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(54) **Closing mechanism**

(57) The present invention is intended for a closing mechanism that has a first element movable according to its longitudinal direction adopting two positions defining the opening and closing positions of a closing element, wherein the first movable element can rotate with respect to a second movable element according to the rotation shaft defined by the longitudinal direction of the first movable element, allowing the first element to be

placed in different relative positions to the case of said closing mechanism, and wherein the first element has some sloping sections that are antagonists of other sloping sections in the second element, so that due to the recovery effect of an elastic element solidly connected to the first element - second element assembly, the two positions between the first element and the case of the closing mechanism are defined.

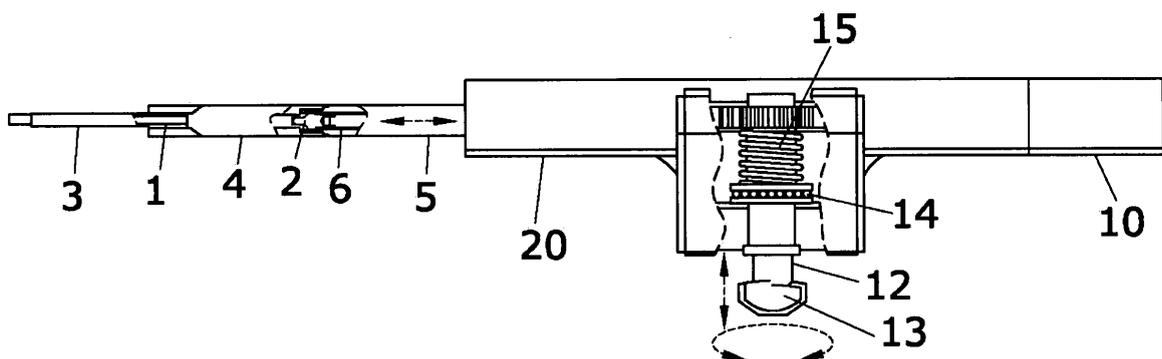


FIG. 1

Description**OBJECT OF THE INVENTION**

[0001] The present invention is intended for a closing mechanism that has a first element movable according to its longitudinal direction adopting two positions defining the closing and opening positions of a closing element.

[0002] The first movable element can rotate with respect to a second movable element according to the rotation shaft defined by the longitudinal direction of the first movable element, allowing the first element to be placed in different relative positions to the case of said closing mechanism.

[0003] Due to its special configuration, the first element has some sloping sections that are antagonists of other sloping sections in the second element, so that due to the recovery effect of an elastic element solidly connected to the first element - second element assembly, the two positions between the first element and the case of the closing mechanism are defined.

[0004] The first movable element is connected to a closing element carrying out the blocking of the element wherein is arranged, which can be a blind.

BACKGROUND OF THE INVENTION

[0005] Closing mechanisms for blinds or similar elements that use a shaft that rotates in cooperation with other series of elements so that determines the opening and blocking positions of said mechanism, and consequently those of the blind are known in the state of the art.

[0006] Among the former is the patent with publication number CN201078179U related to the positioning mechanism of a window blind which has a rotating shaft comprising a series of sloping nerves or sections guiding the travel of a ball during the blind positioning.

[0007] The relative position of the ball to the sloping nerves determines the opening and blocking positions of said mechanism and consequently those of the blind to which is associated.

[0008] However, the above mechanism has the drawback that there may be occasions, due to the wear associated with the friction of the ball with the nerves, in which the ball gets stuck in an area of said nerves thereby blocking the positioning mechanism of the window blind.

[0009] Moreover, during the mounting process an additional operation to place the ball in its initial position is required.

[0010] Likewise, another type of blind closing mechanisms using a side flat bar covering the entire flat bar height and having some pins antagonists of some holes in the blind are known, so that closing occurs when a blocking element prevents the output of said pins from the holes in the blind.

[0011] However, in the previous mechanism is necessary to make said pins match with each one of the cor-

responding holes to subsequently perform the blocking, which hinders the closing operation in case of impacts or, blind or side flat bar defects.

[0012] All these drawbacks are overcome by using the invention now described below, which provides a closing mechanism that eliminates the wear factor associated with one of its parts and requires no prior manipulations in order to be carried out.

DESCRIPTION OF THE INVENTION

[0013] The present invention relates to a closing mechanism that has a first element movable according to its longitudinal direction adopting two positions defining the closing and opening positions of a closing element.

[0014] The first movable element moves with respect to the case of the closing mechanism because both elements are coaxial, the first moveable element having slots antagonists of some projections existing in the case.

[0015] When the slots of the first movable element coincide with the projections antagonist of the case, the first movable element is moved in the longitudinal direction thereof with respect to the case.

[0016] The first element has some protrusions defining the slots sliding through the case projections. Said protrusions of the first element have sloping sections antagonist to other sloping sections in a second element, also having slots arranged between each pair of protrusions of the second element, so that the number of slots in the first element is twice the number of slots in the second element.

[0017] The case projections are housed into the second element slots at all times whilst when the first element slots are aligned with the case projections, the displacement of said first movable element and, consequently that of the second movable element are caused by actuating a transmission element to which is connected, actuating in turn the closing mechanism.

[0018] Likewise, due to the recovery effect of an elastic element solidly connected to the first element -second element assembly, the displacement of the first element - second element assembly in the opposite direction to the initial one and the rotation of the first element with respect to the second element by the displacement that takes place between the sloping sections of one and other elements are caused, wherewith the two positions between the first element and the case of the closing mechanism are defined, positions that define the closing or opening of the closing mechanism.

[0019] Briefly, the present invention relates to a closing mechanism characterized in that it has a first element that moves with respect to a case in an initial direction because both elements are coaxial, the first moveable element having slots antagonist of some projections existing in the case, so that when the first movable element slots coincide with the projections antagonist of the case, the first element is moved in the longitudinal direction thereof with respect to the case, the first element slots

defining some protrusions showing sloping sections antagonist of other sloping sections existing in some protrusions of a second element that also has slots arranged between each pair of projections, so that when the first element slots are aligned with the case projections, the displacement of said first element and consequently that of the second element are caused by actuating a transmission element to which is connected, actuating in turn a closing element.

DESCRIPTION OF THE DRAWINGS

[0020] The present specification is complemented with a set of planes, illustrating and not limiting the preferred embodiment of the invention.

Figure 1 shows an elevational view of the closing mechanism of the present invention.

Figure 2 shows a plan view of the closing mechanism of the present invention.

Figure 3 shows a perspective view of the first movable element of the closing mechanism of the present invention.

Figure 4 shows a perspective view of the second movable element of the closing mechanism of the present invention.

Figure 5 shows a perspective view of the second tube of the case of the closing mechanism of the present invention.

Figure 6 shows a detail in section and another in perspective of the coupling between the first element and second element.

PREFERRED EMBODIMENT OF THE INVENTION

[0021] In sight of the aforementioned, in this preferred embodiment example will be made a detailed description of the closing mechanism of the present invention for closing a blind, which has a first element (1) movable according to its longitudinal direction adopting two positions defining the opening and closing positions of a closing element.

[0022] The first movable element (1) is driven by a cap (3), being moved along the inside of a first tube (4) that together with a second tube (5) connected to the first one (4) acts as case by inside of which the first movable element (1) is moved.

[0023] The first movable element (1) moves with respect to the case of the closing mechanism because both elements are coaxial, the first movable element (1) having slots (1.1) antagonist of some longitudinal inner projections (5.1) existing in the second tube (5) of the case.

[0024] When the first movable element (1) slots (1.1) coincide with the projections (5.1) antagonist of the second tube (5) of the case, the first moveable element (1.1) is moved in the longitudinal direction thereof with respect to the case.

[0025] The first element (1) further has some protrusions (1.2) defining the slots (1.1) sliding through the case protrusions (5.1). Said first element protrusions (1.2) have sloping sections (1.2.1) antagonist of other sloping sections (2.2.1) existing in some protrusions (2.2) of a second element (2), protrusions (2.2) that in turn define some slots (2.1) arranged between each pair of protrusions (2.2) of the second element (2), so that the number of slots (1.1) in the first element (1) is twice the number of slots (2.1) in the second element (2).

[0026] The case projections (5.1) are housed into the second element (2) slots (2.1), so that said second element (2) is moved with respect to the case according to the longitudinal direction and the rotation is restricted by the case projections (5.1).

[0027] On the other hand, when the first element (1) slots (1.1) are aligned with the case projections (5.1), the displacement of said first element (1) by actuating the cap (3) and consequently that of the second element (2) are caused, which in turn is connected to a transmission element, in this case a rack (7), through a rod (6) solidly connected to the second element (2).

[0028] At the rack end opposite to the rod joining end (6) a pusher (8) made of an elastic element (9) which is pressed against a stopper (10) is joined to said rack, being the rack (7), the pusher (8), the elastic element (9) and the stopper (10) arranged on a support (20) of the closing mechanism adjacent to the case thereof.

[0029] Due to recovery effect of the elastic element (9) solidly connected to the first element (1) - second element (2) assembly through the rack, the displacement of the first element (1) - second assembly (2) in the direction opposite to the initial one and the rotation of the first element (1) with respect to the second element (2) are caused, by the displacement that takes place between the sloping sections (1.2.1, 2.2.1) of one (1) and other (2) elements, wherewith two positions are defined between the first element (1) and the case of the closing mechanism.

[0030] Thus when the rack (7) is driven by the first element (1) - second element (2) assembly, it transmits motion to a toothed wheel (11) from which the closing element shaft (12) having an protuberance (13) of ellipsoidal section at its end is set off, so that when the first element (1) - second element (2) assembly is moved, the protuberance (13) is blocked into a housing (not shown) arranged at the bottom of the closure wherein the closing mechanism is arranged, the closure in this preferred embodiment example being the blind.

[0031] When the first element (1) - second element (2) assembly is moved in the opposite direction to the initial displacement direction, the protuberance section coincides with the housing wherewith the closing mechanism does not perform its function and the closure opening is allowed.

[0032] The closing element shaft (12) has another elastic element (15) that is compressed against an axial bearing (14) that is in the closing element shaft (12) which allows the vertical motion of the closing element shaft

(12) to be performed in both closing and opening directions.

[0033] Variations in materials, shape, size and arrangement of the constituent elements, described in a not limited manner, do not alter the essence of this invention, this being sufficient to proceed to its reproduction by an expert.

Claims

1. Closing mechanism **characterized in that** it has a first element (1) movable with respect to a case (4, 5) in an initial direction because both elements are coaxial, the first moveable element (1) having some slots (1.1) antagonist of some projections (5.1) in the case (4, 5), so that when the slots (1.1) of the first moveable element (1) coincide with the projections (5.1) antagonist of the case (4, 5), the first element (1) is moved in the longitudinal direction thereof with respect to the case (4, 5), the first element slots (1.1) defining some protrusions (1.2) having some sloping sections (1.2.1) antagonist of other sloping sections (2.2.1) existing in some projections (2.2) of a second element (2) that also has slots (2.1) arranged between each pair of protrusions (2.2), so that when the first element (1) slots (1.1) are aligned with the case (4) projections (5.1), the displacement of said first element (1) and consequently that of the second element (2) are caused by actuating an transmission element (7) to which is connected, actuating in turn a closing element.
2. Closing mechanism defined in claim 1 **characterized in that** due to the recovery effect of an elastic element (9) solidly connected to the first element (1) - second element (2) assembly, the displacement of the first element (1) - second element (2) assembly in the opposite direction to the initial one and the rotation of the first element (1) with respect to the second element (2) are caused by the displacement that takes place between the sloping sections (1.2.1, 2.2.1) of one and other element.
3. Closing mechanism defined in claim 1 or 2 **characterized in that** the first moveable element (1) is driven by a cap (3), being moved along the inside of a first tube (4) that together with a second tube (5) connected to the first (4) acts as case by inside of which the first element (1) is moved.
4. Closing mechanism defined in claim 1 **characterized in that** the number of slots (1.1) in the first element (1) is twice the number of slots (2.1) in the second element (2).
5. Closing mechanism defined in claim 1 **characterized in that** the case projections (5.1) are housed

into the second element (2) slots (2.1), so that said second element (2) is moved with respect to the case according to the longitudinal direction, and the rotation is restricted by the case projections (5.1).

6. Closing mechanism defined in claim 1 **characterized in that** the second element (2) is connected to the transmission element (7) through a rod (6) solidly connected to the second element (2).
7. Closing mechanism defined in claim 6 **characterized in that** at the end of the transmission element (7) opposed to the rod joining end (6), a pusher (8) of an elastic element (9) which is pressed against a stopper (10) is connected to said transmission element (7), being the transmission element (7), pusher (8), elastic element (9) and stopper (10) arranged on a support (20) of the closing mechanism adjacent to the case thereof.
8. Closing mechanism defined in claim 7 **characterized in that** when the transmission element (7) is driven by the first element (1) - second element (2) assembly, motion is transmitted to a toothed wheel (11) from which the closing element shaft (12) sets off.
9. Closing mechanism defined in claim 8 **characterized in that** the closing element shaft (12) has a protuberance (13) of ellipsoidal section at its end, so that when the first element (1) - second element (2) assembly is moved, the protuberance (13) is blocked into a housing provided at the bottom of the closure wherein the closing mechanism is arranged.
10. Closing mechanism defined in claim 9 **characterized in that** when the first element (1) - second element (2) assembly is moved in the opposite direction to the initial displacement direction, the protuberance section coincides with the housing, where-with the closing mechanism does not perform its function and the closure opening is allowed.
11. Closing mechanism defined in claim 10 **characterized in that** the closing element shaft (12) has another elastic element (15) that is pressed against an axial bearing (14) in the closing element shaft (12), which allows the vertical movement of the shaft (12) to be performed in the two closing and opening directions.
12. Closing mechanism defined in claim 11 **characterized in that** the closure is a bind.

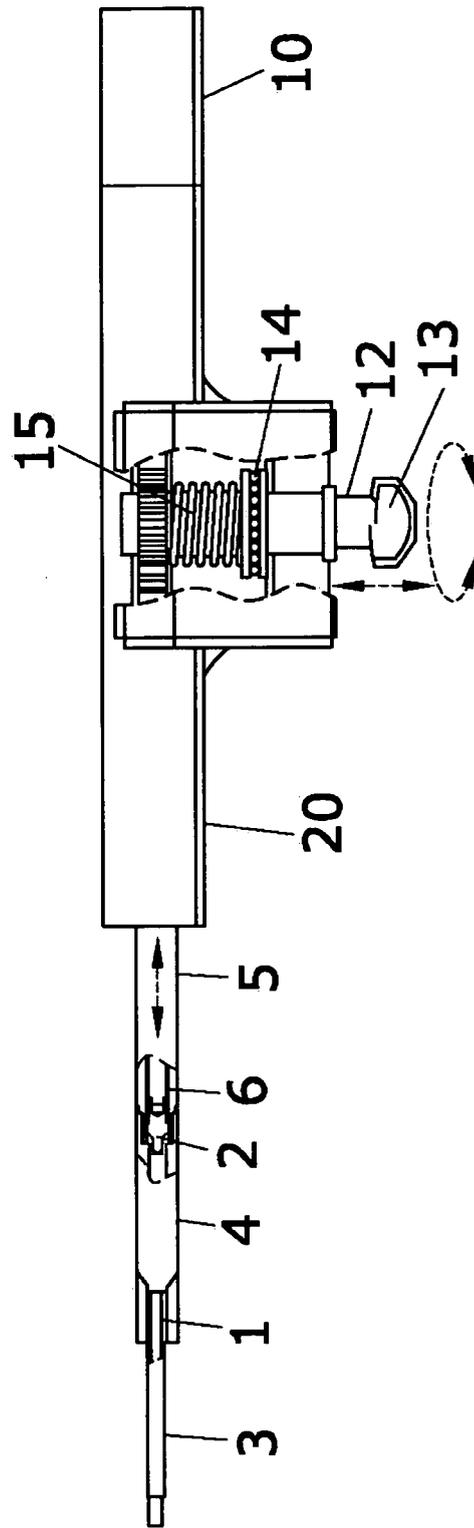


FIG.1

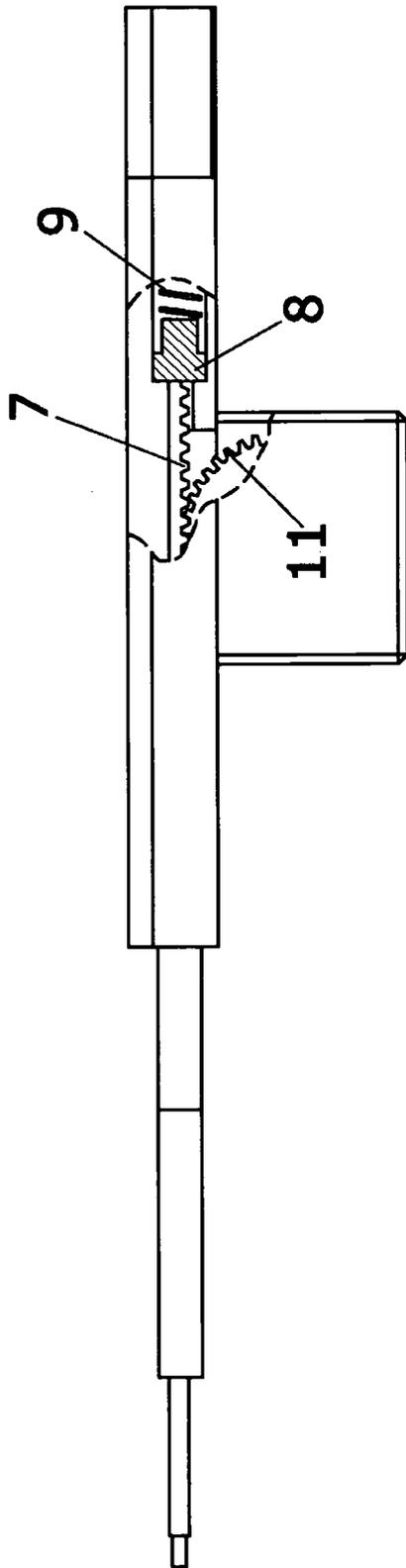


FIG.2

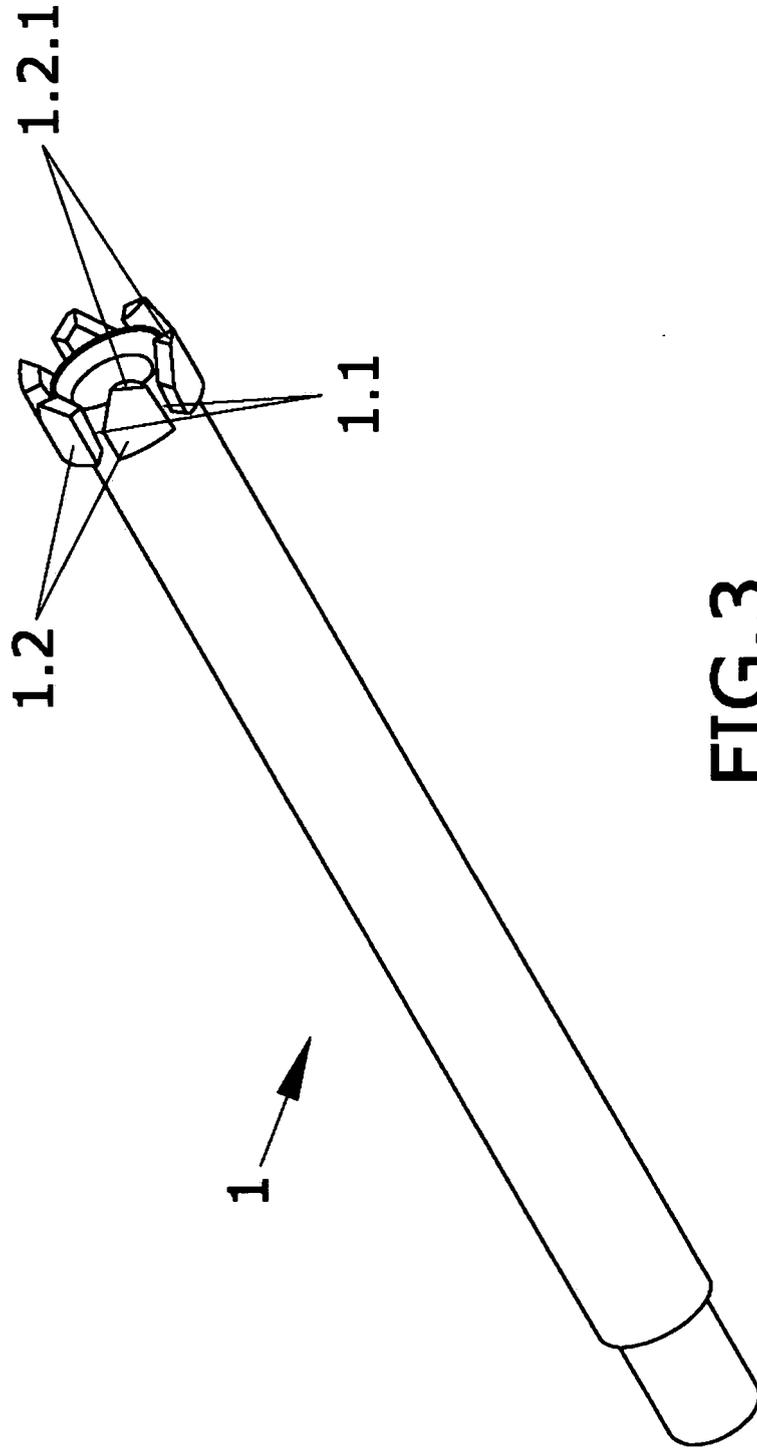
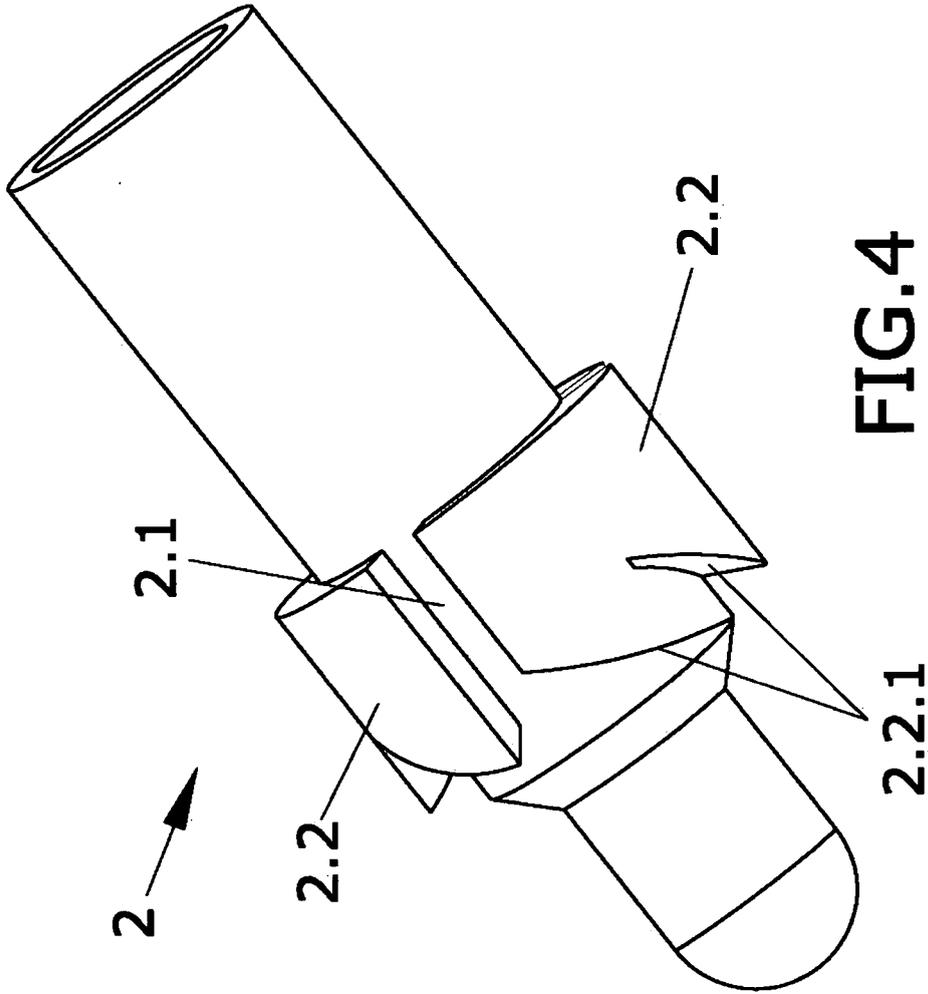


FIG.3



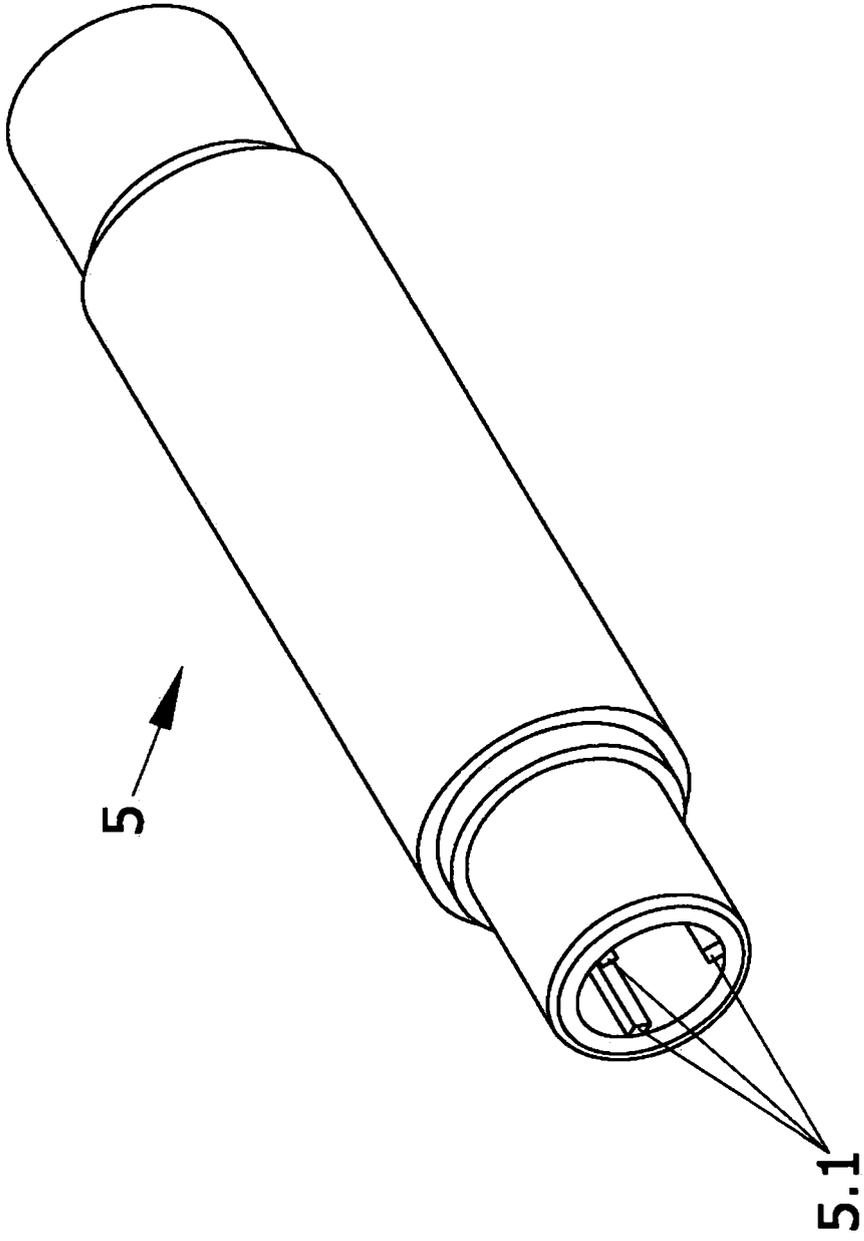


FIG. 5

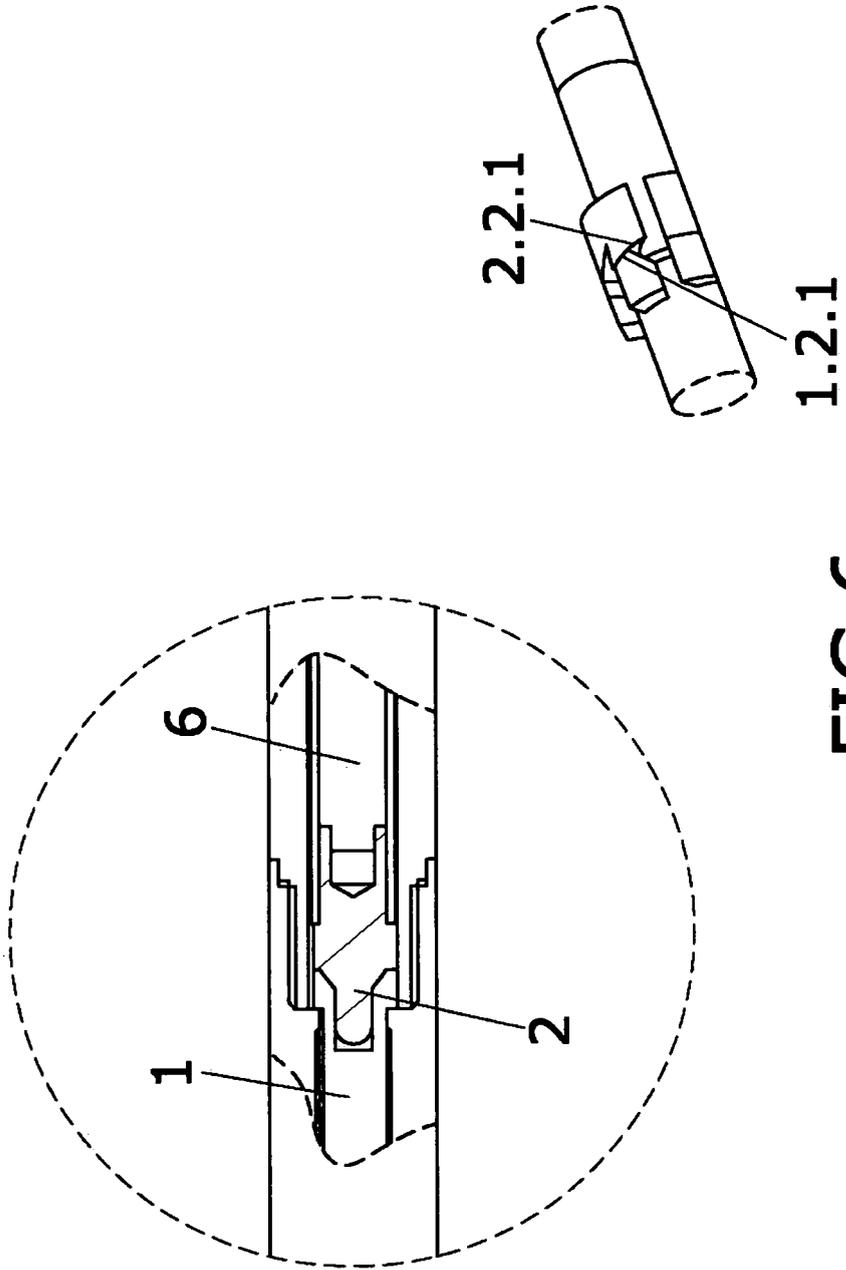


FIG.6



EUROPEAN SEARCH REPORT

Application Number
EP 10 38 2242

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	US 4 641 700 A (ZVEIBIL SALVADOR M [BR]) 10 February 1987 (1987-02-10) * the whole document * -----	1-12	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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1	Place of search The Hague	Date of completion of the search 16 June 2011	Examiner de Beurs, Marco
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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EP 10 38 2242

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16-06-2011

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