

Description

Tubular connectors are commonly used in sub-sea and downhole locations. In such locations the connector are exposed to corrosive conditions and to the wear and detrimental affects of sediment, dirt, and circulating fluids. Further in such applications for a tubular connector, it is most advantageous if the tubular connector has as small a diameter as possible to conserve diametrical space.

In the prior art there have been many tubular connectors which could be remotely operated. A typical example of such connectors is the collet type of connectors which are disclosed in U. S. Patent Nos. 3,321,217 and 3,353,595. Each of these devices are operated by a plurality of pressure responsive means or hydraulic actuators which cam a clamping means into engagement with mating portions of the end of the tubular member opposed to the tubular member carrying the pressure responsive means. Such connectors are not suitable for use in spaces of confined diameter. They also have the disadvantage that the latching elements are not protected from the corrosive and other adverse condition of the environment in which the unit is to be installed.

Another example of the prior art is disclosed in U. S. Patent No. 3,241,864 which includes a lower lead-in funnel shape to guide the entrance of the upper end of the tubular member into the connector. The locking is automatically accomplished through the use of a plurality of resilient circumferentially spaced fingers extending from an upper tubular body and such fingers latch into and out of a latching groove on the exterior of the tubular member which is to be engaged by the connector. A similar structure is disclosed in U.S. Patent No. 3,918,485. This structure includes the flexible latching fingers and also adds an actuated camming collar which cams the fingers into their latching position or releases them from such position. The latching fingers are exposed to the local environment.

GB-A-2165908 describes a tubular connector in which radially movable locking dogs are actuated by an axially slidable sleeve to latch together two tubular members.

Another structure of the prior art is hereinafter disclosed with respect to the structure disclosed in FIGURE 2 of the drawings. While such structure has been found suitable for downhole applications, it does not protect its latching elements from the environment in which it is installed. In all prior art structures of tubular connectors, such structures do not protect their latching means and many also are not suitable for installation in spaces of restricted diameter.

According to the present invention there is provided a tubular connector comprising a first tubular member and a second tubular member, a sleeve slidably mounted around the exterior of the first tubular member, and a plurality of latching fingers carried within the sleeve, each latching finger having an internal profile which can be moved into engagement with an exterior profile on the tubular members to latch them together when the sleeve is moved axially to a latching position, said sleeve having a surface which engages said latching fingers when they are in their restrained position and urges them to a position in which the profiles interengage, at least a portion of said sleeve being spaced from one of the tubular members to form a pressure chamber, and a port extending through said one tubular member into said pressure chamber for supplying fluid pressure to said chamber to effect movement of said sleeve, means provided for restraining the axial movement of the latching fingers when said profile is in alignment with the exterior profile of the tubular members, characterised in that the latching fingers are moveable with the sleeve during initial axial movement thereof, the arrangement is such that when fluid pressure is supplied to said chamber, the sleeve and latching fingers initially move together axially until the latching fingers are restrained by said restraining means following which further axial movement of said sleeve causes the latching fingers to move radially inwardly so that said profiles interengage, the sleeve in its latching position extending beyond the end of the latching fingers and including means sealing between the interior of the sleeve and the exterior of the other of the tubular members beyond the end of the latching fingers, and means sealing between the interior of the sleeve and the exterior of said one of the tubular members.

One embodiment of the present invention provides a tubular connector including a first tubular member with an enlarged external end portion, an external rib space from said enlarged external end portion and an internal tapered end sealing surface, a second tubular member having an enlarged external end portion and an internal tapered end sealing surface, a sleeve surrounding and slidable on said second tubular member and having an enlarged end extending beyond said second tubular member with an inner surface tapering inwardly and toward said second tubular member, said sleeve being spaced from said second tubular member to provide an annular pressure chamber for moving said sleeve along said second tubular member, a plurality of latching fingers positioned within said sleeve and having projections for engaging said external enlargements of said tubular members, mating cam surfaces on said latching

fingers and within said sleeve whereby movement of said sleeve to extend beyond said second tubular member cams said latching fingers into secure engagement with said enlargements and brings said sleeve enlargement into sealing engagement with said external rib on said first tubular section to insulate said latching fingers from both the interior and exterior of said tubular members.

The invention will be described now by way of example only, with particular reference to the accompanying drawings. In the drawings:

FIGURE 1 is an elevation view of a subsea wellhead showing the use of the tubular connection of the present invention in a wellbore.

FIGURE 2 is a quarter sectional view of a tubular connector of the prior art which has been used in a wellbore.

FIGURE 3 is a quarter sectional view of the improved tubular connector of the present invention with the two tubular members spaced apart and ready for the connection to be made.

FIGURE 4 is a quarter sectional view of the connector with the members commencing their interengagement.

FIGURE 5 is another similar view of the connector with the members progressing and the latching fingers partially set.

FIGURE 6 is another similar view of the connector in its connected and latched position.

FIGURE 7 includes FIGURES 7A and 7B which are partial enlarged sectional views of the connector in its connected and latched position with FIGURE 7B showing the lower portion or extension of the connector shown in FIGURE 7A.

In FIGURE 1 subsea well 10 is illustrated including mudline support 12 on which flowline connector 14 is supported, wellhead 16 within wellbore 18 and connected through connector 20, master valve assembly 22, connector 24 and flowline extension spool 26 to the equipment on support 12 including connector 14. Connectors 14, 20 and 24 are the type of connector applications for which the tubular connector of the present invention is suitable.

Prior art connector 28, shown in FIGURE 2, has been used in such installations. Connector 28 includes first tubular member 30 having on its upper end internal tapered end sealing surface 32 and external engagement grooves 34, and second tubular member 36 having flange 38 on its upper end, and lower end internal tapered sealing surface 40 and external latch foot groove 42 on its lower end, sleeve 44 surrounding second tubular member 36 with latching fingers 46 positioned between the lower interior surface 48 of sleeve 44 and the lower exterior of second tubular member 36. Latching fingers 46 include body 50, internal foot 52 on their upper end which projects into latch foot groove 42

and internal lands or ribs 54 which are spaced and sized for latching engagement within external engagement grooves 34 in the upper end of first tubular member 30.

Sleeve 44 is slidably mounted on the exterior of second tubular member 36 and includes internal rib 56 which projects into upper external recess 58 in second tubular member 36. With suitable sealing recess 58 defines upper and lower piston chambers 60 and 62 to which hydraulic fluid is delivered alternately through passages 64 and 66 respectively. When fluid pressure is delivered to upper chamber 60 sleeve 44 is moved downwardly on member 36 and causes latching fingers 46 to be cammed inwardly by the engagement of the internal surface of sleeve with the external surfaces of fingers 46 into latching engagement within engagement grooves 34 and latch foot groove 42 to thereby complete the connection between the two tubular members. Guide rods 68 are secured to the upper end of sleeve 28 and extend through suitable openings in flange 38.

As can be seen from the drawings and the foregoing description, tubular connector 28 has its latching fingers and the interior of its sleeve 44 below chambers 60 and 62 exposed to the environment surrounding tubular members 30 and 32. Further, with the prior art connector 28, difficulty can be encountered with the entry of the upper end of first tubular member 30 within the latching fingers 44.

Improved connector 70 of the present invention is illustrated in the other figures. Connector 70 includes lower tubular member 72 having upper internal tapered sealing surface 74, upper external annular hub or rib 76 and lower external rib 78 spaced below upper rib 76 by a preselected distance as hereinafter explained. Connector 70 also includes upper tubular member 80, sleeve 82 and latching fingers 84.

Upper tubular member 80 includes lower internal tapered sealing surface 86 with seal ring 88 positioned thereon and retained by its external rib 90 being engaged by snap ring 92 in internal groove 94 near the lower end of tubular member 80 as best shown in FIGURE 7. Tubular member 80 includes lower outer hub or rib 96, external setting rib 98 spaced above rib 96, external release rib 100 spaced above rib 98 and chamber defining external rib 102 spaced above rib 100 all as shown and hereinafter described in detail. O ring 101 is positioned in groove 103 on the outer surface of rib 102 for sealing against the interior surface of sleeve 82. Sealing ring 104 is positioned in surrounding relationship to the exterior of upper tubular member 80 spaced above rib 102 and includes internal seal 106 and external seal 108 which seal respectively against the exterior surface of tubular

member 80 and the interior of sleeve 82. Lock ring 110 is threaded onto tubular member 80 as shown and provides the upper shoulder against which sealing ring 104 abuts.

Sleeve 82 surrounds the lower end of upper tubular member 80 with its lower end projecting beyond the lower end of member 80 as member 80 is being lowered toward lower tubular member 72 as shown in FIGURE 3. Sleeve 82 includes internal rib 112 with O ring 114 positioned in groove 116 on the interior of rib 112 and adapted to seal against exterior surface of upper tubular member 80 between rib 102 and sealing ring 104. Sleeve 82 includes lower internal surface 118 which tapers inwardly and upwardly to receive the exterior of latching fingers 84 in their unlatched position. Tapered shoulder 120 is positioned at the upper end of surface 118 and tapers inwardly and upwardly between surface 118 and upper internal tapered surface 122. Ring 124 is threaded onto the lower end of sleeve 82 and includes internal groove 126 in which O ring 128 is positioned, upper surface 130 which tapers upwardly and inwardly to receive the lower ends of latching fingers 84 and lower surface 132 which has a shallow taper to assist in the centering of tubular member 72 within sleeve 82. Ring 134 is threaded onto the upper end of sleeve 82 and includes internal wiping seal 136 which engages the exterior of tubular member 80 above ring 110.

Latching fingers 84 include body 138 with outer surface 140 which tapers upwardly and inwardly, lower tapered surface 142 which engages surface 130 of ring 124, internal groove 144 with tapered shoulders 146 and 148 at its upper and lower ends, upper internal groove 150 which terminates in rib 152 with lower shoulder 154 and upper shoulder 156. Groove 144 is sized so that shoulders 146 and 148 can engage shoulder 158 on the upper portion of rib 96 on upper tubular member and shoulder 160 on the lower portion of external rib 76 on lower tubular member 72 in clamping engagement to retain upper tubular member 80 and lower tubular member 72 in tight sealing engagement with seal ring 88.

Improved tubular connector 70 is made up with sleeve 82 positioned around upper tubular member 80 as shown in FIGURE 3 with lower ring 124 extending below the lower end of upper tubular member 80. In this position the unit is lowered into position aligned with and approaching the upper end of lower tubular member 72. As ring 124 reaches hub 76 of lower tubular member 72, its tapered surface 132 aids in centering lower tubular member 72 within sleeve 82. Once hub 76 enters the interior of ring 124 it is in a cylindrical path leading to its engaged and sealed position with respect to the lower end of upper tubular member

80 and sealing ring 88. This cylindrical path is formed by the interior of ring 124 and the interior of the lower portion of latching fingers 84 which extend upward into surrounding relationship to hub 96 on upper tubular member 80.

Once engagement of hub 76 with hub 96 and seal ring 88 is achieved as shown in FIGURE 4, pressure is conducted through passage 162 in upper tubular member 80 into setting chamber 164 between sealing ring 104 and internal rib 112 on sleeve 82 and venting passage 166 and release chamber 168. This pressure causes sleeve 82 to move downwardly carrying latching fingers 84 in their position within surface 118. At the point as shown in FIGURE 5, lower shoulder 154 on rib 152 has engaged the upper surface of rib 98 and further downward movement of latching fingers 84 has been prevented. The continued downward movement of sleeve 82 responsive to the pressure in setting chamber 164 has caused latching fingers 84 to be forced upwardly over tapered shoulder 120 into engagement with surface 122 as shown. The taper of surface 122 cams latching fingers 84 inwardly so that hubs 76 and 96 are received within internal groove 144 of latching fingers 84. The camming action of the further movement of sleeve 82 causes shoulders 146 and 148 to wedge tightly against shoulders 158 and 160 of hubs 96 and 76 to thereby bring tubular members 72 and 80 into latched position with seal ring 88 fitting in tight metal-to-metal sealing engagement with surfaces 74 and 86 of the two tubular members as illustrated in FIGURES 6 and 7.

It should be noted from the drawings that in such latched position, O ring 128 on the interior of ring 124 is positioned in sealing engagement with the exterior surface of rib 78 and seal 136 seals against the exterior of tubular member 82 to isolate latching fingers 84 and the interior of sleeve 82 surrounding tubular member 72 and 80 and setting and release chambers 164 and 168 from the fluids, dirt, impurities and other undesirable materials contained in the environment surrounding and within tubular connector 70.

Release of tubular connector 70 from its latched position is accomplished by venting hydraulic pressure from setting chamber 164 through passage 162 and delivering hydraulic pressure through passage 166 into release chamber 168. The pressure urges sleeve 82 upwardly and this movement of sleeve 82 moves surface 122 from its camming engagement with the exterior of latching fingers 84. The engagement of the lower end surface 142 of latching fingers 84 on surface 130 of ring 124 and the engagement of upper shoulder 156 on rib 152 with the lower surface of rib 100 occurs as the movement of sleeve 82 stops. This allows sleeve 82 to stop its movement at a position

with its rib 112 a short distance below sealing ring 104 as shown in FIGURE 3.

Claims

1. A tubular connector comprising
a first tubular member (72) and a second tubular member (80), a sleeve (82) slidably mounted around the exterior of the first tubular member, and a plurality of latching fingers (84) carried within the sleeve, each latching finger having an internal profile (144) which can be moved into engagement with an exterior profile (76, 96) on the tubular members to latch them together when the sleeve is moved axially to a latching position, said sleeve having a surface which engages said latching fingers when they are in their restrained position and urges them to a position in which the profiles interengage, at least a portion of said sleeve (82) being spaced from one (80) of the tubular members to form a pressure chamber, and a port (162) extending through said one tubular member (80) into said pressure chamber (164) for supplying fluid pressure to said chamber to effect movement of said sleeve, means (98, 154) provided for restraining the axial movement of the latching fingers (84) when said profile is in alignment with the exterior profile of the tubular members characterised in that the latching fingers (84) are moveable with the sleeve during initial axial movement thereof, the arrangement is such that when fluid pressure is supplied to said chamber (164), the sleeve (82) and latching fingers (84) initially move together axially until the latching fingers are restrained by said restraining means (98, 154) following which further axial movement of said sleeve (82) causes the latching fingers (84) to move radially inwardly so that said profiles (144, 76, 96) interengage, the sleeve (82) in its latching position extending beyond the end of the latching fingers and including means (128) sealing between the interior of the sleeve and the exterior of the other (72) of the tubular members beyond the end of the latching fingers, and means (136) sealing between the interior of the sleeve and the exterior of said one of the tubular members (80).
2. A tubular connector according to claim 1 wherein said sleeve (82) has an internal cam surface (122) which coacts with a cam surface (140) on the exterior of the latching fingers (84) to effect said radially inwardly movement.
3. A tubular connector according to claim 1 or claim 2, wherein said restraining means in-

cludes

shoulder means (154) on said latching fingers (84), and

shoulder means (98) on the exterior of said one of the tubular members and positioned to restrain said latching fingers (84) surrounding the ends of the tubular members in position for clamping engagement of the tubular members.

4. A tubular connector according to any preceding claim, wherein the exterior profiles (76, 96) of the tubular members include
hubs and
said latching fingers (84) engage opposite shoulders on the hubs of said tubular members to clamp the tubular members into tight engagement.
5. A tubular connector according to any preceding claim, including metal sealing means (88) for sealing between the interior surface at the connecting ends of the tubular members (72, 80).
6. A tubular connector according to any preceding claim, wherein said pressure chamber (164) includes
means between the sleeve (82) and said one of the tubular members (80) defining a setting chamber (164) and a release chamber (168), and
means (162, 166) including said port (162) for delivering fluid pressure to and venting fluid pressure from said chambers.
7. A tubular connector according to any preceding claim, wherein the lower end (132) of said sleeve (82) is tapered downwardly and outwardly to guide said sleeve in its movement over said other tubular member (72).

Patentansprüche

1. Rohrförmige Kupplungsvorrichtung, mit einem ersten rohrförmigen Körper (72) und einem zweiten rohrförmigen Körper (80), einer Muffe (82), die verschiebbar um die Außenseite des ersten rohrförmigen Körpers angeordnet ist, und mit einer Vielzahl von Verriegelungsfingern (84), die in der Muffe gehalten werden, wobei jeder Verriegelungsfinger ein inneres Profil (144) aufweist, welches mit dem Außenprofil (76, 96) am rohrförmigen Körper in Eingriff gebracht werden kann, um diese miteinander zu verriegeln, wenn die Muffe axial in eine Verriegelungsstellung bewegt worden ist, und die Muffe eine Oberfläche aufweist, welche an den Verriegelungsfingern angreift, wenn diese



with its rib 112 a short distance below sealing ring 104 as shown in FIGURE 3.

Claims

1. A tubular connector comprising
a first tubular member (72) and a second tubular member (80), a sleeve (82) slidably mounted around the exterior of the first tubular member, and a plurality of latching fingers (84) carried within the sleeve, each latching finger having an internal profile (144) which can be moved into engagement with an exterior profile (76, 96) on the tubular members to latch them together when the sleeve is moved axially to a latching position, said sleeve having a surface which engages said latching fingers when they are in their restrained position and urges them to a position in which the profiles interengage, at least a portion of said sleeve (82) being spaced from one (80) of the tubular members to form a pressure chamber, and a port (162) extending through said one tubular member (80) into said pressure chamber (164) for supplying fluid pressure to said chamber to effect movement of said sleeve, means (98, 154) provided for restraining the axial movement of the latching fingers (84) when said profile is in alignment with the exterior profile of the tubular members characterised in that the latching fingers (84) are moveable with the sleeve during initial axial movement thereof, the arrangement is such that when fluid pressure is supplied to said chamber (164), the sleeve (82) and latching fingers (84) initially move together axially until the latching fingers are restrained by said restraining means (98, 154) following which further axial movement of said sleeve (82) causes the latching fingers (84) to move radially inwardly so that said profiles (144, 76, 96) interengage, the sleeve (82) in its latching position extending beyond the end of the latching fingers and including means (128) sealing between the interior of the sleeve and the exterior of the other (72) of the tubular members beyond the end of the latching fingers, and means (136) sealing between the interior of the sleeve and the exterior of said one of the tubular members (80).
2. A tubular connector according to claim 1 wherein said sleeve (82) has an internal cam surface (122) which coacts with a cam surface (140) on the exterior of the latching fingers (84) to effect said radially inwardly movement.
3. A tubular connector according to claim 1 or claim 2, wherein said restraining means in-

cludes

shoulder means (154) on said latching fingers (84), and

shoulder means (98) on the exterior of said one of the tubular members and positioned to restrain said latching fingers (84) surrounding the ends of the tubular members in position for clamping engagement of the tubular members.

4. A tubular connector according to any preceding claim, wherein the exterior profiles (76, 96) of the tubular members include
hubs and
said latching fingers (84) engage opposite shoulders on the hubs of said tubular members to clamp the tubular members into tight engagement.
5. A tubular connector according to any preceding claim, including metal sealing means (88) for sealing between the interior surface at the connecting ends of the tubular members (72, 80).
6. A tubular connector according to any preceding claim, wherein said pressure chamber (164) includes
means between the sleeve (82) and said one of the tubular members (80) defining a setting chamber (164) and a release chamber (168), and
means (162, 166) including said port (162) for delivering fluid pressure to and venting fluid pressure from said chambers.
7. A tubular connector according to any preceding claim, wherein the lower end (132) of said sleeve (82) is tapered downwardly and outwardly to guide said sleeve in its movement over said other tubular member (72).

Patentansprüche

1. Rohrförmige Kupplungsvorrichtung, mit einem ersten rohrförmigen Körper (72) und einem zweiten rohrförmigen Körper (80), einer Muffe (82), die verschiebbar um die Außenseite des ersten rohrförmigen Körpers angeordnet ist, und mit einer Vielzahl von Verriegelungsfingern (84), die in der Muffe gehalten werden, wobei jeder Verriegelungsfinger ein inneres Profil (144) aufweist, welches mit dem Außenprofil (76, 96) am rohrförmigen Körper in Eingriff gebracht werden kann, um diese miteinander zu verriegeln, wenn die Muffe axial in eine Verriegelungsstellung bewegt worden ist, und die Muffe eine Oberfläche aufweist, welche an den Verriegelungsfingern angreift, wenn diese



sich in ihrer zurückgebogenen Lage befinden, und diese in eine Position drücken, in welcher die Profile ineinandergreifen, und zumindest ein Teil der Muffe (82) von einem (80) der rohrförmigen Körper beabstandet ist, um eine Druckkammer zu bilden, und eine Öffnung (162) durch diesen einen rohrförmigen Körper (80) hindurch in die Druckkammer (164) geht, um dieser Kammer Druckfluid zuzuführen, und eine Bewegung der Muffe zu bewirken, und Mittel (98, 154) die zur Unterbindung der axialen Bewegung der Verriegelungsfinger (84) vorgesehen sind, wenn das Profil mit dem Außenprofil des rohrförmigen Körpers fluchtet, **dadurch gekennzeichnet**, daß die Verriegelungsfinger (84) während ihrer beginnenden axialen Bewegung mit der Muffe bewegbar sind, wobei die Anordnung so ist, daß, wenn die Kammer (164) mit Fluiddruck beaufschlagt wird, die Muffe (82) und die Verriegelungsfinger (84) sich anfangs axial zusammen bewegen, bis die Verriegelungsfinger durch die Rückhaltemittel (98, 154) zurückgehalten werden, und die folgende axiale Bewegung der Muffe (82) die Verriegelungsfinger (84) veranlaßt, sich radial nach innen zu bewegen, so daß die Profile (144, 76, 96) ineinandergreifen, wobei sich die Muffe (82) in ihrer verriegelten Position über das Ende der Verriegelungsfinger erstreckt und Mittel (128) umfaßt, die eine Abdichtung zwischen dem Inneren der Muffe und der Außenseite des ersten (72) der rohrförmigen Körper bis über das Ende der Verriegelungsfinger bewirken, und Mittel (136), die eine Abdichtung zwischen dem Inneren der Muffe und der Außenseite des zweiten rohrförmigen Körpers (80) vornehmen.

2. Rohrförmige Kupplungsvorrichtung nach Anspruch 1, **dadurch gekennzeichnet**, daß die Muffe (82) eine innere Kurvenfläche (122) aufweist, die mit der Kurvenfläche (140) an der Außenseite der Verriegelungsfinger (84) zusammenwirkt, um eine radial nach innen gerichtete Bewegung zu erzeugen.
3. Rohrförmige Kupplungsvorrichtung nach den Ansprüchen 1 oder 2, **dadurch gekennzeichnet**, daß die Rückhalteeinrichtung gebildet ist aus: Schultern (154) an den Rückhaltefingern (84) und einer eine Schulter aufweisende Einrichtung (98) an der Außenseite des ersten rohrförmigen Körpers, die so angeordnet ist, daß sie die Verriegelungsfinger (84) die die Enden des rohrförmigen Körpers für einen umklammern den Eingriff umgeben, zurückhalten.

4. Rohrförmige Kupplungsvorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, daß die Außenprofile (76, 96) des rohrförmigen Körpers Rippen aufweisen und daß die Verriegelungsfinger (84) in die gegenüberliegenden Schultern an den Rippen der rohrförmigen Körper eingreifen, um die rohrförmigen Körper in fester Verbindung zu umklammern.
5. Rohrförmige Kupplungsvorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, daß diese eine metallische Dichtungseinrichtung (88) zur Abdichtung zwischen den inneren Flächen an den Verbindungsenden der rohrförmigen Körper (72, 80) aufweist.
6. Rohrförmige Kupplungsvorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, daß die Druckkammer (164) umfaßt: eine Einrichtung zwischen der Muffe (82) und dem zweiten rohrförmigen Körper (80), die eine Setzkammer (164) und eine Freigabekammer (168) bildet, und eine Einrichtung (162, 166), die eine Öffnung (162) zur Zufuhr von Fluiddruck zu den Kammern bzw. zum Ablassen des Fluiddruckes von diesen.
7. Rohrförmige Kupplungsvorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet**, daß das untere Ende (132) der Muffe (82) nach unten und außen verjüngt verläuft, um die Muffe in ihrer Bewegung über den ersten rohrförmigen Körper (72) zu führen.

Revendications

1. Connecteur tubulaire, comprenant une première pièce tubulaire (72) et une deuxième pièce tubulaire (80), un manchon (82), monté d'une manière coulissante autour de la surface extérieure de la première pièce tubulaire, et plusieurs doigts de verrouillage (84) portés à l'intérieur du manchon, chaque doigt de verrouillage comportant une partie intérieure profilée (144) qui peut être déplacée de façon à venir en prise sur une partie profilée extérieure (76, 96) des pièces tubulaires de façon à les solidariser lorsque le manchon est déplacé axialement à une position de verrouillage, le manchon comportant une surface qui est au contact des doigts de verrouillage lorsqu'ils sont dans leur position bloquée et les repousse dans une position dans laquelle les parties



- profilées sont en prise mutuelle, au moins une partie du manchon (82) étant espacée de l'une (80) des pièces tubulaires de façon à former une chambre de pression, le connecteur tubulaire comprenant en outre un passage d'accès (162), qui s'étend dans ladite une pièce tubulaire (80) pour déboucher dans la chambre de pression (164) et qui sert à alimenter cette chambre en pression de fluide en vue de provoquer un déplacement du manchon, et des moyens (98, 154) prévus pour bloquer le mouvement axial des doigts de verrouillage (84) lorsque leur partie profilée est située en regard de la partie profilée extérieure des pièces tubulaires, caractérisé en ce que les doigts de verrouillage (84) sont agencés de façon à pouvoir être déplacés avec le manchon pendant le mouvement axial initial de ce manchon, en ce que l'agencement est tel que, lorsqu'une pression de fluide est appliquée à la chambre (164), le manchon (82) et les doigts de verrouillage (84) se déplacent initialement ensemble dans le sens axial jusqu'à ce que les doigts de verrouillage soient bloqués par lesdits moyens de blocage (98, 154), à la suite de quoi un mouvement axial supplémentaire du manchon (82) fait se déplacer les doigts de verrouillage (84) radialement vers l'intérieur d'une façon telle que les parties profilées (144, 76, 96) viennent en prise mutuelle, et en ce que, dans sa position de verrouillage, le manchon (82) s'étend au-delà de l'extrémité des doigts de verrouillage et comporte des moyens (128) assurant l'étanchéité entre la surface intérieure du manchon et la surface extérieure de l'autre pièce tubulaire (72) au-delà de l'extrémité des doigts de verrouillage, ainsi que des moyens (136) assurant l'étanchéité entre la surface intérieure du manchon et la surface extérieure de ladite première pièce tubulaire (80).
2. Connecteur tubulaire selon la revendication 1, dans lequel le manchon (82) comporte une surface intérieure de came (122) qui coopère avec une surface de came (140) située sur la surface extérieure des doigts de verrouillage (84) en vue d'effectuer ledit mouvement radial vers l'intérieur.
 3. Connecteur tubulaire selon l'une des revendications 1 et 2, dans lequel les moyens de blocage comprennent des moyens (154) à fonction d'épaulement situés sur les doigts de verrouillage (84) et des moyens (98) à fonction d'épaulement qui sont situés sur la surface extérieure de ladite première pièce tubulaire et sont positionnés de façon à bloquer les doigts de verrouillage (84), qui entourent les extrémités des pièces tubulaires, dans une position permettant une venue en prise de serrage de ces pièces tubulaires.
 4. Connecteur tubulaire selon l'une quelconque des revendications précédentes, dans lequel les éléments profilés extérieurs (76, 96) des pièces tubulaires comprennent des brides, tandis que des doigts de verrouillage (84) viennent au contact d'épaulements qui sont situés sur ces brides des pièces tubulaires et qui se font face, en vue de serrer les pièces tubulaires en contact serré.
 5. Connecteur tubulaire selon l'une quelconque des revendications précédentes, comprenant des moyens métalliques d'étanchéité (88) servant à assurer l'étanchéité vis-à-vis de la surface intérieure à l'endroit des extrémités raccordées des pièces tubulaires (72, 80).
 6. Connecteur tubulaire selon l'une quelconque des revendications précédente, dans lequel la chambre de pression (164) comprend des moyens situés entre le manchon (82) et ladite une (80) des pièces tubulaires et servant à délimiter une chambre de fixation (164) et une chambre de libération (168), et des moyens (162, 166) comprenant le passage d'accès (162) et servant à appliquer une pression de fluide dans lesdites chambres et à l'évacuer de ces chambres.
 7. Connecteur tubulaire selon l'une quelconque des revendications précédentes, dans lequel l'extrémité inférieure (132) du manchon (82) converge vers le bas et vers l'extérieur de façon à guider le manchon dans son mouvement par-dessus l'autre pièce tubulaire (72).