

Description

This invention relates to quick fastening systems and has particular, though not exclusive, application to such systems incorporating reaction nuts associated with hydraulic bolt tensioning tools.

A bolt tensioning tool is essentially a hydraulic jack positioned over a nut and bolt assembly with the bolt extending centrally through the tool. In order to apply a load to the bolt, the tensioning tool must react against a nut screwed onto the bolt above the tool.

The length of the portion of the bolt protruding above the tool can be significant and, particularly in restricted and/or hazardous environments, such as underwater or in the nuclear industry, screwing of the reaction nut onto or from the bolt can be a time consuming and exhausting procedure, especially on larger diameter bolts with fine threads.

There are numerous other situations where two components are joined together by one or more nut and bolt assemblies and in which the free end extent of the bolt protrudes some distance beyond the associated component whereby it is necessary to screw the nut over a considerable distance before the joint is effected. Again this can prove a time consuming exercise.

In order to overcome this problem, it has been proposed, for example in US patent specification no. 4083288, to provide a split nut comprising two half nuts which can be located on a bolt at any axial position therealong, the split nut being provided with a conical surface thereon for co-operation with a complementary recess in a washer or other workpiece. On tightening, the components of the split nut are held together and in threaded engagement with the bolt by co-operation between the conical surface thereon and the recess in the workpiece.

This concept has been applied to hydraulic bolt tensioners, for example as disclosed in US patent specification no. 4438901 and UK patent specification no. 2143608 in which the puller of the tensioner incorporates a collet consisting of a plurality of segments.

A hydraulic bolt tensioner incorporating a simplified puller in the form of a split nut provided with a cam surface thereon for engagement by a complementary recess in the piston of the hydraulic piston-cylinder assembly is disclosed in UK patent specification no. 2193549.

These known split nuts all suffer from the major disadvantage that they initially require the application thereto of an external radially-inwardly directed force to maintain threaded engagement with the associated bolt - i.e. in the absence of such a force, the components of the split nut, being separate from one another, become disengaged from the bolt.

Thus it will be appreciated that it is very difficult, if not impossible, to use such split nuts in upside down

or even horizontal situations, while, in the application of these known split nuts to hydraulic bolt tensioners in such inverted or horizontal situations, it is necessary to hold onto both the tensioner and the nut until positive co-operation between the piston and the nut has been effected.

A split nut comprises at least two segments and it is essential that the segments actually associated with one another are combined to comprise a given split nut - using other than the correct segments in combination with one another can lead to problems in matching the threads of the segments.

With the known arrangements, particularly in mass production of the split nuts in question and because of the entirely separate nature of the segments, it is easy to mismatch the segments and to end up with a nut comprising incompatible segments.

It has been proposed, for example in United Kingdom specification no. 1520555, to interconnect the two halves of a split nut by means of thin flexible webs extending between the two halves of the nut, the nut halves also being provided with co-operating pins and recesses for preventing inadvertent opening of the nut halves after they have been mated about the associated bolt.

The split nut disclosed in United Kingdom specification no. 1520555 is of a synthetic resin material and is provided with means for retaining the two halves of the split nut in their operative position on the associated bolt. These means comprise an annular projection formed on the wall of each recess and a corresponding annular portion bounding each pin, which annular projections and portions snap one over the other on insertion of the pins into the recesses to retain the nut halves in a mating relationship.

Such an arrangement is not suited to quick and repetitive application and removal of a nut to and from a bolt, in that the co-operating annular projections and portions on the recesses and pins respectively, being of a relatively soft synthetic material, would wear and/or-breakdown if they were repeatedly engaged and disengaged.

It would be desirable to be able to provide a quick fastening system incorporating a nut capable of achieving an operative or locking position on an associated bolt quickly and including improved releasable means for retaining the nut in its operative position on the bolt which are capable of withstanding repeated actuation thereof.

According to the present invention there is provided a quick fastening system comprising a nut having a plurality of internally threaded arcuate segments each including a part frusto-conical surface thereon, a bolt for receiving thereon said nut, and a component bounding said bolt and provided with a frusto-conical surface corresponding with the surfaces of the segments, the system further comprising, for each pair of segments, one or more guide pins along which the

segments are radially slidable relative to one another between inoperative positions displaced radially outwardly of concentricity and operative positions in which the segments are substantially concentric and the nut presents a frusto-conical surface thereto, and releasable means for retaining the segments in said operative positions, the arrangement being such that, on-location of the nut on the bolt the frusto-conical surface of the nut engages the frusto-conical surface of the component bounding the bolt, relative axial movement between the nut and said component urging the segments of the nut radially inwardly into positive threaded engagement with the bolt, characterised in that at least one of the guide pins of each pair of segments has a recess provided therein, the releasable retaining means comprising, for the or each recessed guide pin, a bearing member resiliently biased towards the associated guide pin to be received in said recess when the segments are in their operative positions.

It will be appreciated that the guide means reacting between the segments of a nut ensure that the segments of a given nut are retained in association with each other and that a continuous, mating thread is provided by the nut, while the provision of the releasable means for retaining the segments in their operative positions enables a nut to be located on a bolt at any axial point therealong to make initial threaded engagement therewith without the requirement for any external radial force to retain the nut in said initial threaded engagement with the bolt, the nature of the releasable means being such as to enable quick and repeated application of the nut to, and removal of the nut from, a bolt without any significant wear thereto whereby a given nut can be used time and time again to effect a plurality of temporary fixtures.

In one embodiment of the invention, the segments are resiliently urged into said inoperative positions, for example by coil springs reacting between adjacent segments.

In a preferred embodiment of the invention, the nut comprises two segments each of generally semi-circular shape in transverse section, a pair of guide pins being provided one adjacent each end of the diameters of the segments and each extending perpendicular to said diameters.

Conveniently the guide pins are each mounted on, to project from, one of the segments, the other segment being provided with corresponding guide channels therein and carrying the releasable retaining means.

Alternatively, however, each segment may carry one of the guide pins and be provided with a corresponding guide channel for the other guide pin and releasable retaining means for co-operation with the other guide pin.

By way of examples only, embodiments of the invention will now be described in greater detail with ref-

erence to the accompanying drawings of which:

Fig. 1 is a plan view from above of a nut according to the invention;

Figs. 2 and 3 are views in the direction of arrows 'A' and 'B' respectively in Fig. 1, and

Fig. 4 and 5 show, partly in vertical section, two applications of the nut according to the invention.

Referring to Figs. 1 to 3 there is shown a quick-fastening nut according to the invention comprising a pair of opposed, internally threaded segments 2,4, the segments 2,4 including lower portions 6,8 respectively having downwardly and inwardly tapering outer surfaces of generally semi-frusto-conical appearance and upper portions 10,12 respectively of generally semi-cylindrical shape.

A pair of guide pins 14,16 are secured to, to project outwardly one from each end face of, the segment 2, the pins projecting parallel with one another in a direction perpendicular to the bounding diameter of the segment 2.

A pair of corresponding channels 18,20 are formed in the segment 4, the guide pins 14,16 being received within said channels whereby the segments 2,4 are slidable relative to one another in the direction of said pins 14,16 between an inoperative position of the nut shown in the drawings and determined by abutment of heads 14a,16a on the pins 14,16 with shoulders 18a,20a on the guide channels 18,20, and an operative position of the nut in which the end faces of the segments 2,4 are positioned closely adjacent to, but slightly spaced from, one another.

The segments 2,4 are resiliently urged towards their inoperative positions by means of coil springs 22,24 mounted on the guide pins 14,16 respectively and reacting between the end faces of the segments 2,4.

Mounted in the segment 4, one for each of the guide pins 14,16, are a pair of releasable retaining means indicated generally at 26,28. Each retaining means 26,28 comprises a ball bearing 30 resiliently urged in a direction parallel with the central longitudinal axis of the nut by means of a coil spring 32 into engagement with the associated guide pin 14,16, the spring 32 reacting between a screw-threaded bolt 34 mounted in the segment 4 and the ball bearing 30.

Each guide pin 14,16 is provided with a circumferential groove 36 therein the axial position of which along the associated guide pin 14,16 is such that, when the segments 2,4 are in their operative positions, the grooves 36 are located immediately below their associated bearings 30, said bearings 30 thus being resiliently urged by the springs 32 into the grooves 36 therebelow and retaining the segments 2,4 in said operative positions.

Each segment 2,4 is provided with an axially-extending aperture 38 in the upper surface thereof for the insertion therein of a suitable key or the like to facilitate separation of the segments from their opera-

tive positions to their inoperative positions, as well as a pair of radially-extending toggle holes 40 for the insertion therein of a lever or the like to facilitate rotation of the nut on an associated bolt.

Fig. 4 illustrates a first application of the above described nut. Referring to Fig. 4 there is shown a hydraulic bolt tensioning tool indicated generally at 42 and positioned on a threaded bolt 44 to be tensioned, the bolt 44 carrying an associated nut 46 to be tightened on the bolt 44. The tool 42 may be of relatively conventional form other than that the end surface of the piston 48 includes an inwardly and downwardly tapering surface 50 conforming with that of the lower portions 6,8 of the segments 2,4 for reasons which will become apparent.

As mentioned above, actuation of the tensioning tool 42 requires the provision of a reaction nut on the bolt 44 above the tool. Use of a conventional reaction nut would require the nut to be screwed down the upper extent of the bolt 44 into engagement with the tool 42 which can be a time-consuming and laborious exercise particularly on long bolts with fine threads.

These problems are overcome by using the nut shown in Figs. 1 to 3. More particularly, the nut in its inoperative position - i.e. with the segments 2,4 separated from one another - is positioned round the upper extent of the bolt 44 and is lowered into engagement with the upper regions of the tool 42, the lower regions of the tapering outer surfaces of the portions 6,8 of the segments 2,4 engaging with the upper regions of the tapering surface 50 of the piston 48 of the hydraulic tensioning tool 42.

The segments 2,4 are then moved towards their operative positions until the ball bearings 30 snap into the grooves 36 to determine said operative positions, in which positions the internal thread of the segments 2,4 is engaged with the thread of the bolt 44.

The nut is then screwed down the bolt 44, typically one or two turns, until the tapered surfaces of the portions 6,8 of the segments 2,4 mate with the frusto-conical surface 50 of the piston 48 as shown in Fig. 4, the nut then being in its reaction position.

On actuation of the tensioning tool 42, an axial force is applied to the reaction nut by way of the surface 50 of the piston 48, this force having a radially inward component which serves to urge the segments 2,4 inwardly into even more positive threaded engagement with the bolt 44 and which overcomes the radially outward forces, and consequential hoop stress, set up within the nut as a result of the tension between the threads of the nut and the bolt 44. In this respect, the angle between the tapered surfaces of the portions 6,8 of the segments 2,4 and the vertical is significantly less than the angle of the thread of the segments 2,4 and bolt 44.

Thus, the greater the force applied to the reaction nut on the bolt 44 the more positively is the nut secured on the bolt 44.

When it is desired to remove the reaction nut from the bolt 44, the nut is unscrewed sufficiently along the bolt 44 to disengage the tapering portions 6,8 of the segments 2,4 from the surface 50 of the piston 48 whereby the segments 2,4 can be separated from one another into their inoperative positions, for example by means of a key or keys located in the apertures 38, and the nut is then lifted up and off the bolt 44.

Thus there is provided a quick-fastening, quick-release nut enabling rapid location on and removal from even the longest of bolts and which is such that, under load, maximum thread engagement is effected with the associated bolt under all conditions - this is a useful safety feature in the event that, initially, the nut is not adequately engaged with the bolt by the operator.

Further, it will be appreciated that the described nut can be located on a downwardly or horizontally extending bolt without the application thereto of any external radial force, the retention of the segments in their operative positions by the releasable retaining means ensuring initial threaded engagement between the nut and the bolt regardless of the orientation of the bolt.

The provision of a split nut comprising two interconnected segments ensures a continuous thread to the nut.

Fig. 5 shows an alternative application of the quick-fastening nut of the invention in which the nut is used in combination with a bolt 52 to effect the securing together of two components 54,56.

More particularly, the assembly includes, as well as the quick-fastening nut, an annular washer indicated generally at 58 the bore 60 of which is tapered to conform with the frusto-conical shape of the lower portions 6,8 of the segments 2,4, the washer 58 being interposed between the nut and the component 54.

In use, the bolt 52 is positioned through associated bores in the components 54,56 and the washer 58 is positioned on that part of the bolt 52 extending above the component 54. The nut in its inoperative condition is then located over the bolt 52 until the tapering lower regions of the lower portions 6,8 thereof abut the upper regions of the tapering bore 60 in the washer 58.

The segments 2,4 are moved to their operative positions as described with reference to Fig. 4 to engage the threads of the segments and the bolt 52 and the nut is screwed down the bolt 52 until the tapered surfaces of the portions 6,8 of the segments 2,4 mate with the bore 60 of the washer 58.

Securing together of the components 54,56 is then effected by rotating the bolt 52 in the nut. Again, the tighter the joint, the more positive is the threaded engagement between the nut and the bolt 52.

The washer 58 may be integrally formed with the component 54 or the component 54 may be provided with a tapering recess therein equivalent to the bore

60, in which case the washer can be dispensed with.

The precise construction of the quick-fastening nut of the invention may be varied from that described above and illustrated in Figs. 1 to 3 without departing from the scope of the invention. For example, the guide pins 14,16 may be mounted one on each of the segments 2,4 with the releasable retaining means 26,28 mounted in the other of the segments 2,4 while there may be more than two segments each with their associated guide pin or pins and retaining means. Other variations will be apparent to those skilled in the art.

It will also be appreciated that the nut of the invention has numerous applications other than those described and illustrated whenever nut and bolt assemblies are used, and in particular when the extent of the bolt along which a conventional nut would have to be screwed is substantial, relatively inaccessible or contained within a hostile environment, such as sub-sea.

Claims

1. A quick fastening system comprising a nut having a plurality of internally threaded arcuate segments (2,4) each including a part frusto-conical surface (6,8) thereon, a bolt (44,52) for receiving thereon said nut, and a component (48,58) bounding said bolt (44,52) and provided with a frusto-conical surface (50,60) corresponding with the surfaces (6,8) of the segments (2,4), the system further comprising, for each pair of segments (2,4), one or more guide pins (14,16) along which the segments (2,4) are radially slidable relative to one another between inoperative positions displaced radially outwardly of concentricity and operative positions in which the segments (2,4) are substantially concentric and the nut presents a frusto-conical surface thereto, and releasable means (26,28) for retaining the segments (2,4) in said operative positions, the arrangement being such that, on location of the nut on the bolt (44,52), the frusto-conical surface (6,8) of the nut engages the frusto-conical surface (50, 60) of the component (48,58) bounding the bolt (44,52), relative axial movement between the nut and said component (48,58) urging the segments (2,4) of the nut radially inwardly into positive threaded engagement with the bolt (44, 52), characterised in that at least one of the guide pins (14, 16) of each pair of segments (2,4) has a recess (36) provided therein, the releasable retaining means (26,28) comprising, for the or each recessed guide pin (14,16), a bearing member (30) resiliently biased towards the associated guide pin (14,16) to be received in said recess (36) when the segments (2,4) are in their operative positions.

2. A system as claimed in claim 1 in which the segments (2,4) are resiliently urged into said inoperative positions by coil springs (22,24) reacting between adjacent segments.
3. A system as claimed in claim 1 or claim 2 and comprising two segments (2,4) each of generally semi-circular shape in transverse section, a pair of guide pins (14,16) being provided one adjacent each end of the diameters of the segments (2,4) and each extending perpendicular to said diameters.
4. A system as claimed in claim 3 in which the guide pins (14,16) are each mounted on, to project from, one of the segments (2,4), the other segment (4,2) being provided with corresponding guide channels (18,20) therein and carrying the releasable retaining means (26,28).
5. A system as claimed in claim 3 in which each segment (2,4) carries one of the guide pins (14,16) and is provided with a corresponding guide channel (18,20) for the other guide pin (16,14) and with releasable retaining means (26,28) for co-operation with the other guide pin (16,14).

Patentansprüche

1. Schnellverschlußsystem mit einer Mutter mit einer Vielzahl bogenförmiger Segmente (2,4) mit Innengewinde, die jeweils eine teilweise kegelstumpffartige Oberfläche (6,8) darauf umfassen, einem Bolzen (44,52) zum Aufnehmen der genannten Mutter darauf, und einem Bestandteil (48,58), der den genannten Bolzen (44,52) in Schranken hält und mit einer kegelstumpffartigen Oberfläche (50,60) versehen ist, die den Oberflächen (6,8) der Segmente (2,4) entspricht, wobei das System weiterhin für jedes Paar Segmente (2,4) einen oder mehrere Führungsstifte (14,16) umfaßt, entlang derer die Segmente (2,4) radial zueinander zwischen Ruhepositionen, die radial aus der Konzentrität nach außen versetzt sind, und Betriebspositionen gleitbar sind, in denen die Segmente (2,4) im wesentlichen konzentrisch sind und die Mutter ihnen eine kegelstumpffartige Oberfläche darbietet, sowie lösbare Einrichtungen (26,28) zum Halten der Segmente (2,4) in den genannten Betriebspositionen, wobei die Anordnung so ist, daß die kegelstumpffartige Oberfläche (6,8) der Mutter bei einer Position der Mutter auf dem Bolzen (44,52) in die kegelstumpffartige Oberfläche (50,60) des Bestandteils (48,58) eingreift, der den Bolzen (44,52) in Schranken hält, wobei relative axiale Bewegung zwischen der Mutter und dem genannten Be-



60, in which case the washer can be dispensed with.

The precise construction of the quick-fastening nut of the invention may be varied from that described above and illustrated in Figs. 1 to 3 without departing from the scope of the invention. For example, the guide pins 14, 16 may be mounted one on each of the segments 2, 4 with the releasable retaining means 26, 28 mounted in the other of the segments 2, 4 while there may be more than two segments each with their associated guide pin or pins and retaining means. Other variations will be apparent to those skilled in the art.

It will also be appreciated that the nut of the invention has numerous applications other than those described and illustrated whenever nut and bolt assemblies are used, and in particular when the extent of the bolt along which a conventional nut would have to be screwed is substantial, relatively inaccessible or contained within a hostile environment, such as sub-sea.

Claims

1. A quick fastening system comprising a nut having a plurality of internally threaded arcuate segments (2,4) each including a part frusto-conical surface (6,8) thereon, a bolt (44,52) for receiving thereon said nut, and a component (48,58) bounding said bolt (44,52) and provided with a frusto-conical surface (50,60) corresponding with the surfaces (6,8) of the segments (2,4), the system further comprising, for each pair of segments (2,4), one or more guide pins (14,16) along which the segments (2,4) are radially slidable relative to one another between inoperative positions displaced radially outwardly of concentricity and operative positions in which the segments (2,4) are substantially concentric and the nut presents a frusto-conical surface thereto, and releasable means (26,28) for retaining the segments (2,4) in said operative positions, the arrangement being such that, on location of the nut on the bolt (44,52), the frusto-conical surface (6,8) of the nut engages the frusto-conical surface (50,60) of the component (48,58) bounding the bolt (44,52), relative axial movement between the nut and said component (48,58) urging the segments (2,4) of the nut radially inwardly into positive threaded engagement with the bolt (44,52), characterised in that at least one of the guide pins (14,16) of each pair of segments (2,4) has a recess (36) provided therein, the releasable retaining means (26,28) comprising, for the or each recessed guide pin (14,16), a bearing member (30) resiliently biased towards the associated guide pin (14,16) to be received in said recess (36) when the segments (2,4) are in their operative positions.
2. A system as claimed in claim 1 in which the segments (2,4) are resiliently urged into said inoperative positions by coil springs (22,24) reacting between adjacent segments.
3. A system as claimed in claim 1 or claim 2 and comprising two segments (2,4) each of generally semi-circular shape in transverse section, a pair of guide pins (14,16) being provided one adjacent each end of the diameters of the segments (2,4) and each extending perpendicular to said diameters.
4. A system as claimed in claim 3 in which the guide pins (14,16) are each mounted on, to project from, one of the segments (2,4), the other segment (4,2) being provided with corresponding guide channels (18,20) therein and carrying the releasable retaining means (26,28).
5. A system as claimed in claim 3 in which each segment (2,4) carries one of the guide pins (14,16) and is provided with a corresponding guide channel (18,20) for the other guide pin (16,14) and with releasable retaining means (26,28) for co-operation with the other guide pin (16,14).

Patentansprüche

1. Schnellverschlußsystem mit einer Mutter mit einer Vielzahl bogenförmiger Segmente (2,4) mit Innengewinde, die jeweils eine teilweise kegelstumpffartige Oberfläche (6,8) darauf umfassen, einem Bolzen (44,52) zum Aufnehmen der genannten Mutter darauf, und einem Bestandteil (48,58), der den genannten Bolzen (44,52) in Schranken hält und mit einer kegelstumpffartigen Oberfläche (50,60) versehen ist, die den Oberflächen (6,8) der Segmente (2,4) entspricht, wobei das System weiterhin für jedes Paar Segmente (2,4) einen oder mehrere Führungsstifte (14,16) umfaßt, entlang derer die Segmente (2,4) radial zueinander zwischen Ruhepositionen, die radial aus der Konzentrität nach außen versetzt sind, und Betriebspositionen gleitbar sind, in denen die Segmente (2,4) im wesentlichen konzentrisch sind und die Mutter ihnen eine kegelstumpffartige Oberfläche darbietet, sowie lösbare Einrichtungen (26,28) zum Halten der Segmente (2,4) in den genannten Betriebspositionen, wobei die Anordnung so ist, daß die kegelstumpffartige Oberfläche (6,8) der Mutter bei einer Position der Mutter auf dem Bolzen (44,52) in die kegelstumpffartige Oberfläche (50,60) des Bestandteils (48,58) eingreift, der den Bolzen (44,52) in Schranken hält, wobei relative axiale Bewegung zwischen der Mutter und dem genannten Be-



standteil (48,58) die Segmente (2,4) der Mutter radial nach innen in formschlüssigen Gewindeeingriff mit dem Bolzen (44,52) drängt, dadurch gekennzeichnet, daß zumindest einer der Führungsstifte (14,16) eines jeden Paares von Segmenten (2,4) eine Ausnehmung (36) darin vorgesehen hat, wobei die lösbaren Halteeinrichtungen (26,28) für den oder jeden Führungsstift (14,16) mit Ausnahme ein Auflageelement (30) umfaßt, das elastisch hin gegen den zugeordneten Führungsstift (14,16) vorgespannt ist, um in der genannten Ausnehmung (36) aufgenommen zu werden, wenn die Segmente (2,4) sich in ihren Betriebspositionen befinden.

2. System nach Anspruch 1, worin die Segmente (2,4) durch Schraubenfedern (22,24), die zwischen aneinandergrenzenden Segmenten wirken, elastisch in die genannten Ruhepositionen gedrängt sind.
3. System nach Anspruch 1 oder 2, und welches zwei Segmente (2,4) umfaßt, die im Querschnitt jeweils allgemein halbkreisförmig ausgebildet sind, wobei ein Paar Führungsstifte (14,16) angrenzend an jeweils ein Ende der Durchmesser der Segmente (2,4) vorgesehen ist und sich jeweils senkrecht zu den genannten Durchmessern erstreckt.
4. System nach Anspruch 3, worin die Führungsstifte (14,16) jeweils auf einem der Segmente (2,4) montiert sind, um daraus hervorzuragen, wobei das andere Segment (4,2) mit entsprechenden Führungskanälen (18,20) darin versehen ist und die lösbaren Halteeinrichtungen (26,28) trägt.
5. System nach Anspruch 3, worin jedes Segment (2,4) einen der Führungsstifte (14,16) trägt und mit einem entsprechenden Führungskanal (18,20) für den anderen Führungsstift (16,14) und mit lösbaren Halteeinrichtungen (26,28) zum Zusammenwirken mit dem anderen Führungsstift (16,14) ausgestattet ist.

Revendications

1. Un système de fixation rapide comprenant un écrou ayant une pluralité de segments arqués (2, 4) formant filetage, interne et comprenant chacun une partie formant surface frusto-conique (6, 8) sur celui-ci, une vis (44, 52) apte à recevoir ledit écrou sur celle-ci, et un élément (48, 58) reliant ladite vis (44, 52) et pourvu d'une surface frusto-conique (50, 60) correspondant aux surfaces (6, 8) des segments (2, 4), le système comprenant en outre, pour chaque paire de segments (2, 4),

au moins un plot de guidage (14, 16) le long duquel les segments (2,4) sont déplaçables radialement à coulissement l'un par rapport à l'autre entre des positions non-opérationnelles où ils sont déplacés radialement vers l'extérieur par rapport à leur concentricité et des positions fonctionnelles dans lesquelles les segments (2, 4) sont substantiellement concentriques et où l'écrou présente à ceux-ci une surface frusto-conique, ainsi que des moyens relâchables (26, 28) pour retenir les segments (2, 4) dans leurs positions opérationnelles, l'arrangement étant tel que, lors du positionnement de l'écrou sur la vis (44, 52), la surface frusto-conique (6, 8) de l'écrou engage la surface frusto-conique (50, 60) de l'élément (48, 58) reliant la vis (44, 52), un mouvement axial relatif entre l'écrou et ledit élément (48, 58) sollicitant les segments (2, 4) de l'écrou radialement vers l'intérieur en engagement positif fileté avec la vis (44, 52), caractérisé en ce qu'au moins l'un des plots de guidage (14, 16) de chaque paire de segments (2, 4) comporte un renforcement (36) prévu dans celui-ci, les moyens de rétention relâchables (26, 28) comprenant, pour le ou pour chacun des plots de guidage (14, 16) un élément formant palier (30) sollicité de façon élastique vers le plot de guidage associé (14, 16) de manière à être reçu dans ledit renforcement (36) quand les segments (2, 4) sont dans leurs positions opérationnelles.

2. Un système selon la revendication 1, dans lequel les segments (2, 4) sont sollicités de façon élastique jusqu'à leurs positions non-opérationnelles par des ressorts hélicoïdaux (22, 24) qui réagissent entre des segments adjacents.

3. Un système selon la revendication 1 ou la revendication 2 et comprenant deux segments (2, 4) chacun de forme généralement semi-circulaire en section transversale, une paire de plots de guidage (14, 16) étant prévue l'une adjacente à chacune des extrémités des diamètres des segments (2, 4) et s'étendant chacune perpendiculairement auxdits diamètres.

4. Un système selon la revendication 3, dans laquelle les plots de guidage (14, 16) sont chacun montés sur, de manière à s'étendre depuis, l'un des segments (2, 4), l'autre segment (4, 2) étant prévu avec des canaux de guidage correspondants (18, 20) dans celui-ci et supportant les moyens de rétention relâchables (26, 28).

5. Un système selon la revendication 2, dans lequel chaque segment (2, 4) supporte l'un des plots de guidage (14, 16) et est pourvu d'un canal de guidage correspondant (18, 20) pour l'autre plot de

guidage (16, 14) et avec les moyens de rétention relâchables (26, 28) aptes à coopérer avec l'autre plot de guidage (16, 14).



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