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(54) **Mixing retractable single lever tap**

(57) The present invention relates to a tap (1) adapted to be inserted so as to be able to slide in a through hole (21) formed on a support surface (20), said tap (1) being movable between a position wherein it is extracted with respect to said surface (20) and a position wherein it is partially retracted below said surface (20) and comprising a first elongated hollow tubular portion (2) adapted to be slidably inserted into said through hole (21), and a second elongated hollow tubular portion (3) provided on top of said first portion (2) arranged substantially perpendicular to it, interconnected each other by a connection joint (23), and an actuating means (5) for the water outlet from an opening (4) provided on said second elongated hollow portion (3). The actuating means (5) is provided integral with said tap (1) and connected to a mixing cartridge valve (6) arranged inside said connection joint (23).

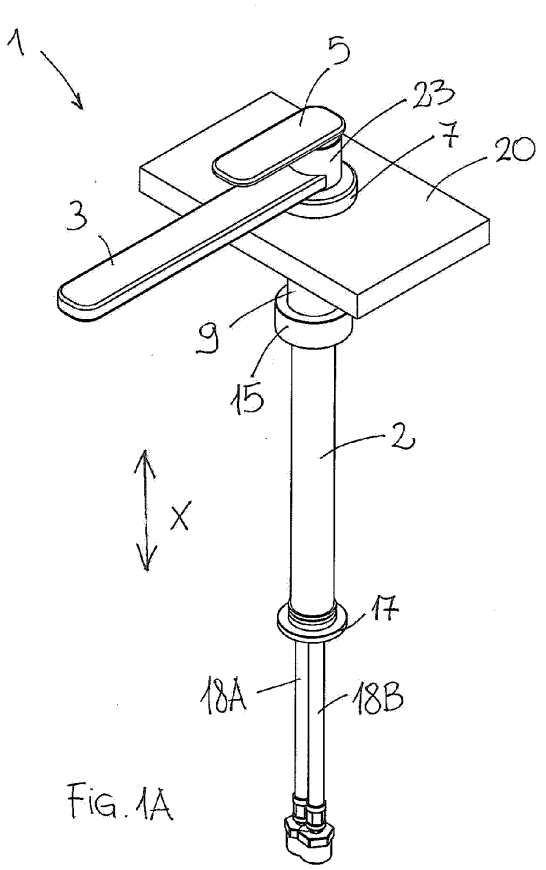

FIG. 1A

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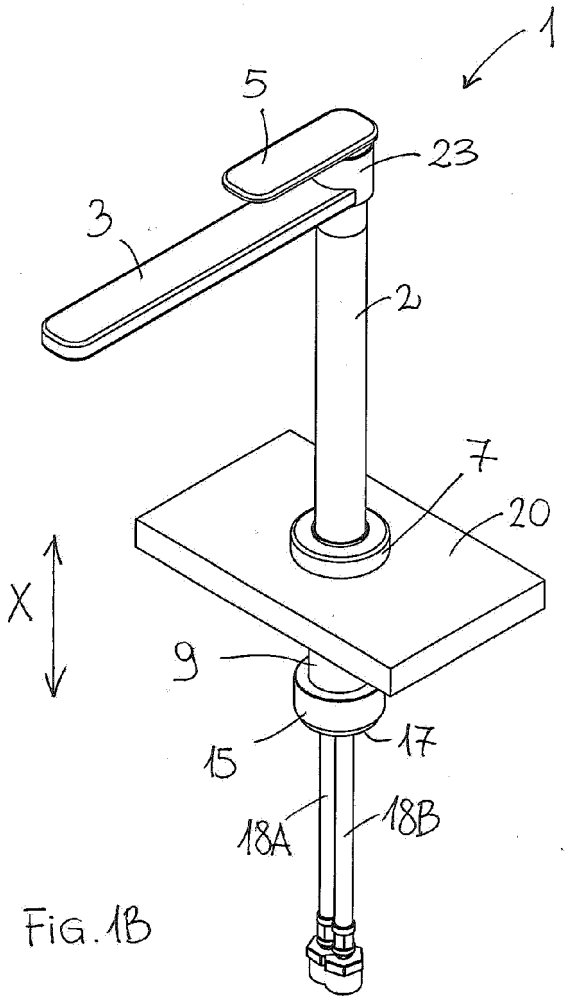

FIG. 1B

Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a mixing "retractable" tap, i.e., which is able to go from an extracted position with respect to a support plane, to a partially retracted position below the plane itself. In particular, the present invention relates to a mixing retractable tap whose actuating lever is arranged integral to the body of the tap itself.

BACKGROUND OF THE INVENTION

[0002] Generally, a tap comprises a hollow body adapted to be fixed on the surface of a bathroom wash-basin or of a kitchen sink or on the top surface of a bathroom or kitchen piece of furniture, basically arranged so as to cover a hole formed on the support surface to enable the water pipes passage. Said taps generally comprise a first tubular hollow portion, called "body", coaxially arranged with the hole on the support surface and a second tubular hollow portion, called "mouth", generally formed in one piece with the body and arranged perpendicular to it so as to project towards the centre of the wash-basin/sink. The mouth is provided with an outlet opening, through which water coming from the water supply and flowing through the hollow of the tap, can be let in the wash-basin/sink. An actuating lever controls the cartridge valve which enables to regulate the water outlet as well as to mix the hot and cold water flow in order to adjust the temperature of the supplied water.

[0003] Taps of the "retractable" type are known, i.e. taps wherein the hollow body telescopically slides inside the hole formed on the support surface from a position wherein it is extracted above the support surface, to a position wherein the hollow body is partially retracted below it, leaving only a minimum portion above the surface. This type of tap is particularly desirable especially when the wash-basin, or the sink, is placed below a window, and hence, especially when the tap is of a high spout type, it could hamper the opening/closing of the window above.

[0004] Patent US 4,457,342 shows a retractable tap, in particular for kitchens, whose position is vertically adjustable so that the hight of the water spout can be varied to enable to wash items of different dimensions. The described tap comprises a remote actuating lever, that is arranged separately with respect to the body of the tap itself in order to adjust the temperature and the water outlet flow. For this reason, the support plane of the tap has to be provided with two holes, the first one for the slidably insertion of the tap body, the second one for the actuating lever.

SUMMARY OF THE INVENTION

[0005] The aim of the present invention is to overcome the drawbacks of the known art by devising a tap whose hight can be adjustable in at least two positions, respectively extracted and partially retracted below the support plane and whose actuating lever is arranged integral with the tap itself so as not to have to provide a second hole besides the one to house the tap body.

[0006] In the scope of the above-mentioned objective, a purpose of the present invention consists in providing a retractable tap constructively simple and practical to use.

[0007] A further purpose is that of providing a retractable tap provided with preferably mechanical means adapted to enable a smooth movement but also capable to ensure the stability of the tap itself at least in the two extreme positions in order to prevent possible pressure changes from causing undesirable movements of the tap itself.

[0008] Another further purpose consists in providing a retractable tap which can take the smallest room possible when in the retracted position.

[0009] One not least important purpose is to devise a retractable telescopic tap to be made by means of the usual and known apparatuses, machinary and equipment.

[0010] The aim and the purposes indicated above, and others which will become more apparent later, are reached by means of a tap as defined in claim 1; further characteristics are defined in the following dependent claims.

BRIEF DESCRIPTION OF THE FIGURES

[0011] The advantages and the characteristics of the invention will be apparent from the following description, given by way of non-limiting example, with reference to the appended figures, wherein:

- figures 1 A and 1 B show a perspective view of a tap of the present invention respectively in the retracted position and in the extracted position;
- figure 2 is a front view of a tap according to the present invention; and
- figure 3 is an A-A longitudinal section of the tap in the previous figure.

DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

[0012] With reference to the foregoing figures, it is described a tap 1 adapted to being arranged on a support surface 20 particularly in correspondence with a through hole 21 formed on said surface 20 to enable the water connection. Said support surface 20 can comprise both the surface of a wash-basin/sink, and also the top surface of a bathroom or kitchen piece of furniture.

[0013] A fundamental characteristic of the present invention consists in that, said tap 1 is retractable, that is movable with respect to said support surface 20 accord-

ing to a substantially perpendicular direction with respect to the plane defined by the same surface 20 and shown in the figures by arrow X, between at least a first position wherein it is extracted, or working position, to a position wherein it is partially retracted below said support surface 20. In other words, the translational movement of the tap 1 into the through hole 21 occurs according to a vertical direction X.

[0014] Tap 1 comprises a first elongated hollow tubular portion 2, called "body", adapted to be coaxially arranged with hole 21 and substiantially extending along a vertical direction X and a second elongated hollow tubular portion 3 called "mouth", joined on the top of said first tubular portion 2 and extending approximatively perpendicular to it so as to project towards the wash-basin/sink and having, on its end portion, an opening 4 for the water outlet.

[0015] Said two elongated hollow portions 2, 3 are interconnected each other by a connection joint 23 whereon it is arranged an actuating means 5, such as a lever-type device, connected in a traditional way to a mixing cartridge valve 6, known per se, arranged inside the connection joint 23 and cooperating with two pipes 18A, 18B, respectively the hot water pipe and the cold water pipe, inserted inside the hollow body of the first tubular portion 2; in this way acting on the actuating lever 5 it is possible to adjust both the flow and the temperature of the water let out by the tap by means of opening 4.

[0016] In particular, it is to note that said actuating lever 5 is integral with the body of tap 1, being arranged on the connection joint 23, and therefore it follows its vertical translational movement; consequently, also the mixing cartridge valve 6, as well pipes 18A and 18B are formed so as to integrally follow the movement of tap 1.

[0017] A base ring nut 7 is arranged on the support surface 20 coaxially to the vertical tubular portion 2 of the tap, in order to cover the through hole 21 opening: inside the ring nut 7, it is provided an annular seat to house a washer 8, such as an o-ring type elastomer ring, which is arranged into contact with the outer surface of the first tubular portion 2 to prevent water from entering also during the vertical translational movement of the tap.

[0018] Below the support surface 20, coaxially with hole 21, it is inserted a hollow cylindrical guide 9 adapted to guide the vertical translational movement of tap 1.

[0019] First and second clamping means 10, 16 are provided in order to determine the movement stop of the vertical translating movement of the tap in both directions. The translational downward movement stops when the connection joint 23 abuts against first clamping means 10, that is an annular clamp arranged around the first tubular portion 2, superiorly and coaxially with said ring nut 7. The retracted position is retained simply because of gravity.

[0020] Instead, the extracted position of tap 1 is reached and retained by means of second clamping means 16 provided in correspondence with the lower end of the cylindrical guide 9 and cooperating with engaging means 14 provided on the external surface of the first tubular portion 2, in particular in correspondence with the lower end.

[0021] In fact, an annular section 15 having an opening communicating with the inner cavity of the guide 9 is adapted to receive said second clamping means 16 comprising for example a spherical element 11 preferably made of metal or hard polymeric material, and an elastically deformable biasing means 12, such as a compression spring. Said spring 12 is axially inserted inside the opening provided in the annular section 15 and cooperates with said spherical element 11 so as to retain it firmly bound against the outer surface of the first tubular portion 2 of the tap. A grub screw 13 is arranged on the opposed end of the spring 12 and is adapted to control the force with which the spring presses the spherical element 11 against the tubular portion 2.

[0022] The sliding movement of the tap upward is free until the spherical element 11 is retained by the spring 12 so as to be bound against the outer tubular surface 2; as soon as said spherical element 11 is reached by said engaging means 14, in particular an annular seat provided on the outer surface of said first tubular portion 2, it positions itself inside the seat 14 itself hence blocking the further upward sliding of the tap. To be more on the safe side, third clamping means 17, for example in the form of a projecting annular portion arranged on the lower end of the tubular portion 2, further block the upward vertical sliding of the tap, abutting against said annular section 15. Besides, once the spherical element 11 is housed into the seat 14, the position reached by the tap 1 is firmly retained, preventing it from falling back downward because of gravity.

[0023] However, exerting a vertical force downward on the tap, the engaging between the annular seat 14 and the spherical element 11 can be "forced": in fact, under the vertical thrust and thanks to the seat 14 configuration, the spherical element 11 is gradually driven back into a radial direction biased by the spring 12, until it goes out of seat 14, unblocking the tap movement. Advantageously, thanks to adjustments which can be obtained acting on the ring nut 7, the O-ring 8 provided in correspondence of hole 21 can be arranged into contact with the outer surface of body 2 of the tap with an adjustable force, slowing down due to friction the movement of tap 1 downward and thus making it smooth and controllable.

[0024] Moreover, when tap 1 is in the extracted position, i.e. it is being used, it can rotate around its own vertical axis; preferably, the extent of the rotation can be limited to an angle of 130° through the use of known and traditional means so as to prevent the pipes 18A and 18B from twisting or flexing causing malfunctioning.

[0025] Obviously, a typical tap is also formed with a lot of other known devices which, being not directly relevant for the invention, have been omitted.

[0026] In conclusion, from what said before it is apparent that a tap according to the present invention achieves the expected purposes and the advantages. In fact, it

has been obtained a mixing "one hole" single lever retractable tap, whose actuating lever is provided integral with the body of the tap itself, hence avoiding the need of providing two holes on the support surface 20, the first one housing the tap body and the second one for the actuating lever as shown in the prior art.

[0027] Moreover, the tap of the present invention is constructively very simple, as it requires a very limited number of pieces easily found on the market. Even so, the tap of the invention is extremally practical, and easy and prompt to use.

[0028] Advantageously, if in the embodiment of the invention of tap 1 some special solutions are used, for example a flush actuating lever is mounted and a compact mixing cartridge valve 6 is chosen, said retractable tap 1 will be very space-saving in the retracted position, hence enabling the installation of high spout taps also for wash-basins/sinks placed near a window. In particular, following the above mentioned solutions, the tap could have an overall bulk of only 55mm.

[0029] Naturally, the present invention can be applied in a great variety of ways, modified or varied without thereby departing from the scope of the patent protection, as defined by the appended claims. Moreover, the materials and the equipment used for the embodiment of the present invention, as well as the shapes and sizes of the individual components, can be the most suitable for the specific requirements.

Claims

1. Mixing tap (1) adapted to be slidably inserted in a through hole (21) formed on a support surface (20), said tap (1) being movable between an extracted position with respect to said surface (20), to a retracted position in which it is partially retracted below said surface (20) and comprising

   - a first elongated tubular portion (2) adapted to be slidably inserted into said hole (21),
   - a second elongate hollow portion (3), provided on the top of said first portion (2) and arranged substantially perpendicular to it, said first portion (2) and said second portion (3) being interconnected by a connection joint (23), and
   - single actuating means (5) to control the water outlet from an opening (4) provided on said second portion (3),

   characterized in that

   said actuating means (5) is provided integral with said mixing tap (1) and is connected to a mixing cartridge valve (6) arranged inside said connection joint (23).

2. Tap (1) according to claim 1, wherein said first portion (2) is arranged coaxially to said through hole (21) and said tap(1) is movable in a perpendicular direction (X) with respect to the plane defined by said support surface (20).

3. Tap (1) according to claim 2, wherein said connection joint (23) abuts against first clamping means (10) provided on said support surface (20) in correspondence of said through hole (21) to determine the movement stop when the retracted position is reached.

4. Tap (1) according to any of claims 1 to 3, wherein below said support surface (20) and coaxially with said hole (21) is arranged a hollow cylindrical guide (9) to guide the translational movement of said tap (1).

5. Tap (1) according to claim 4, wherein said hollow cylindrical guide (9) is externally provided on its lower end, with an annular section (15) adapted to receive second clamping means (16) cooperating with engaging means (14) provided on the lower external surface of said first portion (2) for fixing said tap (1) when the extracted position is reached.

6. Tap (1) according to claim 5, wherein said engaging means (14) comprise an annular seat.

7. Tap (1) according to claim 6, wherein said second clamping means (16) comprise a spherical element (11) and an elastically deformable biasing means (12) placed inside an opening provided into said annular section (15) for retaining said spherical element (11) firmly bound against the outer surface of said first portion (2) and to force it within said annular seat (14).

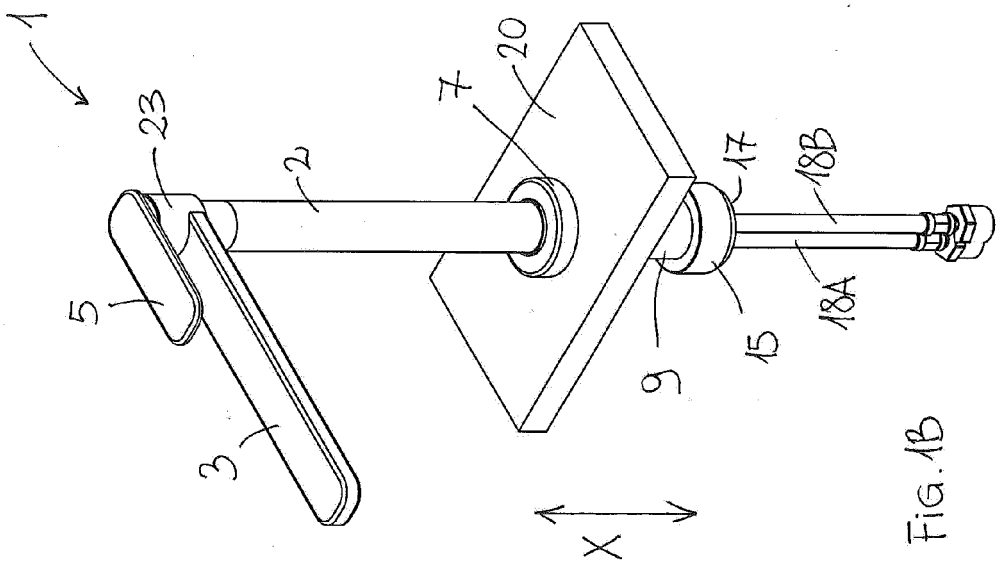

FIG. 1B

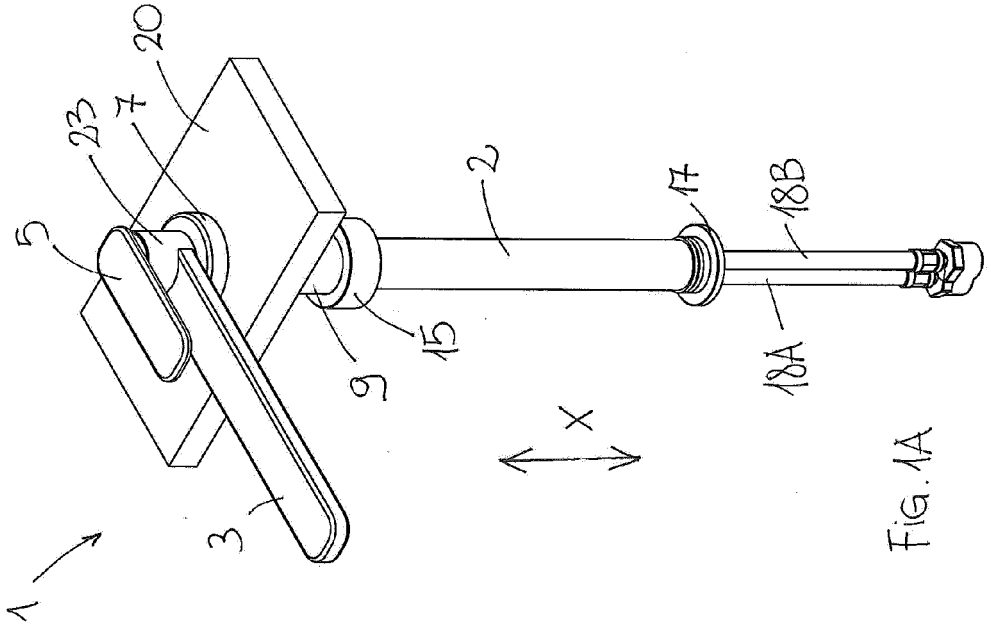

FIG. 1A

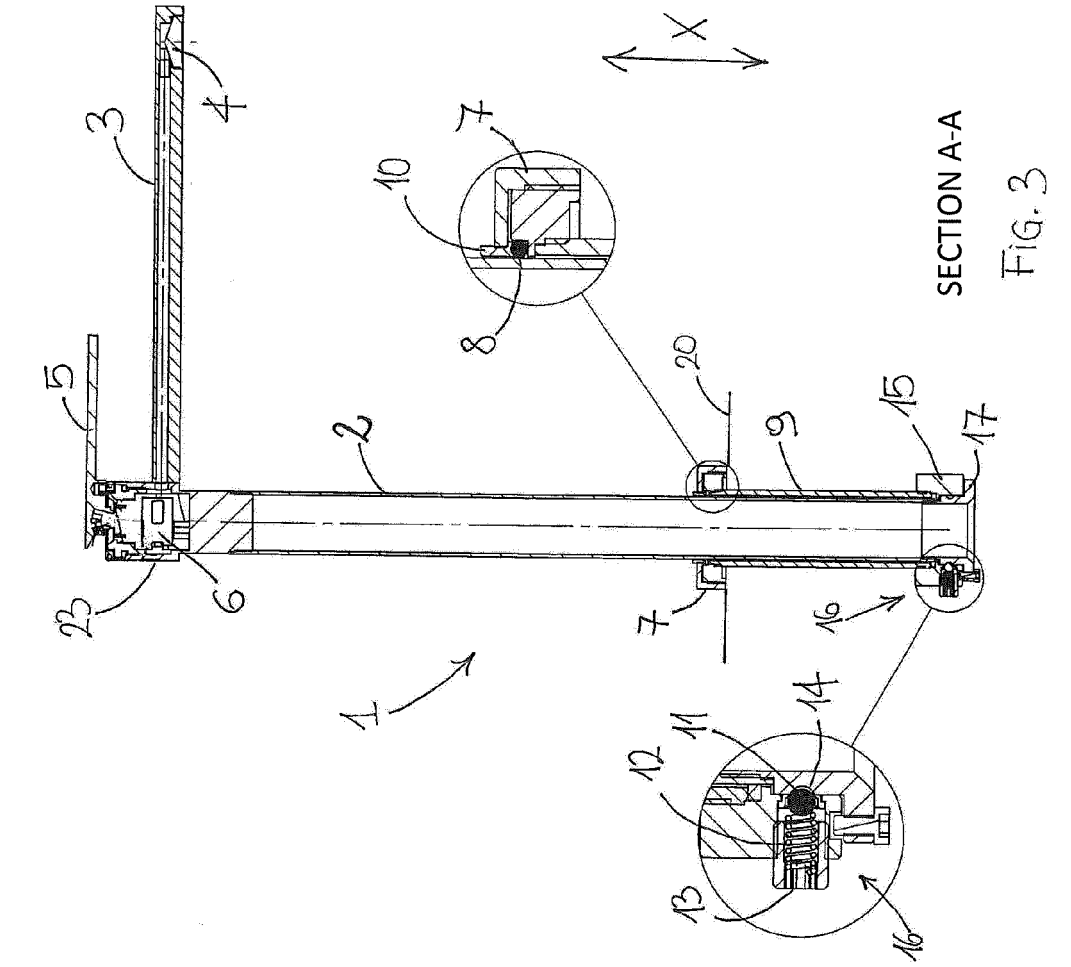
SECTION A-A
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FIG. 3

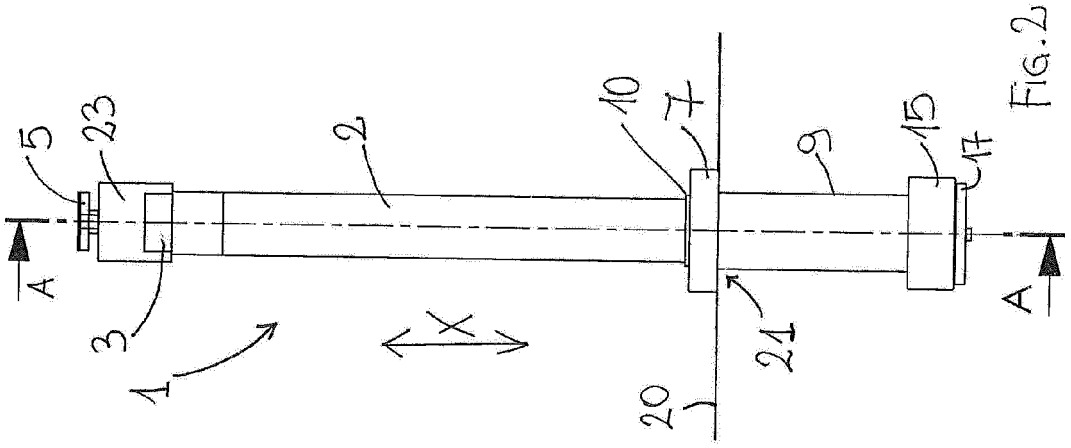
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FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 8286

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 October 2012	Flygare, Esa

CATEGORY OF CITED DOCUMENTS

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