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(54) **A grip for a manoeuvring organ, and a manoeuvring organ comprising the grip**

(57) A manoeuvring organ (2), such as for example a crank handle, comprising a grip (1) able to rotatably accommodate an end of the manoeuvring organ, as well as retaining means for axially but not rotatably blocking an end of the manoeuvring organ (2) in the grip (1), in which the retaining means (13) are elastic means pro-

vided with a central opening able to frictionally receive the end (21) of the manoeuvring organ (2), and in that the grip comprises a first body (11) provided with an annular shank (112) and a second body (12) provided with an annular abutment (122) defining a housing seating (14) for the retaining means (13).

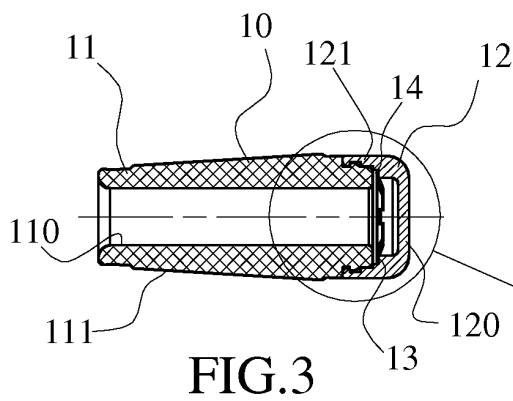


FIG.3

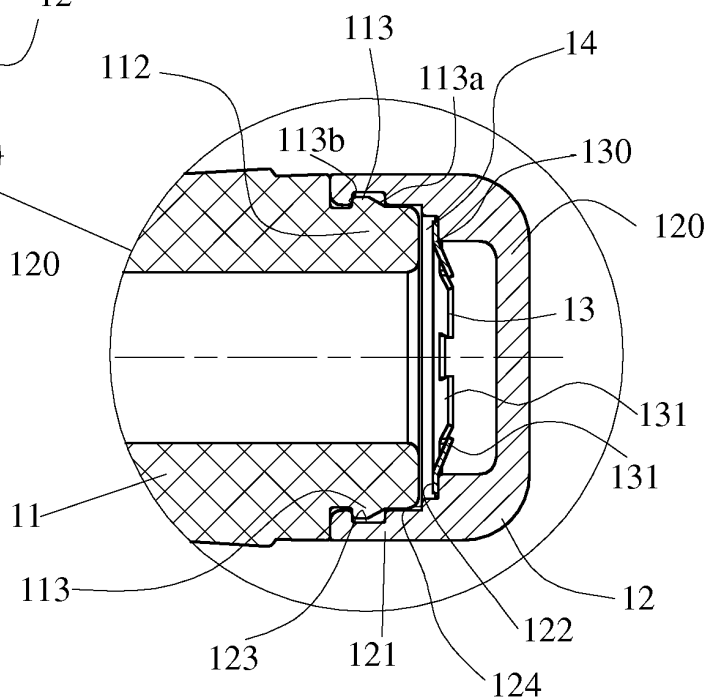


FIG.4

Description

TECHNICAL FIELD

[0001] The present invention relates to a grip that can be associated to manoeuvring organs, such as for example a crank handle.

[0002] In particular, the invention relates to a manoeuvring organ comprising the grip.

PRIOR ART

[0003] As is known, the use of manoeuvring organs is very widespread, for example crank handles or manoeuvring levers, in devices of various natures, for activating in rotation a gearing so as to move heavy weights by application of small forces.

[0004] The manoeuvring organ is usually conformed, for example, in an S or L shape, and comprises an end to which a grip is associated for facilitating the activation.

[0005] In particular, the grip comprises a body that can be associated to the manoeuvring organ, enabling reciprocal rotations, and at least a retaining element is included for unremovably associating the body of the grip to the manoeuvring organ.

[0006] The known grips of this type comprise in particular a body having a substantially tubular shape or beaker shape provided with a cavity able to receive the end of the manoeuvring organ.

[0007] These grips further comprise a radial projection associated to the internal surface of the cavity and projecting into the cavity.

[0008] The manoeuvring organ instead comprises a radial gully able to receive and retain the radial projection of the grip.

[0009] These grips are installed on the manoeuvring organ by means of special apparatus able to apply a sufficient force for enabling the grip to insert on the end of the manoeuvring organ, and to insert the radial projection into the radial gully.

[0010] An aim of the present invention is to enable the above-described operations in a way that is simple, rapid and relatively inexpensive.

[0011] The aim is attained by a manoeuvring organ and relative grip having the characteristics reported in the independent claim.

[0012] The dependent claims delineate preferred and/or particularly advantageous aspects of the invention.

DESCRIPTION OF THE INVENTION

[0013] An embodiment of the invention discloses a manoeuvring organ, such as for example a crank handle, comprising a grip able to rotatably house an end of the manoeuvring organ, as well as retaining means for axially but not rotatably blocking the end of the manoeuvring organ of the grip.

[0014] In the invention, the retaining means are elastic means provided with a central opening able to receive, with friction, the end of the manoeuvring organ. Further, according to the invention, the grip comprises a first body provided with an annular shank and a second body provided with an annular abutment defining a housing seating for the retaining means.

[0015] With this solution a grip is provided which can easily be associated to the manoeuvring organ without requiring special machining operations, for example milling, on the manoeuvring organ, thus reducing production costs.

[0016] In a particular aspect of the invention, the retaining means comprise an elastic ring able to surround the manoeuvring organ, having an annular base provided with a plurality of projecting radial wings, facing towards the centre of the annular base such as to define a smaller diameter than a diameter of the end of the manoeuvring organ.

[0017] In this way an economical and easily-manufactured retaining element is provided, which can easily be associated to the manoeuvring organ without any necessity for realisation of machining operations on the manoeuvring organ.

[0018] In a further aspect of the invention, the radial wings are inclined with respect to a same side of the annular base.

[0019] In this way, during the assembly step of the grip on the manoeuvring organ the flexion of the radial wings is facilitated, which wings then become compressed and exert the required friction force.

[0020] In a further aspect of the invention, the abutment is located at a predetermined distance from a bottom wall of the second body.

[0021] With this solution, a housing seating is defined located at a predetermined distance from the bottom wall so as to retain the retaining element in a predetermined position in the grip.

[0022] In a further aspect of the invention, the housing seating is defined in an internal cavity of the second body.

[0023] In this way the grip will be easy to realise as the first and the second body can be easily designed so that the coupling thereof defines the housing seating. In a further aspect of the invention, the first and the second body of the grip are associable to one another by means of snap-fit elements.

[0024] In this way a solid and effective assembly between the first and the second body of the grip is guaranteed.

[0025] In a particular aspect of the invention, the retaining element is able to house in the housing seating with axial play. For example, the axial play is comprised between 0.5 and 1.5 mm.

[0026] In this way the retaining element is substantially retained in the housing seating and axial displacements of the grip with respect to the end of the manoeuvring organ are prevented.

[0027] In this way the axial play is sufficient to guaran-

tee small displacement of the grip so as to prevent breakage or deformation without influencing the manoeuvrability of the manoeuvring organ.

[0028] The axial play is advantageously 1.3 mm.

[0029] This amount of play enables small displacements of the grip without influencing the manoeuvrability of the manoeuvring organ.

[0030] In a further aspect of the invention, the end of the manoeuvring organ comprises an external surface that is substantially smooth, i.e. without machining operations.

[0031] In this way, the manoeuvring organ is easy and economical to manufacture.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] Further characteristics and advantages of the invention will emerge from a reading of the following description, provided by way of non-limiting example, with the aid of the figures of the accompanying drawings.

Figure 1 is an axonometric view of a manoeuvring organ provided with a grip according to the invention.

Figure 2 is a lateral view of the grip.

Figure 3 is section III-III of figure 2.

Figure 4 is a larger-scale detail of figure 3.

Figure 5 is a lateral view of the manoeuvring organ and the relative grip.

Figure 6 is a larger-scale detail in cross-section of figure 5.

BEST WAY OF CARRYING OUT THE INVENTION.

[0033] With particular reference to the figures, 1 denotes in its entirety a handle assembly comprising a manoeuvring organ 2 and a grip 10 associated to the manoeuvring organ 2.

[0034] The manoeuvring organ 2 is, in the illustrated case, a crank handle, preferably having a circular section and is substantially S-shaped.

[0035] The manoeuvring organ 2 comprises a first end 21 grippable by the operator and an opposite end associable to the respective device to be manoeuvred. In particular, the first end 21 is conformed as a shaft having a substantially cylindrical section.

[0036] The first end 21 has a diameter of, for example, 15 mm.

[0037] Further, the first end 21 comprises, for example, a substantially smooth external surface, i.e. without grooves or other mechanical machine operations. In the illustrated embodiment the grip 10 comprises at least a retaining element 13 able to associate the grip to the manoeuvring organ 2 stably but rotatably. In the preferred and illustrated embodiment in the figures the grip 10 comprises a first body 11 and a second body 12 associable to one another by means of hook elements.

[0038] The first body 11 is substantially tubular and can accommodate the ends 21 of the manoeuvring or-

gan.

[0039] In particular, in the embodiment illustrated in the figures the internal surface 110 of the first body 11 has a substantially cylindrical development and the diameter thereof is greater than the diameter of the manoeuvring organ 2 in proximity of the end 21, so as to surround the manoeuvring organ 2 with a degree of play.

[0040] The first body 11 further comprises an external surface 111 grippable by the operator.

[0041] The external surface 111 of the first body 11 is preferably shaped in such a way as to facilitate the grip of the operator.

[0042] The grip 10 comprises engaging elements able to engage between them the first body 11 and the second body 12.

[0043] In particular the first body 11 comprises an annular shank 112 located coaxially at an end thereof.

[0044] The external diameter of the annular shank 112 is smaller than the diameter of the external surface 111 of the first body 11.

[0045] The annular shank 112 includes an annular radial projection 113 that projects externally with respect to the annular shank.

[0046] The annular projection 113 for example has a triangular section and includes a surface 113a, inclined with respect to the axis of the shank 112, facing the free end of the annular shank and able to define an entry surface for the coupling of the second body 12, as will be more fully described below.

[0047] The radial projection 113 further includes an abutment surface 113b substantially perpendicular to the longitudinal axis of the annular shank, facing towards the end of the shank 112 associated with the first annular body 11 and able to impede the release of the second body 12, as will be described in the following.

[0048] Advantageously, the annular shank 112 is advantageously made in one piece with the first body 11.

[0049] The second body 12 is able to occlude an end opening of the first body 11, when associated to the first body itself.

[0050] The second body 12 is substantially beaker shaped and includes a bottom wall 120 and a lateral wall 121 exhibiting an annular shape and which develops in a perpendicular direction to the bottom wall.

[0051] The second body 12 comprises an annular abutment 122, internal with respect to the lateral wall 121 and formed at a predetermined distance from the bottom wall 120.

[0052] In particular, the abutment 122 defines an annular abutment surface, substantially parallel to the bottom wall 120 (i.e. perpendicular to the central axis of the lateral wall 121) and distanced with respect to the bottom wall. The internal diameter of the portion of the lateral wall 121 comprised between the abutment 122 and the free edge of the lateral wall is substantially equal to the external diameter of the annular shank 112.

[0053] The longitudinal length of the portion of the lateral wall 121 between the abutment 122 and the free

edge of the lateral wall is preferably greater than the longitudinal length of the annular shank 112.

[0054] The second body 12 comprises a radial groove 123 formed internally of and in proximity of the free edge of the lateral wall 121.

[0055] The lateral wall 121 advantageously comprises an entry bevel at the edge of the lateral wall, for facilitating the attachment of the second body 12 to the first body 11 as will be more fully described in the following.

[0056] To attach the second body 12 to the first body 11 it is sufficient to push the shank 112 internally of the second body 12.

[0057] The annular shank 112 is insertable internally of the second body 12 in such a way that the portion of the lateral wall 121 comprised between the abutment 122 and the free edge of the lateral wall surrounds the annular shank.

[0058] The insertion of the annular shank 112 in the second body 12 is facilitated by the bevel made on the edge of the lateral wall 121 and the entry surface 113a; the presence of the entry surface 113a, in fact, requires application of a small longitudinally-directed force for the insertion of the annular shank 112 in the second body 12.

[0059] In this way, following the insertion of the annular shank 112 in the second body 12, the radial projection 113 is able to house and be retained in the radial groove 123, realizing the coupling between the first body 11 and the second body 12.

[0060] In this configuration, the abutment surface 113b of the radial projection 113 is in contact with the wall of the radial groove 123; thus application of a greater force is required for the release of the second body 12 from the first body 11. In this configuration a housing seating 14 is defined between the annular shank 112 and the abutment 122, for housing the retaining element, 13 as will be more fully described below.

[0061] In particular, the housing seating 14 is conformed as an annular gully defined by the front edge of the annular shank 12 and the abutment 122.

[0062] The thickness of the housing seating 14 is greater than the thickness of the retaining element 13, for example double the thickness of the retaining element, preferably three times the thickness thereof.

[0063] In the preferred embodiment, the thickness of the housing seating 14 is comprised between 1 and 2 mm, preferably 1.8 mm.

[0064] The housing seating 14, thus defined, is contained in the internal cavity of the second body 12.

[0065] The housing seating 14 is located at a predetermined distance from the bottom wall 120 of the second body 12, coinciding with the distance of the abutment 122 from the bottom wall 120.

[0066] For example, the housing seating 14 is located at a distance from the bottom wall 120 that is at least five times greater than the thickness of the housing seating, preferably eight times greater.

[0067] For example, the housing seating 14 is located at a distance from the bottom wall 120 of the second body

12 comprised between 12 and 17 mm, preferably 15.6 mm.

[0068] The second body 12 can advantageously comprise a further abutment 124 for distancing the abutment 122 from the edge of the annular shank 112 and defining the housing seating 14.

[0069] In particular, the further abutment 124 enables defining the diameter of the housing seating 14, for example the housing seating 14 has a diameter comprised between 23 and 27 mm.

[0070] In the described embodiment the coupling elements 11 between the first body and the second body 12 of the grip 10 are of the interlocking snap-fit type, though the coupling elements could also be of the screw- or bayonet-type. The grip 10 is preferably made of a synthetic material.

[0071] The retaining element 13 is an elastic retaining element, preferably made of a metal material, configured such as to exert a friction force on the surface of the manoeuvring organ 2.

[0072] In particular, the retaining element 13 is an elastic ring able to receive the manoeuvring organ 2.

[0073] The retaining element 13 comprises a flat annular base 130 and a plurality of radial wings 131 facing towards the centre of the base. The free ends of the radial wings 131 define a central opening of the retaining element 13 defining an internal diameter that is smaller than the external diameter of the manoeuvring organ 2.

[0074] The radial wings 131 are advantageously slightly inclined with respect to the plane in which the flat annular base 130 lies, so as to facilitate the insertion of the manoeuvring organ 2.

[0075] In particular, the radial wings 131 are inclined with respect to a same side of the plane of the flat annular base 130.

[0076] In particular the radial wings 131 are elastically flexible with respect to the flat annular base 130.

[0077] To insert the ends of the manoeuvring organ 2 in the central hole of the retaining element 13 it is necessary to apply a force sufficient to flex the radial wings 13 so as to distance the free ends of the radial wings and thus increase the internal diameter of the retaining element.

[0078] In this configuration the radial wings 131 of the retaining element 13 exert a friction force on the surface of the manoeuvring organ 2 in the form of an elastic return thrust substantially perpendicular to the surface of the manoeuvring organ.

[0079] The friction force prevents de-insertion.

[0080] The retaining element 13 can be housed in the housing seating 14 of the grip 10 so that the annular base is retained between the edge of the annular shank 112 and the abutment 121.

[0081] In particular, the retaining element 13 can be accommodated with axial play in the housing seating 14.

[0082] For example, the axial play between the retaining element 14 and the housing seating is comprised between 0.5 and 1.5 mm, preferably 1.3 mm.

[0083] The thickness of the retaining element 13 is preferably smaller than the thickness of the housing seating 14, i.e. the distance between the edge of the annular shank 112 and the abutment 121.

[0084] For example, the thickness of the retaining element 13 is half the thickness of the housing seating, preferably a third.

[0085] In the illustrated example, the retaining element has a thickness of 0.6 mm.

[0086] The external diameter, greater than the internal diameter of the retaining element 13, is preferably smaller than the diameter of the housing seating 14. For example, the internal diameter of the retaining element 13 is comprised between 22 and 26 mm.

[0087] In this way the retaining element can rotate solidly with the crank handle in relation to the grip.

[0088] The functioning of the handle 1 as described above is the following.

[0089] For the installation of the grip 10 on the manoeuvring organ 2 first the grip 10 itself must be assembled.

[0090] The retaining element 13 is rested on the abutment 122 of the second body 12; in this configuration, the annular base 130 rests on the abutment 122 and the radial wings 131 project from the abutment and are inclined towards the bottom wall.

[0091] The first body 11 is engaged to the second body 12 by inserting the annular shank 112 into the second body and applying a pressure sufficient to allow the radial projection 113 to fit into the radial groove 123.

[0092] In this configuration the second body 12 is able to occlude one of the end openings of the first body 11.

[0093] In this configuration the retaining element is housed and confined in the housing seating 14 defined by the abutment 122 and the edge of the free end of the annular shank 112.

[0094] The grip 10 thus-assembled slides on the manoeuvring organ 2 by inserting the end 21 of the manoeuvring organ in a longitudinal direction through the end opening of the first body 11 opposite the opening occluded by the second body 12, by applying a force sufficient to cause flexion of the radial wings 131. In particular, the end 21 of the manoeuvring organ 2 presses on the retaining element 13 which, being retained in the housing seating 14, deforms under the effect of the pressure.

[0095] The application of this force causes a further longitudinal advancement of the grip on the manoeuvring organ 2, bringing the bottom wall 120 of the second body 12 in proximity of the end 21 of the manoeuvring organ 2, or even in contact there-with.

[0096] In this configuration the retaining element 13 surrounds the manoeuvring organ 2 and the radial wings 131 exert, by effect of the elastic return, a friction force on the surface of the manoeuvring organ.

[0097] In this configuration, thanks to the play provided in the construction phase the grip 10, in particular the first body 11 and the second body 12, are free to rotate about the axis thereof independently of the retaining el-

ement 13 and the manoeuvring organ 2.

[0098] For de-assembly of the grip 10 it is necessary to apply an extraction force on the handle such as to overcome the friction force exerted by the radial wings 131 on the surface of the manoeuvring organ.

[0099] The invention as it is conceived is susceptible to numerous modifications, all falling within the scope of the inventive concept.

[0100] Further, all the details can be replaced with other technically-equivalent elements.

[0101] In practice the materials used, as well as the contingent shapes and dimensions, can be any according to requirements, without forsaking the scope of protection of the following claims.

Claims

1. A manoeuvring organ (2), such as for example a crank handle, comprising a grip (1) able to rotatably accommodate an end (21) of the manoeuvring organ (2), as well as retaining means (13) for axially but not rotatably blocking an end (21) of the manoeuvring organ (2) in the grip (1), **characterised in that** the retaining means (13) are elastic means provided with a central opening able to frictionally receive the end (21) of the manoeuvring organ (2), and **in that** the grip comprises a first body (11) provided with an annular shank (112) and a second body (12) provided with an annular abutment (122) defining a housing seating (14) for the retaining means (13).
2. The manoeuvring organ (2) of claim 1, **characterised in that** the retaining means (13) comprise an elastic ring able to surround the manoeuvring organ (2), having an annular base (130) provided with a plurality of projecting radial wings (131), facing towards the centre of the annular base (130) such as to define a smaller diameter than a diameter of the end of the manoeuvring organ (2).
3. The manoeuvring organ of claim 2, **characterised in that** the radial wings (131) are inclined with respect to a same side of the annular base (130).
4. The manoeuvring organ (2) of any one of the preceding claims, **characterised in that** the abutment (122) is located at a predetermined distance from a bottom wall (120) of the second body (12).
5. The manoeuvring organ (2) of claim 4, **characterised in that** the housing seating (14) is conformed as an annular gully defined in an internal cavity of the second body (12).
6. The manoeuvring organ (2) of claim 4, **characterised in that** engaging elements of a snap-fit type are included between the first body (11) and the second

body (12) of the grip (10).

7. The manoeuvring organ (2) of any one of the preceding claims, **characterised in that** the retaining element (13) is able to house in the housing seating with axial play comprised between 0.5 and 1.5 mm. 5
8. The manoeuvring organ (2) of claim 7, **characterised in that** the axial play is 1.3 mm. 10
9. The manoeuvring organ (2) of any one of the preceding claims, **characterised in that** the end (21) is substantially smooth, i.e. without any machining operations. 15

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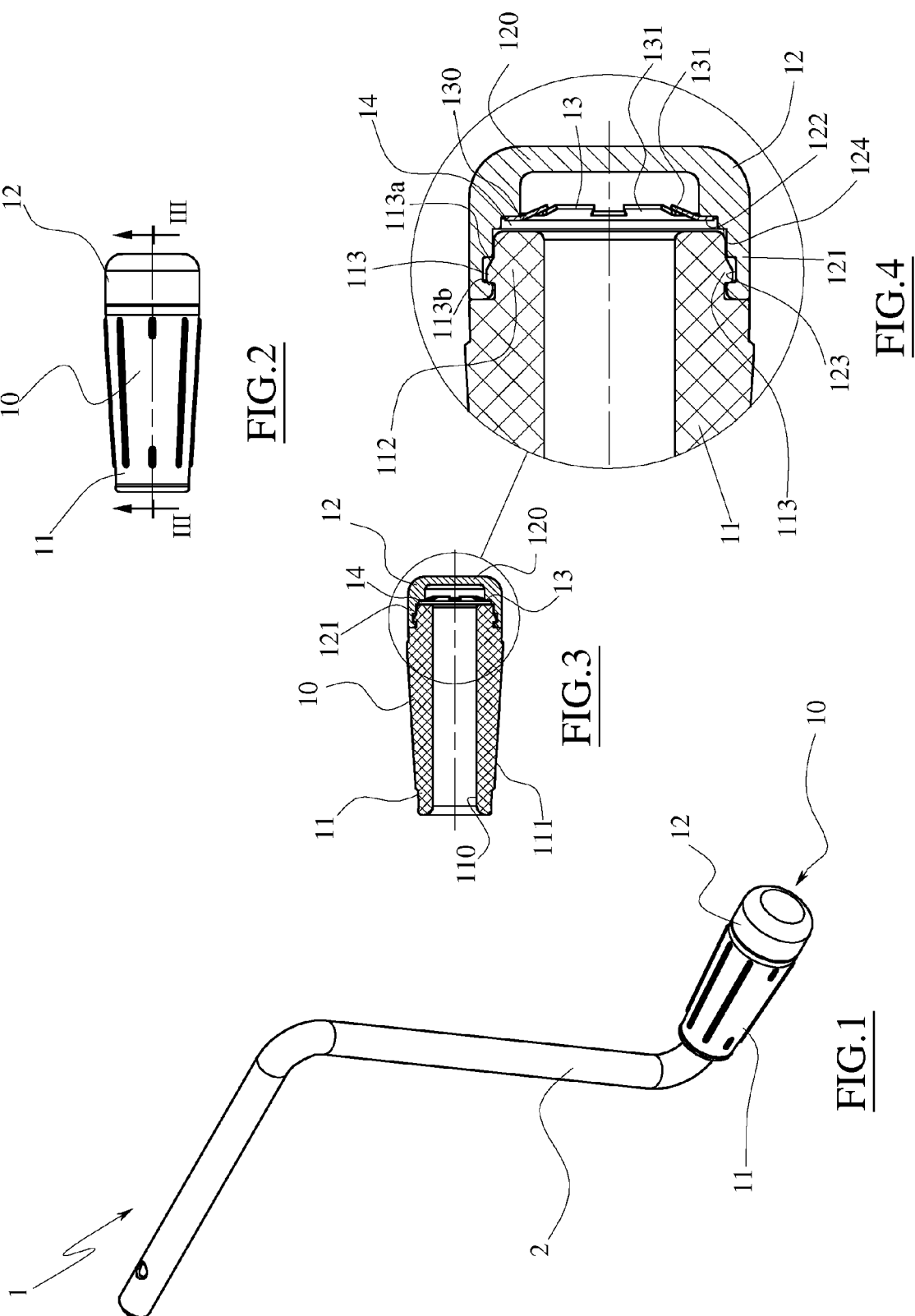
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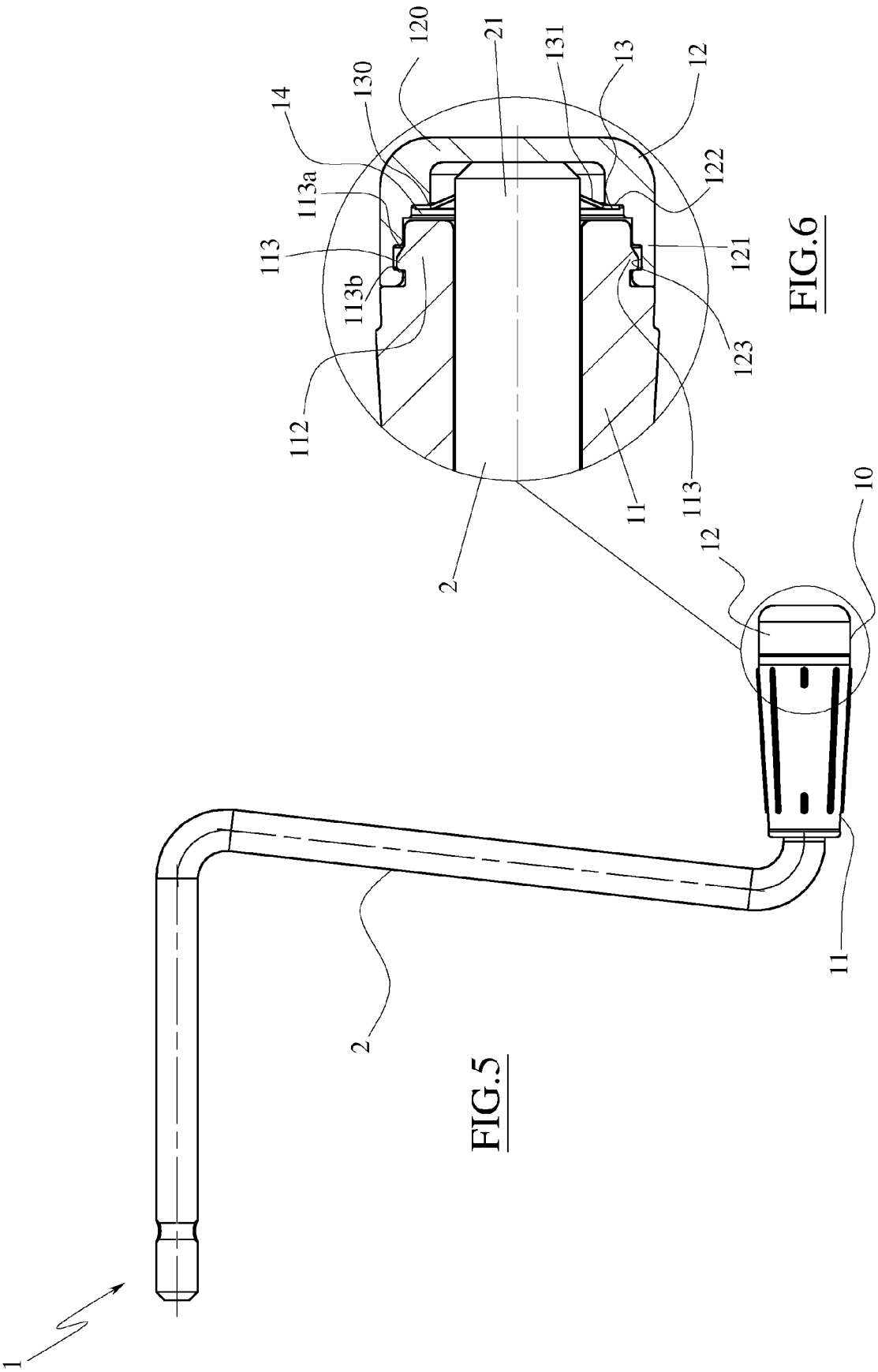


FIG. 5

FIG. 6