

(19)



(11)

**EP 4 164 464 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:  
**16.04.2025 Bulletin 2025/16**

(51) International Patent Classification (IPC):  
**A47L 13/256<sup>(2006.01)</sup> A47L 13/257<sup>(2006.01)</sup>**  
**A47L 13/46<sup>(2006.01)</sup>**

(21) Application number: **21730898.0**

(52) Cooperative Patent Classification (CPC):  
**A47L 13/256; A47L 13/257; A47L 13/44;**  
**A47L 13/46**

(22) Date of filing: **03.06.2021**

(86) International application number:  
**PCT/EP2021/064922**

(87) International publication number:  
**WO 2021/249866 (16.12.2021 Gazette 2021/50)**

---

(54) **CLEANING DEVICE WITH DETACHING DEVICE**

REINIGUNGSVORRICHTUNG MIT LÖSUNGSVORRICHTUNG

DISPOSITIF DE NETTOYAGE COMPORTANT UN DISPOSITIF DE LIBÉRATION

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB**  
**GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO**  
**PL PT RO RS SE SI SK SM TR**

- **STOCKER, Corsin**  
**8640 Rapperswil (CH)**
- **BRUHIN, Silvan**  
**8730 Uznach (CH)**

(30) Priority: **10.06.2020 EP 20179247**

(74) Representative: **Piticco, Lorena**  
**Isler & Pedrazzini AG**  
**Giesshübelstrasse 45**  
**Postfach 1772**  
**8027 Zürich (CH)**

(43) Date of publication of application:  
**19.04.2023 Bulletin 2023/16**

(73) Proprietor: **Cre-A-Solve AG**  
**8360 Wallenwil (CH)**

(56) References cited:  
**EP-A1- 0 568 150 EP-A1- 3 251 575**  
**KR-A- 20200 027 293 US-A1- 2017 265 704**  
**US-A1- 2019 387 948**

(72) Inventors:  
• **DUETSCH, Andreas**  
**9525 Lenggenwil (CH)**

**EP 4 164 464 B1**

---

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

---

**Description**

TECHNICAL FIELD

5 **[0001]** The present invention relates to a cleaning device according to claim 1 and to a method of manufacturing a cleaning device according to claim 14.

PRIOR ART

10 **[0002]** Cleaning devices such as mops, brooms, brushes or the like are well-known in the art. In places such as bathrooms or kitchens it is furthermore often desired to apply moisture or even detergents for better removal of pollutants to the cleaning device. To this end cleaning pads can be attached to certain cleaning devices, and wherein the moisture or detergent is applied to the surface or object to be cleaned via the cleaning pads. After cleaning the soiled cleaning pad is disposed and replaced by a new cleaning pad.

15 **[0003]** So that a user does not have to grasp a soiled cleaning pad US 2019/0387948 A1 discloses a cleaning tool comprising a handle to be gripped by a user and a body that is attached to the handle and to which a web is removably attachable. The body furthermore comprises a pushing unit that enables the user to remove the soiled web. The disadvantages associated with such a cleaning tool are the fact that a user must bend down to the body in order to actuate the pushing unit. Thereby the user comes into proximity with the soiled web which can be unpleasant and above all unhygienically for the user.

20 **[0004]** From US 2019/387948 A1 a cleaning tool is known that comprises a handle configured to be grippable by a user, a body having one side to which the handle is pivotably connected and the other side providing an attachment surface to and from which a web for cleaning is attachable and detachable. The cleaning tool furthermore comprises a pushing unit provided at the handle to be movable therealong, wherein when the web is attached to the attachment surface, the pushing unit is movable along the handle to separate the web from the attachment surface.

25 **[0005]** From EP 0 568 150 A1 a device for manually cleaning surfaces is known, that is formed by a tubular body with an elbow-like bent end bearing a support flange of an elastically deformable material and provided with an opening, onto which a paper sheet can be applied for performing the cleaning operation. After being used, the sheet is expelled by actuating a flexible organ housed and axially movable inside the tubular body and provided at its other end with an enlarged portion.

30 **[0006]** From EP 3 251 575 A1 a mopping implement is known that has a mop-head plate, wherein a mopping cloth can be fastened in a releasable manner on the mopping implement. The mop-head plate is formed by an upper plate and a lower plate. The mopping cloth is arranged under the lower plate and the upper plate can be moved relative to the lower plate in order to release the mopping cloth.

35 SUMMARY OF THE INVENTION

**[0007]** It is an object of the present invention to overcome the disadvantages of the prior art. It is in particular an object of the present invention to provide a cleaning device that enables an ergonomic and hygienic handling.

40 **[0008]** This object is achieved with a cleaning device according to claim 1. In particular, a cleaning device is provided, which cleaning device comprises a handle extending along a longitudinal axis and a cleaning head. The cleaning head is in connection with the handle. Preferably, the cleaning head is pivotally in connection with the handle. The cleaning head is configured such that a cleaning pad is detachably fastenable to the cleaning head. The cleaning device further comprises a detaching device, wherein the detaching device is movably mounted to the handle and is configured to be moved along the longitudinal axis with respect to the handle from a cleaning position into a detaching position. In the cleaning position a cleaning pad being fastened to the cleaning head remains fastened to the cleaning head. In the detaching position a cleaning pad being fastened to the cleaning head is detached from the cleaning head.

45 **[0009]** To this end an ejection direction and a retraction direction can be defined. Both directions, i.e. the ejection direction and the retraction direction run parallel to the longitudinal axis.

50 **[0010]** However, the ejection direction and the retraction direction run opposite to one another. In fact, the ejection direction is understood herein as a direction extending from a proximal end of the handle towards a distal end of the handle. Consequently, the retraction direction is understood as a direction extending from the distal end of the handle towards the proximal end of the handle. The detaching device is preferably movable along the ejection direction as well as along the retraction direction. In fact, it is preferred that the detaching device is movable along the ejection direction in the event that the detaching device is transferred from the cleaning position into the detaching position, and that the detaching device is movable along the retraction direction in the event that the detaching device is transferred from the detaching position into the cleaning position. That is, the detaching device is preferably configured to be moved along the longitudinal axis with respect to the handle from the cleaning position into the detaching position as well as from the detaching position into the cleaning position. It should be noted that statements made herein regarding a movement with respect to the longitudinal

axis or along the longitudinal axis preferably correspond to a movement with respect to or along the ejection direction as well as the retraction direction.

5 [0011] Hence, the cleaning device according to the invention comprises a detaching device that is mounted to the handle, wherein an actuation of the detaching device can be carried out in the region of the handle. Consequently, if a user wishes to replace a soiled cleaning pad he or she can simply actuate the detaching device while remaining in his or her position. In other words, the user does not have to bend himself down towards the cleaning pad. The cleaning device therefore enables an ergonomic and at the same time also hygienic handling.

10 [0012] The handle preferably corresponds to an elongate bar which is grippable by a user. Moreover, the movement of the detaching device along the longitudinal axis of the handle preferably corresponds to an axial displacement of the detaching device with respect to the handle.

[0013] The detaching device preferably comprises a rod extending along the longitudinal axis, wherein an ejector element is provided in the region of a distal end of the rod, and wherein the ejector element is configured to press against a cleaning pad being fastened to the cleaning head in order to detach the cleaning pad from the cleaning head when the detaching device is in the detaching position.

15 [0014] That is, if the user wishes to replace the soiled cleaning pad he can transfer the detaching device from its cleaning position into its detaching position by moving the detaching device along the longitudinal axis, in particular along the ejection direction, whereby the ejector element is moved relative to the handle and towards the cleaning pad until it presses against the cleaning pad and thereby pushes the cleaning pad away from the cleaning head. In the detaching position the ejector element preferably at least partially protrudes from the cleaning head when seen along the ejection direction, i.e. the ejector element preferably at least partially protrudes from an underside of the cleaning device and towards a floor when seen in a state of use. In order to attach a new cleaning pad to the cleaning device the user preferably transfers the detaching device from its detaching position into its cleaning position by moving the detaching device along the longitudinal axis, in particular along the retraction direction, whereby the ejector element is moved relative to the handle from its protruding position back into a non-protruding position, i.e. into the cleaning position.

25 [0015] The ejector element and the rod can be provided as a single piece element. Alternatively, it is likewise conceivable that the ejector element and the rod are configured separately from one another. In the latter case it is furthermore conceivable to removably or permanently fasten the ejector element to the rod. If the ejector element is configured removably it can be replaced by a new ejector element, for example if an ejector element is broken. The rod and the ejector element are preferably mounted at least partially in the handle. In fact, the rod and the ejector element are preferably arranged entirely within the handle when the detaching device is in its cleaning position. Hence, it is preferred that the handle is essentially hollow and preferably corresponds to a hollow bar.

30 [0016] The ejector element can have various shapes. For example, the ejector element can have an uneven shape. An uneven shape could be provided by means of a serration, jags, spikes, indents, etc. that are preferably provided at a distal end of the ejector element. Additionally or alternatively the ejector element can have one or more surfaces which run at angle with respect to the longitudinal axis and/or with respect to a transverse axis running perpendicularly to the longitudinal axis. In this regard it is preferred that a distal end of the ejector element defines an angle that is acute and/or which is 90° or less, preferably 80° or less such as 60° with respect to the longitudinal axis. Additionally or alternatively the ejector element can be configured as one or more tips such as one or more conical tips or can correspond to one or more needles or can correspond to one or more clamps or is serrated, etc. One or more of these elements are preferably provided in a distal region or at the distal end of the ejector element such that they can act on the cleaning pad when the detaching device is in the detaching position. These one or more elements serve the purpose of facilitating a uniform detachment of the cleaning pad from the cleaning head.

35 [0017] The rod can be movably mounted in the handle and can be movable along the longitudinal axis with respect to the handle from the cleaning position into the detaching position and/or from the detaching position into the cleaning position.

40 [0018] That is, the rod of the detachment device can be movably mounted in the handle such that the rod is moved along the longitudinal axis, in particular along the ejection direction, when the cleaning device is transferred from the cleaning position into the detaching position. Additionally or alternatively the rod of the detachment device can be movably mounted in the handle such that the rod is moved along the longitudinal axis, in particular along the retraction direction, when the cleaning device is transferred from the detaching position into the cleaning position.

45 [0019] The ejector element can be configured to be moved together with the rod with respect to the longitudinal axis. In other words, the detaching device can be configured such that the rod and the ejector element are concurrently and/or jointly moved with respect to the handle. In this case, if a user transfers the detaching device from the cleaning position into the detaching position (or vice versa) he can simply move the detaching device with respect to the longitudinal axis, wherein the rod and the ejector element are concurrently and/or jointly moved during the same movement.

50 [0020] Alternatively, the ejector element can be configured to be moved separately from the rod with respect to the longitudinal axis. That is, it is likewise conceivable that the rod and the ejector element are moved successively or in a staggered manner and/or distinct from one another with respect to the handle. In this case, if a user transfers the detaching device from the cleaning position into the detaching position (or vice versa) a movement of either the rod or of the ejector

element is performed before and/or separated from the movement of the other component. In this regard it is particularly preferred if the rod is moved with respect to the ejection direction before the ejector element is moved with respect to the ejection direction. It is thus also particularly preferred if the ejector element is moved with respect to the retraction direction before the rod is moved with respect to the retraction direction. In this latter case it is preferred if the ejector element is movable mounted with respect to the rod. For example, the ejector element could be mounted at least partially within the rod.

**[0021]** The detaching device can further comprise a tube extending along the longitudinal axis, wherein the tube is mounted in the handle, and wherein the rod and preferably also the ejector element are at least partially mounted in the tube and are configured to be moved along the longitudinal axis with respect to the tube. This tube can be seen as a sleeve or the like within which the rod and possibly also the ejector element are arranged. The provision of such a tube or sleeve is particularly preferred in the event that the ejector element is configured to be moved separately from the rod with respect to the longitudinal axis mentioned above. The tube or sleeve is preferably arranged in the handle in a nondisplaceable i.e. fixed manner. Hence, the tube or sleeve can be seen as a guiding element which guides a movement of the rod and preferably also of the ejector element along the longitudinal axis. The rod preferably extends from a distal end of the tube at least partially towards a proximal end of the tube.

**[0022]** The cleaning device further comprises at least one actuation device, wherein the actuation device is operatively connected to the detaching device and is configured to transfer the detaching device from the cleaning position into the detaching position and/or from the detaching position into the cleaning position upon actuation. That is, the detaching device is preferably transferred from its cleaning position into its detaching position and vice versa via the actuation device.

**[0023]** The actuation device is preferably mounted on the handle. Furthermore, the actuation device can be configured to be moved along the longitudinal axis with respect to the handle, whereby a movement of the actuation device results in a movement of the detaching device. The actuation device preferably corresponds to a sleeve which is movably mounted on the handle, in particular on an outer surface of the handle. In addition, it is conceivable that the sleeve extends only partially or entirely around a circumference of the handle. An actuation of the movable actuation device is preferably achieved by grasping the actuation device and moving it along the handle with respect to the longitudinal axis. During this motion the detaching device is moved, as well. The sleeve can correspond to a single-piece or a multipiece element. Additionally or alternatively, the actuation device can be configured to be pivoted with respect to the handle, whereby a pivoting of the actuation device results in a movement of the detaching device. In this case it is preferred that the actuation device corresponds to a lever which can be pivoted by a user. The actuation device is preferably arranged on an outer surface of the handle. The pivotable actuation device preferably pivots about a pivoting axis running perpendicularly to the longitudinal axis. An actuation of the pivotable actuation device is preferably achieved by grasping the actuation device and pivoting it about the pivoting axis, wherein said pivotal motion of the actuation device is transferred into a movement of the detaching device with respect to the longitudinal axis via a lever joint or the like. Additionally or alternatively the actuation device can be configured to be rotated about a rotation axis extending parallel to the longitudinal axis. The advantages of a rotational actuation device are explained further below with respect to the one or more handle guiding elements.

**[0024]** The detaching device further comprises at least one mounting element, wherein the mounting element is arranged in the handle and is in connection with the actuation device. An operative connection between the actuation element and the detaching device is preferably accomplished via the mounting element. Furthermore, the detaching device is preferably mounted to the handle via the mounting element. A cross-section of the mounting element preferably essentially corresponds to a cross-section of the handle. By providing a mounting element with a cross-section that essentially corresponds to a cross-section of the handle a tilting of the mounting element with respect to the handle can be prevented. The rod of the detaching device is preferably connected to the mounting element. Consequently, a tilting of the rod is prevented as well. It is preferred that the cross-sections of the mounting element and of the handle are such, that the mounting element is arranged in the handle in a movable but essentially play-free manner. In other words, it is preferred that the cross-section of the mounting element is slightly smaller than the cross-section of the handle. A conceivable cross-section of the handle is in the range of about 15 millimeter to 50 millimeter, more preferably in the range of about 18 millimeter to 25 millimeter. A conceivable cross-section of the mounting element is in the range of about 14 millimeter to 49 millimeter, more preferably in the range of about 17 millimeter to 24 millimeter.

**[0025]** A length of the detaching device, in particular a length of the rod and a length of the ejector element, is preferably at least 50 %, more preferably at least 75 % of a length of the handle with respect to the longitudinal axis.

**[0026]** That is to say, a length of the detaching device is preferably at least half of a length of the handle, more preferably at least a three-quarter of a length of the handle. For example, if a length of the handle with respect to the longitudinal axis is 1 meter it is preferred that a length of the detaching device is at least 0.5 meter, more preferably at least 0.75 meter. A length of the handle is preferably between 1 meter and 1.5 meter.

**[0027]** The detaching device preferably extends from the distal end of the handle at least partially towards the proximal end of the handle.

**[0028]** The actuation device is preferably arranged in a proximal region of the detaching device, i.e. on a side of the

cleaning device facing the user. Consequently, the actuation device is arranged in an upper region of the handle and can be actuated easily by a user.

**[0029]** The handle preferably comprises at least one handle guiding element and the detaching device comprises at least one detaching guiding element, and wherein the handle guiding element and the detaching guiding element provide a guidance for the detaching device with respect to a movement of the detaching device along the longitudinal axis.

**[0030]** The at least one handle guiding element preferably corresponds to a slot in the handle that extends at least partially along the longitudinal axis. The handle can comprise one or more handle guiding elements. The at least one detaching guiding element preferably corresponds to a protrusion such as a bolt, pin, screw or the like protruding from the detaching device preferably radially outward and which protrusion is received in the slot of the handle in a slidably manner. The detaching device can comprise one or more detaching guiding elements. Hence if the detaching device is moved along the longitudinal axis the protrusion will slide within as well as along the slot, and wherein a rotation of the detaching device with respect to the handle is prevented. Hence, the handle guiding element and the detaching guiding element provide axial guidance. The actuation device mentioned above is particularly preferably mounted to the one or more handle guiding elements of the handle.

**[0031]** The detaching device, in particular the rod and/or the mounting element, can be in connection with the actuation device via the detaching guiding element.

**[0032]** The detaching guiding element preferably corresponds to a bolt, pin, screw or the like that extends from the actuation device through the handle guiding element at least partially into the detaching device, in particular the rod and/or the mounting element. For example, it is conceivable to screw the actuation device to the handle, and wherein said screw extends through the handle guiding element in the form of the slot in the handle into an interior of the handle and further through the mounting element and the rod arranged within the handle. The screw that is used for screwing can be understood as a detaching guiding element.

**[0033]** The cleaning device preferably further comprises at least one locking device, wherein the locking device is configured to adapt at least a locking position and an unlocking position, wherein the locking device in the locking position is configured to lock the detaching device in the cleaning position and to enable a transfer of the detaching device from the cleaning position into the detaching position in the unlocking position.

**[0034]** To this end various embodiments of a locking device are conceivable. In fact, the locking device can be configured such, that the locking device is transferable from its locking position into its unlocking position and/or from its unlocking position into its locking position upon a rotation of the locking device, preferably via a rotation of the actuation device, around a rotation axis extending parallel to the longitudinal axis. For example, according to this first aspect the locking device could comprise a recess extending in the handle and along an axis running at an angle and preferably perpendicularly to the longitudinal axis and a projection being provided on the rod or the mounting element, for example. By rotating the detaching device, the projection on the rod or on the mounting element is rotated into the recess or out of the recess. When the projection is in the recess it abuts against the recess if a user exerts a force on the locking device extending along the longitudinal axis, in particular along the ejection direction, whereby a movement of the detaching device along the longitudinal axis is prevented. If the cleaning device comprises an actuation device it is preferred that said rotation of the detaching device is achieved via a rotation of the actuation device. Hence, the actuation device is preferably not only movably mounted on the handle but also rotatably mounted on the handle and configured to rotate about a rotation axis extending parallel to the longitudinal axis. In this context it is particularly preferred that the recess of the locking device leads into the slot in the handle mentioned above. In this case, in order to detach a cleaning pad from the cleaning head, a user could rotate the actuation device about the rotation axis in a first step so as to remove the protrusion of the locking device, here the detaching guiding element, from the recess formed in the handle, and could then move the actuation device along the ejection direction so as to eject the cleaning pad in a second step. Upon ejection of the cleaning pad, the detaching device could be brought back into its cleaning position by moving the actuation device along the retraction direction in a first step and by rotating the actuation device about the rotation axis in a second step, whereby the protrusion or detaching guiding element, respectively, is rotated into the recess in the handle. Additionally or alternatively the locking device can comprise a recess and a projection, and wherein the projection is receivable in the recess so as to form a stop preventing a movement of the detaching device along the longitudinal axis in the locking position. For example, according to this second aspect it is conceivable that the locking device comprises an inner thread and outer thread, wherein the inner thread could be arranged on the handle or on the actuation device and the outer thread could be arranged on the detaching device such as on the rod or on the mounting element. In order to eject the cleaning pad from the cleaning head a user would have to release the threaded connection established between the inner and outer threads in a first step, which is achieved by rotating the handle or the actuation device with respect to the rod or the mounting element about the rotation axis. Hence, also in this case it is preferred that the actuation device is designed to be rotatable about a rotation axis extending parallel to the longitudinal axis. Additionally or alternatively the locking device can comprise an inner thread and a corresponding outer thread, which threads are configured to enter a threaded connection with one another, and wherein the locking device is in its locking position when the threads are in the threaded connection. For example, according to this third aspect the locking device can comprise two or more engagement elements that are configured to engage one another

and at least one release element that is configured to release the engagement between the engagement elements. When the engagement elements are in the engaged state, the locking device is in its locking position. When the engagement between the engagement elements is released, the locking device is in its unlocking position. A first engagement element could be provided by means of a recess in the detaching device, for example in the rod, or in the mounting element. A second engagement element being configured to engage with the first engagement element could be provided by an element being receivable in the recess such as a bolt, pin or the like. The release element could be provided in the form of a button or bar or the like which can be pushed or shifted by a user so as to move the bolt, pin or the like out of the recess. The release element is preferably pretensioned and could be arranged on the handle or the actuation device, for example. Additionally or alternatively the locking device can be configured such, that it exerts a retaining force on the detaching device, preferably on the rod and/or the ejector element, in the absence of a force being applied on the detaching device by a user and being greater than the retaining force. For example, according to this fourth aspect the locking device can correspond to a retaining element exerting a retaining force on the detaching device, whereby the detaching device is prevented from moving along the longitudinal axis, in particular along the ejection direction. In order to detach the cleaning pad from the cleaning head a force being greater than the retaining force has to be applied to the detaching device. For example, the retaining element could correspond to a projection such as a lug that protrudes into the handle and provides an abutment for the detaching device, preferably for the rod and/or the ejector element. In the absence of a force exerted by a user said projection is capable of maintaining the detachment device in the cleaning position. In order to transfer the detaching device into its detaching position a user has to exert a force on the detaching device, e.g. by pushing the detaching device downwards, i.e. along the ejection direction. If said pushing force is larger than the retaining force exerted by the projection the detaching device is moved along the longitudinal axis, i.e. along the ejection direction. Additionally or alternatively the locking device can comprise a preferably preloaded retaining element acting on the detaching device, preferably on the rod and/or on the ejector element, so as to exert a retaining force on the detaching device, preferably on the rod and/or on the ejector element, the retaining element preferably corresponding to one or more projections extending into an interior of the handle. For example, according to this fifth aspect a pretensioned retaining element and/or an elastic element exerting a spring force or an elastic force can be provided which acts on the detaching device. Moreover, the retaining element could be arranged and configured so as to move outwardly along a radial direction extending perpendicularly to the longitudinal axis upon the application of force on the detaching device. In other words, the retaining element could spring back or flex back upon the application of force being greater than its retaining force, i.e. its spring force or elasticity. That is, various locking devices are conceivable in order to lock the detaching device in its cleaning position. To this end it should be noted that the cleaning device can comprise only one of the locking devices or two or more of the locking devices.

**[0035]** The cleaning head can comprise at least one through opening extending through the cleaning head along the longitudinal axis, and wherein the detaching device, in particular the ejector element, extends at least partially through the through opening of the cleaning head when the detaching device is in the detaching position. Hence, it is preferred if the cleaning head comprises at least one through opening through which the detaching device, in particular at least part of the ejector element, can protrude in the event that the detaching device is transferred into its detaching position.

**[0036]** The cleaning head is preferably mounted to the handle via a joint, particularly preferably via a biaxial or multi-axial joint. The biaxial joint preferably allows a pivoting of the handle about two axes. For example, the biaxial joint could be configured such that the handle can be pivoted with respect to the cleaning head along a first pivoting axis extending perpendicularly to the longitudinal axis as well as along a second pivoting axis extending perpendicularly to the longitudinal axis and the first pivoting axis. The first pivoting axis and the second pivoting axis preferably span a plane that is parallel to a plane extending through the cleaning head. The biaxial or multi-axial joint results in a large freedom of movement of the cleaning head. In fact, it enables a movement of the cleaning head with respect to the handle of 360°. Furthermore, the joint enables a permanent pivoting of the cleaning head. That is, the cleaning head can be pivoted with respect to the handle when the detaching device is in the cleaning position as well as in the detaching position.

**[0037]** The cleaning head preferably is of a square or rectangular shape and thus preferably corresponds to a square or rectangular plate or the like. Furthermore, the cleaning head can comprise an upper surface facing the handle and a lower surface facing a floor. The joint is preferably arranged on the upper surface of the cleaning head and the lower surface of the cleaning head is preferably configured to allow an attachment of the cleaning pad.

**[0038]** The joint preferably comprises at least one through opening extending through the joint along the longitudinal axis. Hence, it is also preferred if the joint comprises at least one through opening through which the detaching device, in particular at least part of the ejector element, can protrude in the event that the detaching device is transferred into its detaching position. That is, at least part of the detaching device, in particular at least part of the ejector element and probably also of the handle, extends through the through opening of the joint and the through opening of the cleaning head when the detaching device is transferred into its detaching position. To this end it is thus preferred when the through opening of the joint and the through opening of the cleaning head are arranged above one another with respect to the longitudinal axis. Moreover, the through opening of the joint and the through opening of the cleaning head are preferably arranged centrally with respect to the joint and the cleaning head, respectively. Thus, it is preferred to centrally arrange the

joint on the cleaning head.

[0039] The joint, in particular its distal end, can be attached to the cleaning head according to well-known manners, e.g. by screwing it to the cleaning head or by means of a snap connection, a click connection, etc.. A connection between the joint and the handle can be achieved in various ways as well. For example, the joint, in particular its proximal end, can be attached to the distal end of the handle. For instance, the proximal end of the joint could be inserted into the distal end of the handle, wherein an attachment between the joint and the handle is achieved by a friction fit. However, other or additional fastening means such as gluing the joint to the handle are likewise conceivable. In the event that the joint is at least partially received in the handle as just explained it is preferred that one or more retaining elements as described above are provided on the joint, in particular in the region of the through opening of the joint. Hence, it is preferred that the joint comprises a locking device being configured to lock the detaching device in its cleaning position.

[0040] The cleaning device is preferably configured for cleaning a floor or the like. That is, the cleaning device is preferably a floor cleaning device.

[0041] The cleaning pad is preferably a textile pad or a textile cloth, particularly preferably a disposable textile pad or a disposable textile cloth. To this end various types of pads or clothes are conceivable: For example, the pad or cloth can correspond to a single layer or a multi-layer component. They can be made of nonwoven, or knitted, or sewn fabrics made from natural and/or synthetic fibres. However, any other cleaning pad known in the art is conceivable as well.

[0042] In a further aspect a cleaning pad is provided, which cleaning pad is configured to be detachably fastened to a cleaning device as described above.

[0043] A detachable fastening of the cleaning pad to the cleaning head can be achieved according to known methods as well. For example, the cleaning pad can be attached to the cleaning head via a Velcro fastener, one or more clips or clamps, etc.

[0044] In a further aspect a method of manufacturing a cleaning device, preferably a cleaning device as described above, is provided. The method comprises the steps of i) providing a handle extending along a longitudinal axis, and ii) providing a cleaning head. The cleaning head is preferably pivotally in connection with the handle. The cleaning head is configured such that a cleaning pad is detachably fastenable to the cleaning head. The method further comprises the step of iii) providing a detaching device, wherein the detaching device is movably mounted to the handle and is configured to be moved along the longitudinal axis with respect to the handle from a cleaning position, in which a cleaning pad being fastened to the cleaning head remains fastened to the cleaning head, into a detaching position, in which a cleaning pad being fastened to the cleaning head is detached from the cleaning head.

[0045] It should be noted that steps i) to iii) can be carried out in any order as well as in a consecutive or simultaneous manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0046] Preferred embodiments of the invention are described in the following with reference to the drawings, which are for the purpose of illustrating the present preferred embodiments of the invention and not for the purpose of limiting the same. In the drawings,

- Fig. 1 shows a perspective view of a cleaning device comprising a handle, a cleaning head, and a detaching device in a cleaning position;
- Fig. 2 shows an exploded view of the cleaning device according to figure 1;
- Fig. 3 shows a sectional view of the cleaning device according to figure 1;
- Fig. 4 shows a partial perspective view of the cleaning device according to figure 1 in a detaching position;
- Fig. 5 shows a sectional view of the cleaning device according to figure 4;
- Fig. 6 shows a perspective view of the cleaning device depicted in area A according to figure 1;
- Fig. 7 shows an exploded view of the cleaning device depicted in area A according to figure 1;
- Fig. 8 shows a an exploded sectional view of the cleaning device depicted in area A according to figure 1;
- Fig. 9 shows a partial perspective view of the cleaning depicted in area A according to figure 1;
- Fig. 10 shows a partial sectional view of the cleaning device depicted in area A according to figure 1;
- Fig. 11 shows another partial sectional view of the cleaning device depicted in area A according to figure 1;
- Fig. 12 shows an enlarged view of area C in figure 11;
- Fig. 13a shows a sectional view of the cleaning device depicted in area B according to figure 1;
- Fig. 13b shows another sectional view of the cleaning device depicted in area B according to figure 1;
- Fig. 14a shows a side view of an ejector element of the detaching device according to another embodiment;
- Fig. 14b shows a front view of the ejector element according to figure 14a;
- Fig. 15a shows a side view of an ejector element of the detaching device according to another embodiment;
- Fig. 15b shows a front view of the ejector element according to figure 15a;
- Fig. 16a shows a side view of an ejector element of the detaching device according to another embodiment;

Fig. 16b shows a front view of the ejector element according to figure 16a.

#### DESCRIPTION OF PREFERRED EMBODIMENTS

5 **[0047]** Several aspects of a cleaning device 1 according to the invention are now discussed with reference to figures 1 to 13b. The cleaning device 1 is configured for cleaning a floor or the like and can be referred to as a floor cleaning device. The cleaning device 1 comprises a handle 2 in the form of an elongate hollow bar extending along a longitudinal axis L. The handle 2 comprises a proximal end 21 and an opposed distal end 22. A cleaning head 3 is pivotally connected to the handle 2 at the distal end of the handle 2. The cleaning head 3 comprises fastening means such as Velcro fastening or the like (not depicted) that allow a releasable connection with corresponding fastening means on a cleaning pad (not depicted). Hence, the cleaning head 3 is configured such that a cleaning pad is detachably fastenable to the cleaning head 3. The cleaning pad is preferably a textile pad or a textile cloth.

10 **[0048]** The cleaning device 1 further comprises a detaching device 4 that is movably mounted to the handle 2 and is configured to be moved along the longitudinal axis L with respect to the handle 2 from a cleaning position, in which a cleaning pad being fastened to the cleaning head 3 remains fastened to the cleaning head 3, into a detaching position, in which a cleaning pad being fastened to the cleaning head 3 is detached from the cleaning head 3.

15 **[0049]** To this end an ejection direction E and a retraction direction R are defined. The ejection direction E extends from the proximal end 21 of the handle 2 towards the distal end 22 of the handle 2. The retraction direction R extends from the distal end 22 of the handle 2 towards the proximal end 21 of the handle 2. Figures 1 to 3 depict the cleaning device 1 in its cleaning position and figures 4 to 5 depict the cleaning device 1 in its detaching position.

20 **[0050]** As best seen in figure 2 the detaching device 4 comprises a rod 5 extending along the longitudinal axis L and comprising a proximal end 8 and a distal end 7. The detaching device 4 furthermore comprises an ejector element 6 which is provided in a region of the distal end 7 of the rod 5. Here, the ejector element 6 and the rod 5 are provided as separate components, wherein the ejector element 6 is removably fastenable to the rod 5 via corresponding fastening elements 23, 24. As can be seen in figure 12, for example, the fastening elements can be provided by means of an outer thread 23 being arranged in a region of the proximal end 25 of the ejector element 6 and an inner thread 24 being arranged in region of the distal end 7 of the rod 5. Hence, the ejector element 6 and the rod 5 can be connected to one another via a threaded connection.

25 **[0051]** The rod 5 is movably mounted in the handle 2 and is movable along the longitudinal axis L with respect to the handle 2 from the cleaning position into the detaching position and from the detaching position into the cleaning position. In the present example the ejector element 6 is firmly connected to the rod 5 via the threaded connection 23, 24 and is thus moved concurrently and jointly with the rod 5 with respect to the handle 2 and along the longitudinal axis L.

30 **[0052]** The ejector element 6 is configured to press against a cleaning pad being fastened to the cleaning head 3 in order to detach the cleaning pad from the cleaning head 3 when the detaching device 4 is in the detaching position. To this end the ejector element 6, in particular a region of its distal end 26, has an uneven shape comprising several surfaces 9 which run at angle with respect to the longitudinal axis L as well as with respect to a transverse axis T running perpendicularly to the longitudinal axis L so as to form a conical tip 27. In fact, when the detaching device 4 is transferred from its cleaning position as depicted in figures 1 to 3 into its detaching position as depicted in figures 4 to 5, the conical tip 27 of the ejector element 6 will press against the cleaning pad and push the cleaning pad away from the cleaning head 3. Due to its shape the ejector element 6 results in a uniform detachment of the cleaning pad from the cleaning head 3. Various designs of the ejector element 6 are conceivable, examples of which will be discussed in greater detail with respect to figures 14a to 16b.

35 **[0053]** As best seen in figures 7 to 11 the cleaning head 3 comprises a rectangular plate 28 having an upper surface 29 facing the handle 2 and a lower surface 30 facing a floor in an application state of the cleaning device 1. A joint 19 is preferably arranged on the upper surface 29 of the cleaning head 3 and the lower surface 30 of the cleaning head 3 is preferably configured to allow an attachment of the cleaning pad. The cleaning head 3 is mounted to the handle 2 via the joint 19. The joint 19 corresponds here to a biaxial joint which allows a pivoting of the handle 2 about two axes. In particular, the biaxial joint 19 is configured such that the handle 2 can be pivoted with respect to the cleaning head 3 along a first pivoting axis P1 extending perpendicularly to the longitudinal axis L as well as along a second pivoting axis P2 extending perpendicularly to the longitudinal axis L and the first pivoting axis P1. The first pivoting axis P1 and the second pivoting axis P2 preferably span a plane that is parallel to a plane spanning the rectangular plate 28 of the cleaning head 3.

40 **[0054]** The cleaning head 3 comprises a through opening 18 extending through the cleaning head 3 along the longitudinal axis L, and wherein the detaching device 4, in particular the ejector element 6, extends at least partially through the through opening 18 of the cleaning head 3 when the detaching device 4 is in the detaching position. In order to allow a movement of the detaching device 4 through the cleaning head 3 also the joint 19 comprises a through opening 20 extending along the longitudinal axis L. To this end the through opening 20 of the joint 19 and the through opening 18 of the cleaning head 3 are arranged above one another with respect to the longitudinal axis L. In other words, a (fictitious) line extending through the through opening 20 of the joint 19 coincides with a (fictitious) line extending through the through opening 18 of the cleaning head 3. Moreover, the through opening 20 of the joint 19 and the through opening 18 of the

cleaning head 3 are arranged centrally with respect to the joint 19 and the cleaning head 3, respectively. A distal end 31 of the joint 19 is attached to the cleaning head 3 via a snap-connection, wherein here two protrusions 33 of the joint 19 are snapped into corresponding recesses 34 provided in the cleaning head 3. A connection between the joint 19 and the handle 2 is achieved here via a proximal end 32 of the joint 19 that is attached to the distal end 22 of the handle 2. In particular, the proximal end 32 of the joint 19 is inserted into the distal end 22 of the handle 2, and wherein an attachment between the joint and the handle 2 is achieved by a friction fit as well as a snap connection established between a protruding nose 35 provided on the joint 19 and a corresponding recess 36 provided in the handle 2.

**[0055]** In order to enable an unobstructed cleaning by the cleaning device 1 the detaching device shall remain in its cleaning position during a cleaning operation. To this end the cleaning device 1 further comprises at least one locking device 15, which is configured to adapt at least a locking position and an unlocking position. In the locking position the locking device 15 is configured to lock the detaching device 4 in the cleaning position, wherein the ejector element 6 is mounted within the handle 2. In the unlocking position the locking device 15 allows a transfer of the detaching device 4 from the cleaning position into the detaching position. As follows from figure 12 the locking device 15 is configured such that it exerts a retaining force on the detaching device 4, here on the ejector element 6, in the absence of a force being applied on the detaching device 4 by a user and being greater than the retaining force. In particular, the locking device 15 comprises a preloaded retaining element 16 in the form of an elastic and/or pretensioned lug which protrudes inwardly into an interior 17 of the handle 2 and which provides an abutment surface 37 for the ejector element 6. In the absence of a force exerted by a user said lug 16 is capable of maintaining the detachment device 4 in the cleaning position. In order to transfer the detaching device 4 into its detaching position a user has to exert a force on the detaching device 4, e.g. by pushing the detaching device 4 downwards along the ejection direction E. If said pushing force is larger than the retaining force exerted by the lug 16 the lug 16 is pressed by the ejector element 6 radially outward, i.e. it deflects along a radial direction O, and the detaching device 4 can be moved along the longitudinal axis. As indicated in figure 12 the radial direction O runs perpendicularly to the longitudinal axis L.

**[0056]** In order to move the detaching device 4 along the handle 2 from the detaching position into the cleaning position and vice versa the cleaning device 1 further comprises an actuation device 10. The actuation device 10 is operatively connected to the detaching device 4 and is configured to transfer the detaching device 4 from the cleaning position into the detaching position and/or from the detaching position into the cleaning position upon its actuation. As follows from figures 1 to 3, for example, the actuation device 10 is mounted on the handle 2, in particular on an outer surface 38 of the handle 2, and has the form of a sleeve that surrounds an entire circumference of the handle 2. To this end the actuation device 10 is movable along the longitudinal axis L as well as rotatable about a rotation axis A. The rotation axis A extends parallel to the longitudinal axis L. Because of its operational connection with the detaching device 4 a movement of the actuation device 10 along the longitudinal axis L is transferred into a movement of the detaching device 4 along the longitudinal axis L. Likewise, a rotation of the actuation device 10 about the rotation axis A is transferred into a rotation of the detaching device 4 about the rotation axis A. A user can actuate the actuation device 10 by grasping the actuation device 10 and moving it along the handle 2 with respect to the longitudinal axis L and/or by rotating it about the rotation axis A.

**[0057]** As indicated in figure 3 a length  $l_d$  of the detaching device 4, in particular a total length being comprised of a length  $l_r$  of the rod 5 and a length  $l_e$  of the ejector element 6, is at least 50 % of a length  $l_h$  of the handle 2 with respect to the longitudinal axis L. Furthermore, the actuation device 10 is arranged in a proximal region 12 of the detaching device 4, in particular in a region of the proximal end 8 of the rod 5. Consequently, the actuation device 10 is arranged in an upper region of the handle 2 and can be actuated easily by a user.

**[0058]** As best seen in figures 13a and 13b, the detaching device 4 further comprises a mounting element 11, which corresponds here to a block of an essentially cylindrical shape, and which is movably mounted within the handle 2. The mounting element 11 is in connection with the actuation device 10 such that a movement of the actuation device 10, e.g. a rotation about or a displacement along the longitudinal axis L is transferred onto the mounting element 11. An external cross-section  $c_m$  of the mounting element 11 preferably essentially corresponds to an internal cross-section  $c_h$  of the handle 2. The internal cross-section  $c_h$  can also be referred to as the clear width of the handle 2. By providing a mounting element 11 with a cross-section  $c_m$  that essentially corresponds to a cross-section  $c_h$  of the handle 2 a tilting of the mounting element 11 with respect to the handle 2 can be prevented. Because the rod 5 is connected to the mounting element 11 a tilting of the rod 5 with respect to the handle 2 is thereby prevented as well.

**[0059]** The mounting element 11 comprises here two bores, a first bore 39 extending along the longitudinal axis L and extending from a distal end 42 of the mounting element 11 partially towards a proximal end 41 of the mounting element 11, and a second bore 40 extending perpendicularly to the first bore 39, i.e. along the transverse axis T. The rod 5 of the detaching device 4 is mounted to the mounting element 11 via its first bore 39. More specifically, a region 12 of the proximal end 8 of the rod 5 is inserted into the first bore 39 and is connected to the first bore 39 by means of a press-fit and/or a form fit and/or a frictional fit. The second bore 40 is used for connecting the mounting element 11 with the actuation device 10. Said connection is achieved via a screw 14 that extends from the actuation device 10 through the handle 2, through the rod 5 and essentially through the second bore 40 of the mounting element 11. To this end the screw 14 extends through a slot 13 running along the longitudinal axis L of the handle 2, see figures 1 and 2. Hence, if the actuation device 10 and thereby also

the detaching device 4 is moved along the longitudinal axis L the screw 14 will slide within as well as along the slot 13, and wherein a rotation of the detaching device 4 with respect to the handle 2 is prevented. As a result an axial guidance is provided. The slot 13 can thus also be referred to as a handle 2 guiding element 13 and the screw 14 can be referred to as a detaching guiding element 14.

5 **[0060]** As mentioned earlier, various designs of the ejector element 6 are conceivable. For instance, and as follows from figures 14a and 14b, a region of the distal end 26 of the ejector element 6 can comprise a first conical element 43 followed by a second element 44 terminating in an acute tip 27, i.e. in a tip 27 that defines an acute angle  $\alpha$ . A proximal end 45 of the first conical element 43 is in connection with the outer thread 23 via which the ejector element 6 can be removably fastened to the inner thread 24 of the rod 5. Said proximal end 45 of the first conical element 43 furthermore comprises an undercut 46 having a diameter  $d_u$  that matches a diameter of the rod. In the depicted example, outer surfaces 47 of the first conical element 43 run inwardly towards the longitudinal axis L run at an angle of  $60^\circ$  with respect to one another. Also the outer surfaces of the second element run inwardly towards the longitudinal axis and run at an angle  $\beta$  of  $60^\circ$  with respect to one another. A length  $l_{c1}$  of the first conical element is 4 mm. A length  $l_{c2}$  of the second element 44 is 1.5 mm and a diameter of the second element is 1 mm. Furthermore, a diameter  $d_u$  of the undercut is 7 mm, a diameter  $d_t$  of the outer thread is 5 mm, and a length  $l_t$  of the outer thread is 6.5 mm, respectively.

10 **[0061]** Figures 15a and 15b as well as figures 16a and 16b depict further conceivable examples of conceivable designs. In fact, the region of the distal end 26 of the ejector element 6 according to figures 15a and 15b comprises a conical element 43 that terminates in a plurality of acute tips 27. Said tips 27 are arranged next to one another and provide a serrated distal end face of the ejector element 6. Like in the embodiment of figures 14a and 14b, the proximal end 45 of the conical element 43 is in connection with the outer thread 23 via which the ejector element 6 can be removably fastened to the inner thread 24 of the rod 5. Also in this case said proximal end 45 of the conical element furthermore comprises an undercut 46 having a diameter  $d_u$  that matches a diameter of the rod. Furthermore, the outer surfaces 47 of the conical element run inwardly towards the longitudinal axis L and at an angle  $\beta$  of  $60^\circ$  with respect to one another. Moreover, the outer surfaces 48 of each tip 27 run inwardly towards the longitudinal axis L and at an acute angle  $\alpha$ , here at an angle  $\alpha$  of  $60^\circ$  with respect to one another. A length  $l_c$  of the conical element 43 is here about 3.5 mm and a lateral distance  $d$  between neighbouring tips 27 is 1 mm. Furthermore, a diameter  $d_u$  of the undercut is 7 mm, a diameter  $d_t$  of the outer thread is 5 mm, and a length  $l_t$  of the outer thread 23 is about 6.5 mm.

15 **[0062]** Figures 16a and 16b depict another conceivable example of a region of the distal end 26 of the ejector element 6, which corresponds here to an essentially conical element 43 terminating in notches or grooves 49. Like in the previous examples, the surfaces 48 defining the notch or groove 49 define an acute angle  $\alpha$  with respect to one another, which is in the present case  $90^\circ$ . In contrast to the previous examples, here said surfaces 48 defining the notch or groove 49 run from the longitudinal axis L toward the distal end 26 of the tips 27 outwardly. Also in this case the proximal end 45 of the conical element 43 is in connection with the outer thread 23 via which the ejector element 6 can be removably fastened to the inner thread 24 of the rod 5. Likewise, said proximal end 45 of the conical element furthermore comprises an undercut 46 having a diameter  $d_u$  that matches a diameter of the rod. Moreover, a length  $l_c$  of the conical element 43 is here about 4 mm, a diameter  $d_u$  of the undercut is 7 mm, a diameter  $d_t$  of the outer thread is 5 mm, and a length  $l_t$  of the outer thread 23 is about 6.5 mm.

## LIST OF REFERENCE SIGNS

40	1	cleaning device	35	nose
	2	handle	36	recess
	3	cleaning head	37	abutment surface
	4	detaching device	38	outer surface
45	5	rod	39	bore
	6	ejector element	40	bore
	7	distal end	41	proximal end
	8	proximal end	42	distal end
	9	surface	43	conical element
50	10	actuation device	44	conical element
	11	mounting element	45	proximal end
	12	proximal region	46	undercut
	13	handle guiding element	47	outer surface
55	14	detaching guiding element	48	outer surface
	15	locking device	49	groove or notch
	16	retaining element		
	17	interior	L	longitudinal axis

(continued)

5	18	through opening	T	transverse axis
	19	joint	A	rotation axis
	20	through opening	O	radial direction
	21	proximal end	E	ejection direction
	22	distal end	R	retraction direction
	23	fastening element	P1	pivoting axis
	24	fastening element	P2	pivoting axis
10	25	proximal end	cm	cross-section
	26	distal end	ch	cross-section
	27	tip	lh	length handle
	28	plate	le	length ejector element
15	29	upper surface	lr	length rod
	30	lower surface	lc	length conical element
	31	distal end	lc1	length conical element
	32	proximal end	lc2	length conical element
	33	protrusion	lt	length thread
20	34	recess	d	distance
	$\alpha$	angle	dt	diameter
	$\beta$	angle		
	du	diameter		

25

**Claims**

1. A cleaning device (1) comprising:

30

- a handle (2) extending along a longitudinal axis (L); and
- a cleaning head (3),

35

wherein the cleaning head (3) is preferably pivotally in connection with the handle (2), and wherein the cleaning head (3) is configured such that a cleaning pad is detachably fastenable to the cleaning head (3),

40

wherein the cleaning device (1) further comprises a detaching device (4), wherein the detaching device (4) is movably mounted to the handle (2) and is configured to be moved along the longitudinal axis (L) with respect to the handle (2) from a cleaning position, in which a cleaning pad being fastened to the cleaning head (3) remains fastened to the cleaning head (3), into a detaching position, in which a cleaning pad being fastened to the cleaning head (3) is detached from the cleaning head (3), and

45

wherein the cleaning device (1) further comprises at least one actuation device (10), wherein the actuation device (10) is operatively connected to the detaching device (4) and is configured to transfer the detaching device (4) from the cleaning position into the detaching position and/or from the detaching position into the cleaning position upon actuation, and

**characterized in that** the detaching device (4) further comprises at least one mounting element (11), wherein the mounting element (11) is arranged in the handle (2) and is in connection with the actuation device (10).

50

2. The cleaning device (1) according to claim 1, wherein the detaching device (4) comprises a rod (5) extending along the longitudinal axis (L), wherein an ejector element (6) is provided in the region of a distal end (7) of the rod (5), and wherein the ejector element (6) is configured to press against a cleaning pad being fastened to the cleaning head (3) in order to detach the cleaning pad from the cleaning head (3) when the detaching device (4) is in the detaching position.

55

3. The cleaning device (1) according to claim 2, wherein at least one of i) the ejector element (6) has an uneven shape, ii) the ejector element (6) has one or more surfaces (9) which run at angle with respect to the longitudinal axis (L) and/or with respect to a transverse axis (T) running perpendicularly to the longitudinal axis (L), and iii) the ejector element (6) is configured as one or more tips, preferably one or more conical tips or corresponds to one or more needles or

corresponds to one or more clamps or is serrated.

4. The cleaning device (1) according to any one of claims 2 to 3, wherein the rod (5) is movably mounted in the handle (2) and is movable along the longitudinal axis (L) with respect to the handle (2) from the cleaning position into the detaching position and/or from the detaching position into the cleaning position, and/or

wherein i) the ejector element (6) is configured to be moved together with the rod (5) with respect to the longitudinal axis (L), or

wherein ii) the ejector element (6) is configured to be moved separately from the rod (5) with respect to the longitudinal axis (L).

5. The cleaning device (1) according to any one of claims 2 to 4, wherein the detaching device (4) further comprises a tube extending along the longitudinal axis (L), wherein the tube is mounted in the handle (2), and wherein the rod (5) and preferably also the ejector element (6) are at least partially mounted in the tube and are configured to be moved along the longitudinal axis (L) with respect to the tube.

6. The cleaning device (1) according to any one of the preceding claims, wherein the actuation device (10) is mounted on the handle (2), and

wherein the actuation device (10) is configured to be moved along the longitudinal axis (L) with respect to the handle (2), whereby a movement of the actuation device (10) results in a movement of the detaching device (4), and/or

wherein the actuation device (10) is configured to be pivoted with respect to the handle (2), whereby a pivoting of the actuation device (10) results in a movement of the detaching device (4), and/or

wherein the actuation device (10) is configured to be rotated about a rotation axis (A) extending parallel to the longitudinal axis (L).

7. The cleaning device (1) according to any one of the preceding claims, wherein a cross-section (cm) of the mounting element (11) essentially corresponds to a cross-section (ch) of the handle (2).

8. The cleaning device (1) according to any one of the preceding claims, wherein a length (ld) of the detaching device (4), in particular a length (lr) of the rod (5) and a length (le) the ejector element (6), is at least 50 %, preferably at least 75 % of a length (lh) of the handle (2) with respect to the longitudinal axis (L), and wherein the actuation device (10) is preferably arranged in a proximal region (12) of the detaching device (4).

9. The cleaning device (1) according to any one of the preceding claims, wherein the handle (2) comprises at least one handle guiding element (13) and the detaching device (4) comprises at least one detaching guiding element (14), and wherein the handle guiding element (13) and the detaching guiding element (14) provide a guidance for the detaching device (4) with respect to a movement of the detaching device (4) along the longitudinal axis (L).

10. The cleaning device (1) according to claim 9, wherein the detaching device (4), in particular the rod (5) and/or the mounting element (11), is in connection with the actuation device (10) via the detaching guiding element (14), and wherein the detaching guiding element (14) preferably corresponds to a bolt, pin, screw or the like that extends from the actuation device (10) through the handle guiding element at least partially into the detaching device (4), in particular the rod (5) and/or the mounting element (11).

11. The cleaning device (1) according to any one of the preceding claims, further comprising at least one locking device (15), wherein the locking device (15) is configured to adapt at least a locking position and an unlocking position, wherein the locking device (15) in the locking position is configured to lock the detaching device (4) in the cleaning position and to enable a transfer of the detaching device (4) from the cleaning position into the detaching position in the unlocking position.

12. The cleaning device (1) according to claim 11, wherein at least one of:

i. the locking device is configured such, that the locking device is transferable from its locking position into its unlocking position and/or from its unlocking position into its locking position upon a rotation of the locking device, preferably via a rotation of the actuation device (10), around a rotation axis (A) extending parallel to the longitudinal axis (L);

ii. the locking device comprises a recess and a projection, and wherein the projection is receivable in the recess so as to form a stop preventing a movement of the detaching device (4) along the longitudinal axis (L) in the locking position;

iii. the locking device comprises an inner thread and a corresponding outer thread, which threads are configured to enter a threaded connection with one another, and wherein the locking device is in its locking position when the threads are in the threaded connection;

iv. the locking device (15) is configured such, that it exerts a retaining force on the detaching device (4), preferably on the rod (5) and/or the ejector element (6), in the absence of a force being applied on the detaching device (4) by a user and being greater than the retaining force;

v. the locking device (15) comprises a preferably preloaded retaining element (16) acting on the detaching device (4), preferably on the rod (5) and/or on the ejector element (6), so as to exert a retaining force on the detaching device (4), preferably on the rod (5) and/or on the ejector element (6), the retaining element (16) preferably corresponding to one or more projections extending into an interior (17) of the handle (2).

13. The cleaning device (1) according to any one of the preceding claims, wherein the cleaning head (3) comprises at least one through opening (18) extending through the cleaning head (3) along the longitudinal axis (L), and wherein the detaching device (4), in particular the ejector element (6), extends at least partially through the through opening (18) of the cleaning head (3) when the detaching device (4) is in the detaching position, and/or wherein the cleaning head (3) is mounted to the handle (2) via a joint (19), preferably via a biaxial or multi-axial joint, the joint (19) preferably comprising at least one through opening (20) extending through the joint (19) along the longitudinal axis (L).

14. A method of manufacturing a cleaning device (1), preferably a cleaning device according to any one of the preceding claims, the method comprising the steps of:

- Providing a handle (2) extending along a longitudinal axis (L); and
- Providing a cleaning head (3),

wherein the cleaning head (3) is preferably pivotally in connection with the handle (2), and wherein the cleaning head (3) is configured such that a cleaning pad is detachably fastenable to the cleaning head (3),

**characterized in that** the method further comprises the step of:

- Providing a detaching device (4),

wherein the detaching device (4) is movably mounted to the handle (2) and is configured to be moved along the longitudinal axis (L) with respect to the handle (2) from a cleaning position, in which a cleaning pad being fastened to the cleaning head (3) remains fastened to the cleaning head (3), into a detaching position, in which a cleaning pad being fastened to the cleaning head (3) is detached from the cleaning head (3), wherein the cleaning device (1) further comprises at least one actuation device (10), wherein the actuation device (10) is operatively connected to the detaching device (4) and is configured to transfer the detaching device (4) from the cleaning position into the detaching position and/or from the detaching position into the cleaning position upon actuation, and

**characterized in that** the detaching device (4) further comprises at least one mounting element (11), wherein the mounting element (11) is arranged in the handle (2) and is in connection with the actuation device (10).

## Patentansprüche

1. Reinigungsvorrichtung (1) umfassend:

- einen Griff (2), der sich entlang einer Längsachse (L) erstreckt; und
- einen Reinigungskopf (3),

wobei der Reinigungskopf (3) vorzugsweise schwenkbar mit dem Griff (2) verbunden ist, und wobei der Reinigungskopf (3) derart ausgebildet ist, dass ein Reinigungspad abnehmbar am Reinigungskopf (3) befestigbar ist,

- wobei die Reinigungsvorrichtung (1) weiter eine Lösungsvorrichtung (4) umfasst, wobei die Lösungsvorrichtung (4) beweglich an dem Griff (2) angebracht ist und derart ausgebildet ist, dass sie entlang der Längsachse (L) in Bezug auf den Griff (2) von einer Reinigungsposition, in der ein an dem Reinigungskopf (3) befestigtes Reinigungspad an dem Reinigungskopf (3) befestigt bleibt, in eine Ablöseposition bewegt wird, in der ein an dem Reinigungskopf (3) befestigtes Reinigungspad von dem Reinigungskopf (3) gelöst wird, und wobei die Reinigungsvorrichtung (1) weiter mindestens eine Betätigungsvorrichtung (10) aufweist, wobei die Betätigungsvorrichtung (10) mit der Lösungsvorrichtung (4) in Wirkverbindung steht und derart ausgebildet ist, dass sie bei Betätigung die Lösungsvorrichtung (4) von der Reinigungsposition in die Ablöseposition und/oder von der Ablöseposition in die Reinigungsposition überführt, und
- dadurch gekennzeichnet, dass** die Lösungsvorrichtung (4) weiter mindestens ein Befestigungselement (11) umfasst, wobei das Befestigungselement (11) im Griff (2) angeordnet ist und mit der Betätigungsvorrichtung (10) in Verbindung steht.
2. Reinigungsvorrichtung (1) nach Anspruch 1, wobei die Lösungsvorrichtung (4) eine Stange (5) umfasst, die sich entlang der Längsachse (L) erstreckt, wobei ein Ausstosselement (6) im Bereich eines distalen Endes (7) der Stange (5) vorgesehen ist, und wobei das Ausstosselement (6) derart ausgebildet ist, dass es gegen ein am Reinigungskopf (3) befestigtes Reinigungspad drückt, um das Reinigungspad vom Reinigungskopf (3) zu lösen, wenn sich die Lösungsvorrichtung (4) in der Ablöseposition befindet.
  3. Reinigungsvorrichtung (1) nach Anspruch 2, wobei mindestens eines von: i) das Ausstosselement (6) weist eine unebene Form auf, ii) das Ausstosselement (6) weist eine oder mehrere Flächen (9) auf, die unter einem Winkel zur Längsachse (L) und/oder unter zu einer senkrecht zur Längsachse (L) verlaufenden Querachse (T) verlaufen, und iii) das Ausstosselement (6) ist als eine oder mehrere Spitzen, vorzugsweise eine oder mehrere konische Spitzen, ausgebildet oder entspricht einer oder mehreren Nadeln oder einer oder mehreren Klammern oder ist gezahnt.
  4. Reinigungsvorrichtung (1) nach einem der Ansprüche 2 bis 3, wobei die Stange (5) im Griff (2) beweglich gelagert ist und entlang der Längsachse (L) gegenüber dem Griff (2) von der Reinigungsposition in die Ablöseposition und/oder von der Ablöseposition in die Reinigungsposition bewegbar ist, und/oder
    - wobei i) das Ausstosselement (6) derart ausgebildet ist, dass es zusammen mit der Stange (5) in Bezug auf die Längsachse (L) bewegt werden kann, oder
    - wobei ii) das Ausstosselement (6) derart ausgebildet ist, dass es getrennt von der Stange (5) in Bezug auf die Längsachse (L) bewegt werden kann.
  5. Reinigungsvorrichtung (1) nach einem der Ansprüche 2 bis 4, wobei die Lösungsvorrichtung (4) weiter ein sich entlang der Längsachse (L) erstreckendes Rohr aufweist, wobei das Rohr im Griff (2) gelagert ist, und wobei die Stange (5) und vorzugsweise auch das Ausstosselement (6) zumindest teilweise im Rohr gelagert und gegenüber dem Rohr entlang der Längsachse (L) bewegbar ausgebildet sind.
  6. Reinigungsvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei die Betätigungsvorrichtung (10) am Griff (2) angebracht ist, und
    - wobei die Betätigungsvorrichtung (10) derart ausgebildet ist, dass sie entlang der Längsachse (L) in Bezug auf den Griff (2) bewegt werden kann, wodurch eine Bewegung der Betätigungsvorrichtung (10) zu einer Bewegung der Lösungsvorrichtung (4) führt, und/oder
    - wobei die Betätigungsvorrichtung (10) derart ausgebildet ist, dass sie in Bezug auf den Griff (2) schwenkbar ist, wobei ein Schwenken der Betätigungsvorrichtung (10) zu einer Bewegung der Lösungsvorrichtung (4) führt, und/oder
    - wobei die Betätigungsvorrichtung (10) um eine parallel zur Längsachse (L) verlaufende Drehachse (A) drehbar ausgebildet ist.
  7. Reinigungsvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei ein Querschnitt (cm) des Befestigungselements (11) im Wesentlichen einem Querschnitt (ch) des Griffs (2) entspricht.
  8. Reinigungsvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei eine Länge (ld) der Lösungsvorrichtung (4), insbesondere eine Länge (lr) der Stange (5) und eine Länge (le) des Ausstosselements (6), mindestens 50 %, vorzugsweise mindestens 75 %, einer Länge (lh) des Griffs (2) in Bezug auf die Längsachse (L) beträgt, und wobei die Betätigungsvorrichtung (10) vorzugsweise in einem proximalen Bereich (12) der Lösungsvorrichtung (4)

angeordnet ist.

- 5
9. Reinigungsvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der Griff (2) mindestens ein Griff-Führungselement (13) und die Lösungsvorrichtung (4) mindestens ein Ablöse-Führungselement (14) aufweist, und wobei das Griff-Führungselement (13) und das Ablöse-Führungselement (14) eine Führung für die Lösungsvorrichtung (4) in Bezug auf eine Bewegung der Lösungsvorrichtung (4) entlang der Längsachse (L) bereitstellen.
10. Reinigungsvorrichtung (1) nach Anspruch 9, wobei die Lösungsvorrichtung (4), insbesondere die Stange (5) und/oder das Befestigungselement (11), über das Ablöse-Führungselement (14) mit der Betätigungsvorrichtung (10) in Verbindung steht, und wobei das Ablöse-Führungselement (14) vorzugsweise einem Bolzen, Stift, einer Schraube oder dergleichen entspricht, der/die sich von der Betätigungsvorrichtung (10) durch das Griff-Führungselement zumindest teilweise in die Lösungsvorrichtung (4), insbesondere die Stange (5) und/oder das Befestigungselement (11), erstreckt.
- 15
11. Reinigungsvorrichtung (1) nach einem der vorangehenden Ansprüche, weiter umfassend mindestens eine Verriegelungsvorrichtung (15), wobei die Verriegelungsvorrichtung (15) derart ausgebildet ist, dass sie mindestens eine Verriegelungsposition und eine Entriegelungsposition einnimmt wobei die Verriegelungsvorrichtung (15) in der Verriegelungsposition derart ausgebildet ist, dass sie die Lösungsvorrichtung (4) in der Reinigungsposition verriegelt und in der Entriegelungsposition einen Transfer der Lösungsvorrichtung (4) von der Reinigungsposition in die Ablöseposition ermöglicht.
- 20
12. Reinigungsvorrichtung (1) nach Anspruch 11, wobei mindestens eines der folgenden Merkmale vorliegt:
- 25
- i. die Verriegelungsvorrichtung ist derart ausgebildet, dass die Verriegelungsvorrichtung bei einer Drehung der Verriegelungsvorrichtung, vorzugsweise durch eine Drehung der Betätigungsvorrichtung (10), um eine parallel zur Längsachse (L) verlaufende Drehachse (A) von ihrer Verriegelungsstellung in ihre Entriegelungsstellung und/oder von ihrer Entriegelungsstellung in ihre Verriegelungsstellung überführbar ist;
- 30
- ii. die Verriegelungsvorrichtung umfasst eine Aussparung und einen Vorsprung, und wobei der Vorsprung in der Aussparung aufgenommen werden kann, um einen Anschlag zu bilden, der eine Bewegung der Lösungsvorrichtung (4) entlang der Längsachse (L) in der Verriegelungsposition verhindert;
- 35
- iii. die Verriegelungsvorrichtung umfasst ein Innengewinde und ein entsprechendes Aussengewinde, wobei die Gewinde derart ausgebildet sind, dass sie eine Gewindeverbindung miteinander eingehen, und wobei sich die Verriegelungsvorrichtung in ihrer Verriegelungsposition befindet, wenn sich die Gewinde in der Gewindeverbindung befinden;
- 40
- iv. die Verriegelungsvorrichtung (15) ist derart ausgebildet, dass sie eine Haltekraft auf die Lösungsvorrichtung (4), vorzugsweise auf die Stange (5) und/oder das Ausstosselement (6), ausübt, wenn keine Kraft durch einen Benutzer auf die Lösungsvorrichtung (4) ausgeübt wird, die grösser als die Haltekraft ist;
- v. die Verriegelungsvorrichtung (15) umfasst ein vorzugsweise vorgespanntes Rückhalteelement (16), das auf die Lösungsvorrichtung (4), vorzugsweise auf die Stange (5) und/oder auf das Ausstosselement (6) einwirkt, um eine Rückhaltekraft auf die Lösungsvorrichtung (4), vorzugsweise auf die Stange (5) und/oder auf das Ausstosselement (6) auszuüben, wobei das Rückhalteelement (16) vorzugsweise einem oder mehreren Vorsprüngen entspricht, die sich in einen Innenraum (17) des Griffs (2) erstrecken.
- 45
13. Reinigungsvorrichtung (1) nach einem der vorhergehenden Ansprüche, wobei der Reinigungskopf (3) mindestens eine Durchgangsöffnung (18) aufweist, die sich entlang der Längsachse (L) durch den Reinigungskopf (3) erstreckt, und wobei die Lösungsvorrichtung (4), insbesondere das Ausstosselement (6), sich in der Ablöseposition der Lösungsvorrichtung (4) zumindest teilweise durch die Durchgangsöffnung (18) des Reinigungskopfes (3) erstreckt, und/oder wobei der Reinigungskopf (3) über ein Gelenk (19), vorzugsweise über ein zwei- oder mehrachsiges Gelenk, an dem Griff (2) befestigt ist, wobei das Gelenk (19) vorzugsweise mindestens eine Durchgangsöffnung (20) aufweist, die sich durch das Gelenk (19) entlang der Längsachse (L) erstreckt.
- 50
14. Verfahren zur Herstellung einer Reinigungsvorrichtung (1), vorzugsweise einer Reinigungsvorrichtung nach einem der vorhergehenden Ansprüche, wobei das Verfahren die folgenden Schritte umfasst:
- 55
- Bereitstellen eines Griffs (2), der sich entlang einer Längsachse (L) erstreckt; und
  - Bereitstellen eines Reinigungskopfes (3),

wobei der Reinigungskopf (3) vorzugsweise schwenkbar mit dem Griff (2) verbunden ist, und wobei der Reinigungskopf (3) derart ausgebildet ist, dass ein Reinigungspad abnehmbar am Reinigungskopf (3) befestigt werden kann,  
**dadurch gekennzeichnet, dass** das Verfahren weiter den folgenden Schritt umfasst:

- Bereitstellen einer Lösungsvorrichtung (4),

wobei die Lösungsvorrichtung (4) beweglich an dem Griff (2) angebracht ist und derart ausgebildet ist, dass sie entlang der Längsachse (L) in Bezug auf den Griff (2) von einer Reinigungsposition, in der ein an dem Reinigungskopf (3) befestigtes Reinigungspad an dem Reinigungskopf (3) befestigt bleibt, in eine Ablöseposition bewegt wird, in der ein an dem Reinigungskopf (3) befestigtes Reinigungspad von dem Reinigungskopf (3) gelöst wird,

wobei die Lösungsvorrichtung (4) weiter mindestens eine Betätigungsvorrichtung (10) aufweist, wobei die Betätigungsvorrichtung (10) mit der Lösungsvorrichtung (4) in Wirkverbindung steht und derart ausgebildet ist, dass sie bei Betätigung die Lösungsvorrichtung (4) von der Reinigungsposition in die Ablöseposition und/oder von der Ablöseposition in die Reinigungsposition überführt, und

**dadurch gekennzeichnet, dass** die Lösungsvorrichtung (4) weiter mindestens ein Befestigungselement (11) umfasst, wobei das Befestigungselement (11) im Griff (2) angeordnet ist und mit der Betätigungsvorrichtung (10) in Verbindung steht.

## Revendications

1. Un dispositif de nettoyage (1) comprenant :

- une poignée (2) s'étendant selon un axe longitudinal (L) ; et
- une tête de nettoyage (3),

dans lequel la tête de nettoyage (3) est de préférence reliée de manière pivotante à la poignée (2), et dans lequel la tête de nettoyage (3) est configurée de telle sorte qu'un tampon de nettoyage peut être fixé de manière amovible à la tête de nettoyage (3),

dans lequel le dispositif de nettoyage (1) comprend en outre un dispositif de détachement (4), dans lequel le dispositif de détachement (4) est monté de manière déplaçable sur la poignée (2) et est configuré pour être déplacé le long de l'axe longitudinal (L) par rapport à la poignée (2) d'une position de nettoyage, dans laquelle un tampon de nettoyage fixé à la tête de nettoyage (3) reste fixé à la tête de nettoyage (3), dans une position de détachement, dans laquelle un tampon de nettoyage fixé à la tête de nettoyage (3) est détaché de la tête de nettoyage (3), et

dans lequel le dispositif de nettoyage (1) comprend en outre au moins un dispositif d'actionnement (10), le dispositif d'actionnement (10) étant relié de manière fonctionnelle au dispositif de détachement (4) et étant configuré pour transférer le dispositif de détachement (4) de la position de nettoyage à la position de détachement et/ou de la position de détachement à la position de nettoyage lors de l'actionnement, et **caractérisé en ce que** le dispositif de détachement (4) comprend en outre au moins un élément de montage (11), dans lequel l'élément de montage (11) est disposé dans la poignée (2) et est en liaison avec le dispositif d'actionnement (10).

2. Le dispositif de nettoyage (1) selon la revendication 1, dans lequel le dispositif de détachement (4) comprend une tige (5) s'étendant le long de l'axe longitudinal (L), dans lequel un élément éjecteur (6) est prévu dans la région d'une extrémité distale (7) de la tige (5), et dans lequel l'élément éjecteur (6) est configuré pour appuyer contre un tampon de nettoyage fixé à la tête de nettoyage (3) afin de détacher le tampon de nettoyage de la tête de nettoyage (3) lorsque le dispositif de détachement (4) est dans la position de détachement.
3. Le dispositif de nettoyage (1) selon la revendication 2, dans lequel au moins i) l'élément éjecteur (6) présente une forme irrégulière, ii) l'élément éjecteur (6) présente une ou plusieurs surfaces (9) qui s'étendent en biais par rapport à l'axe longitudinal (L) et/ou par rapport à un axe transversal (T) s'étendant perpendiculairement à l'axe longitudinal (L), et iii) l'élément éjecteur (6) est configuré sous la forme d'une ou plusieurs pointes, de préférence d'une ou plusieurs pointes coniques ou correspond à une ou plusieurs aiguilles ou correspond à une ou plusieurs pinces ou est dentelé.
4. Le dispositif de nettoyage (1) selon l'une quelconque des revendications 2 à 3, dans lequel la tige (5) est montée de

manière mobile dans la poignée (2) et est mobile le long de l'axe longitudinal (L) par rapport à la poignée (2) de la position de nettoyage à la position de détachement et/ou de la position de détachement à la position de nettoyage, et/ou dans lequel i) l'élément éjecteur (6) est configuré pour être déplacé conjointement avec la tige (5) par rapport à l'axe longitudinal (L), ou dans lequel ii) l'élément éjecteur (6) est configuré pour être déplacé séparément de la tige (5) par rapport à l'axe longitudinal (L).

5  
10  
15  
20  
25  
30  
35  
40  
45  
50  
55

5. Le dispositif de nettoyage (1) selon l'une quelconque des revendications 2 à 4, dans lequel le dispositif de détachement (4) comprend en outre un tube s'étendant le long de l'axe longitudinal (L), dans lequel le tube est monté dans la poignée (2), et dans lequel la tige (5) et de préférence également l'élément éjecteur (6) sont au moins partiellement montés dans le tube et sont configurés pour être déplacés le long de l'axe longitudinal (L) par rapport au tube.

6. Le dispositif de nettoyage (1) selon l'une quelconque des revendications précédentes, dans lequel le dispositif d'actionnement (10) est monté sur la poignée (2), et

dans lequel le dispositif d'actionnement (10) est configuré pour être déplacé le long de l'axe longitudinal (L) par rapport à la poignée (2), de sorte qu'un mouvement du dispositif d'actionnement (10) entraîne un mouvement du dispositif de détachement (4), et/ou

dans lequel le dispositif d'actionnement (10) est configuré pour être pivoté par rapport à la poignée (2), de sorte qu'un pivotement du dispositif d'actionnement (10) entraîne un mouvement du dispositif de détachement (4), et/ou

dans lequel le dispositif d'actionnement (10) est configuré pour être tourné autour d'un axe de rotation (A) s'étendant parallèlement à l'axe longitudinal (L).

7. Le dispositif de nettoyage (1) selon l'une quelconque des revendications précédentes, dans une section transversale (cm) de l'élément de montage (11) correspond de préférence essentiellement à une section transversale (ch) de la poignée (2).

8. Le dispositif de nettoyage (1) selon l'une quelconque des revendications précédentes, dans lequel une longueur (ld) du dispositif de détachement (4), en particulier une longueur (lr) de la tige (5) et une longueur (le) de l'élément éjecteur (6), représente au moins 50 %, de préférence au moins 75 % d'une longueur (lh) de la poignée (2) par rapport à l'axe longitudinal (L), et dans lequel le dispositif d'actionnement (10) est de préférence disposé dans une région proximale (12) du dispositif de détachement (4).

9. Le dispositif de nettoyage (1) selon l'une quelconque des revendications précédentes, dans lequel la poignée (2) comprend au moins un élément de guidage de poignée (13) et le dispositif de détachement (4) comprend au moins un élément de guidage de détachement (14), et dans lequel l'élément de guidage de poignée (13) et l'élément de guidage de détachement (14) fournissent un guidage pour le dispositif de détachement (4) par rapport à un mouvement du dispositif de détachement (4) le long de l'axe longitudinal (L).

10. Le dispositif de nettoyage (1) selon la revendication 9, dans lequel le dispositif de détachement (4), en particulier la tige (5) et/ou l'élément de montage (11), est en liaison avec le dispositif d'actionnement (10) par l'intermédiaire de l'élément de guidage de détachement (14), et dans lequel l'élément de guidage de détachement (14) correspond de préférence à un boulon, une goupille, une vis ou similaire qui s'étend du dispositif d'actionnement (10) à travers l'élément de guidage de poignée au moins partiellement dans le dispositif de détachement (4), en particulier la tige (5) et/ou l'élément de montage (11).

11. Le dispositif de nettoyage (1) selon l'une quelconque des revendications précédentes, comprenant en outre au moins un dispositif de verrouillage (15), dans lequel le dispositif de verrouillage (15) est configuré pour adapter au moins une position de verrouillage et une position de déverrouillage, le dispositif de verrouillage (15) dans la position de verrouillage étant configuré pour verrouiller le dispositif de détachement (4) dans la position de nettoyage et pour permettre un transfert du dispositif de détachement (4) de la position de nettoyage à la position de détachement dans la position de déverrouillage.

12. Le dispositif de nettoyage (1) selon la revendication 11, dans lequel au moins

i. le dispositif de verrouillage est configuré de telle sorte que le dispositif de verrouillage est transférable de sa

position de verrouillage à sa position de déverrouillage et/ou de sa position de déverrouillage à sa position de verrouillage lors d'une rotation du dispositif de verrouillage, de préférence via une rotation du dispositif d'actionnement (10), autour d'un axe de rotation (A) s'étendant parallèlement à l'axe longitudinal (L) ;

ii. le dispositif de verrouillage comprend un évidement et une saillie, et dans lequel la saillie est apte à être reçue dans l'évidement de manière à former une butée empêchant un mouvement du dispositif de détachement (4) le long de l'axe longitudinal (L) dans la position de verrouillage ;

iii. le dispositif de verrouillage comprend un filetage intérieur et un filetage extérieur correspondant, lesquels filetages sont configurés pour entrer dans une connexion fileté l'un avec l'autre, et dans lequel le dispositif de verrouillage est dans sa position de verrouillage lorsque les filetages sont dans la connexion fileté ;

iv. le dispositif de verrouillage (15) est configuré de telle sorte qu'il exerce une force de retenue sur le dispositif de détachement (4), de préférence sur la tige (5) et/ou l'élément éjecteur (6), en l'absence d'une force appliquée sur le dispositif de détachement (4) par un utilisateur et qui soit supérieure à la force de retenue ;

v. le dispositif de verrouillage (15) comprend un élément de retenue (16) de préférence précontraint agissant sur le dispositif de détachement (4), de préférence sur la tige (5) et/ou sur l'élément éjecteur (6), de manière à exercer une force de retenue sur le dispositif de détachement (4), de préférence sur la tige (5) et/ou sur l'élément éjecteur (6), l'élément de retenue (16) correspondant de préférence à une ou plusieurs saillies s'étendant dans un intérieur (17) de la poignée (2).

13. Le dispositif de nettoyage (1) selon l'une quelconque des revendications précédentes, dans lequel la tête de nettoyage (3) comprend au moins une ouverture traversante (18) s'étendant à travers la tête de nettoyage (3) le long de l'axe longitudinal (L), et dans lequel le dispositif de détachement (4), en particulier l'élément éjecteur (6), s'étend au moins partiellement à travers l'ouverture traversante (18) de la tête de nettoyage (3) lorsque le dispositif de détachement (4) est dans la position de détachement, et/ou dans lequel la tête de nettoyage (3) est montée sur la poignée (2) par l'intermédiaire d'une articulation (19), de préférence par l'intermédiaire d'une articulation biaxiale ou multiaxiale, l'articulation (19) comprenant de préférence au moins une ouverture traversante (20) s'étendant à travers l'articulation (19) le long de l'axe longitudinal (L).

14. Un procédé de fabrication d'un dispositif de nettoyage (1), de préférence d'un dispositif de nettoyage selon l'une quelconque des revendications précédentes, le procédé comprenant les étapes consistant à :

- fournir une poignée (2) s'étendant le long d'un axe longitudinal (L) ; et
- fournir une tête de nettoyage (3),

dans lequel la tête de nettoyage (3) est de préférence reliée de manière pivotante à la poignée (2), et dans lequel la tête de nettoyage (3) est configurée de telle sorte qu'un tampon de nettoyage peut être fixé de manière amovible à la tête de nettoyage (3), **caractérisé en ce que** le procédé comprend en outre l'étape consistant à :

- fournir un dispositif de détachement (4),

dans lequel le dispositif de détachement (4) est monté de manière déplaçable sur la poignée (2) et est configuré pour être déplacé le long de l'axe longitudinal (L) par rapport à la poignée (2) depuis une position de nettoyage, dans laquelle un tampon de nettoyage fixé à la tête de nettoyage (3) reste fixé à la tête de nettoyage (3), dans une position de détachement, dans laquelle un tampon de nettoyage fixé à la tête de nettoyage (3) est détaché de la tête de nettoyage (3),

dans lequel le dispositif de nettoyage (1) comprend en outre au moins un dispositif d'actionnement (10), le dispositif d'actionnement (10) étant relié de manière fonctionnelle au dispositif de détachement (4) et étant configuré pour transférer le dispositif de détachement (4) de la position de nettoyage à la position de détachement et/ou de la position de détachement à la position de nettoyage lors de l'actionnement, et **caractérisé en ce que** le dispositif de détachement (4) comprend en outre au moins un élément de montage (11), dans lequel l'élément de montage (11) est disposé dans la poignée (2) et est en liaison avec le dispositif d'actionnement (10).

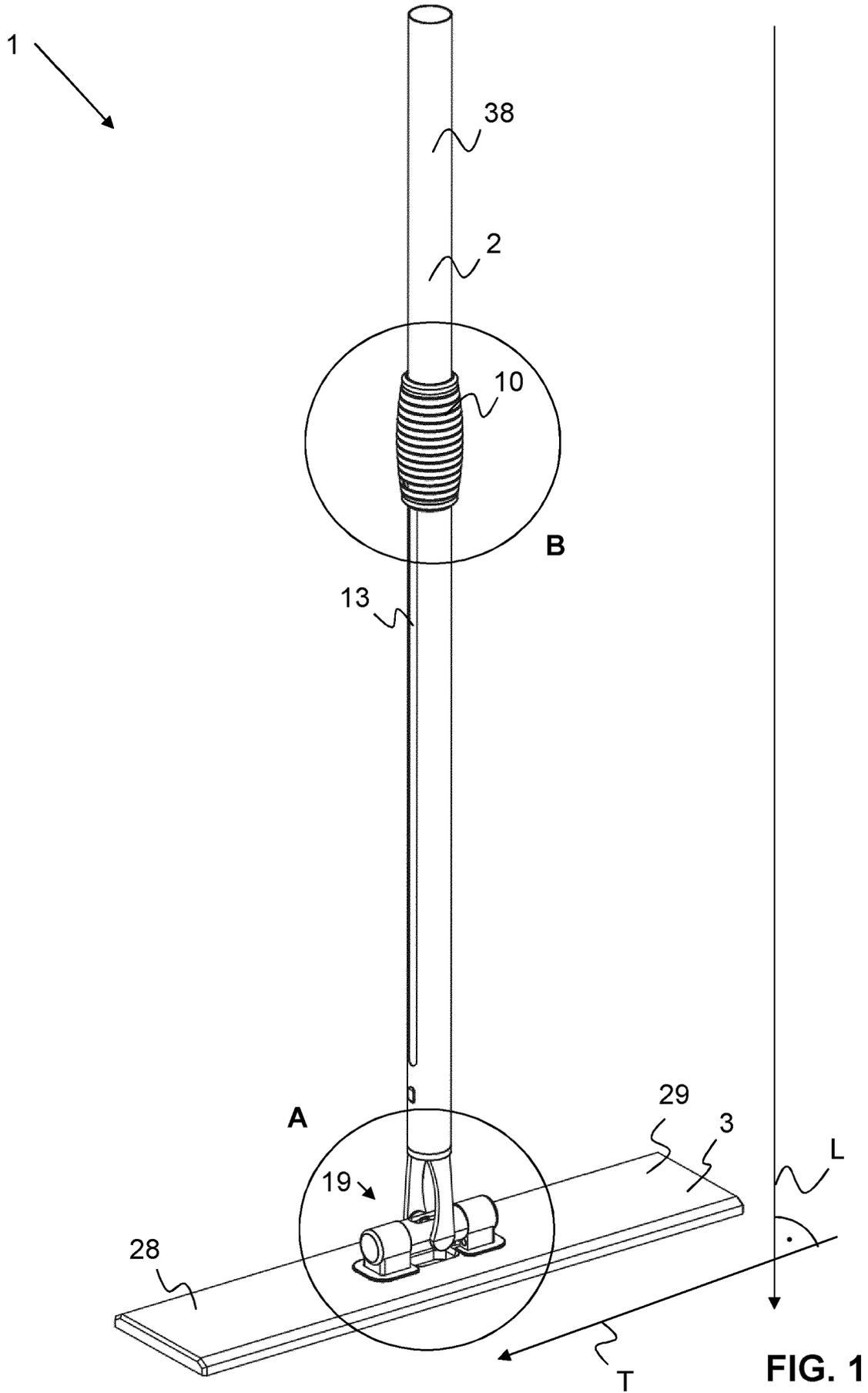


FIG. 1

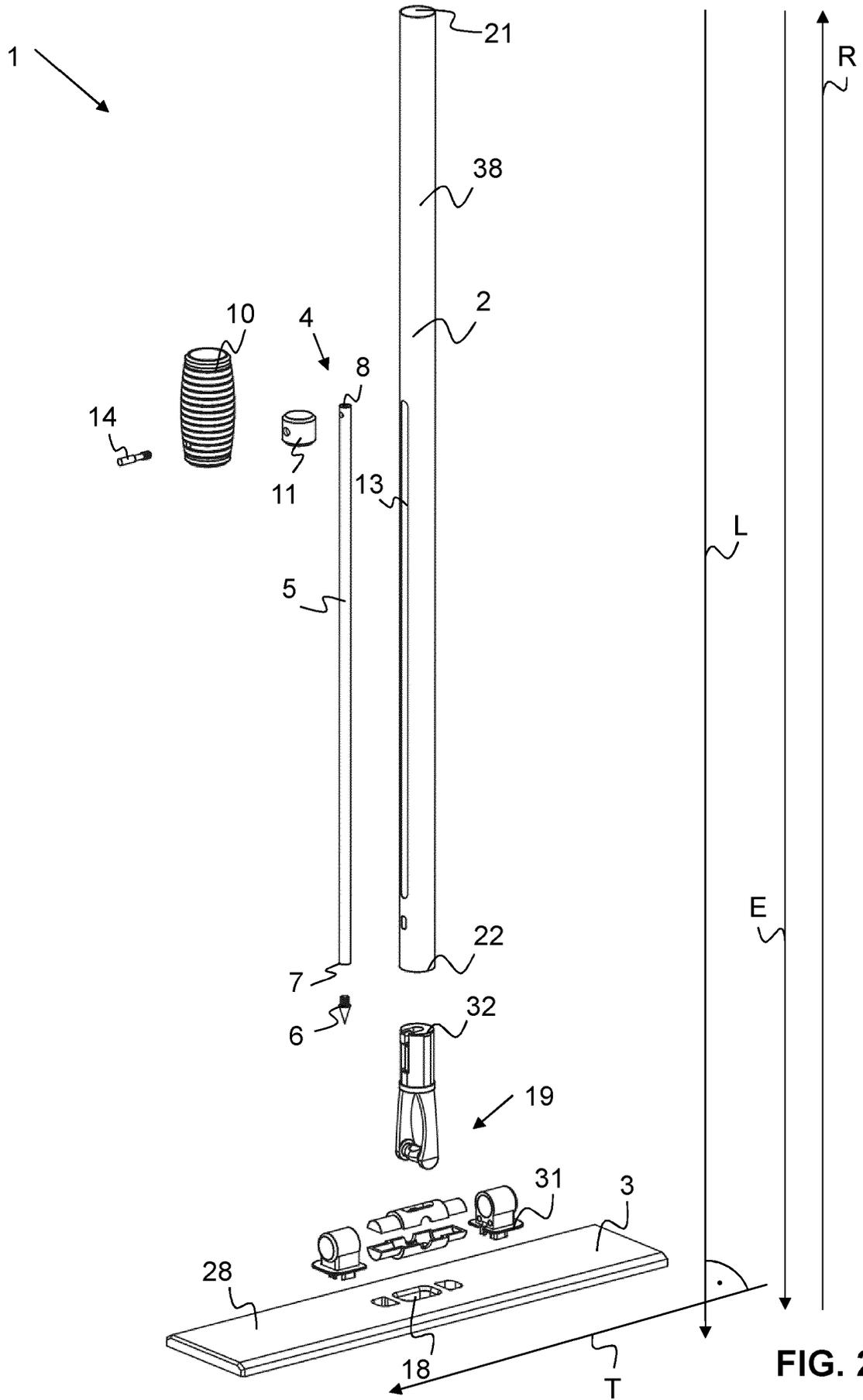


FIG. 2

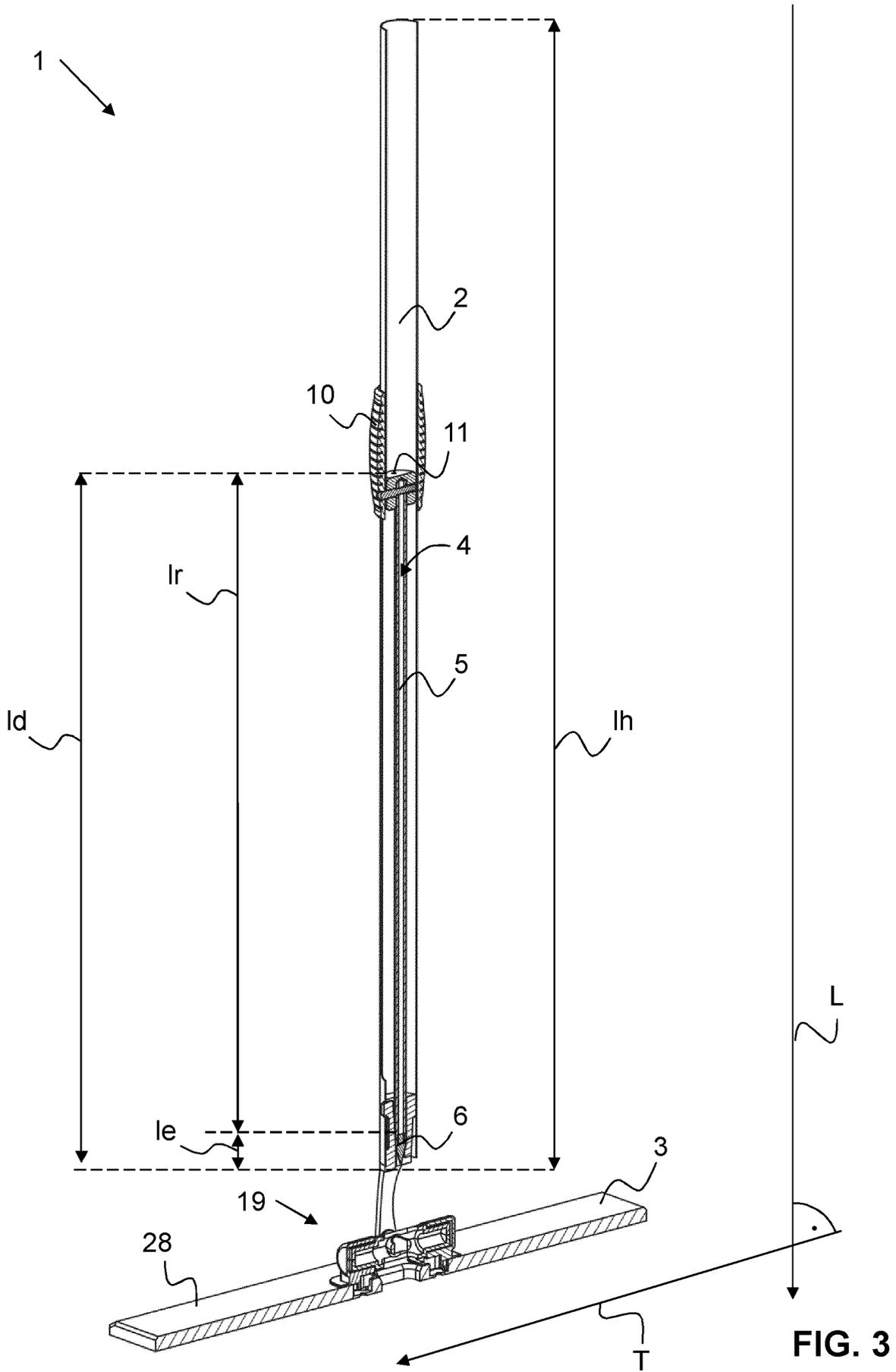


FIG. 3

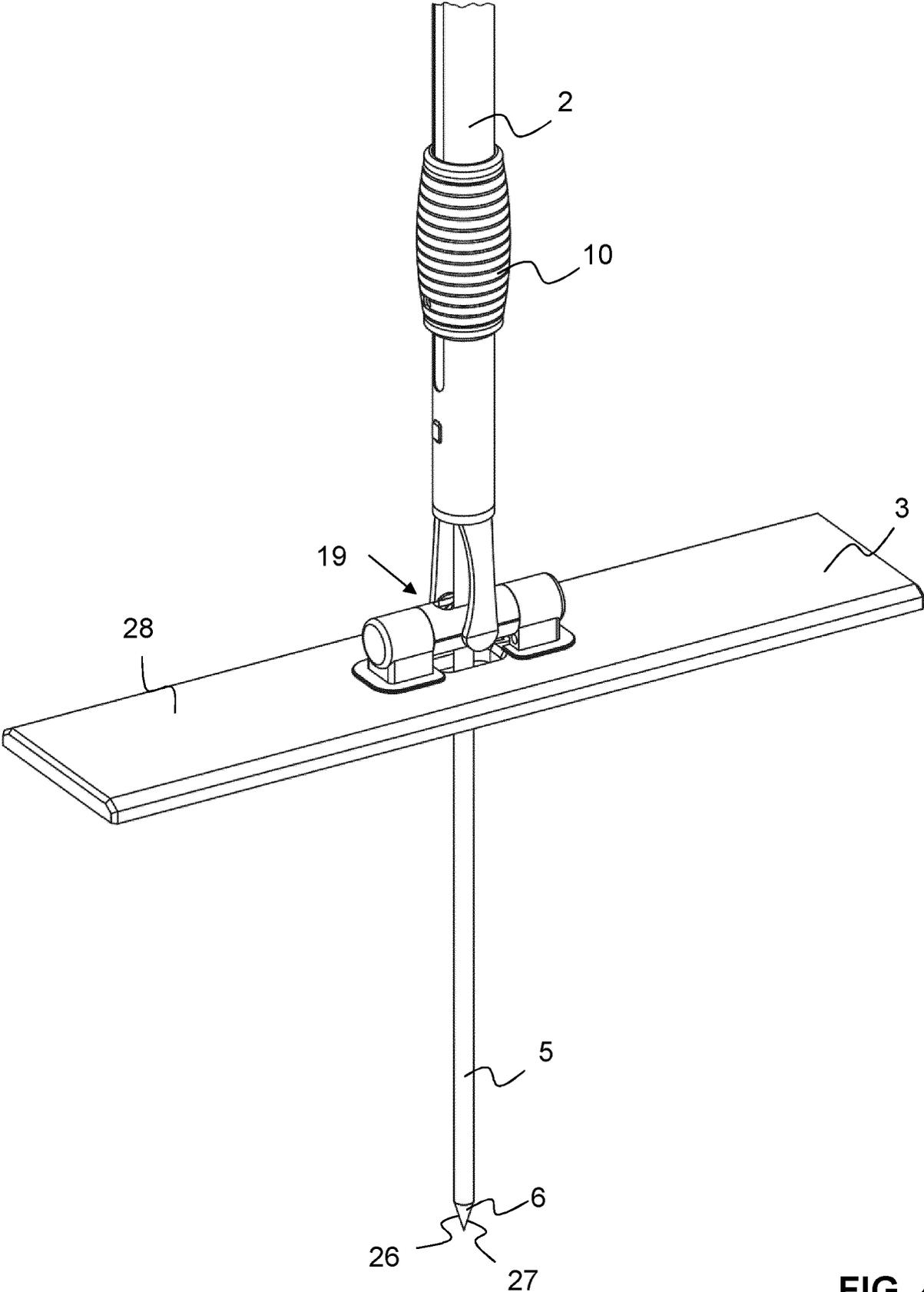


FIG. 4

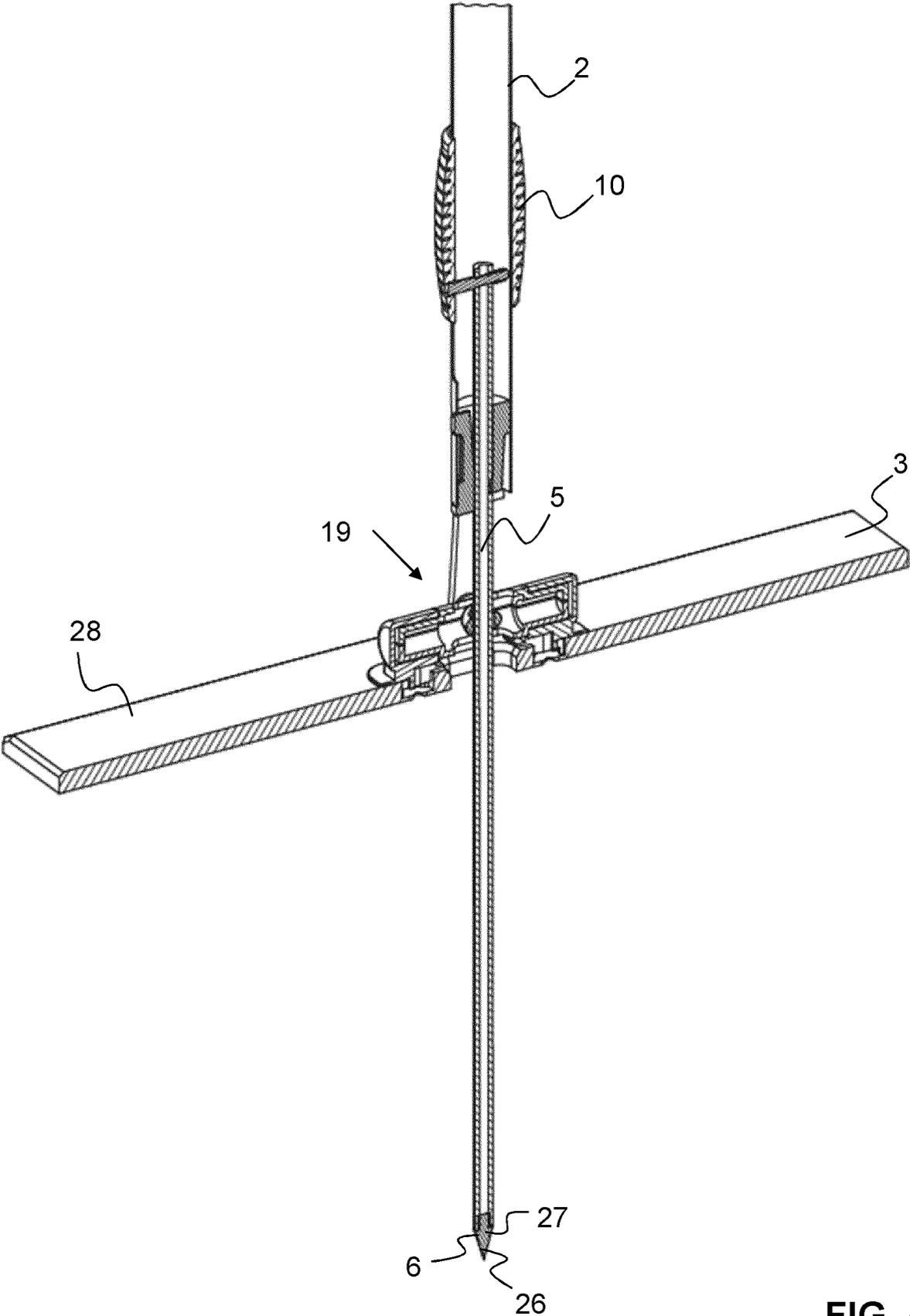


FIG. 5

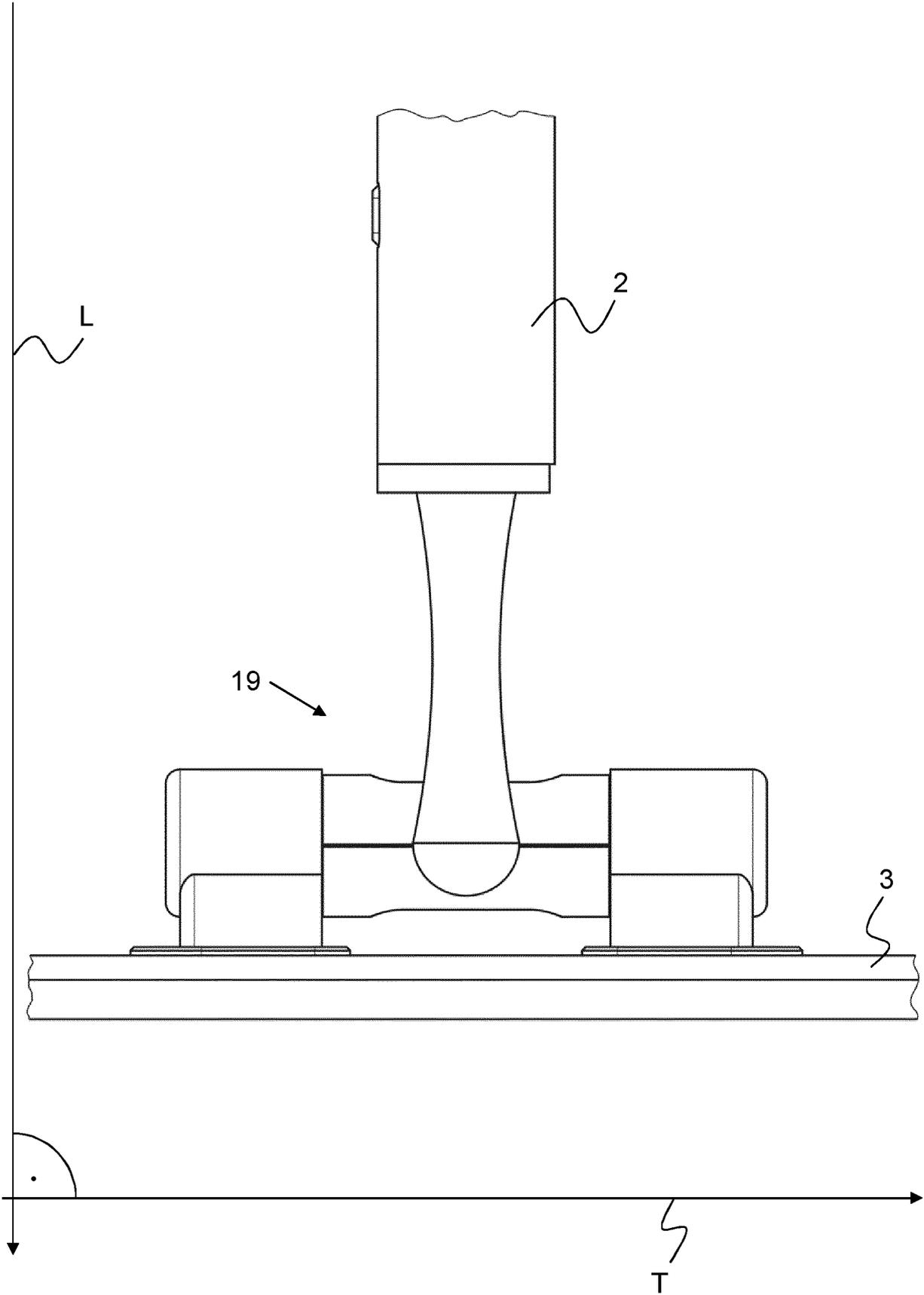


FIG. 6

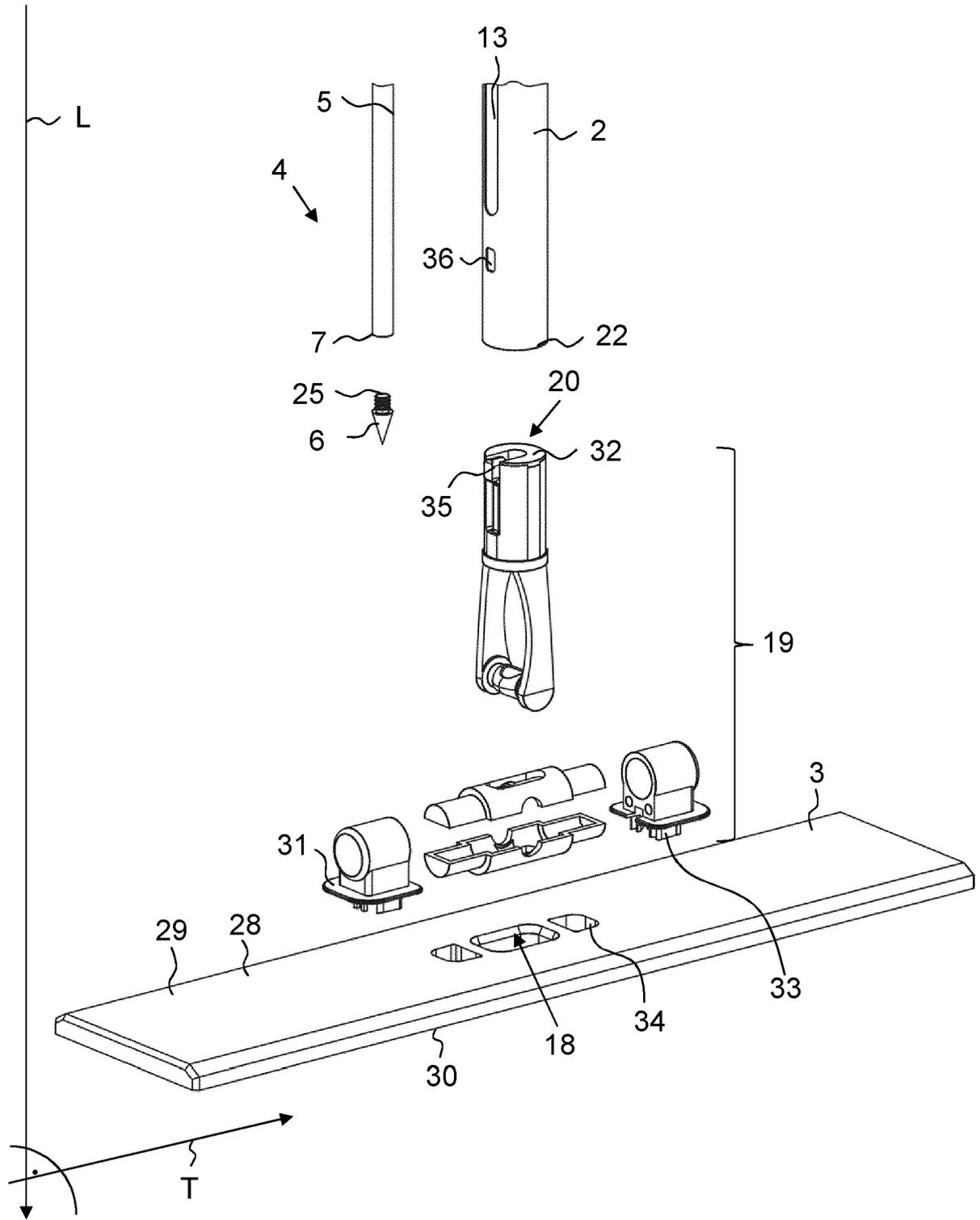


FIG. 7

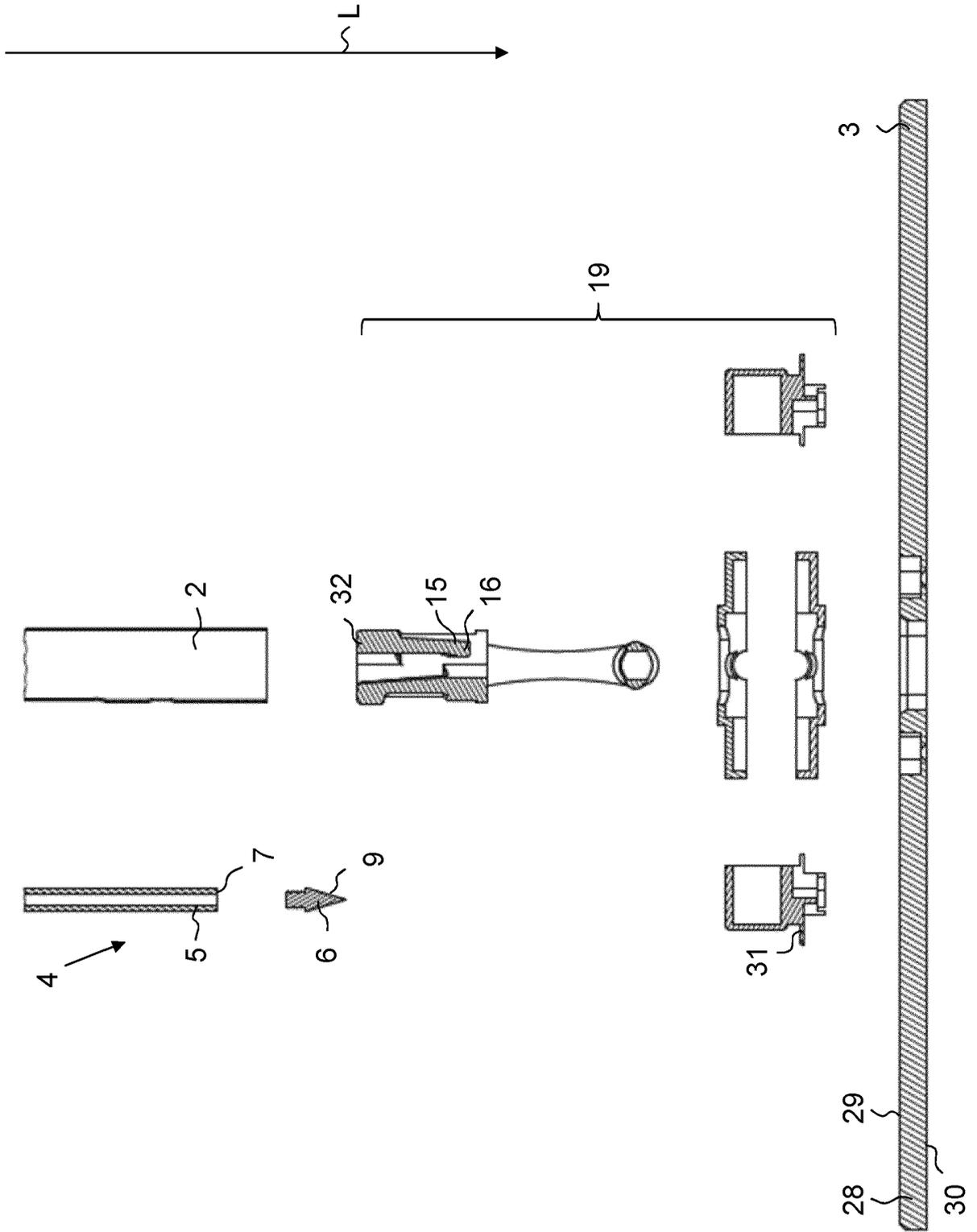


FIG. 8

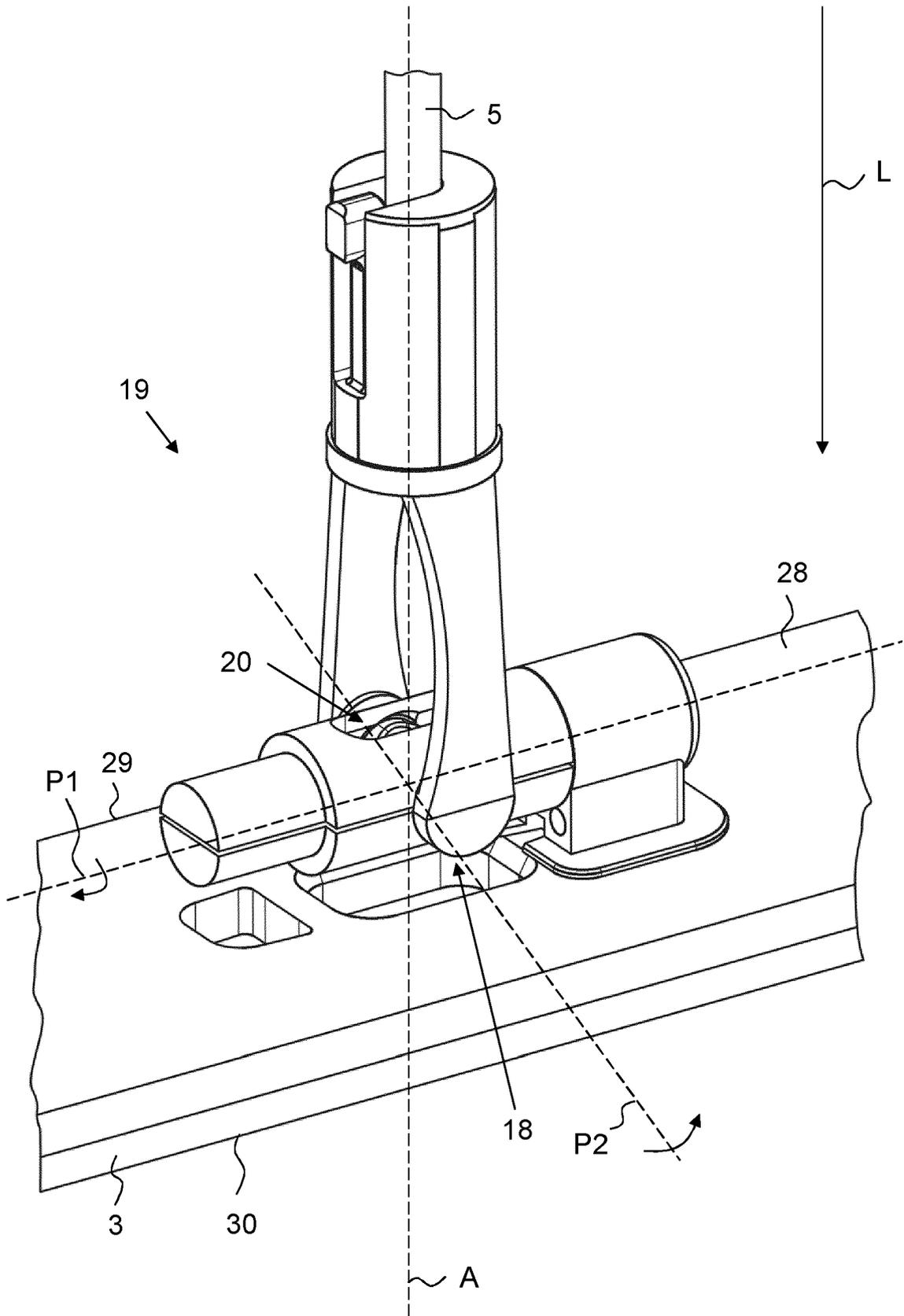


FIG. 9

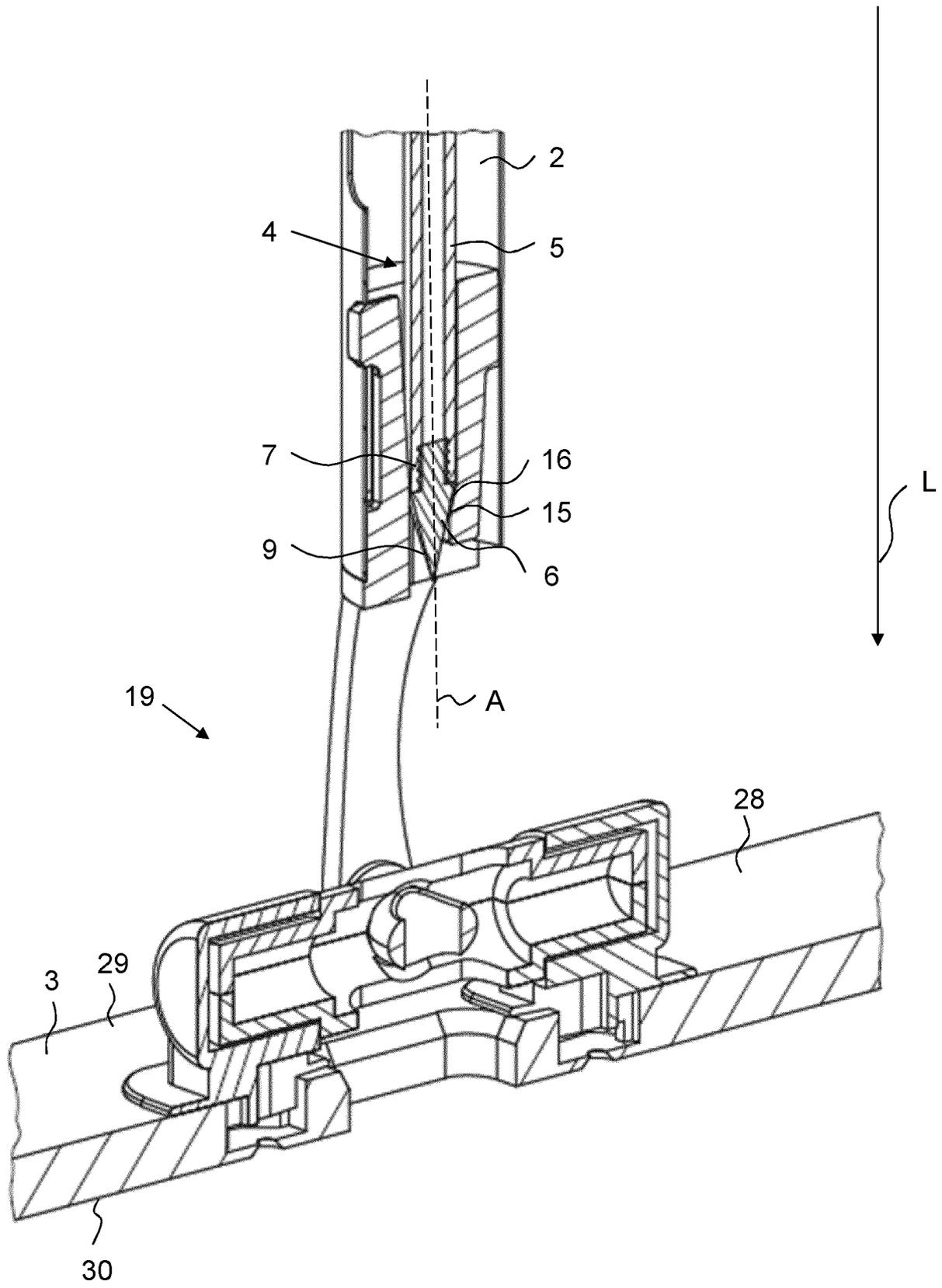


FIG. 10



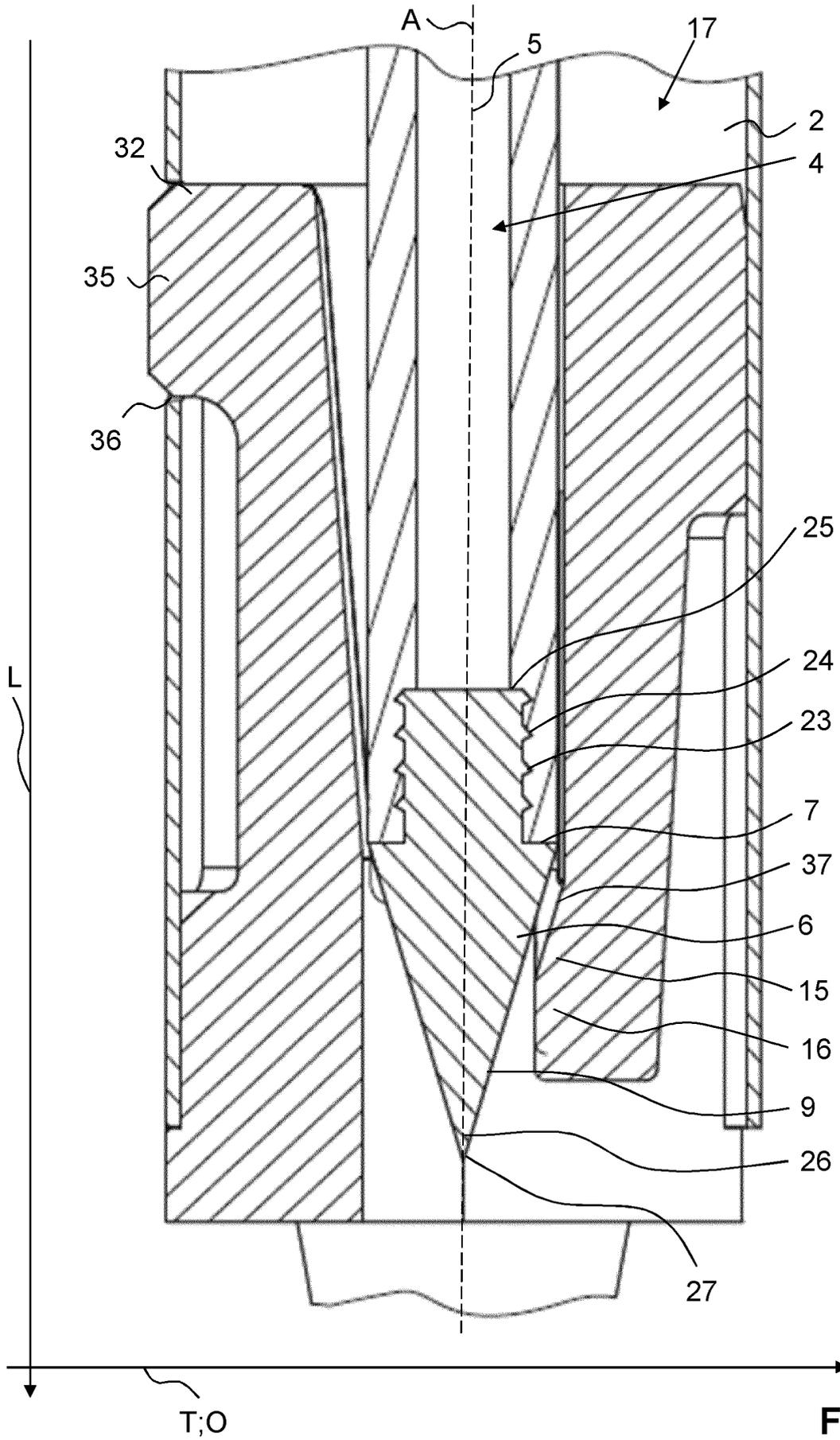


FIG. 12

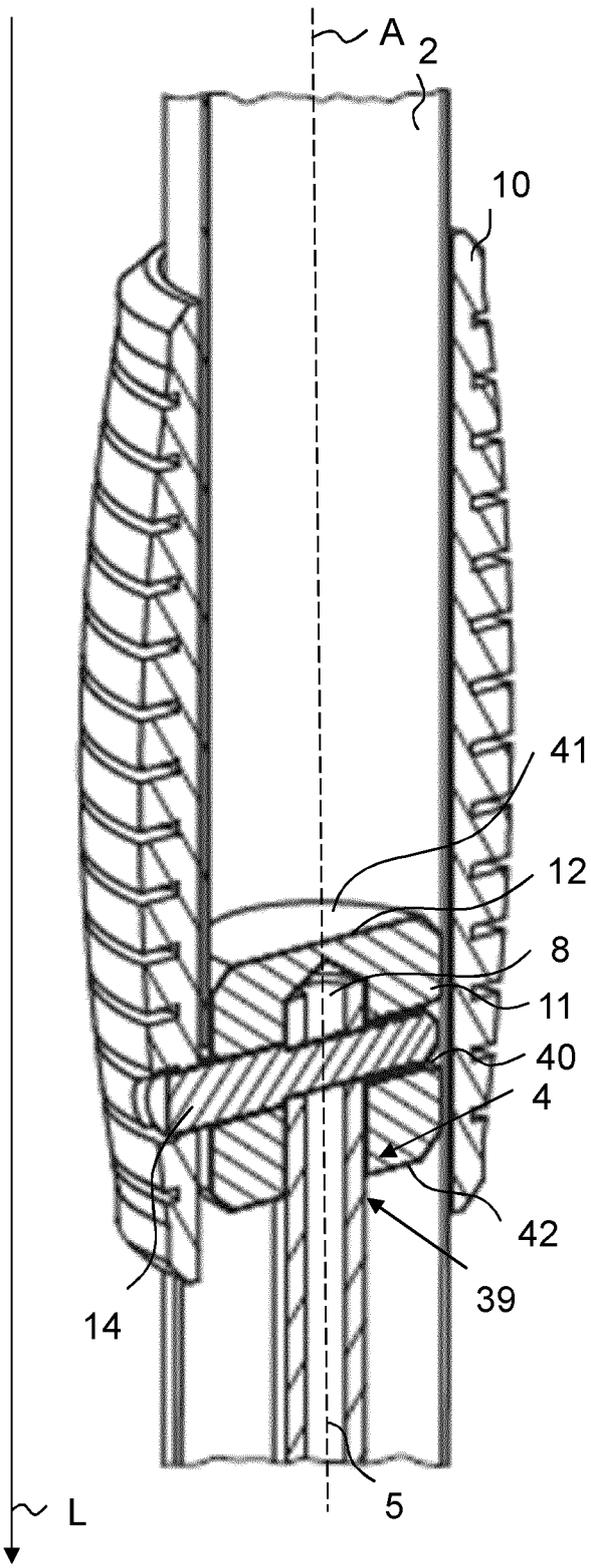


FIG. 13a

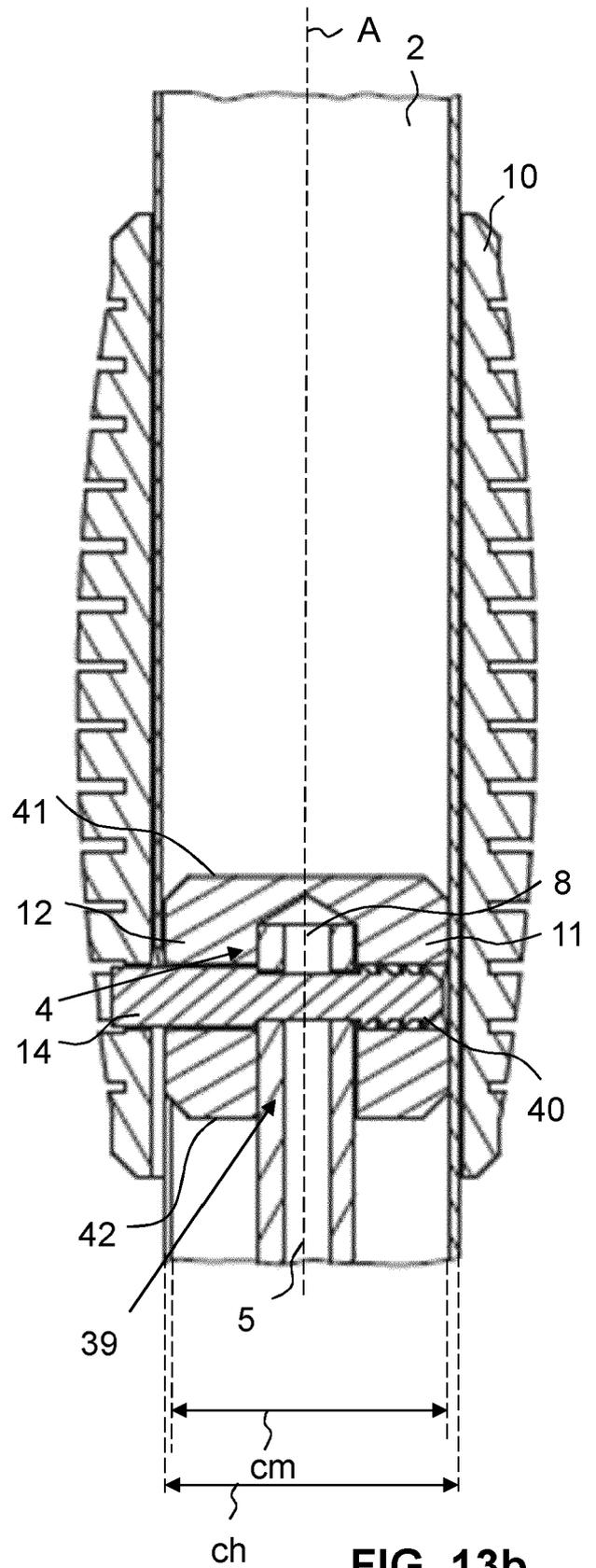


FIG. 13b

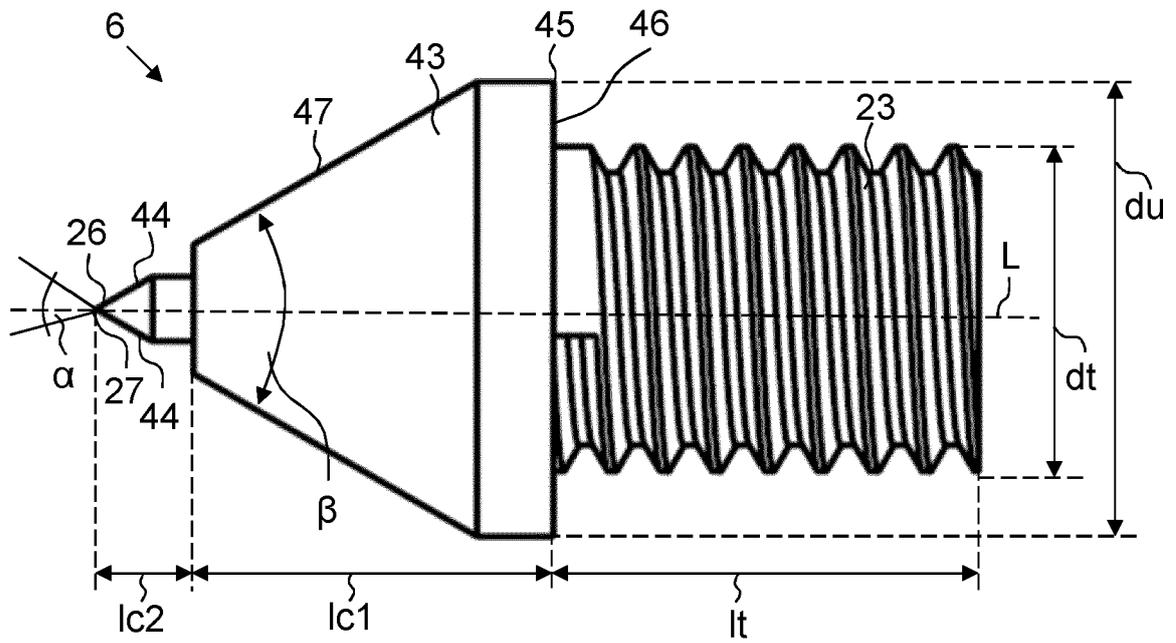


FIG. 14a

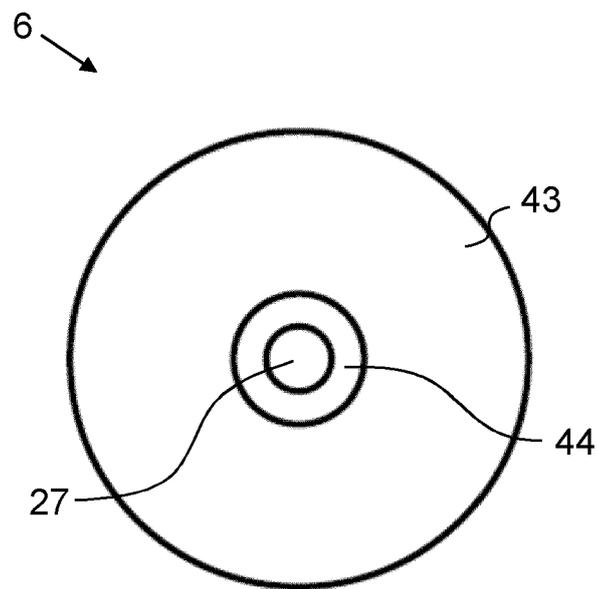


FIG. 14b

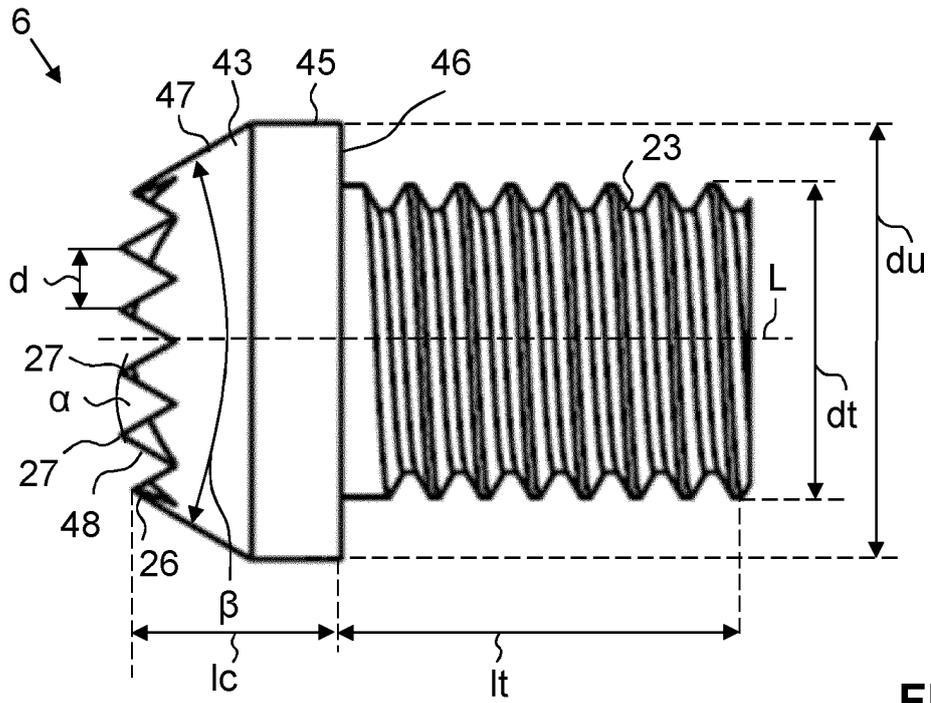


FIG. 15a

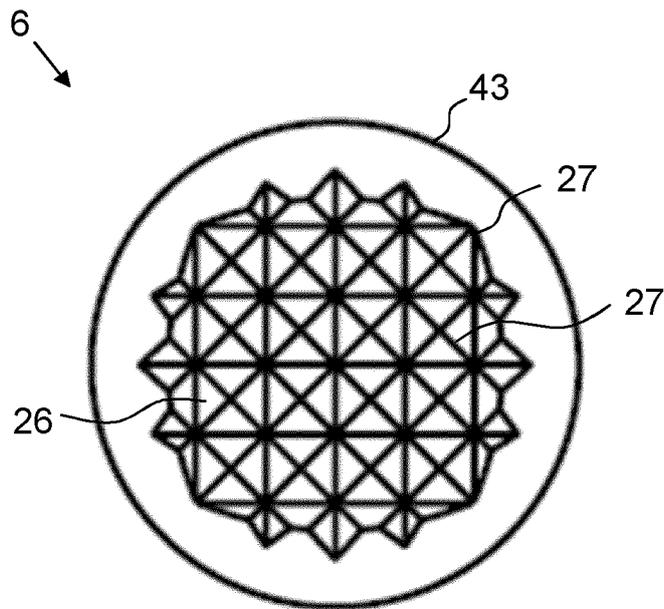


FIG. 15b

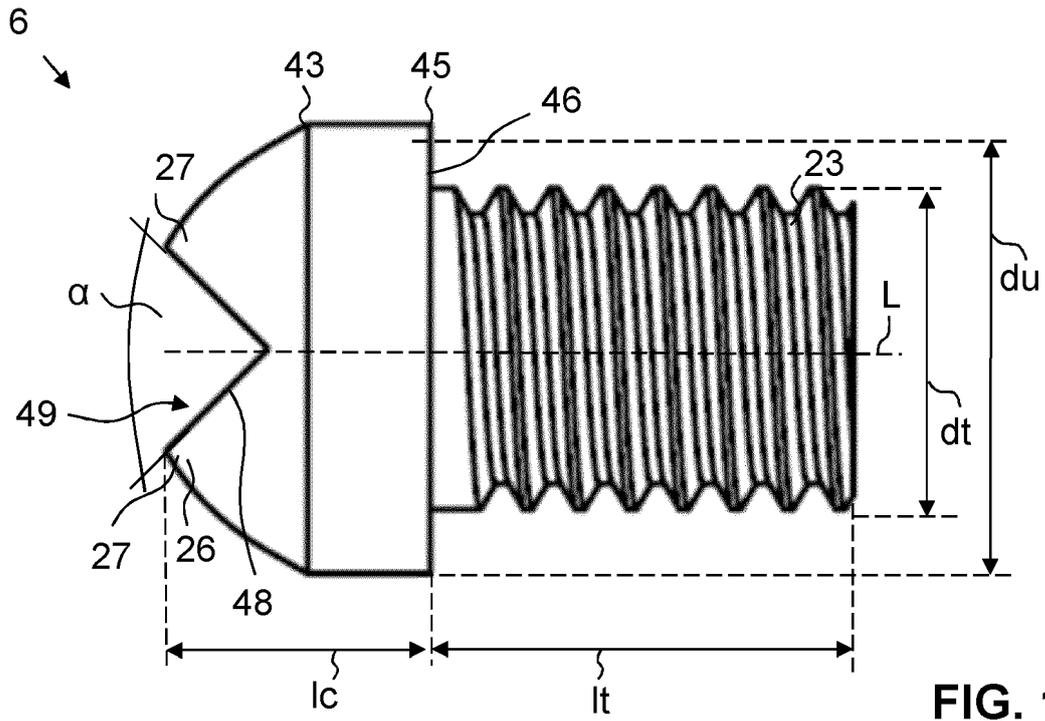


FIG. 16a

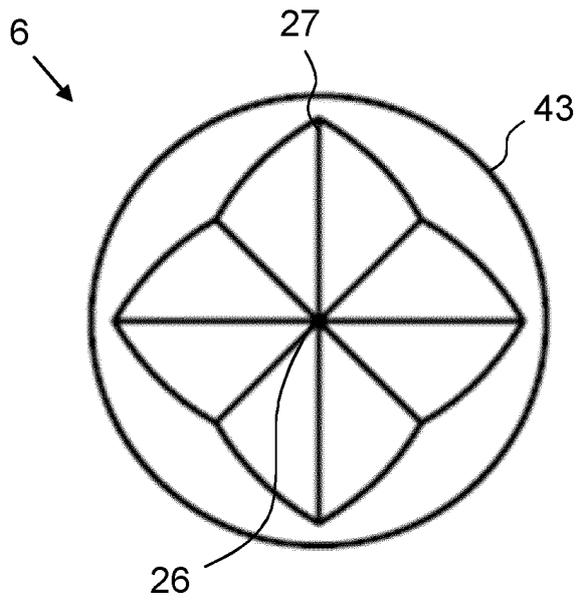


FIG. 16b

**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- US 20190387948 A1 [0003]
- US 2019387948 A1 [0004]
- EP 0568150 A1 [0005]
- EP 3251575 A1 [0006]