 will exclusively be able to rotate about the pivot 7 without performing any other movement).

[0028] The through transverse cut 10 arranged on a diametrical plane of the pivot 7 will advantageously be

delimited by two mirror-symmetrical appendages 14 and 15 of the end portion 8.

[0029] By adopting a particular shape structure of the screw 12 (for example by having a slight increase in its diameter at least proximate to its head), the complete screwing thereof will force a minimum mutual spacing apart of the appendages 14 and 15, in so doing forcing them onto the female thread of the tightening element 11 (and so determining an effective locking thereof on the end portion 8).

[0030] It should further be noted that the through transverse cut 10, which is arranged along a diametrical plane of the pivot 7, extends longitudinally along the pivot 7 for a length greater than the length of the end portion 8.

[0031] With reference to an embodiment of undoubted practical and applicative interest, the pivot 7 can profitably comprise: an enlarged head 16 designed to abut against a predefined region of a surface of the moving blade 5; a cylindrical first section 17, contiguous with the head and designed to be accommodated in the through pivoting hole of the moving blade 5; a partially cylindrical second section 18, affected by mutually opposite flattened-out areas arranged on planes perpendicular to the diametrical plane of arrangement of the cut 10, this second section 18 being contiguous with the first section 17 and designed to be accommodated in a fixing slit 13 of the main body 3, noting that the shape and dimensions of the slit 13 will be complementary to those of the second section 18; the end portion 8, which is contiguous with the second section 18.

[0032] It should be noted that the fixing slit 13 of the main body 3 is at least partially open toward an internal compartment of the main body 3 which accommodates at least the movement elements.

[0033] It should be noted that the fixed blade 4 comprises a threaded hole for the engagement of a fixing screw 19, which in turn leads to a threaded recess 20 of the main body 3 for coupling thereto.

[0034] The pivot 7, at its threaded internal channel 9 with the transverse cut 10, can comprise, transversely, a transverse channel 21 (arranged substantially between the head 16 and the apex of the transverse cut 10 of the pivot 7). The function of the transverse channel 21 is to allow the dispensing of lubricant (in the course of ordinary operations involving the lubrication of the blades 4, 5 and of the movement elements) directly between the blades 4, 5, since, in the assembled configuration, the transverse channel 21 is substantially aligned with the mutually juxtaposed faces of the blades 4, 5.

[0035] The protection offered by the present invention also extends to a motorized scissors 2 comprising a main body 3 which defines a grip and houses respective movement elements and an actuation motor: the actuation motor can be preferably electrical, although the possibility is not ruled out of adopting a pneumatic or hydraulic motor in particular applications.

[0036] The motorized scissors 2 comprise a fixed blade 4, integral with the main body 3, and a moving blade 5,

pivoted to the main body 3 in substantial juxtaposition with the fixed blade 4.

[0037] The moving blade 5 is functionally associated with the movement elements (which in turn are actuated by the motor).

[0038] The scissors 2 according to the invention advantageously comprise a locking assembly 1 for the blades 4, 5 which confirms what is described up to this point (in particular provided according to any of the embodiments described above, and/or a combination thereof, and/or according to alternative embodiments that are substantially equivalent to those described above).

[0039] It should be noted that the main body 3 of the scissors 2 according to the invention will conveniently comprise a seat for an actuation lever (for example shaped like a trigger): the motor and the movement elements will be, in such case, controlled by the lever for their activation/deactivation; the movement of the moving blade 5 with respect to the fixed blade 4 will be commanded by the actuation lever (which could also allow an adjustment of the intensity of force applied by the movement elements on the moving blade 5, which is determined by the extent of the stroke the actuation lever is called on to perform).

[0040] It should be noted that, if the locking screw 12 is not present, the threaded longitudinal internal channel 9 of the pivot 7 defines a conduit for the introduction of lubricant (distributed by a conventional external dispenser provided with a spout of suitable dimensions): the conduit constituted by the channel 9 leads, through the opening of the fixing slit 13, to the internal compartment in the main body 3 which accommodates at least the movement elements and then the lubricant introduced (for example an oil, a grease or an emulsion or a gel, etc.) can affect the surfaces of these movement elements, protecting them from the accelerated wear that would be produced by direct friction (without the interposition of lubricants) of the parts involved in the transmission of motion.

[0041] It is evident that proceeding with periodic lubrication operations, simply by removing the screw 12 and introducing the lubricant, renders such activities simple and rapid (they can potentially even be performed during a short pause in a work cycle with the scissors 2).

[0042] Advantageously the present invention solves the problems previously explained, by providing a locking assembly 1 for blades 4, 5 for motorized scissors 2 which enables a stable positioning of the moving blade 5 with respect to the fixed blade.

[0043] Conveniently the locking assembly 1 makes it possible to provide a locking assembly for blades for motorized scissors in which the lubrication operations are simplified with respect to the prior art and are more precise.

[0044] Conveniently the locking assembly 1 allows an easy and rapid lubrication of the movement elements of the moving blade 5.

[0045] Profitably, in the motorized scissors 2 according to the invention, the moving blade 5 is stably positioned

with respect to the fixed blade 4, by virtue of the locking of the element 11 on the end 8, which is obtained by screwing the screw 12 into the channel 9.

[0046] Usefully the motorized scissors 2 according to the invention offers a simple adjustment of the pivoting position (and also of the mechanical play therein) of the moving blade 5 with respect to the fixed blade 4.

[0047] Positively the motorized scissors 2 according to the invention can be subjected to the necessary periodic operations of lubrication and adjustment in a simple manner.

[0048] Conveniently the motorized scissors 2 according to the invention can be subjected to the necessary periodic operations of lubrication and adjustment in a rapid manner.

[0049] Positively the locking assembly 1 for blades 4, 5 for motorized scissors 2 and the motorized scissors 2 are easily and practically implemented and of low cost: such characteristics make the assembly 1 and the scissors 2 innovations certain to be applied.

[0050] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0051] In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

[0052] In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

[0053] The disclosures in Italian Utility Model Application No. 202023000001884 from which this application claims priority are incorporated herein by reference.

[0054] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

45 Claims

1. A locking assembly for blades for motorized scissors, of the type comprising a main body (3) which defines a grip and houses respective movement elements and an actuation motor, a fixed blade (4) which is integral with said main body (3), and a moving blade (5) which is pivoted to said main body (3) in substantial juxtaposition with said fixed blade (4) and is functionally associated with said movement elements, **characterized in that**, at the pivoting axis of said blade (5) that is movable with respect to said main body (3) and to said fixed blade (4), it comprises:

- a pivot (7) provided with an externally threaded end portion (8) and with a threaded longitudinal internal channel (9), said internally and externally threaded hollow end portion (8) being slotted by a through transverse cut (10) arranged on a diametrical plane of said pivot (7);
- a tightening element (11) provided, in a through hole thereof, with a female thread with shape and dimensions complementary to those of said threaded end portion (8) for screwing thereon, said through hole having an inner volume corresponding to the correct volume of lubricant to be periodically introduced during maintenance operations;
- a locking screw (12) matching the internal threading of said longitudinal channel (9) of said end portion (8) of said pivot (7) for screwing therein.
2. The locking assembly according to claim 1, **characterized in that** said through transverse cut (10), which is arranged along a diametrical plane of the pivot (7), is delimited by two mirror-symmetrical appendages (14, 15) of said end portion (8).
 3. The locking assembly according to one or more of the preceding claims, **characterized in that** said through transverse cut (10), which is arranged along a diametrical plane of said pivot (7), extends longitudinally along said pivot (7) for a length greater than the length of the said end portion (8).
 4. The locking assembly according to one or more of the preceding claims, **characterized in that** said pivot (7) comprises:
 - an enlarged head (16) designed to abut against a predefined region of a surface of said moving blade (5),
 - a cylindrical first section (17), contiguous with said head (16) and designed to be accommodated in the through pivoting hole of said moving blade (5),
 - a partially cylindrical second section (18), affected by mutually opposite flattened-out areas arranged on planes perpendicular to the diametrical plane of arrangement of said cut (10), said second section (18) being contiguous with said first section (17) and designed to be accommodated in a fixing slit (13) of said main body (3), the shape and dimensions of said slit (13) being complementary to those of said second section (18), and
 - said end portion (8), contiguous with said second section (18).
 5. The locking assembly according to claim 4, **characterized in that** said fixing slit (13) of said main body
- (3) is at least partially open toward an internal compartment of said main body (3) which accommodates at least said movement elements.
6. The locking assembly according to claim 1, **characterized in that** said fixed blade (4) comprises a threaded hole for the engagement of a fixing screw (19), in turn leading to a threaded recess (20) for stable coupling to said main body (3).
 7. A motorized scissors of the type comprising a main body (3) which defines a grip and houses respective movement elements and an actuation motor, a fixed blade (4) which is integral with said main body (3), and a moving blade (5) which is pivoted to said main body (3) in substantial juxtaposition with said fixed blade (4) and is functionally associated with said movement elements, **characterized in that** it comprises a locking assembly (1) for the blades (4, 5) according to one or more of the preceding claims which is configured to pivot the said blades (4, 5) to each other.
 8. The motorized scissors according to claim 7, **characterized in that** said main body (3) comprises a seat for an actuation lever, said motor and said movement elements being controlled by said lever dedicated to their activation/deactivation and, therefore, to the movement of said moving blade (5) with respect to said fixed blade (4).
 9. The motorized scissors according to one or more of claims 7 and 8, **characterized in that**, when said locking screw (12) is absent, said threaded longitudinal internal channel (9) of said pivot (7) defines a conduit for the introduction of lubricant, through said opening of said fixing slit (13), into the said internal compartment of said main body (3) which accommodates at least said movement elements.

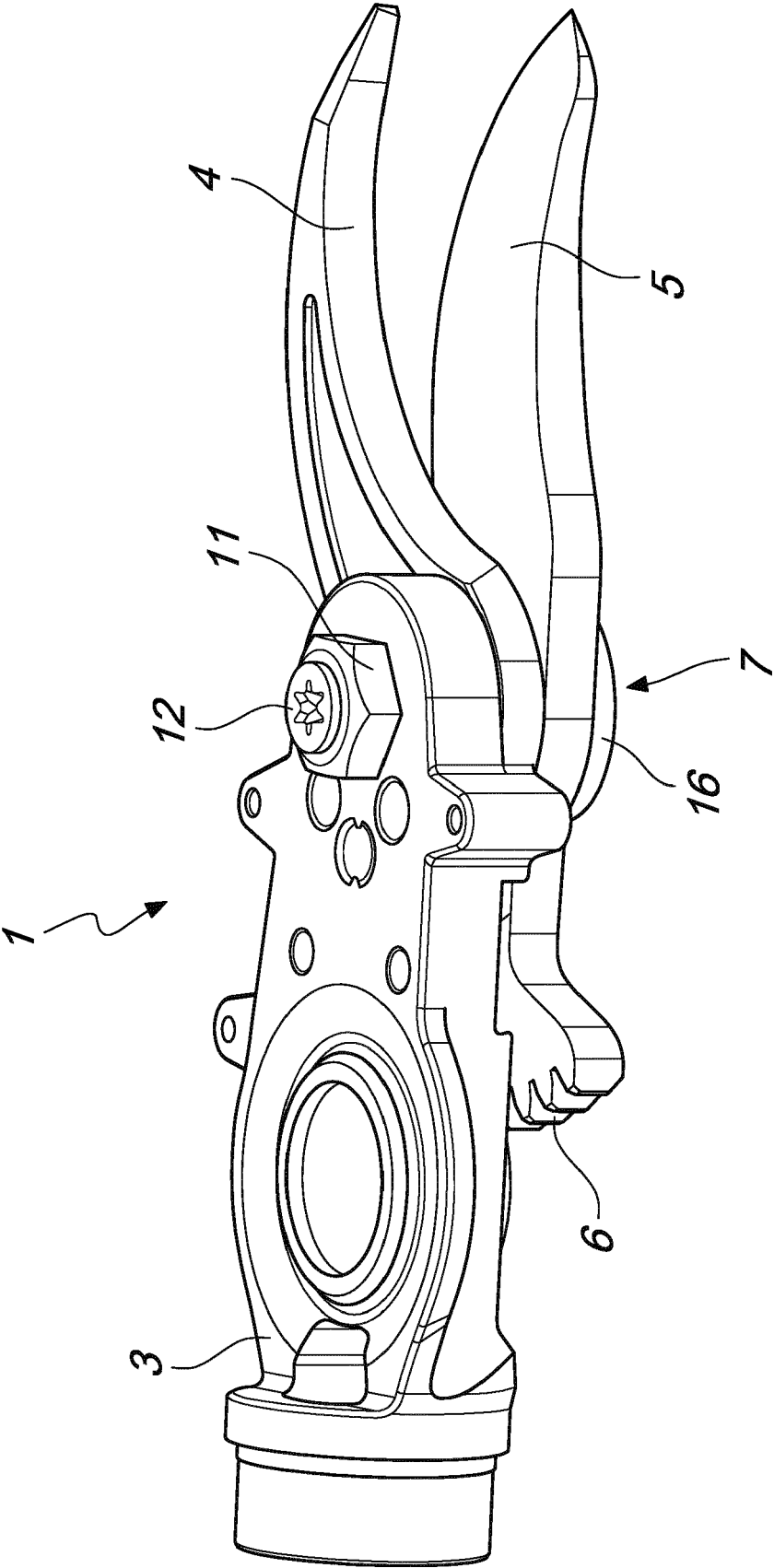
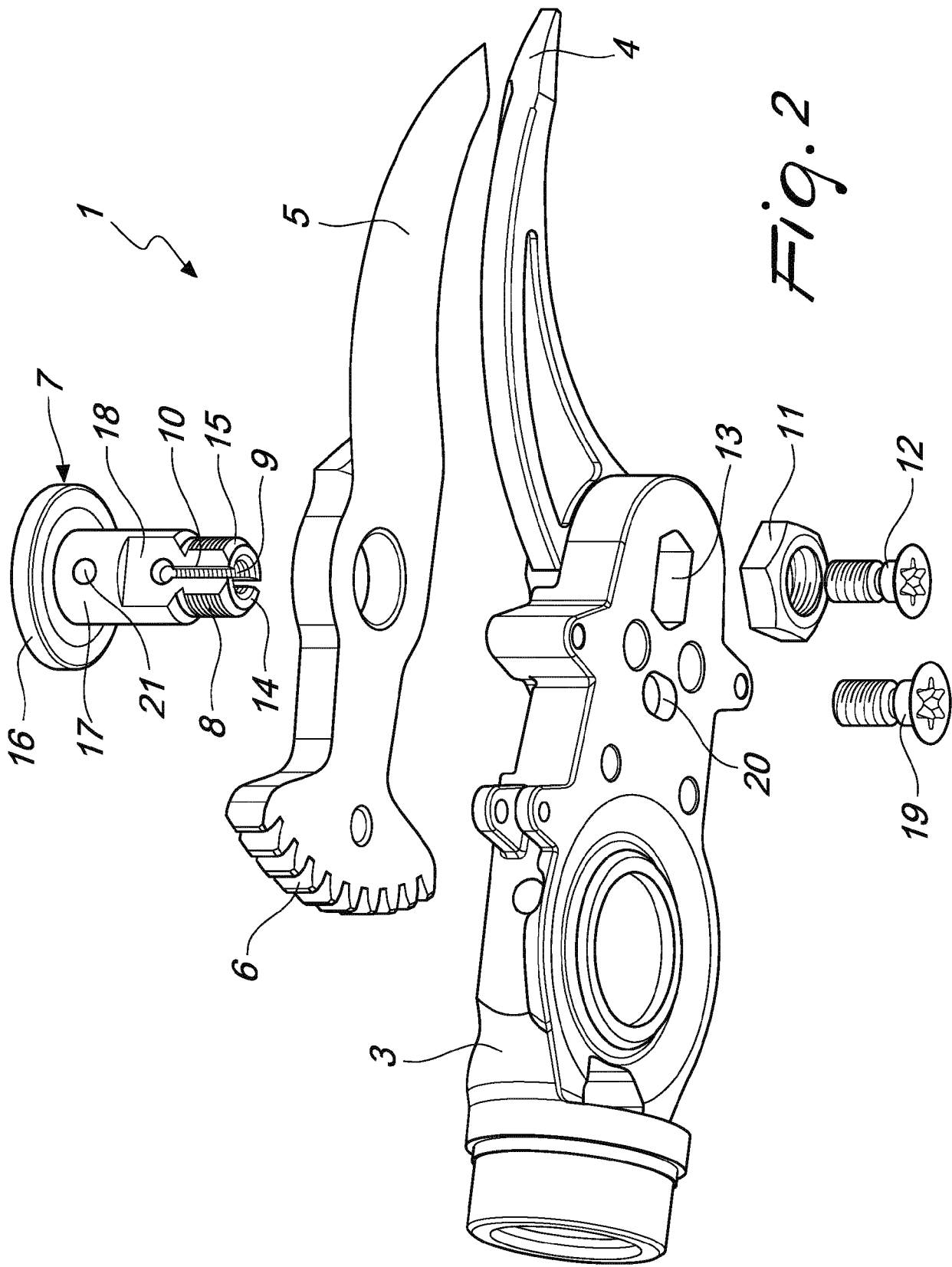


Fig. 1





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Application Number

EP 24 16 6961

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EPO FORM 1503 03.82 (P04C01)

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