

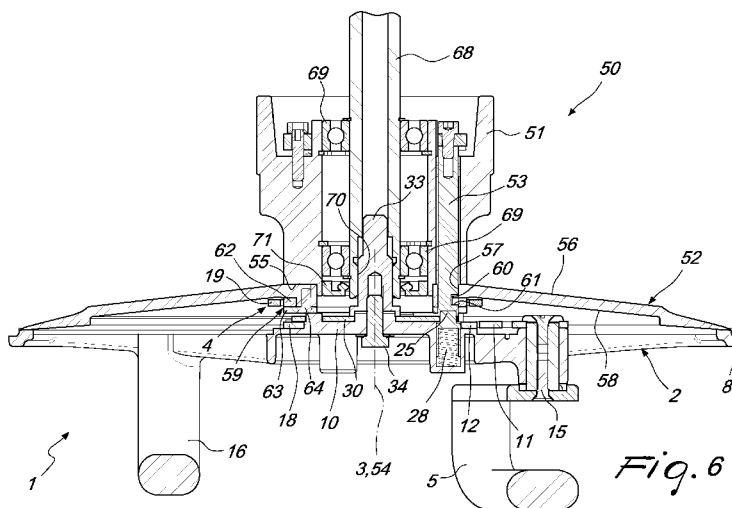


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(54) Title: TOOL FOR SAFELY DISASSEMBLING AND REASSEMBLING BLADES FOR SLICING MACHINES



(57) Abstract: A tool for safely disassembling and reassembling blades for slicing machines. The tool (1) comprises a protective body (2) that is extended around a main axis (3) and has a perimetric profile adapted to be superimposed, with one of its sides, on a peripheral band of the blade (52). The protective body (2) supports rotatably, about the main axis (3), an actuation element (4) that can engage a rotatable locking element (59) of the blade (52) which is provided on the blade (52) and can engage the slicing machine. The protective body (2) supports, on its opposite side with respect to the side to be directed toward the blade (52), an actuation handle (5) which is connected to the actuation element (4) and can be maneuvered to turn the actuation element (4) with respect to the protective body (2) about the main axis (3). The actuation handle (5) is supported rotatably by the protective body (2) about a secondary axis (6), which is parallel and spaced with respect to the main axis (3) and is connected to the actuation element (4) through a kinematic transmission (7), which is adapted to increase the torque transmitted by the actuation handle (5) to the actuation element (4).



TOOL FOR SAFELY DISASSEMBLING AND REASSEMBLING BLADES FOR SLICING MACHINES

The present invention relates to a tool for safely disassembling and reassembling blades for slicing machines provided with a detachable blade.

5 As is known, slicing machines are provided with a cutting assembly which comprises a blade holder, constituted by a pulley, which can be actuated with a rotary motion about its own axis, and a blade, generally having a circular profile, which is associated coaxially with the pulley so as to be integral with it in rotation about its axis.

10 In machines of the professional type, the blade can be associated with the pulley detachably so that it can be removed from the pulley during maintenance and/or cleaning of the machine.

In some machines, the pulley is provided with centering pins which protrude from one axial end of the pulley and can be inserted within through
15 holes provided in the blade, which is provided centrally, proximate to such through holes, with a locking element which can rotate with respect to the blade and which, by utilizing this possibility to rotate, can engage the centering pins so as to firmly lock the blade to the pulley or can be disengaged from the centering pins so as to allow the removal of the blade
20 from the pulley or the reassembly of the blade on the pulley.

Since blade handling is a dangerous operation, tools have been devised which prevent the operator from making direct contact with the blade in order to remove the blade from the slicing machine and subsequently reassemble it when washing or maintenance of the blade is
25 necessary.

One type of these tools is constituted substantially by a disk-shaped protective body, which can face coaxially the blade so as to cover, by means of a peripheral band, the sharp edge of the blade. This protective body is provided centrally with an annular actuation element, which can rotate with
30 respect to the protective body about its own axis and can engage the locking

element associated with the blade so as to cause its rotation to engage it or disengage it with respect to the centering pins and thus couple or uncouple the blade from the pulley of the slicing machine. It should be noted that the actuation element, while it disengages the locking element from the centering pins, simultaneously engages the blade, coupling it firmly to the protective body, and at the end of the engagement of the locking element with the centering pins it disengages from the locking element and therefore from the blade.

Two handles are associated on the face of the protective body that is opposite with respect to the face designed to be directed toward the blade: respectively, a supporting handle, which is fixed to the protective body and is spaced laterally from the axis thereof, and an actuation handle, which is arranged at the axis of the protective body and can rotate with respect to the protective body about such axis. The actuation handle is integral with the actuation element so that by turning the actuation handle the rotation of the actuation element is produced in order to couple or uncouple the blade from the pulley of the slicing machine.

Although this type of tool offers adequate assurances of safety against the danger of accidental injury by the operator during removal and reassembly of the blade, it has some drawbacks.

One of the drawbacks is the relatively large force required to rotate the actuation element by way of the actuation handle. In the presence of dirt or oxide between the locking element and the centering pins and/or between the actuation element and the protective body, the manual force that can be applied by the operator assigned to this operation may be insufficient to cause the disengagement of the locking element from the centering pins and thus to disengage the blade from the slicing machine.

Another drawback is constituted by the arrangement of the two handles, particularly by the central position of the actuation handle, which does not make it possible to balance the weight of the blade during its

movement, making this operation awkward and difficult.

The aim of the present invention is to obviate the above mentioned drawbacks, by providing a tool that makes disassembly and reassembly of the blade of slicing machines particularly easy.

5 Within this aim, an object of the invention is to provide a tool that allows the removal of the blade from slicing machines with a significantly lower force than that required by tools of the known type.

 Another object of the invention is to provide a tool that makes it possible to remove and reassemble the blade in slicing machines in
10 conditions of absolute safety.

 A further object of the invention is to provide a tool that has a low weight, so as to be simple to transport.

 Another object of the invention is to provide a tool that can be manufactured with competitive costs.

15 This aim, as well as these and other objects which will become better apparent hereinafter, are achieved by a tool for safely disassembling and reassembling blades for slicing machines, comprising a protective body that is extended around a main axis and has a perimetric profile adapted to be
20 superimposed, with one of its sides, on a peripheral band of the blade, said protective body supporting rotatably, about said main axis, an actuation element that can engage a rotatable locking element of the blade which is provided on the blade and can engage the slicing machine, said protective
25 body supporting, on its opposite side with respect to the side to be directed toward the blade, an actuation handle which is connected to said actuation
30 element and can be maneuvered to turn said actuation element with respect to said protective body about said main axis, characterized in that said actuation handle is supported rotatably by said protective body about a secondary axis, which is parallel and spaced with respect to said main axis and is connected to said actuation element through a kinematic
30 transmission, which is adapted to increase the torque transmitted by said

actuation handle to said actuation element.

Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the tool according to the invention, illustrated by way of
5 non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially exploded perspective view of the tool according to the invention;

Figure 2 is a plan view of the tool, taken from the side designed to be directed away from the blade;

10 Figure 3 is a plan view of the tool, taken from the side designed to be directed toward the blade;

Figure 4 is a sectional view of Figure 3, taken along the line IV-IV;

Figure 5 is a view of a blade mounted on a slicing machine, taken from its side designed to be directed toward the tool according to the
15 invention;

Figure 6 is a sectional view, taken like Figure 4, of the tool according to the invention coupled to a blade of the type shown in Figure 5, mounted on a slicing machine which is shown only as regards the blade supporting element or the blade holder element.

20 With reference to the figures, the tool according to the invention, generally designated by the reference numeral 1, is designed to be used to disassemble and reassemble a blade on a slicing machine.

Merely by way of indication, Figures 5 and 6 illustrate a cutting assembly of a slicing machine on which the tool 1 according to the
25 invention can be used.

The cutting assembly shown in these figures, generally designated by the reference numeral 50, comprises substantially a supporting element 51, constituted by a pulley, and a blade 52, which has a circular plan shape and can be associated coaxially and detachably with the pulley 51. More
30 precisely, the pulley 51 is provided with centering pins 53 which lie parallel

to the axis 54 of the pulley 51 and protrude from a resting surface 55 of the blade 52 which is defined at an axial end of the pulley 51 and at right angles to the axis 54 of the pulley 51. The blade 52 can rest with a first face 56 against the resting surface 55 and is crossed by through holes 57 which are arranged so as to correspond to the centering pins 53, so that when the blade 52 is rested with its first face 56 against the resting surface 55 the centering pins 53 enter the through holes 57 and exit from the opposite or second face 58 of the blade 52. On the second face 58, the blade 52 supports a locking element 59, which can rotate about the axis of the blade 52 with respect to the blade 52 so as to pass from a locking position, in which it engages the centering pins 53 to firmly couple the blade 52 to the pulley 51, to a release position, in which it is disengaged from the centering pins 53 in order to allow the removal of the blade 52 from the pulley 51.

More precisely, each centering pin 53 has, on its portion designed to protrude from the second face 58 of the blade 52, a transverse slot 60, which defines a shoulder 61 which is directed toward the resting surface 55. The locking element 59 is constituted by a locking ring 62, which is interposed between the second face 58 of the blade 52 and a fixed ring 63, which is fixed integrally, for example by means of screws 64, to the second face 58 of the blade 52. The locking ring 62, when the blade 52 is engaged with the centering pins 53, surrounds the centering pins 53 and has, along its internal perimeter, recesses 65 which, through the rotation of the locking ring 62 with respect to the blade 52 about the axis of the blade 52, which coincides with the axis of the locking ring 62, can be arranged in alignment with the through holes 57 of the blade 52, providing the release position, in which it allows the free disengagement of the centering pins 53 from the through holes 57, or can be angularly offset with respect to the through holes 57, providing the locking position in which it engages, by means of its portions arranged between two contiguous recesses 65, the transverse slots 60 of the centering pins 53, thus locking the blade 52 with respect to the centering

pins 53 and therefore with respect to the pulley 51.

The fixed ring 63 and the locking ring 62 have, along their external perimeter, safety notches 66, 67. The safety notches 67 of the locking ring 62 are aligned with the safety notches 66 of the fixed ring 63 when the locking ring 62 is in the locking position and are instead angularly offset with respect to the safety notches 66 of the fixed ring 63 when the locking ring 62 is in the release position.

The pulley 51 is supported, so that it can rotate about its own axis 54, by a shaft 68 by means of the interposition of a pair of bearings 69. The end of the shaft 68, which is inserted in the pulley 51, which is directed toward the blade 52, has a centering seat 70. The space between the shaft 68 and the pulley 51, occupied by the bearings 69, is closed, on its side directed toward the blade 52, by a gasket 71.

As regards additional elements related to the cutting assembly 50 illustrated in Figures 5 and 6, reference is made for the sake of completeness to the co-pending patent application in the name of the same Applicant, which relates to such cutting assembly and is assumed to be included herein as reference.

The tool 1 according to the invention comprises a protective body 2, which lies around a main axis 3 and has a perimetric profile which is adapted to be superimposed, with one of its sides, on the sharp peripheral band of the blade 52.

The protective body 2 supports, so that it can rotate about the main axis 3, an actuation element 4, which can engage the locking element 59 of the blade 52, i.e., the locking ring 62 of the cutting assembly 50 of the slicing machine, for example of the type described above.

The protective body 2 supports, on its opposite side with respect to the side to be directed toward the blade 52, an actuation handle 5, which is connected to the actuation element 4 and can be maneuvered in order to rotate the actuation element 4 with respect to the protective body 2 about the

main axis 3.

According to the invention, the actuation handle 5 is supported by the protective body 2, so that it can rotate about a secondary axis 6 which is parallel and spaced with respect to the main axis 3, and is connected to the actuation element 4 by means of a kinematic transmission 7, which is adapted to increase the torque transmitted by the actuation handle 5 to the actuation element 4.

More precisely, the protective body 2 preferably has the shape of a circular profile centered on the main axis 3.

The protective body 2 is provided with a perimetric annular portion 8, which can be superimposed, with one of its sides, on the sharp peripheral band of the blade 52. The perimetric annular portion 8 is connected, by means of radial spokes 9, to a central portion 10 of the protective body 2. The central portion 10 supports the actuation element 4.

This particular shape of the protective body 2 achieves, for the tool 1 according to the invention, a reduced weight which makes its handling and movement particularly easy.

Conveniently, the kinematic transmission 7 comprises a first toothed sector 11, whose axis coincides with the secondary axis 6 and is integral with the actuation handle 5, and a second toothed sector 12, whose axis coincides with the main axis 3 and is fixed rigidly to the actuation element 4.

The actuation handle 5 is fixed to a shaft 13 which is supported, so that it can rotate about its own axis which defines the secondary axis 6, by a bridge 14, which mutually connects two contiguous spokes 9 of the protective body 2. The axial end of the shaft 13 which is opposite with respect to the end connected to the actuation handle 5 protrudes from the side of the protective body 2 designed to be directed toward the blade 52 and is fixed, for example by means of a screw 15, to the first toothed sector 11. The radius of the first toothed sector 11 is smaller than the radius of the

second toothed sector 12, so that the transmission ratio of the kinematic transmission 7 provided by the first toothed sector 11 and by the second toothed sector 12 is smaller than 1, thus achieving an increase in the torque transmitted by the actuation handle 5 to the actuation element 4.

5 Advantageously, the tool 1 according to the invention also comprises a supporting handle 16, which is connected, for example by means of screws 17, to the side of the protective body 2 that is opposite with respect to the side to be directed toward the blade 52. The supporting handle 16 is fixed to two contiguous spokes 9 of the protective body 2 and is spaced laterally to
10 the main axis 3 on the opposite side with respect to the actuation handle 5. In this manner, due to the fact that the supporting handle 16 and the actuation handle 5, designed to be engaged simultaneously in order to move the tool 1, are arranged on mutually opposite sides with respect to the main axis 3, a better balancing of the tool 1 during the movement of the blade 52,
15 with respect to tools of the known type, is achieved.

The actuation element 4 has an annular shape that is composed of a first ring 18, which is smaller in diameter, and a second ring 19, which has a larger diameter, their axes coinciding with the main axis 3. The second ring 19 is spaced from the first ring 18 on the opposite side with respect to the
20 protective body 2. The first ring 18 rests against the central portion 10, which is disk-shaped, of the protective body 2, on the side thereof that is designed to be directed toward the blade 52. The second ring 19 protrudes from the side of the protective body 2 to be directed toward the blade 52 and is connected integrally with the first ring 18 by three connecting bridges 20
25 which are uniformly mutually spaced around the main axis 3.

At the connecting bridges 20, the second ring 19 has coupling teeth 21 which protrude radially from the internal perimeter of the second ring 19 and can engage the safety notches 67 of the locking ring 62 which is connected to the blade 52, as will become better apparent hereinafter.

30 The second toothed sector 12 is fixed to the first ring 18 and the

extent of the arc of possible rotation of the actuation element 4 about the main axis 3 is delimited by a pair of abutments 22, 23 which protrude from the central portion 10.

Advantageously, safety means 24 are provided in order to lock the rotation of the actuation element 4 when it is disengaged from the cutting assembly 50 of the slicing machine.

The safety means 24 preferably comprise at least one locking pin 25, which is supported, so that it can slide along its axis 26, which is parallel to the main axis 3, by the central portion 10 of the protective body 2.

Preferably, three locking pins 25 are provided, which are mutually uniformly spaced around the main axis 3. Each locking pin 25 is inserted so that it can slide within a corresponding cylindrical seat 27 defined in the central portion 10 of the protective body 2 and can protrude, with one of its ends, from the face of the protective body 2 that is designed to be directed toward the blade 52. A spring 28 is interposed between the bottom of the cylindrical seat 27 and each locking pin 25, is accommodated partially within the body of the locking pin 25 and pushes the locking pin 25 so that it exits from the side of the protective body 2 to be directed toward the blade 52.

The first ring 18 of the actuation element 4 is arranged around the locking pins 25 and has, along its internal perimeter, recesses 29, which, due to the rotation of the actuation element 4 about the main axis 3 with respect to the protective body 2, can be arranged at the locking pins 25. The recesses 29 that can be engaged by a same locking pin 25 are angularly mutually spaced around the main axis 3 with an angle which is equal to the breadth of the angle of possible rotation of the actuation element 4 delimited by the abutments 22 and 23.

The locking pins 25, proximate to their end which is opposite with respect to the bottom of the cylindrical seat 27 in which they are inserted, have an end portion with a reduced diameter with respect to the remaining

part of the locking pin 25.

The locking pins 25 are kept within the corresponding cylindrical seat 27 despite the action of the spring 28 by a fixed disk-shaped body 30, which is locked against the central portion 10 of the protective body 2. More precisely, the fixed disk-shaped body 30 is crossed by three holes 31 which
5 mate with three protrusions 32 that protrude from the central portion 10 and are evenly mutually spaced around the main axis 3. Moreover, at the main axis 3 a centering pin 33 is provided, which protrudes from the side of the protective body 2 that is designed to be directed toward the blade 52 and is
10 fixed to the protective body 2 by means of a screw 34 which is arranged at the main axis 3. The centering pin 33 engages a central region of the fixed disk-shaped body 30, locking it axially on the protective body 2.

The fixed disk-shaped body 30 is crossed by three other holes 35, which are arranged at the locking pins 25, the end portion of which, having
15 a reduced diameter, engages within the three holes 35.

The inside diameter of the portions of the first ring 18 that lie between two contiguous recesses 29 is equal to the diameter of an imaginary circle the center of which is arranged on the main axis 3 and which is externally tangent to the end portions having a smaller diameter of the
20 locking pins 25. The recesses 29 are instead sized so as to allow the passage of the remaining part having a larger diameter of the locking pins 25. In this manner, the free rotation of the first ring 18 and therefore of the actuation element 4 is allowed only when the locking pins 25 are pushed within the corresponding cylindrical seat 27 until their end portion having a reduced
25 diameter is at the level of the first ring 18 and the remaining part, which has a larger diameter, is in a position in which it does not interfere with the first ring 18 of the actuation element 4. Vice versa, when no pressure capable of overcoming the elastic reaction of the spring 28 that acts thereon is applied to at least one locking pin 25, if it is aligned with a recess 29, it arranges
30 itself with its part having a larger diameter at the level of the first ring 18,

preventing its rotation. The locking pins 25 are arranged so as to rest with their end, which protrudes from the holes 35, against the end of the centering pins 53 of the cutting assembly 50 which supports the blade 52 to be removed. Only the simultaneous contact of all the locking pins 25 with all the centering pins 53 achieves the simultaneous compression of the locking pins 25, allowing the rotation of the actuation element 4 with respect to the protective body 2. In this manner, it becomes assuredly impossible for the actuation element 4 to be rotated accidentally if the tool 1 is not correctly coupled to the cutting assembly 50.

10 The fixed disk-shaped body 30 has, along its profile, in a manner similar to the second ring 19 of the actuation element 4, coupling teeth 36, which protrude from the opposite side with respect to the protective body 2. The coupling teeth 36 can engage the safety notches 66 provided on the fixed ring 63 of the blade 52, as will become better apparent hereinafter.

15 Use of the tool 1 according to the invention is as follows.

When the tool 1 is in the inactive condition, disengaged from the blade 52, the actuation element 4 is arranged so that the coupling teeth 21 are aligned with the coupling teeth 36 of the fixed disk-shaped body 30. Moreover, the locking pins 25 have their larger-diameter part engaged within the recesses 29 of the first ring 18, thus preventing the possibility of an accidental rotation of the actuation element 4 with respect to the protective body 2.

The blade 52, locked correctly on the pulley 51, has the locking ring 62 engaged with its portions, located between two contiguous recesses 65, within the transverse slots 60 of the centering pins 53. In this condition, the safety notches 67 of the locking ring 62 are aligned with the safety notches 66 of the fixed ring 63.

In order to remove the blade 52, the tool 1 according to the invention is picked up by using the handles 5 and 16 and is arranged so as to face coaxially, with its opposite side with respect to the side that supports the

handles 5 and 16, the blade 52. The correct placement of the tool 1 with respect to the blade 52 is facilitated by the insertion of the centering pin 33 within the centering seat 70. During positioning, the tool 1 can be rotated about the main axis 3 with respect to the blade 52 so as to position the locking pins 25 in alignment with the centering pins 53. Due to this alignment, the coupling teeth 21 and 36 are also aligned with the safety notches 66 and 67.

The tool 1 is then pushed slightly in an axial direction toward the blade 52 so as to compress the locking pins 25 within the corresponding cylindrical seat 27. Due to this compression, the part having a larger diameter of the locking pins 25 disengages from the recesses 29 of the first ring 18.

The axial movement of the tool 1 with respect to the blade 52 also causes the engagement of the coupling teeth 21 of the second ring 19 with the safety notches 67 of the locking element 62 and of the coupling teeth 36 of the fixed disk-shaped body 30 with the safety notches 66 of the fixed ring 63.

At this point, by acting on the actuation handle 5, one causes, by means of the kinematic transmission 7, composed of the first toothed sector 11 and the second toothed sector 12, the rotation of the actuation element 4 about the main axis 3 with respect to the protective body 2. The actuation element 4, being engaged by means of the coupling teeth 21 with the safety notches 67, entrains in rotation the locking ring 62 until the recesses 65 are moved at the centering pins 53, while the fixed ring 63 and therefore the blade 52 remain stationary, integrally with the protective body 2, following the engagement of the coupling teeth 36 of the fixed disk-shaped body 30 with the safety notches 66 of the fixed ring 63.

With the recesses 65 arranged at the centering pins 53, the coupling teeth 21 of the second ring 19 are angularly offset with respect to the safety notches 66 of the fixed ring 63 and therefore the second ring 19, which is

coupled to the locking ring 62, can no longer be disengaged from the blade 52, which thus remains firmly coupled to the tool 1. In this condition, the perimetric annular portion 8 of the tool 1 is superimposed on the sharp peripheral band of the blade 52 and therefore the blade 52 can be handled in absolute safety.

It should be noted that the disengagement of the tool 1 from the pulley 51 causes, due to the action of the springs 28, again the engagement of the part having a larger diameter of the locking pins 25 with the recesses 29 and therefore safely prevents an accidental rotation of the actuation element 4 about the main axis 3 relative to the protective body 2. In this manner, the possibility of an accidental disengagement of the tool 1 from the blade 52 is prevented assuredly.

The reassembly of the blade 52 on the pulley 51 is performed by working in reverse with respect to what has been described with respect to the step for disassembly of the blade 52.

In practice it has been found that the tool according to the invention fully achieves the intended aim, since the presence of the kinematic transmission between the actuation handle and the actuation element makes it possible to disassemble and reassemble the blade with less force than that required with tools of the conventional type.

A further advantage of the tool according to the invention is that it is possible to achieve a better balancing of the blade and therefore to facilitate its handling.

Although the tool according to the invention has been described with reference to its use with a cutting assembly of the type described in a co-pending patent application in the name of the same Applicant, it can also be used with cutting assemblies of the known type provided with a blade locking element which can rotate and be engaged by the actuation element of the tool according to the invention.

The tool thus conceived is susceptible of numerous modifications and

variations, all of which are within the scope of the appended claims. All the details may further be replaced with other technically equivalent elements.

In practice, the materials used, as well as the dimensions, may be any according to requirements and to the state of the art.

5 The disclosures in Italian Patent Application No. MI2011A001120 from which this application claims priority are incorporated herein by reference.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole
10 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.

CLAIMS

1. A tool (1) for safely disassembling and reassembling blades for slicing machines, comprising a protective body (2) that is extended around a main axis (3) and has a perimetric profile adapted to be superimposed, with one of its sides, on a peripheral band of the blade (52), said protective body (2) supporting rotatably, about said main axis (3), an actuation element (4) that can engage a rotatable locking element (59) of the blade (52) which is provided on the blade (52) and can engage the slicing machine, said protective body (2) supporting, on its opposite side with respect to the side to be directed toward the blade (52), an actuation handle (5) which is connected to said actuation element (4) and can be maneuvered to turn said actuation element (4) with respect to said protective body (2) about said main axis (3), characterized in that said actuation handle (5) is supported rotatably by said protective body (2) about a secondary axis (6), which is parallel and spaced with respect to said main axis (3) and is connected to said actuation element (4) through a kinematic transmission (7), which is adapted to increase the torque transmitted by said actuation handle (5) to said actuation element (4).

2. The tool (1) according to claim 1, characterized in that said protective body (2) has a shape with a circular profile centered on said main axis (3).

3. The tool (1) according to claims 1 and 2, characterized in that said protective body (2) has a perimetric annular portion (8) which can be superimposed, with one of its sides, on the sharp peripheral band of the blade (52), said perimetric annular portion (8) being connected, by means of radial spokes (9), to a central portion (10) that supports said actuation element (4).

4. The tool (1) according to one or more of the preceding claims, characterized in that said kinematic transmission (7) comprises: a first toothed sector (11), whose axis coincides with said secondary axis (6) and is

integral with said actuation handle (5), and a second toothed sector (12), whose axis coincides with said main axis (3) and meshes with said first toothed sector (11), said second toothed sector (12) being integral with said actuation element (4).

5 5. The tool (1) according to one or more of the preceding claims, characterized in that it comprises a supporting handle (16), which is connected to the side of said protective body (2) that is opposite with respect to the side to be directed toward the blade (52) and is spaced laterally to said main axis (3) on the opposite side with respect to said
10 actuation handle (5).

6. The tool (1) according to one or more of the preceding claims, characterized in that it comprises safety means (24) for locking the rotation of said actuation element (4) disengaged from the supporting element (51) of the slicing machine that supports the blade (52).

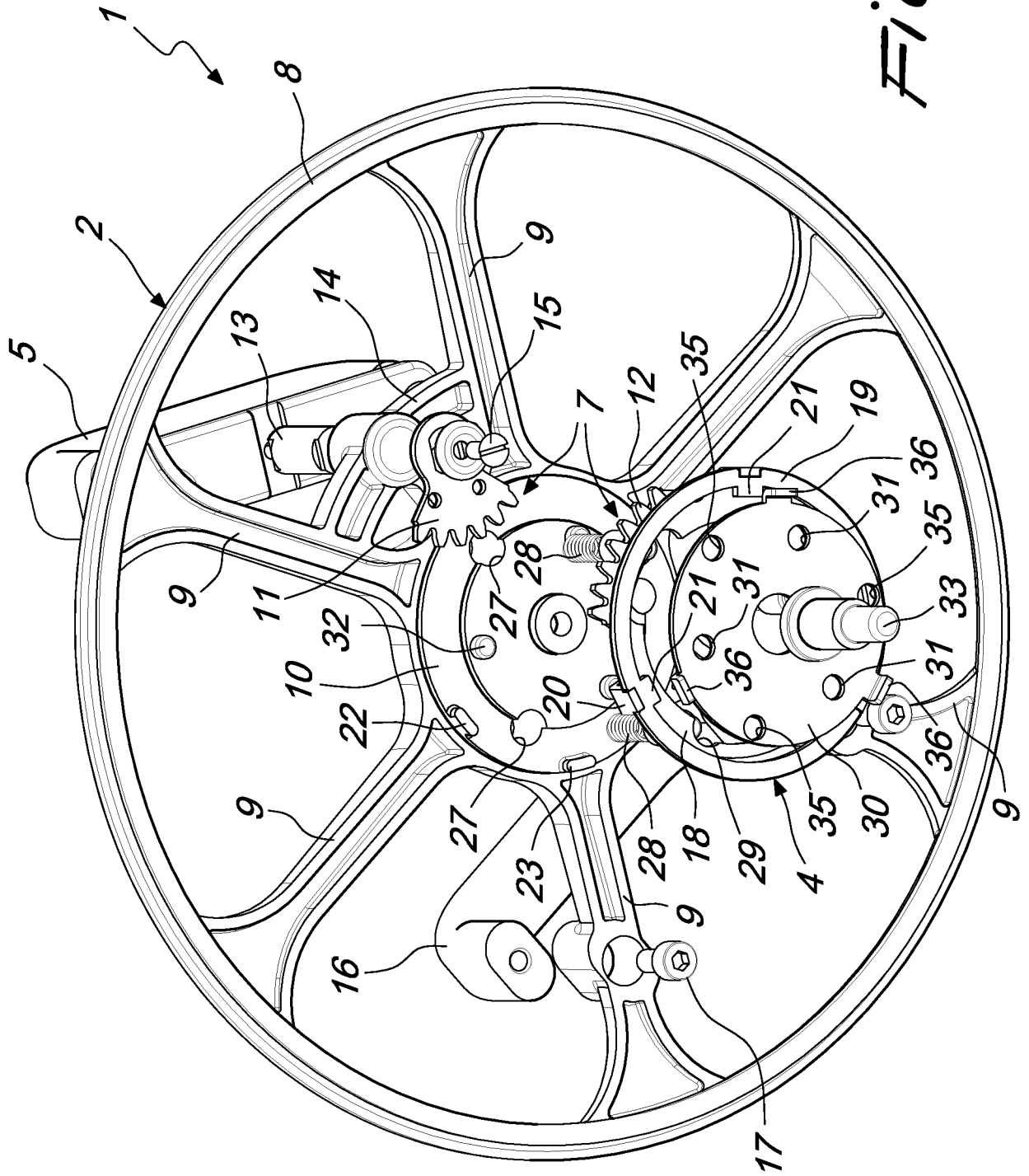
15 7. The tool (1) according to one or more of the preceding claims, characterized in that said actuation element (4) has an annular shape in which the axis coincides with said main axis (3), said safety means (24) comprising at least one locking pin (25) which is supported, so that it can slide along its own axis (26), which is oriented parallel to said main axis (3),
20 by said central portion (10) of the protective body (2); said at least one locking pin (25) being movable, in contrast with elastic means (28), from a locking position, in which it protrudes from said central portion (10), engaging said actuation element (4) to prevent its rotation about said main axis (3) with respect to said protective body (2), to a release position, in
25 which it is retracted further into said central portion (10) with respect to said locking position so as to not interfere with said actuation element (4), and vice versa; said at least one locking pin (25) being engageable with an abutment (53) provided correspondingly on the slicing machine for its transition from said locking position to said release position in contrast with
30 the action of said elastic means (28).

8. The tool (1) according to one or more of the preceding claims, characterized in that said at least one locking pin (25) comprises three locking pins (25) which are uniformly mutually spaced around said main axis (3).

5 9. The tool (1) according to one or more of the preceding claims, characterized in that said protective body (2) has, at said main axis (3), on its side to be directed toward the blade (52), a centering pin (33) that protrudes and can engage a centering seat (70) provided at the center of the supporting element (51) of the slicing machine that supports the blade (52).

10 10. The tool (1) according to one or more of the preceding claims, characterized in that it comprises means (22, 23) for delimiting the arc of the possible rotation of said actuation element (4) about said main axis (3) with respect to said protective body (2).

Fig. 1



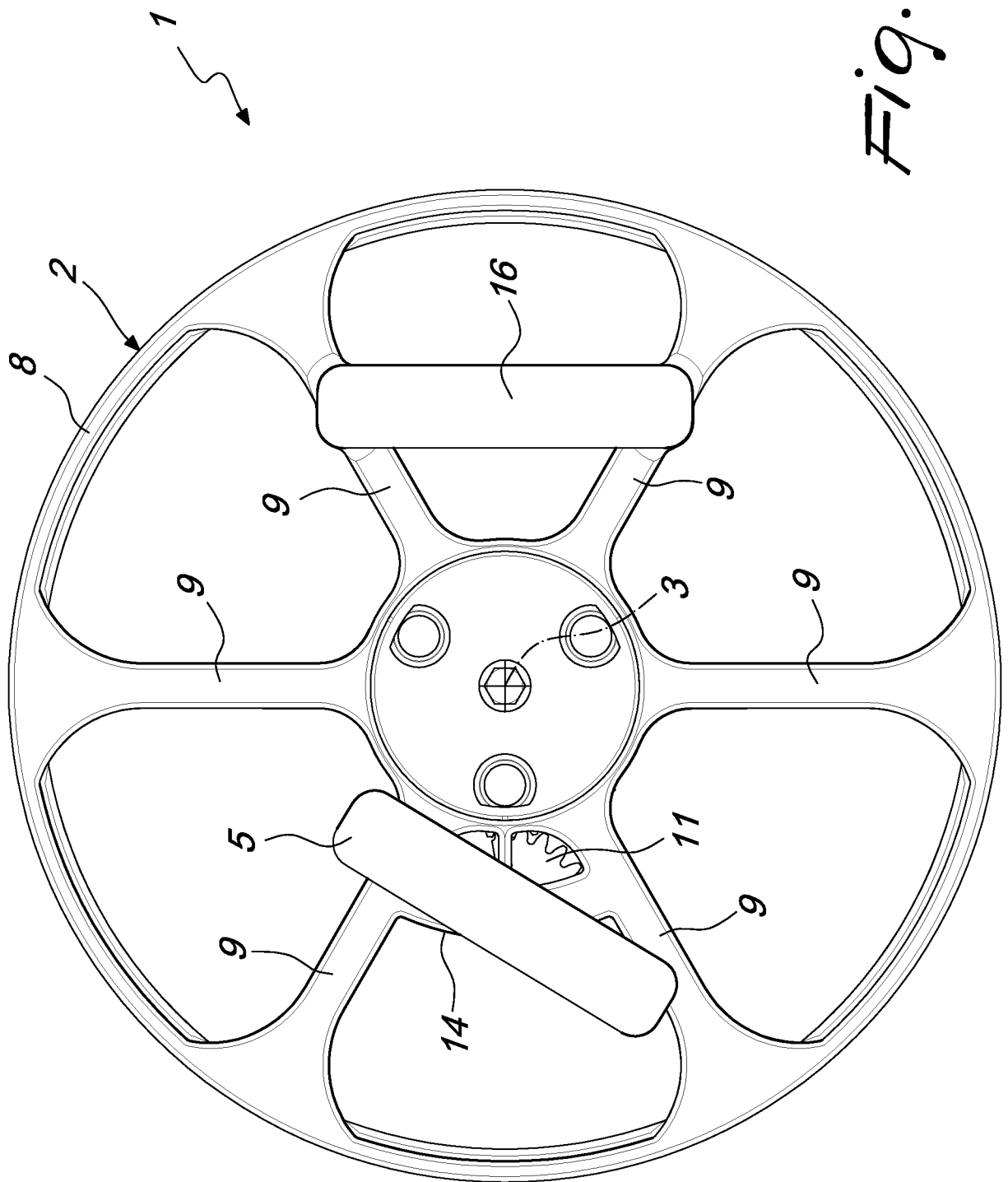


Fig. 2

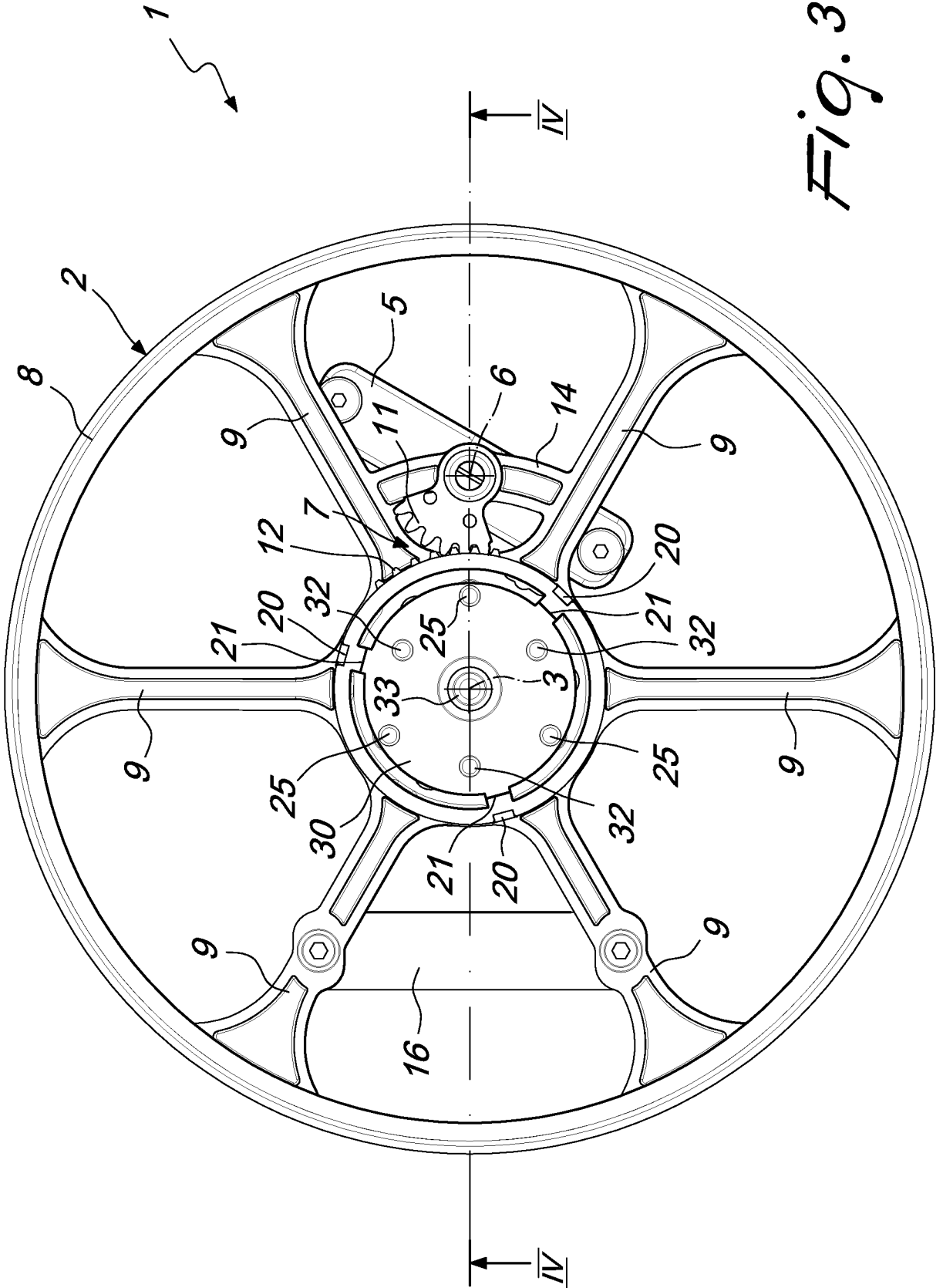


Fig. 3

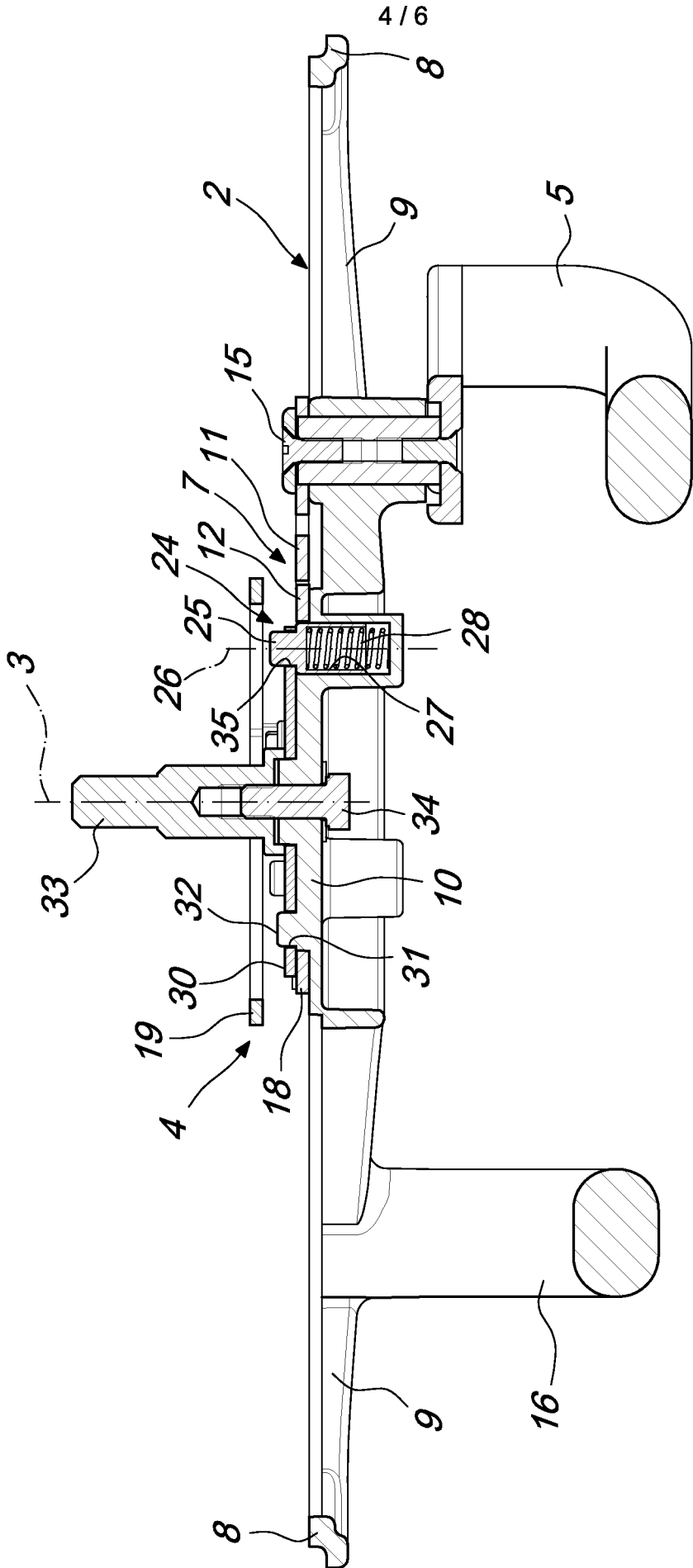
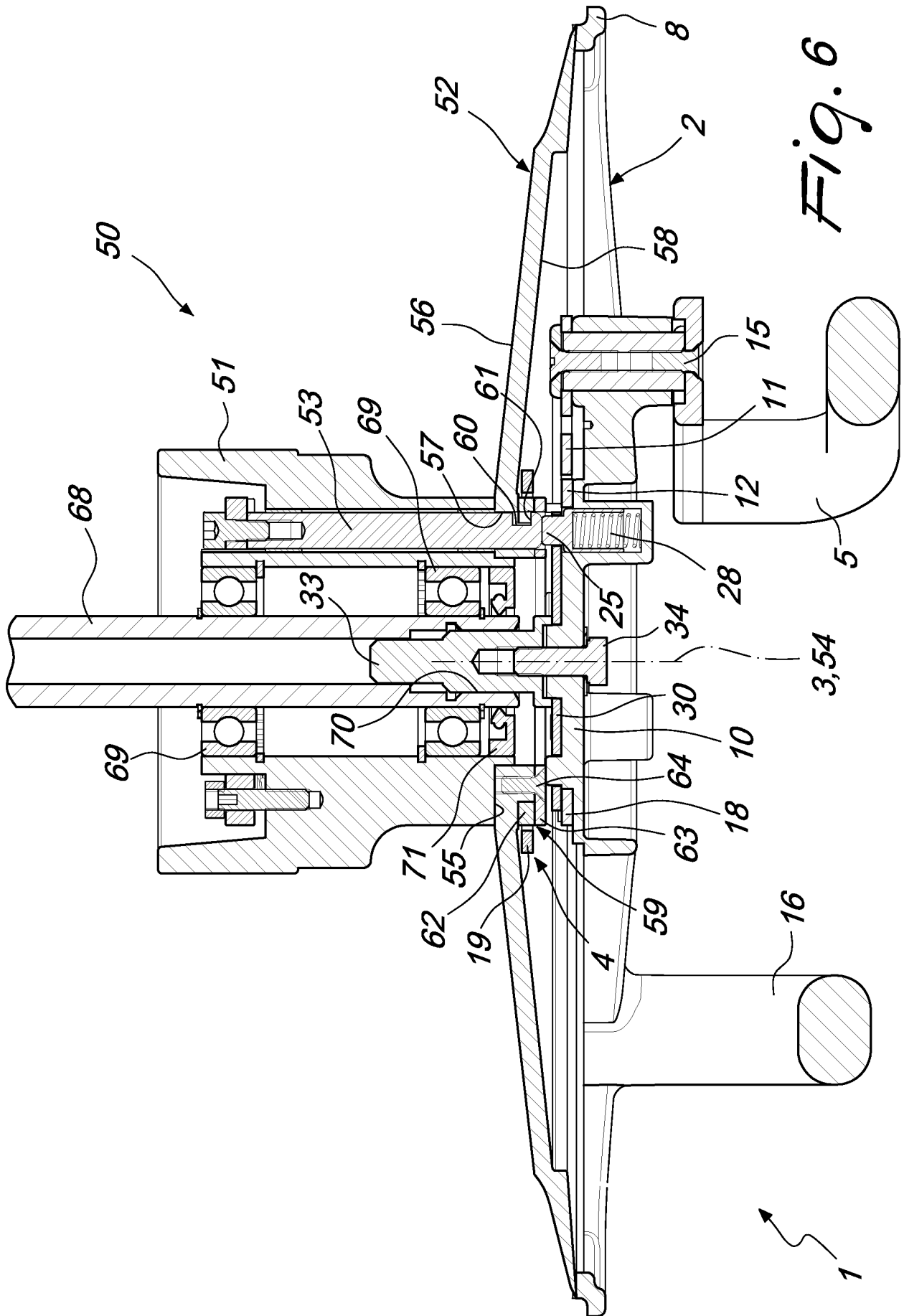


Fig. 4



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/061325

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B26D7/22
 ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 B26D

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007/103899 A2 (PREMARK FEG LLC [US]; ZHU GUANGSHAN [US]; SHARIFF SHAHRAM [US]) 13 September 2007 (2007-09-13) figures 2-5	1-10
A	US 4 246 818 A (MCGRAW JR VERAL L) 27 January 1981 (1981-01-27) the whole document	1-10
A	US 5 188 011 A (SOMAL HARDEV S [US] ET AL) 23 February 1993 (1993-02-23) the whole document	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

24 July 2012

Date of mailing of the international search report

01/08/2012

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/061325

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