

(19)



(11)

EP 3 118 386 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

11.08.2021 Bulletin 2021/32

(51) Int Cl.:

E04C 5/12 (2006.01)

(21) Application number: **16179904.4**

(22) Date of filing: **18.07.2016**

(54) **WEDGE FOR POST TENSIONING TENDON**

KEIL FÜR NACHTRÄGLICHES SPANNEN VON BEWEHRUNGSKABELN

COIN POUR TENDON DE POST-TENSION

(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**

(30) Priority: **17.07.2015 US 201562193866 P**

17.07.2015 US 201562193883 P

17.07.2015 US 201562193898 P

28.08.2015 US 201514838779

28.08.2015 PCT/US2015/047389

(43) Date of publication of application:

18.01.2017 Bulletin 2017/03

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EP 3 118 386 B1

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Description

Cross-Reference to Related Applications

[0001] This application is a nonprovisional application which claims priority from U.S. provisional application number 62/193,866, filed July 17, 2015; U.S. provisional application number 62/193,883 filed July 17, 2015; U.S. provisional application number 62/193,898 filed July 17, 2015; US non-provisional application number 14/838,779 filed 28 August 2015; and PCT application number PCT/US15/47389.

Technical Field/Field of the Disclosure

[0002] The present disclosure relates generally to post-tensioned, pre-stressed concrete construction. The present disclosure relates specifically to wedges for anchors for use therein.

Background of the Disclosure

[0003] Many structures are built using concrete, including, for instance, buildings, parking structures, apartments, condominiums, hotels, mixed-use buildings, casinos, hospitals, medical buildings, government buildings, research/academic institutions, industrial buildings, malls, bridges, pavement, tanks, reservoirs, silos, foundations, sports courts, and other structures.

[0004] Pre-stressed concrete is structural concrete in which internal stresses are introduced to reduce potential tensile stresses in the concrete resulting from applied loads. This can be accomplished by two methods—post-tensioned pre-stressing and pre-tensioned pre-stressing. When post tensioning concrete, the pre-stressing assembly is tensioned after the concrete has attained a specified strength. The pre-stressing assembly, commonly known as a tendon, may include for example and without limitation, anchorages, one or more strands, and sheathes or ducts. The strand is tensioned between anchors which are embedded in the concrete once the concrete has hardened. The strand may be formed from a metal or composite or any suitable material exhibiting tensile strength which can be elongated, including, for example and without limitation, reinforcing steel, single wire cable, or multi-wire cable. The strand is typically fixedly coupled to a fixed anchorage positioned at one end of the tendon, the so-called "fixed end", and is adapted to be stressed at the other anchor, the "stressing end" of the tendon. The strand is generally held to each anchor by one or more wedges. Typically, anchors include a tapered recess which, when the strand is placed under tension, causes the wedges to further engage the strand. Wedges are typically made of metal. Typically, wedges must be assembled to or threaded onto the end of the strand once the strand is in position in the concrete member. In the case of a bridge or other elevated structure, there is a risk of dropping wedges. Additionally, as

strands may extend far from the end of the structure and bend due to gravity, the ability to thread the wedge onto the end of the strand is limited. Furthermore, misalignment between the wedges during installation may damage the strand or result in an insufficient anchor between strand and the anchor.

[0005] US2007/014630 discloses a continuity system for a building, designed to compensate for the downward settling of building elements over time, which occurs due to the shrinkage of wooden building members. The continuity system comprises one or more hold-down assemblies each having a stud-connector secured to a generally vertical stud, a generally vertical rod inserted into an opening of the stud connector, a rod-gripping member in toothed engagement with the rod above the opening, and one or more positioning elements exerting a downward force on the rod-gripping member. The rod has a lower portion secured to a stable building element such as the building's foundation. The opening of the stud-connector defines a frustoconical bearing surface on the upper surface of a portion of the stud-connector, or on a gripper support element in some embodiments. The rod-gripping member includes a plurality of gripping portions each having a lower surface defining a circumferential portion of a frustoconical shape sized and adapted to conform with the frustoconical bearing surface of the stud-connector. If the stud and stud-connector settle downward with respect to the rod, the downward force of the positioning element causes teeth of the gripping portions to disengage from circumferential teeth of the rod so that the rod-gripping member moves downward until the lower surfaces of the gripping portions bear against the frustoconical bearing surface of the stud-connector. The radial components of the reaction forces of the frustoconical bearing surface of the stud-connector causes the teeth of the gripping portions to reengage the teeth of the rod. If lateral forces on the building (e.g., earthquake or strong winds) urge the stud and stud-connector upward relative to the rod, the frustoconical bearing surface of the stud-connector exerts radially inward compression forces onto the gripping portions to cause the teeth of the gripping portions to engage the teeth of the rod and thereby substantially prevent the rod-gripping member and stud-connector from moving upward relative to the rod.

Summary

[0006] The present disclosure provides for a wedge assembly according to claim 1, for an anchor of a tendon for post tensioning concrete.

[0007] The present disclosure also provides for a method according to claim 5.

Brief Description of the Drawings

[0008] The present disclosure is best understood from the following detailed description when read with the ac-

companying figures. It is emphasized that, in accordance with the standard practice in the industry, various features are not drawn to scale. In fact, the dimensions of the various features may be arbitrarily increased or reduced for clarity of discussion.

FIG. 1 depicts a cross section of an anchor having a wedge assembly consistent with at least one embodiment of the present disclosure.

FIG. 2 depicts a perspective view of a wedge assembly consistent with at least one embodiment of the present disclosure installed onto a strand.

FIG. 3 depicts a top view of the wedge ring assembly of FIG. 2.

FIGS. 4A, 4B depict a wedge assembly consistent with at least one embodiment of the present disclosure.

FIGS. 5A, 5B, 5C depict a wedge assembly consistent with at least one embodiment of the present disclosure.

FIGS. 5D, 5E depict the wedge ring of FIGS. 5A, 5B, 5C.

Detailed Description

[0009] It is to be understood that the following disclosure provides many different embodiments, or examples, for implementing different features of various embodiments. Specific examples of components and arrangements are described below to simplify the present disclosure. These are, of course, merely examples and are not intended to be limiting. In addition, the present disclosure may repeat reference numerals and/or letters in the various examples. This repetition is for the purpose of simplicity and clarity and does not in itself dictate a relationship between the various embodiments and/or configurations discussed.

[0010] FIG. 1 depicts anchor 10 for use in post tensioning concrete. Anchor 10 is adapted to receive and couple to strand 12 of tendon 14. Strand 12 may be, for example and without limitation, mono-wire cable, or multi-wire cable. For the purposes of this disclosure, the axis parallel with the length of strand 12 will be referred to as the longitudinal axis of strand 12. Anchor 10 may include anchor body 16 adapted to retain the position of anchor 10 when positioned in formed concrete.

[0011] Anchor 10 may couple to strand 12 by the use of one or more wedges 100. Wedges 100 may be substantially wedge shaped and adapted to fit into a tapered recess 18 formed in anchor body 16. Tension on strand 12 may cause wedges 100 to move into tapered recess 18, applying a gripping force on strand 12.

[0012] In some embodiments, wedges 100 may be coupleable by wedge ring 101. As depicted in FIG. 2, each wedge 100 may include groove 103. Groove 103 may be formed in the outer surface 105 of wedges 100 and adapted to receive wedge ring 101. Groove 103 may be formed in a plane substantially perpendicular to the

longitudinal axis of strand 12. As depicted in FIG. 3, wedge ring 101 may be substantially annular and may be formed from a material capable of elastic deformation. Wedge ring 101 may include gap 107. Gap 107 may allow wedge ring 101 to be slipped into groove 103 of wedges 100 when wedges are positioned about strand 12 as depicted in FIG. 1. Wedges 100 may thus be positioned about strand 12 before being coupled by wedge ring 101, allowing wedges 100 to be coupled to strand 12 without having to thread strand 12 through wedges 100. Once wedges 100 are positioned about strand 12, wedge ring 101 may be installed to gap 107 in a direction substantially perpendicular to the extent of the strand. Wedge ring 101 may retain wedges 100 to strand 12 before tensioning of strand 12 relative to anchor 10. In some embodiments, gap 107 may be a substantially 60° opening. **[0013]** In some embodiments, wedge ring 101 may include expansion features 109. Expansion features 109 may be positioned at either end of gap 107 to, for example and without limitation, allow the ends of wedge ring 101 to more easily pass over wedges 100 to allow gap 107 to expand when wedge ring 101 is installed to grooves 103 of wedges 100. In some embodiments, as depicted in FIG. 3, the ends of wedge ring 101 may include a re-curve portion to facilitate expansion of wedge ring 101. In some embodiments, one or more loops or holes may be utilized to, for example and without limitation, allow a tool such as snap ring pliers to expand wedge ring 101 during installation.

[0014] Because wedge ring 101 is capable of being installed from beside wedges 100 when already installed on strand 12, wedge ring 101 does not need to be threaded onto the end of strand 12 before installation to wedges 100. Likewise, wedges 100 may be individually installed to strand 12 rather than being slipped on from the end of strand 12 as in a case where wedges 100 and wedge ring 101 were previously coupled.

[0015] In some embodiments, as depicted in FIGS. 4A, 4B, wedges 100 may be adapted be coupled together prior to installation to strand 12 (not shown) and may include guides 111 adapted to assist with coupling wedges 100 to strand 12. Guides 111 may be positioned to, for example and without limitation, assist in expanding gap 107 by forming a tapered surface against which strand 12 may push. A portion of the force between wedges 100 and strand 12 may thus act to separate wedges 100, allowing for strand 12 to more easily enter wedges 100. Guides 111 may be one or more features positioned on at least a portion of outer surface 105 of one or more wedges 100. In some embodiments, guides 111 may, as depicted be chamfered surfaces positioned at an end of wedges 100. One having ordinary skill in the art with the benefit of this disclosure will understand that guides 111 may be any geometry known in the art including, for example and without limitation, one or more chamfers, ramps, curves, fillets, or combinations thereof. Additionally, guides 111 may be formed at locations on wedges 100 other than that shown in the present disclosure with-

out deviating from the scope of the present disclosure.

[0016] In some embodiments, wedges 100 may be formed such that once positioned on strand 12 as depicted in FIGS. 5A, 5C, wedges 100 form a clearance fit around strand 12. The clearance fit is depicted as annular space 113 in FIG. 5A and is sufficiently small that although a clearance fit is maintained, wedge ring 101' may retain wedges 100 to strand 12. The clearance fit may allow wedges 100 to more easily slide along strand 12 during installation whether installed from the end of strand 12 or from the side. Once installed to tapered recess 18 as depicted in FIG. 5B, wedges 100 may grip strand 12 as annular space 113 is closed.

[0017] In some embodiments, as depicted in FIGS. 5A, 5D, 5E wedge ring 101' may include one or more hooks 115 adapted to maintain the clearance fit between wedges 100 and strand 12 by, for example and without limitation, maintaining separating tension on wedges 100 to maintain gap 107'. When installed to tapered recess 18 as depicted in FIG. 5B, the force applied on wedges 100 by tapered recess 18 may be sufficient to overcome the separating tension of wedge ring 101', allowing wedges 100 to grip strand 12.

[0018] The foregoing outlines features of several embodiments so that a person of ordinary skill in the art may better understand the aspects of the present disclosure. Such features may be replaced by any one of numerous equivalent alternatives, only some of which are disclosed herein. One of ordinary skill in the art should appreciate that they may readily use the present disclosure as a basis for designing or modifying other processes and structures for carrying out the same purposes and/or achieving the same advantages of the embodiments introduced herein. One of ordinary skill in the art should also realize that such equivalent constructions do not depart from the scope of the present disclosure and that they may make various changes, substitutions, and alterations herein without departing from the scope of the present disclosure.

Claims

1. A wedge assembly for an anchor (10) of a tendon (14) for use in post tensioning concrete comprising:

at least two wedges (100) adapted to fit on an outer surface of a strand (12) of the tendon (14), each wedge (100) including an outer surface (105) having a circumferential groove (103) formed thereon, the groove (103) positioned in a plane substantially perpendicular to the longitudinal axis of the strand (12); and
a wedge ring (101, 101'), the wedge ring (101, 101') adapted to fit into the groove of each wedge (100), to couple the wedges (100) together and to retain the wedges (100) to the strand (12), the wedge ring (101, 101') including a gap;

wherein the wedge ring (101, 101') gap aligns with a space between the wedges (100) such that the wedge assembly can be installed from the side of the strand (12).

2. The wedge assembly of claim 1, wherein the wedge ring (101, 101') is adapted to be coupled to the groove (103) in a direction substantially perpendicular to the longitudinal axis of the strand (12).
3. The wedge assembly of claim 1 or claim 2 comprising two wedges (100).
4. The wedge assembly of any one of claims 1 to 3, wherein the wedge ring (101, 101') further comprises an expansion feature (109) positioned at each end of the wedge ring (101, 101'), the expansion feature (109) adapted to cause the gap to expand as the wedge ring (101, 101') is installed onto the wedge (100); optionally, wherein the expansion feature (109) comprises:
 - a recurve portion; and/or,
 - a hole adapted to operably couple to a snap ring plier.
5. A method for installing the wedge assembly of claim 1 onto a strand, the method comprising:

providing an anchor (10) for post tensioning concrete;
threading a strand (12) through the anchor (10);
providing at least two wedges (100), each wedge (100) including an outer surface having a circumferential groove (103) formed thereon, the groove (103) positioned in a plane substantially perpendicular with the longitudinal axis of the strand (12);
providing a wedge ring (101, 101'), the wedge ring (101, 101') adapted to fit into the groove (103) of each wedge (100) and to retain the wedge (100) to a strand (12), the wedge ring (101, 101') including a gap adapted to allow the wedge ring (101, 101') to be installed into the groove (103) of the wedge (100);
installing the wedge ring (101, 101') into the groove (103) of the wedges (100) by expanding the gap of the wedge ring (101, 101') and positioning the wedge ring (101, 101') into the groove (103) so as to couple the wedge ring (101, 101') to the wedges (100); and
installing the coupled wedges (100) and wedge ring (101, 101') to the strand (12) in a direction perpendicular to the longitudinal axis of the strand (12).

6. The method of claim 5, wherein the wedge ring (101, 101') gap aligns with a space between the wedges

(100).

7. The wedge assembly of claim 1, wherein: the wedge ring (101, 101') retains the wedges (100) to the strand (12) while allowing a clearance fit between the wedges (100) and the strand (12) when the wedges (100) are installed to the strand (12).

8. The wedge assembly of claim 1 or claim 7, wherein the wedge ring (101, 101') further comprises one or more hooks (115) adapted to elastically retain a radial space between the wedges (100) and the strand (12) to maintain the clearance fit on the strand (12); optionally, wherein, once installed to the anchor (10), the wedges (100) couple to the outer surface of the strand (12).

9. The method of claim 6, wherein:

the wedge ring (101, 101') is adapted to fit into the grooves of the wedges (100) and to retain the wedges (100) to the strand (12) while allowing a clearance fit between the wedges (100) and the strand (12) when the wedges (100) are installed to the strand (12); and further including maintaining the clearance fit between the wedges (100) and the strand (12) when the wedges (100) are installed to the strand (12).

10. The method of claim 9, wherein the wedge ring (101, 101'):

further comprises one or more hooks (115) adapted to elastically retain a radial space between the wedges (100) and the strand (12) to maintain the clearance fit; optionally, wherein, once installed to the anchor (10), the wedges (100) couple to the outer surface of the strand (12); and/or, further comprises a gap adapted to allow the wedges (100) adjacent the gap to separate, allowing the wedges (100) to be installed to the strand (12) in a direction perpendicular to the longitudinal axis of the strand (12).

11. The wedge assembly of claim 1, wherein:

at least one wedge (100) includes a guide (111) formed therein, the guide (111) adapted to assist in the separation of the wedges (100) when the wedges (100) are installed to the strand (12) from the side of the strand (12); and wherein the wedge ring (101, 101') gap is positioned proximate the guide such that the separation of the wedges (100) substantially elastically expands the wedge ring (101, 101').

12. The wedge assembly of claim 11, wherein:

the wedge ring (101, 101') is adapted to be coupled to the groove (103) in a direction substantially perpendicular to the longitudinal axis of the strand (12); and/or, one wedge (100) proximate the gap includes a guide (111); and/or, both wedges (100) proximate the gap include guides (111); and/or, the guide (111) comprises one or more chamfers, ramps, curves, fillets, or combinations thereof.

13. The method of claim 6, wherein:

at least one wedge (100) includes a guide (111) formed therein, the guide (111) adapted to assist in the separation of the wedges (100) when the wedges (100) are installed to the strand (12) from the side of the strand (12); and wherein the wedge ring (101, 101') gap is proximate the guide (111) such that the separation of the wedge ring (101, 101') substantially elastically expands the wedge ring (101, 101'); aligning the wedge assembly with the guide (111) such that the guide (111) is aligned with the strand (12); pressing the guide (111) against the strand (12) such that the wedges (100) are separated and the gap is expanded and the wedge ring (101, 101') expands elastically as the wedge ring (101, 101') is installed on the strand (12).

14. The method of claim 13, wherein:

one wedge (100) proximate the gap includes a guide (111); and/or, both wedges (100) proximate the gap include guides (111); and/or, the guide (111) comprises one or more chamfers, ramps, curves, fillets, or combinations thereof.

Patentansprüche

1. Keilanordnung für einen Anker (10) eines Bewehrungskabels (14) zur Verwendung beim nachträglichen Spannen von Beton, umfassend:

mindestens zwei Keile (100), die dafür ausgelegt sind, auf einer Außenfläche einer Litze (12) des Bewehrungskabels (14) zu passen, wobei jeder Keil (100) eine Außenfläche (105) mit einer darauf gebildeten Umfangsrille (103) beinhaltet, wobei die Rille (103) in einer Ebene im Wesentlichen senkrecht zu der Längsachse der Litze

- (12) positioniert ist; und
einen Keilring (101, 101'), wobei der Keilring (101, 101') dafür ausgelegt ist, in die Rille jedes Keils (100) zu passen, um die Keile (100) miteinander zu verbinden und die Keile (100) an der Litze (12) zu halten, wobei der Keilring (101, 101') eine Lücke beinhaltet;
wobei die Keilring- (101, 101') Lücke mit einem Raum zwischen den Keilen (100) fluchtet, so dass die Keilanordnung von der Seite der Litze (12) aus installiert werden kann.
2. Keilanordnung nach Anspruch 1, wobei der Keilring (101, 101') dafür ausgelegt ist, mit der Rille (103) in einer Richtung im Wesentlichen senkrecht zu der Längsachse der Litze (12) verbunden zu sein.
3. Keilanordnung nach Anspruch 1 oder Anspruch 2, umfassend zwei Keile (100).
4. Keilanordnung nach einem der Ansprüche 1 bis 3, wobei der Keilring (101, 101') ferner ein Ausdehnungsmerkmal (109) umfasst, das an jedem Ende des Keilrings (101, 101') positioniert ist, wobei das Ausdehnungsmerkmal (109) dafür ausgelegt ist, zu bewirken, dass sich die Lücke ausdehnt, während der Keilring (101, 101') auf den Keil (100) installiert wird; wahlweise, wobei das Ausdehnungsmerkmal (109) umfasst:
einen Zurückbiegungsabschnitt; und/oder
ein Loch, das für die Wirkverbindung mit einer Sprengringzange ausgelegt ist.
5. Verfahren zum Installieren der Keilanordnung nach Anspruch 1 auf eine Litze, wobei das Verfahren umfasst:
Bereitstellen eines Ankers (10) zum nachträglichen Spannen von Beton;
Durchfädeln einer Litze (12) durch den Anker (10);
Bereitstellen mindestens zweier Keile (100), wobei jeder Keil (100) eine Außenfläche mit einer darauf gebildeten Umfangsrille (103) beinhaltet, wobei die Rille (103) in einer Ebene im Wesentlichen senkrecht zu der Längsachse der Litze (12) positioniert ist;
Bereitstellen eines Keilrings (101, 101'), wobei der Keilring (101, 101') dafür ausgelegt ist, in die Rille (103) jedes Keils (100) zu passen und den Keil (100) an einer Litze (12) zu halten, wobei der Keilring (101, 101') eine Lücke beinhaltet, die dafür ausgelegt ist, dass der Keilring (101, 101') in die Rille (103) des Keils (100) installiert werden kann;
Installieren des Keilrings (101, 101') in die Rille (103) der Keile (100) durch Ausdehnen der Lücke des Keilrings (101, 101') und Positionieren des Keilrings (101, 101') in die Rille (103), um so den Keilring (101, 101') mit den Keilen (100) zu verbinden; und
Installieren der verbundenen Keile (100) und des Keilrings (101, 101') an der Litze (12) in einer Richtung senkrecht zu der Längsachse der Litze (12).
6. Verfahren nach Anspruch 5, wobei die Keilring- (101, 101') Lücke mit einem Raum zwischen den Keilen (100) fluchtet.
7. Keilanordnung nach Anspruch 1, wobei: der Keilring (101, 101') die Keile (100) an der Litze (12) hält und dabei eine Spielpassung zwischen den Keilen (100) und der Litze (12) erlaubt ist, wenn die Keile (100) an der Litze (12) installiert sind.
8. Keilanordnung nach Anspruch 1 oder Anspruch 7, wobei der Keilring (101, 101') ferner einen oder mehrere Haken (115) umfasst, die dafür ausgelegt sind, einen Radialraum zwischen den Keilen (100) und der Litze (12) elastisch beizubehalten, um die Spielpassung auf der Litze (12) aufrechtzuerhalten; wahlweise, wobei, nach Installation an dem Anker (10), sich die Keile (100) mit der Außenfläche der Litze (12) verbinden.
9. Verfahren nach Anspruch 6, wobei:
der Keilring (101, 101') dafür ausgelegt ist, in die Rillen der Keile (100) zu passen und die Keile (100) an der Litze (12) zu halten dabei eine Spielpassung zwischen den Keilen (100) und der Litze (12) erlaubt ist, wenn die Keile (100) an der Litze (12) installiert sind; und
ferner beinhaltend das Aufrechterhalten der Spielpassung zwischen den Keilen (100) und der Litze (12), wenn die Keile (100) an der Litze (12) installiert sind.
10. Verfahren nach Anspruch 9, wobei der Keilring (101, 101'):
ferner einen oder mehrere Haken (115) umfasst, die dafür ausgelegt sind, einen Radialraum zwischen den Keilen (100) und der Litze (12) elastisch beizubehalten, um die Spielpassung aufrechtzuerhalten; wahlweise, wobei, nach Installation an dem Anker (10), sich die Keile (100) mit der Außenfläche der Litze (12) verbinden; und/oder,
ferner eine Lücke umfasst, die dafür ausgelegt ist, dass die Keile (100) neben der Lücke sich trennen können, wodurch die Keile (100) an der Litze (12) in einer Richtung senkrecht zu der

Längsachse der Litze (12) installiert werden können.

Rampen, Kurven, Kehlen oder Kombinationen davon umfasst.

11. Keilanordnung nach Anspruch 1, wobei:

mindestens ein Keil (100) eine darin gebildete Führung (111) beinhaltet, wobei die Führung (111) dafür ausgelegt ist, die Trennung der Keile (100) zu unterstützen, wenn die Keile (100) an der Litze (12) von der Seite der Litze (12) aus installiert werden; und
wobei die Keilring- (101, 101') Lücke nahe der Führung positioniert ist, so dass die Trennung der Keile (100) den Keilring (101, 101') im Wesentlichen elastisch ausdehnt.

12. Keilanordnung nach Anspruch 11, wobei:

der Keilring (101, 101') dafür ausgelegt ist, mit der Rille (103) in einer Richtung im Wesentlichen senkrecht zu der Längsachse der Litze (12) verbunden zu sein; und/oder,
ein Keil (100) nahe der Lücke eine Führung (111) beinhaltet; und/oder,
beide Keile (100) nahe der Lücke Führungen (111) beinhalten; und/oder,
die Führung (111) eine oder mehrere Fasen, Rampen, Kurven, Kehlen oder Kombinationen davon umfasst.

13. Verfahren nach Anspruch 6, wobei:

mindestens ein Keil (100) eine darin gebildete Führung (111) umfasst, wobei die Führung (111) dafür ausgelegt ist, die Trennung der Keile (100) zu unterstützen, wenn die Keile (100) von der Seite der Litze (12) aus an der Litze (12) installiert werden; und
wobei die Keilring- (101, 101') Lücke nahe der Führung (111) positioniert ist, so dass die Trennung des Keilrings (101, 101') den Keilring (101, 101') im Wesentlichen elastisch ausdehnt;
Ausrichten der Keilanordnung mit der Führung (111), so dass die Führung (111) mit der Litze (12) fluchtet;
Pressen der Führung (111) gegen die Litze (12), so dass die Keile (100) getrennt werden und die Lücke ausgedehnt wird und der Keilring (101, 101') sich elastisch ausdehnt, während der Keilring (101, 101') auf der Litze (12) installiert wird.

14. Verfahren nach Anspruch 13, wobei:

ein Keil (100) nahe der Lücke eine Führung (111) beinhaltet; und/oder,
beide Keile (100) nahe der Lücke Führungen (111) beinhalten; und/oder,
die Führung (111) eine oder mehrere Fasen,

5 Revendications

1. Ensemble coin pour un ancrage (10) d'un toron (14) pour une utilisation dans du béton de post-contrainte, l'ensemble coin comprenant :

au moins deux coins (100) conçus pour s'ajuster sur une surface externe d'un fil (12) du toron (14), chaque coin (100) incluant une surface externe (105) sur laquelle est formée une rainure circonférentielle (103), la rainure (103) étant positionnée dans un plan sensiblement perpendiculaire à l'axe longitudinal du fil (12) ; et un anneau de coin (101, 101'), l'anneau de coin (101, 101') étant conçu pour s'ajuster dans la rainure de chaque coin (100) pour accoupler les coins (100) ensemble et pour retenir les coins (100) sur le fil (12), l'anneau de coin (101, 101') incluant un écart ;
l'écart de l'anneau de coin (101, 101') s'alignant avec un espace entre les coins (100) de façon que l'ensemble coin puisse être installé depuis le côté du fil (12).

2. Ensemble coin selon la revendication 1, dans lequel l'anneau de coin (101, 101') est conçu pour être accouplé à la rainure (103) dans une direction sensiblement perpendiculaire à l'axe longitudinal du fil (12).

3. Ensemble coin selon la revendication 1 ou 2, comprenant deux coins (100).

4. Ensemble coin selon l'une quelconque des revendications 1 à 3, dans lequel l'anneau de coin (101, 101') comprend en outre une caractéristique d'élargissement (109) positionnée à chaque extrémité de l'anneau de coin (101, 101'), la caractéristique d'élargissement (109) étant conçue pour amener l'écart à s'élargir quand l'anneau de coin (101, 101') est installé sur le coin (100) ;
éventuellement dans lequel la caractéristique d'élargissement (109) comprend :

une partie recourbée ; et/ou
un trou conçu pour s'accoupler de manière fonctionnelle à des pinces à anneau de retenue.

5. Procédé d'installation de l'ensemble coin selon la revendication 1 sur un fil, le procédé consistant à :

fournir un ancrage (10) pour du béton de post-contrainte ;
fileter un fil (12) par l'ancrage (10) ;

- fournir au moins deux coins (100), chaque coin (100) incluant une surface externe sur laquelle est formée une rainure circonférentielle (103), la rainure (103) étant positionnée dans un plan sensiblement perpendiculaire à l'axe longitudinal du fil (12) ;
- fournir un anneau de coin (101, 101'), l'anneau de coin (101, 101') étant conçu pour s'ajuster dans la rainure (103) de chaque coin (100) et pour retenir le coin (100) sur un fil (12), l'anneau de coin (101, 101') incluant un écart conçu pour permettre l'installation de l'anneau de coin (101, 101') dans la rainure (103) du coin (100) ;
- installer l'anneau de coin (101, 101') dans la rainure (103) des coins (100) en élargissant l'écart de l'anneau de coin (101, 101') et en positionnant l'anneau de coin (101, 101') dans la rainure (103) de façon à accoupler l'anneau de coin (101, 101') aux coins (100) ; et
- installer les coins (100) et l'anneau de coin (101, 101') accouplés sur le brin (12) dans une direction perpendiculaire à l'axe longitudinal du fil (12).
6. Procédé selon la revendication 5, dans lequel l'écart de l'anneau de coin (101, 101') s'aligne avec un espace entre les coins (100).
7. Ensemble coin selon la revendication 1, dans lequel l'anneau de coin (101, 101') retient les coins (100) sur le fil (12) tout en permettant un ajustement avec jeu entre les coins (100) et le fil (12) quand les coins (100) sont installés sur le fil (12).
8. Ensemble coin selon la revendication 1 ou 7, dans lequel l'anneau de coin (101, 101') comprend en outre un ou plusieurs crochets (115) conçus pour retenir élastiquement un espace radial entre les coins (100) et le fil (12) pour maintenir l'ajustement avec jeu sur le fil (12) ;
- éventuellement dans lequel, une fois installés sur l'ancrage (10), les coins (100) s'accouplent à la surface externe du fil (12).
9. Procédé selon la revendication 6, dans lequel :
- l'anneau de coin (101, 101') est conçu pour s'ajuster dans les rainures des coins (100) et pour retenir les coins (100) sur le fil (12) tout en permettant un ajustement avec jeu entre les coins (100) et le fil (12) quand les coins (100) sont installés sur le fil (12) ; et
- consistant en outre à maintenir l'ajustement avec jeu entre les coins (100) et le fil (12) quand les coins (100) sont installés sur le fil (12).
10. Procédé selon la revendication 9, dans lequel l'anneau de coin (101, 101') comprend en outre un ou
- plusieurs crochets (115) conçus pour retenir élastiquement un espace radial entre les coins (100) et le fil (12) pour maintenir l'ajustement avec jeu ; éventuellement
- dans lequel, une fois installés sur l'ancrage (10), les coins (100) s'accouplent à la surface externe du fil (12) ; et/ou
- comprenant en outre un écart conçu pour permettre la séparation des coins (100) adjacents à l'écart, ce qui permet aux coins (100) d'être installés sur le fil (12) dans une direction perpendiculaire à l'axe longitudinal du fil (12).
11. Ensemble coin selon la revendication 1, dans lequel :
- au moins un coin (100) inclut un guide (111) formé dans celui-ci, le guide (111) étant conçu pour faciliter la séparation des coins (100) quand les coins (100) sont installés sur le fil (12) depuis le côté du fil (12) ; et
- l'écart de l'anneau de coin (101, 101') est positionné à proximité du guide de sorte que la séparation des coins (100) élargisse sensiblement élastiquement l'anneau de coin (101, 101').
12. Ensemble coin selon la revendication 11, dans lequel :
- l'anneau de coin (101, 101') est conçu pour être accouplé à la rainure (103) dans une direction sensiblement perpendiculaire à l'axe longitudinal du fil (12) ; et/ou
- un coin (100) à proximité de l'écart inclut un guide (111) ; et/ou
- les deux coins (100) à proximité de l'écart incluent des guides (111) ; et/ou
- le guide (111) comprend un ou plusieurs chanfreins, rampes, courbes, congés ou combinaisons correspondantes.
13. Procédé selon la revendication 6, dans lequel :
- au moins un coin (100) inclut un guide (111) formé dans celui-ci, le guide (111) étant conçu pour faciliter la séparation des coins (100) quand les coins (100) sont installés sur le fil (12) depuis le côté du fil (12) ; et
- l'écart de l'anneau de coin (101, 101') est proche du guide (111) de sorte que la séparation de l'anneau de coin (101, 101') élargisse sensiblement élastiquement l'anneau de coin (101, 101') ;
- et consistant en outre à :
- aligner l'ensemble coin avec le guide (111) de sorte que le guide (111) soit aligné avec le fil (12) ; et

pousser le guide (111) contre le fil (12) de sorte que les coins (100) soient séparés et que l'écart soit élargi et que l'anneau de coin (101, 101') s'élargisse élastiquement quand l'anneau de coin (101, 101') est installé sur le fil (12). 5

14. Procédé selon la revendication 13, dans lequel :

un coin (100) à proximité de l'écart inclut un guide (111) ; et/ou 10

les deux coins (100) à proximité de l'écart incluent des guides (111) ; et/ou

le guide (111) comprend un ou plusieurs chanfreins, rampes, courbes, congés ou combinaisons correspondantes. 15

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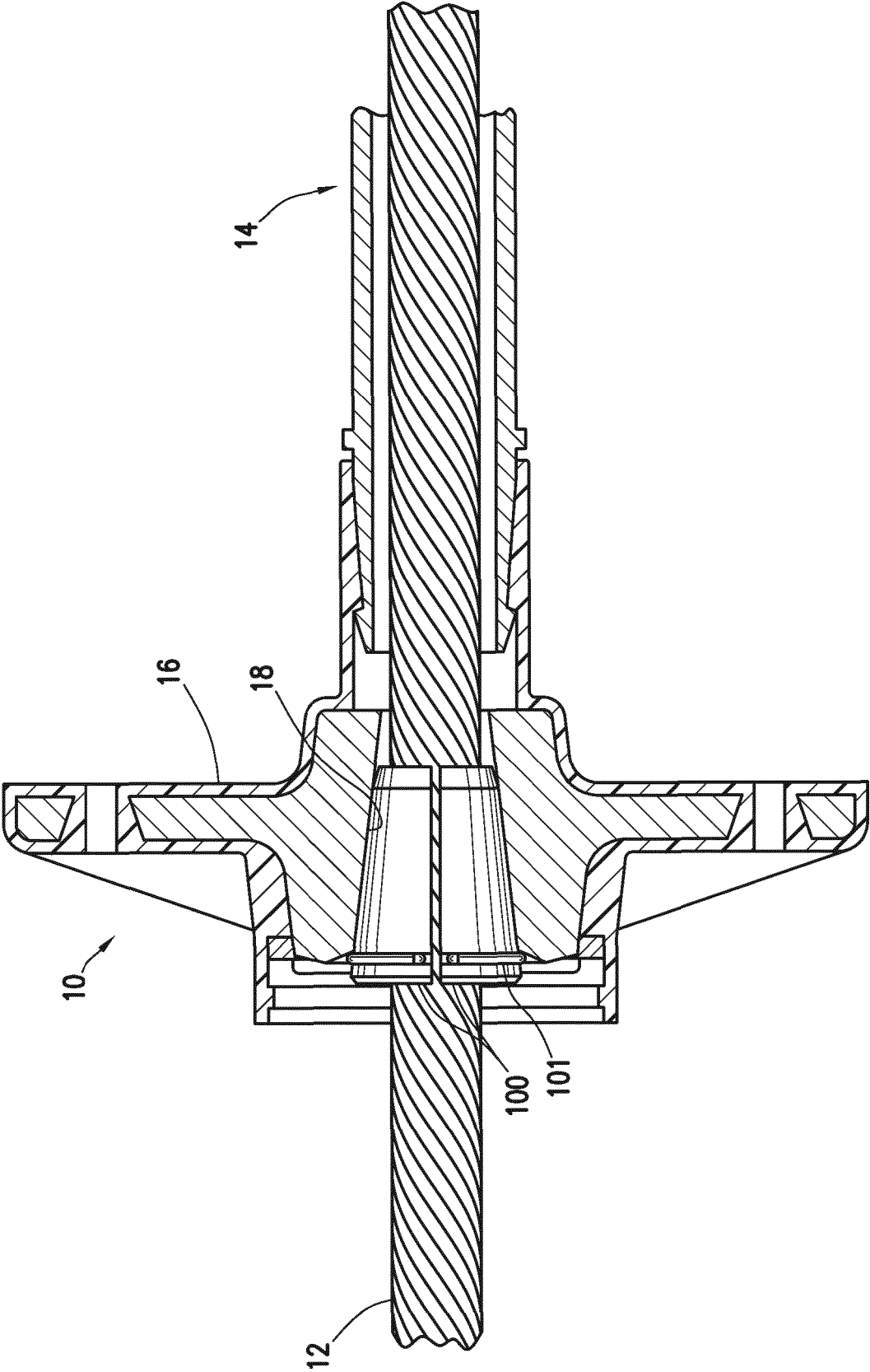


FIG. 1

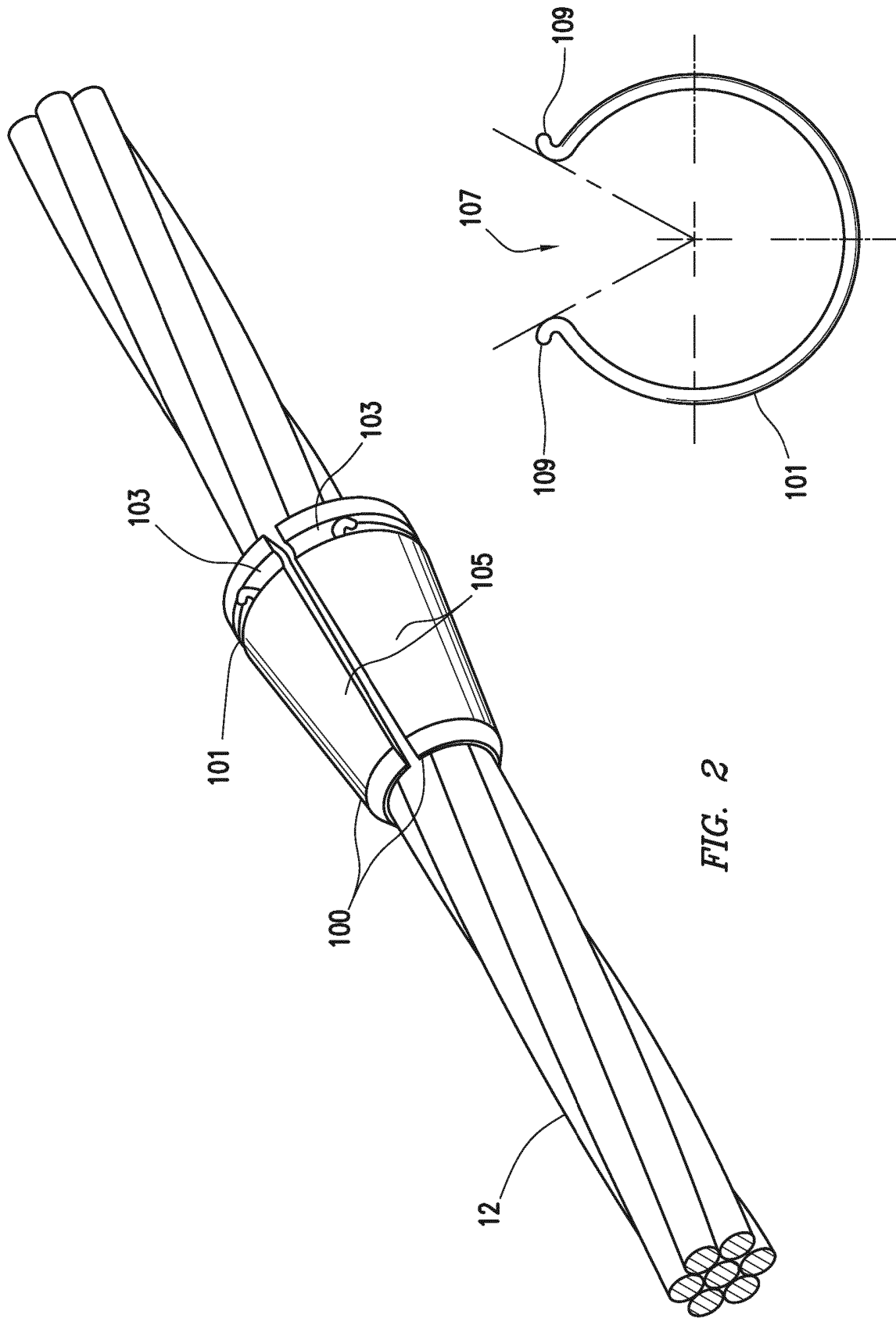


FIG. 2

FIG. 3

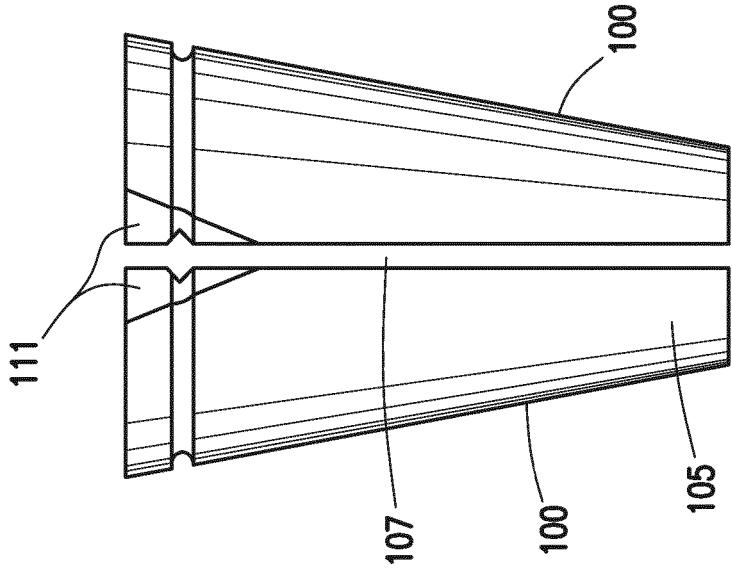


FIG. 4A

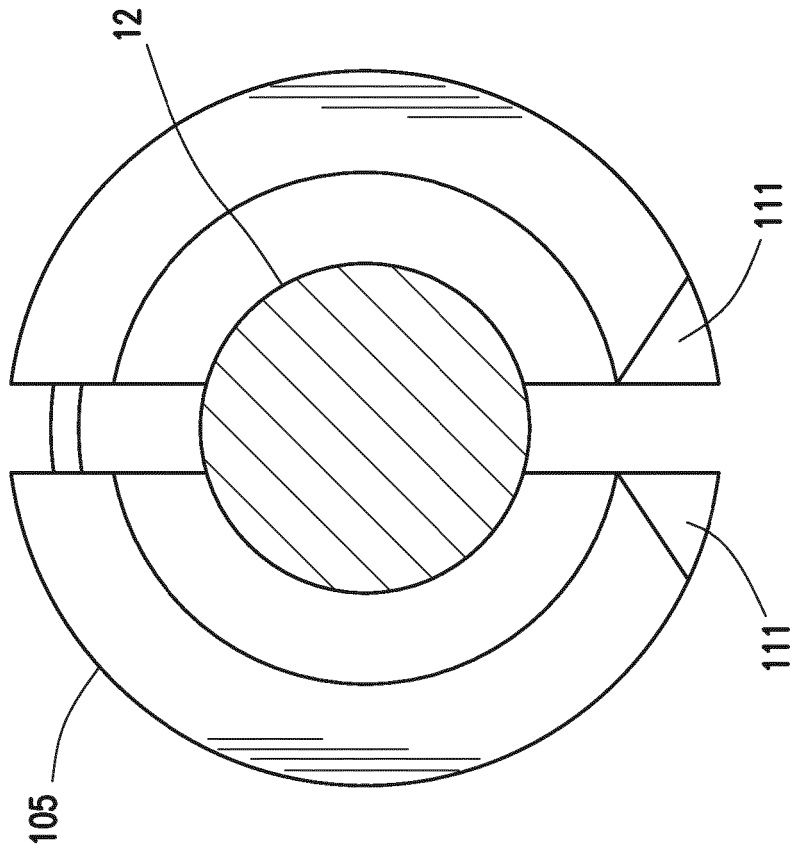


FIG. 4B

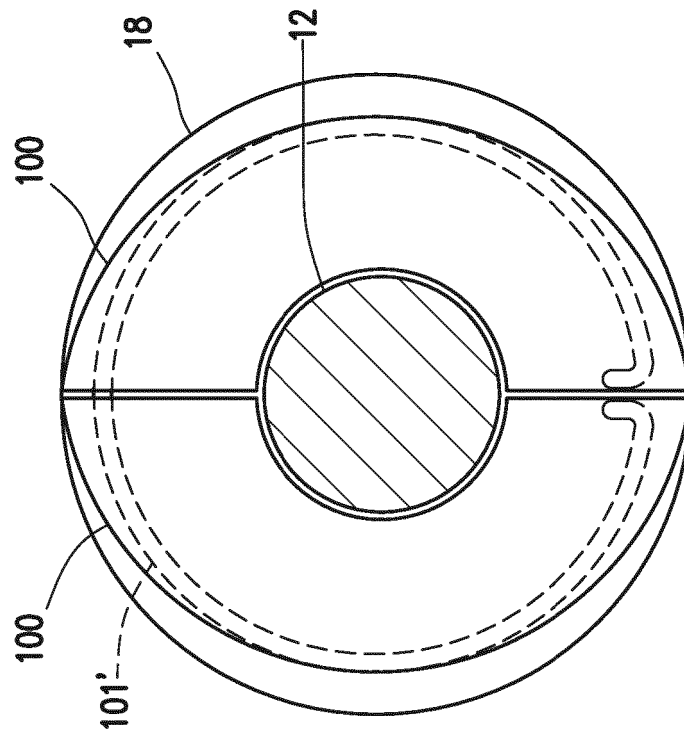


FIG. 5B

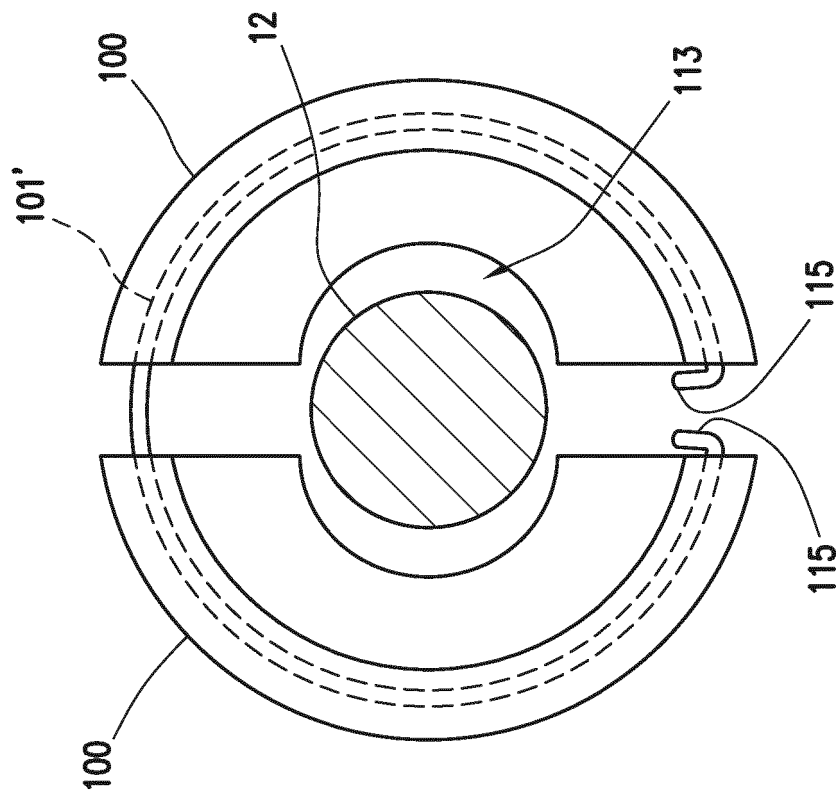


FIG. 5A

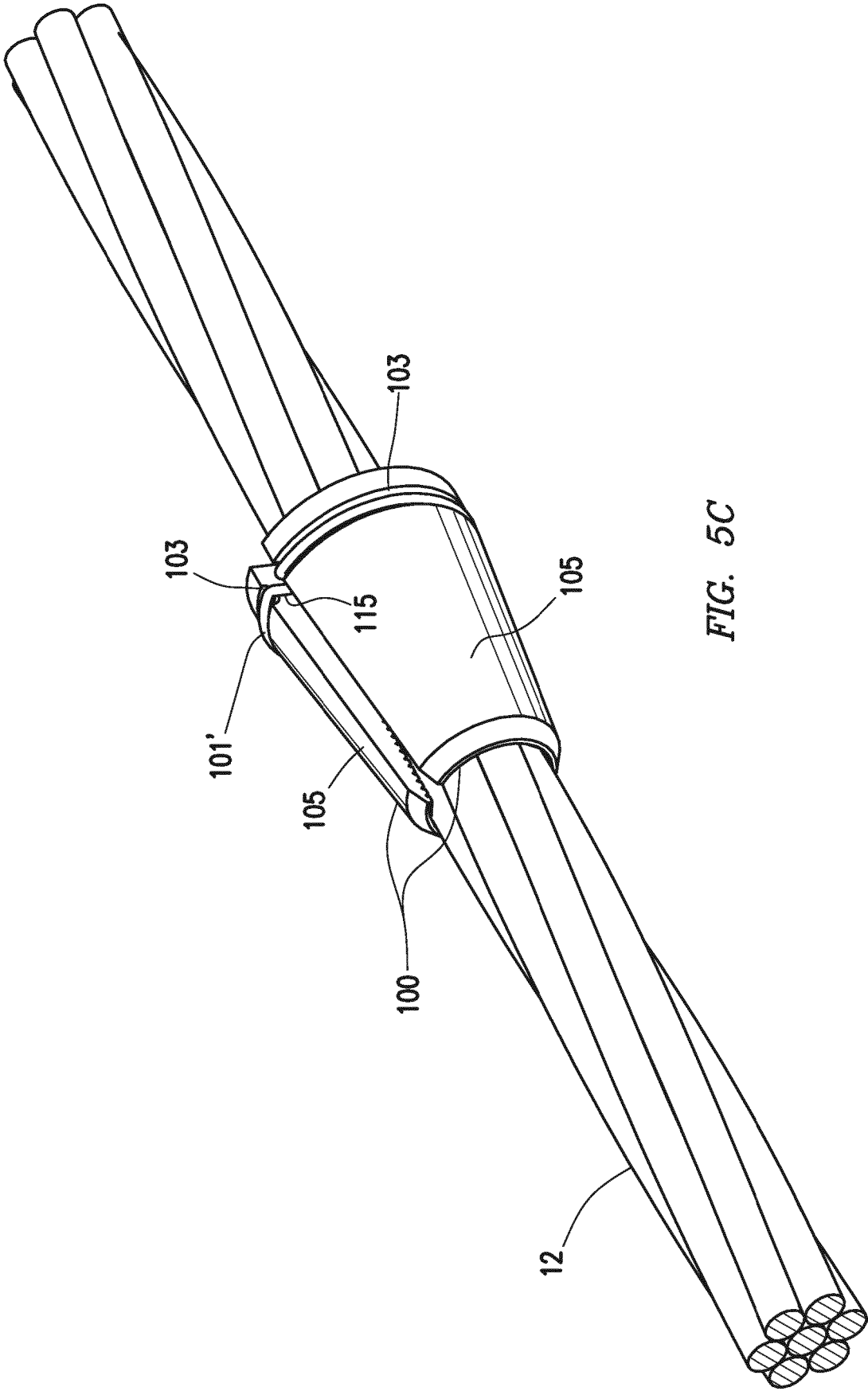


FIG. 5C

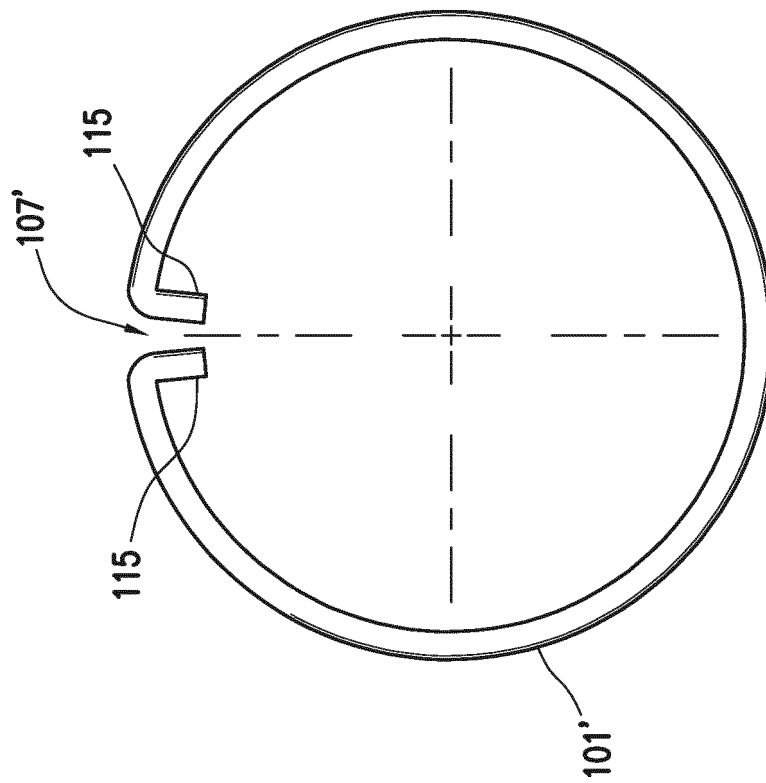


FIG. 5D

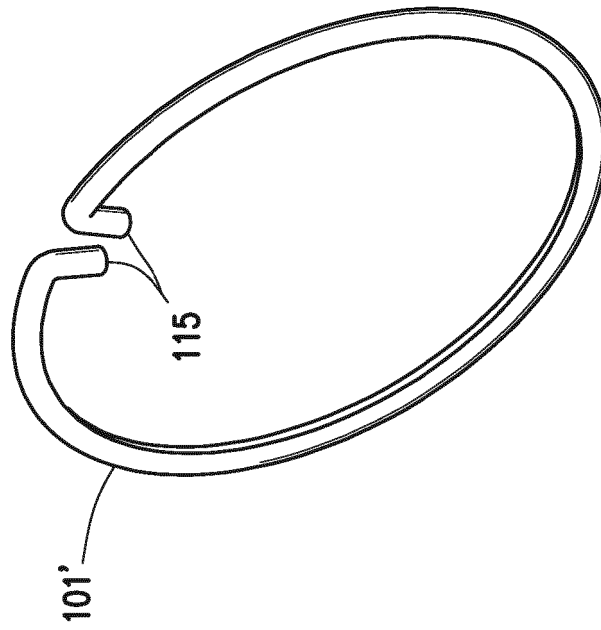


FIG. 5E

REFERENCES CITED IN THE DESCRIPTION

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