

Telescopic prop for the construction industry

The invention relates to a telescopic prop for the construction industry, comprising an outer tube and an inner tube axially displaceably arranged therein, said inner tube being secured against removal from the outer tube by means of a removal preventing device, wherein the removal preventing device has a stop element which is arranged on the outer tube and with which at least one stop means arranged on the inner tube can be brought in contact.

Telescopic props of this type are used in the construction sector for a plurality of supporting tasks and are e.g. used as ceiling supports or set-up supports for supporting concrete formwork.

GB 755 831 A discloses a telescopic prop for the construction industry, in which the stop element is formed by a tapered edge section of the end of the outer tube facing towards the telescopic end of the telescopic prop. The outer tube of the telescopic prop according to EP 1 273 740 B1 also has a stop element formed by a cross-sectional area having such a tapering. EP 0 625 622 A1 shows a telescopic prop, in which the stop element is formed by a wall section of a tube piece welded onto one end of the outer tube and having a smaller inner diameter than the outer tube.

The production of telescopic props of this type is complex in terms of manufacturing technology and for this reason expensive.

It is the object of the invention to improve a telescopic prop of the above-mentioned type with simple constructive measures in such a manner that its manufacture is facilitated and the manufacturing costs are reduced.

Advantages of the invention

This object is achieved in accordance with the invention by a telescopic prop comprising the features stated in claim 1.

In accordance with the invention, the stop element of the inventive telescopic prop is provided in the region of one end of the outer pipe, wherein the stop element covers at least part of the free cross-sectional surface of the outer tube. The expression "covering the cross-sectional surface" in the present application also includes at least partial projection of the stop element into the inside cross-section of the outer tube. The advantage associated with the invention basically consists in that the stop element can be arranged on the outer tube in a simple manner and no complex changes to the inner cross-section of the outer tube or welding of separate tube pieces are necessary in this connection. In dependence on the selected type of mounting, one can realize a robust pull-out limit of the inner tube, which is highly resistant to axial forces. In accordance with the invention, the stop element is advantageously mounted to the outer tube without separate connecting means and in the simplest case merely arranged with press fit on or in the outer tube. The stop element can also be arranged like a retaining ring in a groove arranged on the outer tube or may be arranged via a locking connection or bayonet joint-like mounting on the outer tube. The stop element is connected to the outer tube in the region of the free end of the outer tube.

In accordance with a preferred further development of the invention, the stop element engages with an internal and/or external thread of the outer tube arranged on a circumferential surface of the outer tube, wherein the stop element is arranged to have a high load-bearing capacity in that an external and/or internal thread of the stop element engage(s) with the corresponding thread(s) of the outer tube.

In practice, it has proven to be advantageous to associate the stop element with a removal protection device in order to secure the stop element from unintentional release from its mounting position. The removal protection device can, in particular, have a securing shackle that is arranged on the stop element and can be driven into the thread of the outer tube. The stop element, in the present case a bendable shackle, engages in an opening of the outer tube.

The loading capacity of the stop element with respect to axial loads that can occur, in particular, when a soiled inner tube is inserted into the outer tube, is further improved in that the stop element at least partially covers a front face, i.e. a front face wall section of one end of the outer tube.

In accordance with one embodiment of the invention, the stop element is advantageously designed as a cap or as a sleeve. This counteracts entry of soiling, e.g. fresh concrete, into the inside of the outer tube, which is advantageous for low-maintenance and reliable function. On the other hand, the stop element can thus be used as a (sliding) bearing and at the same time as a wiper element for a soiled inner tube. When the stop element is designed as a cap or a sleeve, no additional processing is required for providing a stop element on the outer tube.

The stop means of the inner tube is advantageously designed as a widened, e.g. beaded end of the inner tube so that the function of the removal protection device does not depend on the orientation of the inner tube in the outer tube. For this reason, the inner tube cannot be removed from the outer tube even when very large forces act, which could occur in practice.

In order to ensure that the stop element cannot be removed from its mounted position even under the action of high bending moments of the

pulled-out inner tube, in accordance with a further development of the invention, the inner tube has at least one projection that radially laterally projects past its outer lateral area and is axially spaced apart from the widened end of the inner tube, the stop means. The projection is advantageously formed in one piece with the inner tube and, in particular, produced on the inner tube through a forming process. The projection is advantageously designed in the form of a burl or crimped projection and can extend at an advantageously large peripheral angle in the peripheral direction of the inner tube. In accordance with an embodiment of the invention, also several projections can be provided, which are lined up along the outer periphery of the inner tube at a distance from one another and are advantageously arranged in a plane disposed orthogonally with respect to the longitudinal axis of the inner tube.

The inner tube is axially guided on the stop element and/or on an inner lateral area of the outer tube, advantageously with positive fit with sliding play, in order to improve the positioning accuracy and provide reliable support. The inner tube is advantageously guided on the inner lateral area of the outer tube by one stop means, in the present case e.g. the crimped edge of its end arranged in the outer tube, and/or by the at least one projection.

In accordance with a further development of the invention, which is particularly preferred in view of manufacturing aspects, the stop element which is advantageously designed as a cap has an internal thread that engages with an external thread of the outer tube, wherein the external thread is additionally in engagement with an internal thread of a lowerable nut on which a securing pin can be supported, which can be guided transversely to the longitudinal axis of the telescopic prop through the outer and inner tubes. This enables on the one hand fine adjustment of the functional overall length of the telescopic prop and facilitates stripping, on the other hand the stop element can be directly screwed onto a thread

that is already provided. In this connection, the stop element simultaneously acts like a check nut or a stop element for the lowerable nut such that the latter is undetachably arranged on the telescopic prop.

With regard to a particularly inexpensive production of the telescopic prop, the outer tube advantageously has a substantially constant inner diameter over its entire axial length.

Altogether, the prop in accordance with the invention offers the advantage that it can be mounted with maximum simplicity (final assembly). The outer and the inner tube can be processed and produced without additional elements and the lowerable nut including the associated elements are screwed to the outer tube only upon joining the outer and the inner tube. The securing pin is also mounted to the outer tube before the inner tube and the outer tube are joined. When the prop has been assembled in accordance with the invention, the securing pin can only be used in the region of the insertion opening provided that the stop element has an outer diameter that is larger than the inner diameter of a section of the correspondingly formed securing pin, which section surrounds the outer tube.

Further advantages and advantageous embodiments of the subject matter of the invention can be gathered from the description, the drawing and the claims.

Drawing

The invention is explained below in more detail in the drawing with reference to an embodiment. In the drawing:

Fig. 1 shows a perspective view of a part of a telescopic prop in accordance with the invention with a stop element designed as a cap;

Fig. 2 shows a longitudinal section through a part of a telescopic prop in correspondence with Fig. 1;

Fig. 3 shows a perspective view of the cap of Fig. 1;

Fig. 4 shows a sectional view of the cap illustrated in Fig. 3; and

Fig. 5 shows the individual parts of the telescopic prop in accordance with the invention before the inner and the outer tube are joined.

Description of the embodiment

Fig. 1 shows a telescopic prop for the construction industry, referred to in total by reference numeral 10, in a selected part of the prop. The telescopic prop 10 has an outer tube 12 and an inner tube 14 axially displaceably arranged therein. At its free end 16 illustrated at the top in the figure, the inner tube 14 has a carrying plate 18, which is known per se, whereas the foot-sided end of the outer tube 12, which is not shown in detail in the figure, comprises a foot plate for secure positioning on a respective ground.

A cap 22 is arranged at an end 20 of the outer tube 12 at the head side, i.e. facing the carrying plate 18 of the inner tube 14, which is used as stop element for the inner tube 14 and prevents axial removal or falling out of the inner tube 14 from the outer tube 12.

The cap 22 is designed in correspondence with a union nut and has a substantially cylindrical wall section 24 with an internal thread 26. An edge region 28 of the cap 22, arranged above the cylindrical wall section 24 in the figure, adjoins the cylindrical wall section 24, the edge region 28 being radially angled with respect to the cylindrical wall region 24 in the

direction of a longitudinal axis 30 of the telescopic prop 10 and partially covering a free cross-sectional surface 32 of the outer tube 12.

The cap 22 or its internal thread 26 engages with an external thread 36 arranged on the outer lateral area 34 of the outer tube 12. A so-called lowerable nut 38 also engages in the external thread 36 of the outer tube 12, on which a handle 38' is pivotably disposed, and which can be axially moved along the outer tube 12 through rotation about the longitudinal axis 30 of the telescopic prop 10.

A securing pin 40, which is inserted through the outer and the inner tube 12, 14 in a direction transverse to the longitudinal axis 30 of the telescopic prop 10, is supported on the lowerable nut 38. In this regard, the outer tube 12 has two opposite first insertion openings (elongated holes) 42 extending in a longitudinal direction parallel to the longitudinal axis 30 of the telescopic prop 10, whereas the inner tube 14 has a plurality of circular opposite (aligned) second insertion openings 44 which are arranged along the inner tube 14 at regular intervals below or above one another.

For roughly adjusting the length of the telescopic prop 10, the inner tube 14 is initially pulled out to a desired length of the telescopic prop 10 and the securing pin 40 is subsequently inserted through the first insertion openings 42 of the outer tube and second insertion openings 44 of the inner tube 14, which are respectively aligned therewith.

By turning the lowerable nut 38 that is arranged below the securing pin 40 in the figure, the relative position of the nut can subsequently be gradually changed along the outer tube 12. In this way, the axial support position of the securing pin 40 on the outer tube 12 or the axial support position of the inner tube 14, coupled thereto, along the outer tube 12,

i.e. the length of the telescopic prop 10, can simultaneously be finely adjusted as required.

As is illustrated, in particular, in Fig. 2, which shows a longitudinal section of a portion of the telescopic prop 10, the angled edge region of the cap 22 covers an end face 46 of one end 20 of the outer tube 12. The inner tube 14 has a stop means 48 designed as widened end, which can be brought into abutment with the cap 22 or its angled edge region 28 for preventing the inner tube 14 from falling out of the outer tube 12 in case no further retaining elements are effective.

The inner tube 14 additionally comprises several burl-like projections 50, which are arranged at a distance from the stop means (widened end) 48 of the inner tube 14 and laterally project in a radial direction past an outer lateral area 34' of the inner tube 14. The burl-like projections 50 are brought into abutment with the cap 22 when the inner tube 14 has been pulled out to a predetermined maximum extent and in this manner enforce that a minimum length of the inner tube 14 remains in the outer tube 12. When bending moments occur, the inner tube 14 is thus supported on an inner lateral area 52 of the outer tube 12, which safely prevents levering off of the cap 22 from the outer tube 12.

The burl-like projections 50 have a function like the stop means 48 and delimit the length of extension of the telescopic prop.

The internal thread 26 of the cap 22 is designed as a flat section, as illustrated in more detail in Figs. 3 and 4, and has a thread profile 54 that is interrupted in the longitudinal direction of the thread.

The illustration of Fig. 4 shows that the cylindrical cap section 24 of the cap 22 is provided with an unscrew protection device 56 designed in the form of a bendable shackle, which is driven into the external thread 36 of

the outer tube 12 when the cap has been screwed onto the external thread 36 (Figs. 1 and 2) of the outer tube 12, and is anchored in an opening 57 (see Fig. 5) in the external thread 36 of the outer tube 12.

Fig. 5 shows the individual parts of the inventive telescopic prop 10 before the inner tube 14 and the outer tube 12 are joined. The above explained carrying plate 18 is already welded to the inner tube 14, whereas a foot plate 58 is welded to the end of the outer tube 12 on the foot side. The lowerable nut 38 is screwed onto the external thread 36 of the outer tube 12 and the securing pin 40 is pushed onto the thread region of the outer tube 12 above the lowerable nut 38, whereas the cap 22 is pushed onto the inner tube 14 and is secured by the burl-like projections 50 or the carrying plate 18 against axial removal from the inner tube 14. For joining the inner tube 14 and the outer tube 12, the inner tube 14 is axially inserted with its widened end 48 (stop means) into the outer tube 12 at the head-side end 20 of the outer tube 12 until at least the burl-like projections 50 come to rest inside the outer tube 12. The cap 22 is subsequently screwed onto the external thread 36 of the outer tube 12 and the bendable shackle 56 is driven into the opening 57 of the outer tube 12 by means of a tool.

The invention relates to a telescopic prop 10 for the construction industry, comprising an outer tube 12 and an inner tube 14 axially displaceably arranged therein, said inner tube being secured against removal from the outer tube 12 by means of a removal preventing device. The removal preventing device comprises a stop element which is arranged on the outer tube 12, and with which at least one stop means 48 arranged on the inner tube 14 can be brought into contact. In accordance with the invention, the stop element is provided in the region of an end 20 of the outer tube 12 and covers the free cross-sectional surface of the outer tube 12 at least partially. The stop element is preferably designed as a cap 22 and comprises an internal thread 26 that engages with an external thread

36 of the outer tube 12. The external thread 36 is in engagement with a lowerable nut 38 on which a securing pin 40 can be supported, which can be guided through the outer and inner tubes 12, 14 transversely to the longitudinal axis 30 of the telescopic prop 10.

Claims

1. Telescopic prop (10) for the construction industry, comprising an outer tube (12) and an inner tube (14) axially displaceably arranged therein, said inner tube being secured against removal from the outer tube (12) by means of a removal preventing device, wherein the removal preventing device comprises a stop element which is arranged on the outer tube (12) and with which at least one stop means (48) arranged on the inner tube (14) can be brought in contact, characterized in that the stop element is attached to the outer tube (12) in the region of one end (20) of the outer tube (12) and covers the free cross-sectional surface (32) of the outer tube (12) at least partially.
2. Telescopic prop according to claim 1, characterized in that advantageously an external and/or internal thread (26) of the stop element engage(s) with an internal and/or external thread (36) of the outer tube (12) arranged on an outer lateral area (34; 50) of the outer tube (12).
3. Telescopic prop according to claim 2, characterized in that the stop element is associated with an unscrew protection device, which is advantageously designed as a bendable shackle (56).
4. Telescopic prop according to claim 3, characterized in that the bendable shackle (56) engages in a recess, in particular, in an opening of the outer tube (12).
5. Telescopic prop according to any one of the preceding claims, characterized in that the stop element covers at least part of an end face (46) of one end (20) of the outer tube (12).

6. Telescopic prop according to any one of the preceding claims, characterized in that the stop element is designed as a cap (22) or a sleeve.
7. Telescopic prop according to any one of the preceding claims, characterized in that the stop means (48) is designed as a widened end of the inner tube (14).
8. Telescopic prop according to claim 7, characterized in that the inner tube (14) has at least one projection (50) which laterally projects in a radial direction past its outer lateral area (34') and is arranged at an axial distance from the stop means (48) of the inner tube (14).
9. Telescopic prop according to any one of the preceding claims, characterized in that the inner tube (14) is axially guided on the stop element and/or on an inner lateral area (52) of the outer tube (12), advantageously with positive fit with sliding play.
10. Telescopic prop according to any one of the preceding claims, characterized in that the stop element has an internal thread (26) which engages in an external thread (36) of the outer tube, wherein the external thread (36) is in engagement with a lowerable nut (38) on which a securing pin (40) can be supported, which can be guided through the outer and the inner tube (12; 14) transversely to the longitudinal axis (30) of the telescopic prop (10).
11. Telescopic prop according to any one of the preceding claims, characterized in that the outer tube (12) has a substantially constant inner diameter over its entire axial length.