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The invention relates to a tube connection according to the preamble of claim 1.

For the realisation of tube fittings, tube connections are known which comprise a connecting body, which receives the tube end to be connected and onto which a nut can be screwed. The connecting body has a cylindrical bore for receiving the tube end, wherein the tube end is provided with an outwardly projecting formation, the first clamping surface of which abuts against the end face of the connecting body. A second clamping surface of the formation is of conical design and abuts against a conical bore of the nut. By tightening the screw connection between nut and connecting body, the projecting formation can be pressed against the end face of the connecting body. For sealing the connecting body against the tube received thereby, the connecting body is provided with a conical bore, which extends up to the end face of the connecting body and widens in the direction of the end face, thereby forming a receptacle for a sealing ring between connecting body and tube. The sealing ring has a substantially triangular cross-section corresponding to the formed receptacle. Such a tube connection is known, for example, from DE 195 26 316 A1.

With tube connections of the aforementioned type, depending on the design of the sealing ring, it may occur that the sealing ring is twisted or even completely inverted in the course of assembly, whereby the sealing effect as well as the durability of the sealing ring may be impaired.

The invention seeks to remedy this problem. The invention is based on the task of providing a tube connection of the aforementioned type which can be produced with minimum effort and in which twisting or inverting of the sealing ring is prevented. According to the invention, this problem is solved by the features of the characterising portion of claim 1.

With the invention, a tube connection of the aforementioned type is created which can be produced with minimum effort and in which twisting or inverting of the sealing ring is prevented. Due to the fact that the sealing ring has a polygonal, symmetrical cross-section, it is ensured that a force applied on one side generates a corresponding opposite force, whereby a symmetrical pressure distribution in the sealing ring is achieved. It has been shown that a polygonal sealing ring with a symmetrical pressure distribution has a significantly lower tendency to twist or invert. Furthermore, the sealing ring also fulfils its function when “inverted”.

In a development of the invention, the sealing ring has a pentagonal or hexagonal cross-section. As a result, contact sides for sealing the sealing surfaces of a tube connection are formed, which are connected via vertex lines, which allow the formation of directed restoring forces. Alternatively, the cross-section of the sealing ring may have more than six corners. Under the term “corner” or “angular”, a radius is also to be subsumed which connects two surfaces at an angle to each other.

The term "vertex line" is understood to mean a linear external corner created by the angular alignment of two planes (corresponds to the ridge of a saddle roof).

The first clamping surface of the tube merges into a connecting surface, which tapers in the direction of the cylindrical end section of the tube. As a result, an angular transition for receiving a vertex line of the sealing ring is formed, whereby a stable positioning of the sealing ring is made possible.

Other developments and embodiments of the invention are indicated in the remaining dependent claims. An exemplary embodiment of the invention is shown in the drawings and is hereinafter described in detail. It is shown in:

Figure 1 the schematic representation of a tube connection;
Figure 2 the enlarged detailed representation of the section II from figure 1;
Figure 3 the schematic representation of the sealing ring of the tube connection from figure 1 and
Figure 4 the enlarged detailed representation of the section IV of the sealing ring from figure 3.

The tube connection 1 selected as an exemplary embodiment substantially consists of a connecting body 2, which receives a tube 4 and onto which a nut 3 is screwed, wherein a sealing ring 5 is arranged between tube 4 and connecting body 2.

The connecting body 2 is partially shown in Figure 1, i.e. with regard to the connection of the end section of the tube 4. The further end can be provided a second time according to this representation, so that the connecting body 2 serves the connection of two tubes. Alternatively, it can also be provided with a thread at its end, which is not shown, for connection to or in a threaded piece. An external thread 21 for screwing on the nut 3 is arranged circumferentially on the outside of the connecting body 2 and

extends up to its end face 22. Along its central axis, the connecting body 2 has a through bore 25, which opens into a cylindrical bore 24 of enlarged diameter, which is followed by a conical bore 23, which widens in the direction of the end face 22.

The nut 3 is screwed onto the external thread 21 of the connecting body 2, which nut is provided with an internal thread 31 for this purpose. The nut 3 has a conical bore 32, which widens in the direction of the connecting body 2. The conical bore 32 of the nut 3 is followed by a through bore 33, through which the tube 4 is guided.

A formation 41 is moulded into the end section of the tube 4, the outer diameter of which substantially corresponds to the inner diameter of the cylindrical bore 24 of the connecting body 2. The formation 41 has a first clamping surface 42, which is substantially orthogonal to the rotational centre axis of the tube 4 and which rests against the end face 22 of the connecting body 2. The first clamping surface 42 merges into a connecting surface 44, which tapers in the direction of the cylindrical end section 45.

The second clamping surface 43 opposite the first clamping surface 42 is of conical design, wherein the course of this second clamping surface 43 substantially corresponds to the conical bore 32 of the nut 3, against which the formation 41 rests with the second clamping surface 43.

An annular receiving space 6 with a substantially quadrangular cross-section for receiving the sealing ring 5, which is pushed onto the tube 4, is delimited by the conical bore 23 of the connecting body 2 and the end section of the tube 4 with its first clamping surface 4 and its connecting surface 45.

The sealing ring 5 is shown enlarged in figures 3 and 4. It has a substantially hexagonal cross-section formed by two parallel, saddle-roof-like, outwardly angled base sides, which are connected to one another by two shorter outer sides. As a result, the sealing ring 5 has four wide sealing surfaces 52, each tapering outwards from a vertex line 51, which open into one of two straight, narrow sealing surfaces 53 arranged parallel to one another. The "corners" of the hexagonal cross-section are rounded over a radius 54. In the exemplary embodiment, the sealing ring is made of rubber. It can also be made of any other elastomer material.

As can be seen particularly from figure 2, the sealing ring 5 abuts with a narrow sealing surface 53 against the first clamping surface 42 of the formation 41 of the tube 4 and extends with a wide sealing surface 52 of its inner contour along the connecting surface 44. The second wide sealing surface 52 of the inner contour of the sealing ring 5 rests against the cylindrical end section 45, wherein the vertex line 51 formed between these two inner wide sealing surfaces 52 abuts in the angular transition between connecting surface 44 and cylindrical section 45. The two outer wide sealing surfaces 52 of the sealing ring 5 are pressed against the inner wall of the conical bore 23 in such a manner that they form a common flat surface. By the restoring forces thus formed, the sealing ring is pressed against the transition between connecting surface 44 and cylindrical section 45 as well as against the sealing gap between the end face 22 of the connecting body 2 and the first clamping surface 42 of the tube 4. An extrusion in the gap as well as a twisting of the sealing 5 is reliably prevented by this design. In the exemplary embodiment, the cross-section of the sealing ring 5 is designed as a symmetrical hexagon. Depending on the design of the sealing gap, the cross-section can also have another symmetrical polygonal shape.

PATENTKRAV

1. Rørforbindelse (1) med et forbindelseslegeme (2), en møtrik (3), som kan skrues på eller ind i forbindelseslegemet, som har en konisk boring (32), som udvides i retning mod forbindelseslegemet (2) og et rør (4), som er ført igennem en boring (33) i møtrikken og som har en udad stikkende udformning (41) med to klemflader (42, 43), hvoraf en første klemflade (42) er parallel med endefladen (22) på forbindelseslegemet (2) og, i den sammenspændte tilstand for rørforbindelsen (1), er understøttet i det mindste i områder på forbindelseslegemet (2), og den anden klemflade (43) har en konisk udformning svarende til den koniske boring (32) i møtrikken (3) og er understøttet i den koniske boring (32) i møtrikken (3), hvor forbindelseslegemet (2) har en radial rundtgående udsparing, via hvilken et modtagerum (6) for en tætningsring (6) er dannet, som er afgrænset af den første klemflade (42), **kendetegnet ved, at** den første klemflade (42) i røret (4) overgår i en forbindelsesflade (44), som tilspidses konisk i retningen mod det cylindriske endeafsnit (45) på røret (4), og at tætningsringen (5) har et polygonalt symmetrisk tværsnit.

2. Rørforbindelse ifølge krav 1, **kendetegnet ved, at** udsparingen er dannet af en konisk boring (23), som strækker sig op til endefladen (22) på forbindelseslegemet (2) og som udvider sig i retning mod endefladen (22), hvilken konisk boring, ved sin mindste diameter, udmunder i en cylindrisk boring (24) i forbindelseslegemet (2), hvis indvendige diameter fortrinsvis svarer i det væsentlige til den udvendige diameter på endeafsnittet på røret (4), som modtages af forbindelsesstykket (2).

3. Rørforbindelse ifølge ethvert af de foregående krav, **kendetegnet ved, at** tværsnittet af tætningsringen (3) er pentagonalt eller hexagonalt.

4. Rørforbindelse ifølge krav 3, **kendetegnet ved, at** tværsnittet af tætningsringen (5) er hexagonalt, hvor tværsnittet er dannet af to basissider, som er indbyrdes parallelle og vinklede udad i form af et sadeltag, hvilke basissider er forbundet med hinanden via to udvendige sider, som er kortere end basissiderne.

5. Rørforbindelse ifølge krav 4, **kendetegnet ved, at** hjørnerne på tværsnittet af tætningsringen (5) er afrundede via en radius (54).

Fig. 1

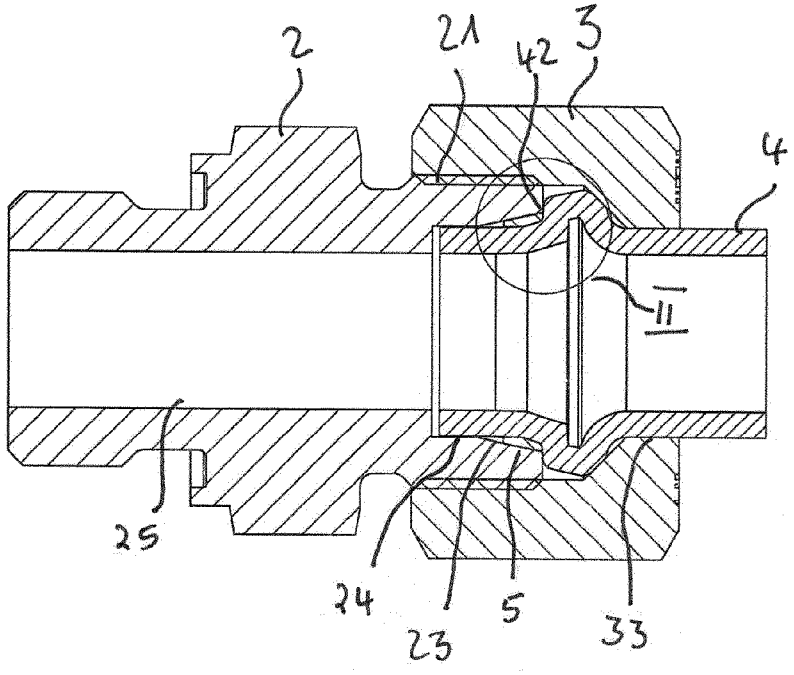

Fig. 2

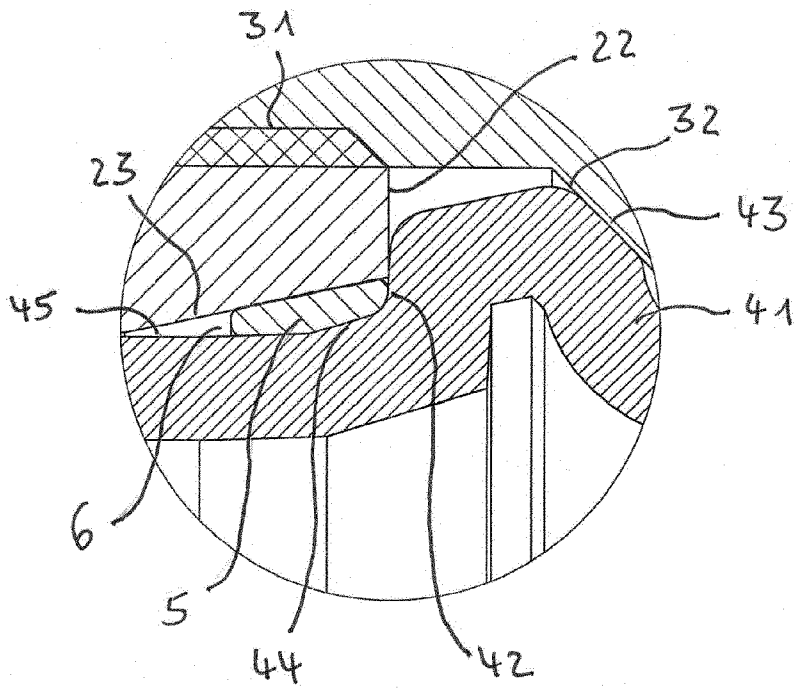

Fig. 3

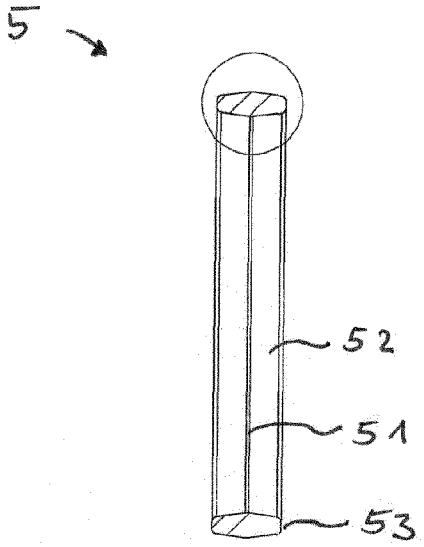

Fig. 4