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DescriptionField of the invention

5 The invention relates to a telescopic handle for cleaning devices comprising an outer tube, a central tube and an inner tube, wherein the outer tube is guided to slide around the central tube, and the inner tube is guided to slide in the central tube.

Prior art

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Handles which can be extended telescopically for various devices are known from the prior art. Thus, for example, pulling out in one direction, wherein one part is respectively brought into motion and another follows by entrainment, is already known. Examples are known from US5881601A and WO96/24000.

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The push-in rod for a hand tool known from DE 20 2014 103 225 U1 has an inner tube and an outer tube which can be displaced with respect to one another in the axial direction. Displacement is only possible if a locking mechanism is released. With the aid of a knob which is connected to a part of the locking mechanism which can be displaced in the axial direction by means of a steel wire, the locking mechanism is released so that the inner tube can be pushed or pulled relative to the outer tube in order to set the telescopic rod to the desired length.

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US 7,096,530 B2 discloses a paint roller with an extendable handle which has three tubes arranged one inside the other such that they can be displaced with respect to one another. A second tube is arranged displaceably within a first tube here, and a third tube is arranged displaceably within the second tube. Actuation of the telescopic handle takes place by moving the second tube relative to the first tube. However, the third tube disposed within the second tube automatically follows the movement between the first and the second tube. This is brought about by a steel strip which is able to transmit both tensile and compressive forces. If the telescopic handle is extended, the steel strip acts as a pushing element, whereas when the telescopic handle is shortened, the steel strip is used as a pulling element. The steel strip according to US 7,096,530 B2 must therefore absorb both tensile and compressive loads and is deflected by built-in rollers. However, due to the deflection there is the risk that the steel strip will be damaged and be torn at the edge. This may shorten the life span of the mechanism, in particular if the length of the handle is adjusted frequently.

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Description of the invention

The object underlying the invention is to propose a telescopic handle which can be extended in three parts and the mechanism of which has an increased life span. This object is achieved with the aid of a telescopic handle that has the features of Claim 1. Preferred embodiments emerge from the other claims.

A telescopic handle according to the invention for cleaning devices comprises an outer tube, a central tube and an inner tube, wherein the outer tube is guided to slide around the central tube, and the inner tube is guided to slide in the central tube, wherein the central tube has a first tube end in the outer tube and a second tube end. A first deflecting roller and an elongated attachment element are attached to the first tube end, wherein the elongated attachment element extends in the direction of the second tube end and a second deflecting roller is attached to the side of the attachment element facing away from the first tube end. The telescopic handle according to the invention further comprises a first traction rope which is guided over the first deflecting roller so that it changes the direction by about 180° and the first traction rope end thereof is attached to the inner tube and the second traction rope end thereof is attached to the outer tube. Furthermore, the telescopic handle according to the invention comprises a second traction rope which is guided over the second deflecting roller so that it changes the direction by about 180° and the first rope end thereof is attached to the inner tube and the second rope end thereof is attached to the outer tube, wherein the first traction rope and the second traction rope are arranged so that a displacement movement between outer tube and central tube and a displacement movement in the same direction between central tube and inner tube are coupled to one another. A manual displacement movement between outer tube and central tube brings about an automatic displacement movement in the same direction between central tube and inner tube.

Alternatively, the displacement movement of the telescope rod can also be triggered by moving the inner and the central tube.

The three-part telescopic handle according to the invention can be extended while coupled, but only uses traction ropes which can be in the form of pull cords or elastic steel ropes. Since the tensile loading of traction ropes is more suitable for the materials than combined tensile and compressive loading, a long life span of the extending mechanism of the telescopic handle is achieved. In order to be able to work only with traction ropes, the deflecting rollers and attachment points of the traction ropes must be arranged as claimed. In this way the telescopic elements are extended and pushed together by tensile force. The use of pulling elements is in particular also made possible by the deflecting roller required to extend the telescopic handle being attached to an elongated attachment element, the elongated attachment element being attached to the central tube and running within the inner tube. The

elongated attachment element may be a thin rod here which has dimensions such that it is only bent negligibly when subjected to the maximum compressive forces that occur.

5 The precise attachment points of the traction rope ends of the first traction rope and of the rope ends of the second traction rope may be chosen suitably, deflection on the first deflecting roller and the second deflecting roller about 180° being required in each case, however, in order to generate the correct, desired relative movement between the inner tube and the central tube.

10 An automatic displacement movement in the same direction between central tube and inner tube is understood here to mean that an extending movement between the outer tube and the central tube also brings about an automatic extending movement between central tube and inner tube, whereas moving the outer tube and central tube together also causes the inner tube to slide into the central tube.

15 According to one preferred embodiment of the invention the outer tube, central tube and inner tube are profiled in each case so that a relative twisting movement between the tube pairs arranged one in another is not possible or only within conventional tolerances. In other words, the outer tube is designed to be torsionally stiff relative to the central tube, and also the central tube is designed to be torsionally stiff relative to the inner tube. This may take place with any tube profiling, provided this profiling does not have a circular cross section.

20 Preferably, the telescopic handle further comprises a locking device which is attached to the central tube to be fixed, wherein the locking device comprises a hand-actuable locking element. The telescopic handle according to the invention is actuated by manually moving the central tube relative to the outer tube, i.e. by being pulled out of or by being pushed into the latter. Therefore, a user must on the one 25 hand grasp the outer tube, and on the other hand grasp the central tube. For this purpose, an appropriate and ergonomically shaped grasping region must be provided which, in the case of the central tube, can include the locking device. Since after setting the desired length of the telescopic handle the latter should only be held on the outer tube, the position of the central tube relative to the outer tube should be able to be locked.

30 Preferably, the hand-actuable locking element is a spring-loaded interlocking element which can be engaged positively in the inner tube and can be pushed out of the inner tube by hand actuation. Since according to the invention a displacement movement between outer tube and central tube brings about an automatic displacement movement in the same direction between central tube and inner tube, by 35 fixing between central tube and inner tube in the same way, the position of central tube in relation to outer tube is also fixed since the outer tube is also held in the initial position by the traction ropes.

According to one preferred embodiment the interlocking element is a bolt which can be engaged positively in the openings in the inner tube. This constitutes a very simple solution and also makes it possible to define defined engagement positions for the interlocking element by a bolt engaging positively in openings in the inner tube. The provision of defined engagement positions makes it possible for certain activities to once again establish extended positions of the telescopic handle recognised as appropriate easily and reproducibly.

Brief description of the figures

In the following the invention is described, purely by way of example, with reference to the attached figures in which

Fig. 1 shows a schematic view of the three-part telescopic handle according to the invention;

Fig. 2 schematically illustrates the extending mechanism in the three-part telescopic handle; and

Fig. 3 illustrates the locking mechanism of the telescopic handle according to the invention.

Ways of implementing the invention.

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In the following the invention is described, purely by way of example, with reference to the figures which illustrate one possible embodiment of the invention, the geometry of the telescopic handle, which is very elongated depending on the application, being illustrated with respectively relatively short individual elements however so as to better illustrate the components.

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The telescopic handle illustrated in Fig. 1 is generally identified by reference number 10. It consists of three tube elements, an outer tube 13 which, as shown in the example of Fig. 1, can be surrounded by an appropriate grip element 11, for example an elastic Teflon sleeve arranged over the outer tube.

Alternatively, the outer tube 13 may also be provided with an appropriate coating. The central tube 14 is guided to slide in the outer tube 13. An inner tube 15 is arranged within the central tube 14. As can be seen from the schematic illustration in Fig. 1, both the central tube 14 and the inner tube 15 are non-circular, but are provided with groove-shaped seams 17a, 17b which serve to establish a torsionally stiff connection. In order to ensure the torsionally stiff connection between the outer tube and the central tube as well as between the central tube and the inner tube, positive fit elements 17a and 17b, such as flattenings or grooves, are respectively provided on the outside of the central tube 14 as well as on the inner tube 15, which positive fit elements interact positively with counter-elements that are not illustrated in the figures.

As illustrated in Fig. 1, a hand grip 16 is provided on the central tube. Therefore, a user holds the telescopic handle with both hands, one hand being placed around the grip element 11 in the outer tube 13 and the other hand being placed around the hand grip 16. When the telescopic handle is actuated, the locking knob 12 is moreover actuated, with the aid of which locking between the central tube 14 and the inner tube 15 is released, whereupon the telescopic handle can be extended or be pushed back in again after use.

The locking mechanism with the locking knob 12 is schematically illustrated in Fig. 3 and may have a tilting element 18 which can be moved rotationally around an axis 20 and is pre-loaded into a locking position, e.g. with the aid of a spring 19. If pressure is now applied to the locking head 12, the tilting element 18 and the axis 20 are pivoted against the force of the spring 19. There are many known alternatives in the prior art for locking together two tubes that can be connected rotatably to one another and be inserted into one another. The simplest possibility consists of providing openings 21 spaced apart from one another by graduated intervals in the inner tube 15, in which openings a pin-shaped locking element 23 which is provided on the tilting element 18 engages. When pressure is applied to the locking knob 12 the locking pin 23 is therefore moved out of one of the locking openings 21, whereupon a relative movement between the individual tubes is possible. Audible engagement of the pin-shaped locking element in an opening signals to the user that the telescopic handle is securely locked.

The telescopic handle is actuated by a user increasing or reducing the distance between the grip element 11 on the outer tube 13 and the hand grip 16. At the same time, with the relative movement between the outer tube 13 and the central tube 14 which is thus brought about, the corresponding relative movement between the central tube 14 and the inner tube 15 also takes place, as will be explained below with reference to the schematic Figure 2. Fig. 2 shows schematically, and in a greatly shortened view, the outer tube 13, the central tube 14 and the inner tube 15 in a sectional illustration. As illustrated in Fig. 2, a first deflecting roller 22 is attached such as to move rotationally to the proximal tube end of the central tube 14. A rod 24 is also attached to the proximal end of the central tube by means of an appropriate attachment element 26, which rod is arranged such that it extends into the inner cavity of the inner tube 15. The distal end of the rod 24 holds a second deflecting roller 28 such as to move rotationally.

A first traction rope 30 is guided over the first deflecting roller 22. The traction rope 30 may be a non-extendable synthetic rope, but also an elastic wire element or a metal rope plaited from individual strands. A first end of the first traction rope 30 is attached here to the proximal end of the inner tube 15,

while a second end 34 of the first traction rope is attached to the distal end of the outer tube 13. The attachment of the traction ropes to the tube ends may take place here in any way.

5 Furthermore, a second traction rope 36 is provided which is guided over the second deflecting roller 29 and is deflected by the second deflecting roller 28 by substantially 180°. The second traction rope 36 has a first rope end 38 which is attached to the proximal end of the inner tube 15. Since, as stated above, the rod 24 has dimensions such that it extends into the inner cavity of the inner tube 15, and the distal end of the rod 24 supports the second deflecting roller 28, this means that the second traction rope, starting with the first rope end, initially extends into the inner tube 15 and in the distal direction so
10 as to then be guided over the second deflecting roller 28 and to be deflected by the latter. The second rope end 28 of the second traction rope 36 is fixed appropriately to the outer tube 13.

The synchronous movement of the tubes which are respectively guided to slide into one another is controlled by the traction ropes 30 and 36. By means of the described positioning of the deflecting
15 rollers and traction ropes, the telescopic elements can respectively be extended and pushed together by tensile force. This is possible because the second deflecting roller 28 required for the extension is disposed on the rod 24 which is attached to the central tube 14 but runs within the inner tube 15.

If a relative movement between the outer tube 13 and the central tube 14 is implemented manually, this
20 relative movement is transferred in the same way to a relative movement between the central tube 14 and the inner tube 15. If, for example, the inner tube 14 is pushed together in the direction of the outer tube 13, the first deflecting roller 22, the second end of which is connected securely to the outer tube 13, is pushed further into the outer tube 13 and also pulls the proximal end of the inner tube in the proximal direction, and so into the central tube 14. If, however, the central tube 14 is pulled out of the outer tube
25 13 in the distal direction, the second deflecting roller 28 is also moved in the distal direction and, since the second rope end of the second traction rope 36 placed over the second deflecting roller 13 is connected securely to the outer tube 13, also pulls the inner tube 15 outwards in the distal direction by means of its first rope end 38.

30 The advantage of the telescopic handle according to the invention is that only traction ropes are used, as a result of which a clearly longer life span of the entire mechanism can be achieved because the tensile loading of traction ropes is more suitable for the materials.

Patentkrav

1. Teleskopskift til rengøringsindretninger omfattende et ydre rør (13), et midterrør (14) og et indre rør (15), hvor det ydre rør (13) er glidbevægeligt omkring midterrøret (14), og det indre rør (15) er glidbevægeligt i midterrøret (14); hvor midterrøret (14) har en første rørende i det ydre rør (13) og en anden rørende omkring det indre rør (15); en første afbøjningsrulle (22) og et langstrakt fastgørelseselement (24) er fastgjort til den første rørende, hvor det langstrakte fastgørelseselement (24) strækker sig i retningen af den anden rørende og en anden afbøjningsrulle (28) er fastgjort til siden af det langstrakte fastgørelseselement (24) vendende væk fra den første rørende; et første træktov (30), hvilket er ført over den første afbøjningsrulle (22), således at den ændrer retningen med omkring 180° og den første træktovsende (32) deraf er fastgjort til det indre rør (15), og den anden træktovsende (34) deraf er fastgjort til det ydre rør (13); og et andet træktov (36), hvilket er ført over den anden afbøjningsrulle (28), således at den ændrer retningen med omkring 180° og den første tovende (38) deraf er fastgjort til det indre rør (15) og den anden tovende (40) deraf er fastgjort til det ydre rør (13), hvor det første træktov (30) og det andet træktov (36) er anbragt således, at en forskydningsbevægelse mellem ydre rør (13) og midterrør (14) og en forskydningsbevægelse i den samme retning mellem midterrør (14) og indre rør (15) er koblet til hinanden.

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2. Teleskopskift ifølge krav 1, **kendetegnet ved, at** det ydre rør (13), midterrøret (14) og det indre rør (15) er profileret i hvert tilfælde således, at en relativ snoningsbevægelse mellem rørparrene (13, 14; 14, 15) anbragt en i den anden ikke er muligt eller kun inden for normale tolerancer.

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3. Teleskopskift ifølge krav 1 eller krav 2, yderligere omfattende en låseindretning (12, 18, 20), der er fastgjort til midterrøret (14), der skal fastgøres, hvor låseindretningen omfatter et håndaktuerbart låseelement (12).

5 **4.** Teleskopskift ifølge krav 3, **kendetegnet ved, at** låseelementet (12, 18) er et fjederspændt indgrebselement, der kan indgribes formlåsende i det indre rør (15) og kan blive skubbet ud af det indre rør (15) ved håndkraft.

5. Teleskopskift ifølge krav 4, **kendetegnet ved, at** indgrebselementet er en
10 bolt, der kan indgribes formlåsende i åbningerne i det indre rør (15).

