(19) SUOMI - FINLAND
(FI)

PATENTTI- JA REKISTERIHALLITUS
PATENT- OCH REGISTERSTYRELSEN
FINNISH PATENT AND REGISTRATION OFFICE

(10) **FI/EP4102121 T3**

(12) **EUROOPPAPATENTIN KÄÄNNÖS**
ÖVERSÄTTNING AV EUROPEISKT PATENT
TRANSLATION OF EUROPEAN PATENT SPECIFICATION

(45) Käännöksen kuulutuspäivä - Kungörelsedag av översättning - Translation available to the public **16.04.2024**

(97) Eurooppapatentin myöntämispäivä - Meddelandedatum för det europeiska patentet - Date of grant of European patent **28.02.2024**

(51) Kansainvälinen patenttiluokitus - Internationell patentklassificering - International patent classification
F16L 21/035 (2006 . 01)
F16L 25/00 (2006 . 01)
F16L 25/14 (2006 . 01)

(96) Eurooppapatenttihakemus - Europeisk patentansökan - European patent application EP22177494.6

(22) Tekemispäivä - Ingivningsdag - Filing date **07.06.2022**

(97) Patenttihakemuksen julkiseksitulopäivä - Patentansökans publiceringsdag - Patent application available to the public **14.12.2022**

(30) Etuoikeus - Prioritet - Priority

08.06.2021 DE DE202021103085 U

(73) Haltija - Innehavare - Holder

1• Funke Kunststoffe GmbH , Siegenbeckstrasse 15 , 59071 Hamm-Uentrop , (DE)

(72) Keksijä - Uppfinnare - Inventor

1• Funke, Norbert , 48324 Sendenhorst , (DE)
2• Funke, Hans-Günter , 48324 Sendenhorst , (DE)

(74) Asiamies - Ombud - Agent

Leitzinger Oy , c/o Spaces Mannerheiminaukio 1A , 00100 Helsinki , (FI)

(54) Keksinnön nimitys - Uppfinningens benämning - Title of the invention

Muhvisovitin keskitin- ja ohjausrengas

BUSHING ADAPTER WITH CENTERING AND GUIDING RING

Description

[0001] The invention relates to a sleeve adapter according to the preamble of claim 1.

[0002] Such sleeve adapters are known from DE 20 2015 102 252 U1, DE 20 2016 106 736 L1 and DE 20 2016 104 133 U1. If such a sleeve adapter is inserted into a pipe component designed as a shaft or pipeline section, for example into the sleeve of a stoneware pipe, a seal arranged in the pipe component can make it more difficult to insert the sleeve adapter. For pipes that are designed according to DIN EN 295 and have a push-in sleeve L according to the connection system F, the seal used is both very strong and very thick. In any case, a lubricant must be applied to the seal so that a sleeve adapter can be inserted into the seal and thus into the stoneware pipe component. If a force is then applied to the sleeve adapter in the axial direction in order to introduce it into the seal and the pipe component, the lubricant disadvantageously causes the slightest irregularities in the alignment of the sleeve adapter and/or in the effective direction of the applied force that the sleeve adapter moves sideways instead of penetrating the seal in the intended insertion direction. Due to the limited space in a pipe trench, the working conditions are often suboptimal in order to create the ideal conditions with regard to the alignment of the sleeve adapter or also the tools that are used to insert the sleeve adapter into the pipe component, which would theoretically allow the sleeve adapter to be inserted in a straight line into the pipe component and its seal would allow the sleeve adapter to move without any evasive movement of the sleeve adapter.

[0003] The invention is based on the task of improving a generic sleeve adapter in such a way that it can be inserted as easily as possible into differently designed pipe components, even if the pipe component in question has a seal that has a high insertion resistance.

[0004] This task is solved by a sleeve adapter having the features of claim 1. Advantageous embodiments are described in the following subclaims.

[0005] In other words, the invention proposes that at the so-called insertion end with which the sleeve adapter is inserted into the pipe component, the seal itself should not form the front area of this insertion end but rather a guide ring should be arranged there. The guide ring is made of a material that is harder than the material from which the seal of the sleeve adapter is made, so that it ensures high dimensional stability, even when it is placed against a seal of the pipe component which due to its geometry and/or material properties offers a high resistance to the insertion movement of the sleeve adapter.

[0006] The guide ring is positioned in front of the seal, so that when the sleeve adapter is inserted into the pipe component the guide ring initially comes into contact with the pipe component or the seal of the pipe component. When the aforementioned axial force is then applied to insert the sleeve adapter into the pipe component, the dimensional stability of the guide ring ensures that a section of the sleeve adapter is not deformed, for example, due to a high insertion resistance, which may then result in an inclined position of the sleeve adapter, but rather that the seal of the pipe component is deformed so that the sleeve adapter can penetrate further into the pipe component or its seal while maintaining its alignment.

[0007] Finally, the proposal also provides for the outer diameter of the guide ring to widen rearwardly before its front end. In this way, the resistance forces only gradually increase during its insertion as the axial advance of the sleeve adapter increases, so that the desired centring of the sleeve adapter in the pipe component is initially achieved. If significant resistance forces occur as the sleeve adapter is advanced further, lateral deflection of the sleeve adapter is prevented by the fact that the sleeve adapter, namely at least the guide ring, is already guided all round in the pipe component or in its seal and is therefore secured against radial evasive movements. Therefore, the high forces that have to be applied to overcome a high insertion resistance can now be exerted without causing any problems in an inclined position or a similar evasive movement of the sleeve adapter relative to the pipe component.

[0008] While the seal of the sleeve adapter is typically made of an elastomer material, the guide ring which is harder in comparison can be made of metal or a hard plastic such as PVC, for example.

[0009] The outer diameter of the guide ring can, for example, widen in a straight line so that the guide ring is conical on the outside. Advantageously, however, it can be provided for that the outer diameter widens in a concave curve from the front to the rear. This ensures that the existing pipe seal expands over an advantageously short axial length compared to a straight conical shape. At the foremost end of the guide ring, the concave shape creates a section of the guide ring that ensures secure centring within the pipe seal, whereas a straight conical outer surface of the guide ring would be at a much less acute angle to the pipe seal and could allow undesired evasive movements. Compared to a guide ring with a straight conical outer surface, the desired centring and guidance can therefore be achieved with a significantly shorter axial length thanks to the concave curvature of the outer surface.

[0010] The concave curved section can be followed by a convex curved section, within which the diameter of the guide ring also continues to widen, so that an approximately S-shaped, softly curved outer contour of the guide ring is created, while avoiding steps or edges, which supports penetration of the sleeve adapter into the seal with as little resistance as possible.

[0011] The sleeve adapters are provided in different diameters and are intended for use on certain pipe components. The guide ring can be suitably dimensioned to match the pipe seals used, which the pipe components have and whose dimensions are known, so that it can initially be inserted with its foremost end into the seal of the pipe component without having to exert forces on this seal and deform the seal, if the foremost outer diameter of the guide ring is correspondingly small. As the outer diameter of the guide ring expands towards the rear, the guide ring only comes into circumferential, still force-free contact with the pipe seal after the guide ring has already been immersed in the pipe seal. The corresponding feed forces in the axial direction only need to be applied during further feed to be able to insert the sleeve adapter into the pipe component.

[0012] An additional aid against evasive movements, but also a gentle increase in the axial force to be applied, which is required to insert the sleeve adapter into the pipe component, can be achieved by the outer surface of the guide ring being provided with longitudinally extending ribs or grooves, i.e. in the radial or axial direction of the sleeve adapter. The profiling prevents rotational movements of the sleeve adapter around its longitudinal axis, for example, and also reduces the force required to deform the pipe seal because the guide ring does not lie evenly against the pipe seal over its entire circumference. If the sleeve adapter is advanced further, this deformation of the pipe seal must be achieved and the required axial feed force applied, but the sleeve adapter, in particular its guide ring, has then already penetrated sufficiently far into the pipe seal to ensure reliable guidance of the sleeve adapter and to prevent evasive movements in the event of the high forces that subsequently occur.

[0013] An embodiment example of the invention is explained in more detail with reference to the purely schematic representation.

[0014] The drawing shows a longitudinal section through a sleeve adapter 1, which has a pipe section 2, a seal 3 and a wedge 4. The wedge 4 can be displaced in an axial direction, to the left in the drawing, and is thereby pushed radially outwards by a stationary abutment 5. While a first section 15 of the seal 3 lies against the pipe section 2 and also remains stationary in this arrangement, a second section 16 of the seal 3 is also moved radially outwards together with the wedge 4 by the displacement of the wedge 4 can thus be applied in a sealing manner to a pipe component.

[0015] The axial movement of the wedge 4 takes place by means of a drive ring 6, which bears against the wedge 4 and has a swivel bearing 8 in which the wedge 4 is pivotably mounted so that it can be swivelled radially outwards to different extents. The drive ring 6 is designed as a closed ring. A large number of wedges 4 is arranged along the circumference of the pipe section 2, where the circumferential distances between them increase with increasing expansion of the second seal section 16.

[0016] The course of the sectional line of the longitudinal section is selected such that differently designed circumferential sections of the sleeve adapter 1 are recognisable at an angle deviating from 180°. The drawing below shows a clamping screw 7 which extends through the drive ring 6 and interacts with a thread provided in the abutment 5. Two or more clamping screws 7 are arranged around the circumference of the sleeve adapter 1, so that the drive ring 6 can be moved evenly in an axial direction towards the abutment 5 thereby spreading the wedges 4.

[0017] The end of the sleeve adapter 1 shown on the left in the drawing represents a so-called insertion end 9, with which the sleeve adapter 1 can be inserted into a pipe component. At this insertion end 9 there is a guide ring 10, the outer diameter of which initially increases from a front edge 11 in a concave bend 12 towards the rear – i.e. towards the right in the drawing – and which then curves convexly into its final, largest outer diameter.

[0018] The pipe section 2 is made of plastic and has been manufactured by cutting a plastic pipe to the desired length. With the end of the pipe section 2 opposite the insertion end 9 and having a chamfer on the outer circumference, the sleeve adapter 1 provides for a spigot 14, which serves to connect further plastic pipes by pushing such a plastic pipe with its sleeve end onto this spigot 14 of the sleeve adapter 1.

[0019] Reference numbers:

1	Sleeve adapter
2	Pipe section
3	Seal
4	Wedge
5	Abutment
6	Drive ring
7	Clamping screw
8	Swivel bearing
9	Insertion end
10	Guide ring
11	Front edge
12	Bend
14	Spigot
15	First section
16	Second section

Patenttivaatimukset

1. Muhvisovitin (1),

• jossa on sylinterimäinen putkiosa (2),

• elastisesti muotoaan muuttavaa materiaalia oleva tiiviste (3), joka ympäröi putkiosuutta (2) ulkopuolelta,

jossa tiivisteessä (3) on ensimmäinen osa (15), jonka kanssa se liittyy tiiviisti putkiosaan (2),

ja toinen osa (16), jota voidaan siirtää putkiosan (2) suhteen radiaalisesti ulospäin,

• ja jossa on ainakin yksi paisuntaelementti, joka on järjestetty tiivisteen (3) putkiosan (2) ja toisen osan (16) väliin ja joka on liikuteltavissa radiaalisesti ulospäin siten, että tiivisteen (3) ulkohalkaisija on muuttuva paisuntaelementin kunkin sijainnin mukaan,

• ja jossa on kytkentäpää tiivisteen (3) alueella, joka on tarkoitettu tuotavaksi putken komponenttiin,

• jolloin tiiviste (3) on tarkoitettu kiinnitettäväksi tiiviisti putkiosaan,

tunnettu

siitä, että kytkentäpäähän on järjestetty ohjausrengas (10), joka on tiivistettä (3) kovempaa materiaalia, ja joka sijaitsee tiivisteen (3) sisääntyöntösuunnassa ja jonka ulkohalkaisija levenee etupäästä taaksepäin sen työntösuunnassa.

2. Patenttivaatimuksen 1 mukainen muhvisovitin (1), **tunnettu**
siitä, että ohjausrengas (10) on metallia.

3. Patenttivaatimuksen 1 tai 2 mukainen muhvisovitin (1), **tunnettu**
siitä, että ohjausrengas (10) on valmistettu PVC:stä.

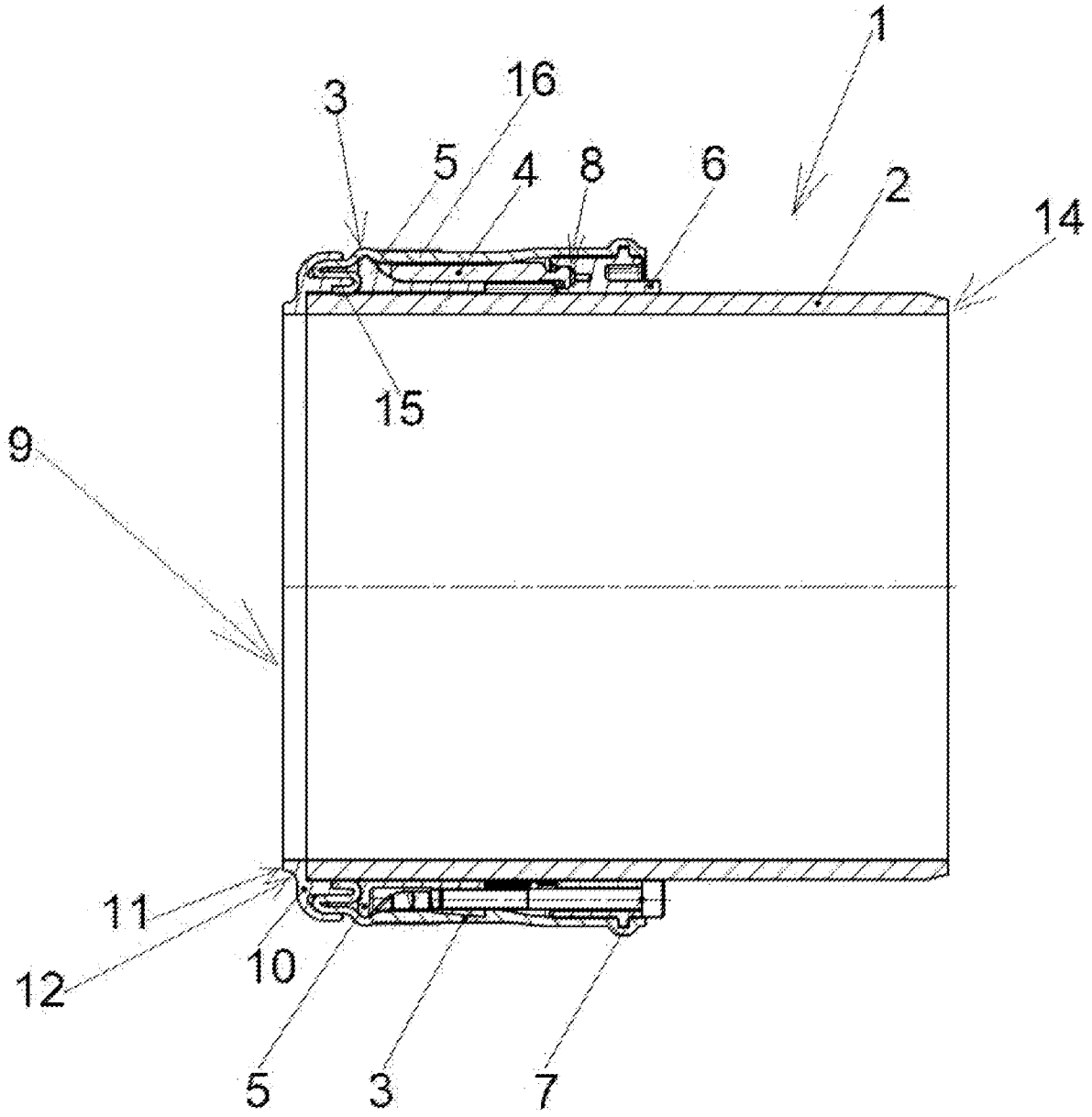
4. Jonkin edellisen patenttivaatimuksen mukainen muhvisovitin (1), **tunnettu**
siitä, että ohjausrenkaan (10) ulkohalkaisija levenee koverasti.

5. Jonkin edellisen patenttivaatimuksen mukainen muhvisovitin (1), **tunnettu**
siitä, että ohjausrenkaan (10) etupäässä on etureuna (11), jonka ulkohalkaisija on mitoitettu niin pieneksi, että ohjausrengas (10) on tarkoitettu työnnettäväksi aluksi

ilman voimaa putkiosan tiivisteeseen ja upotettavaksi tiivisteeseen etureunaan (11), kunnes ohjausrengas (10) tulee kehäkosketukseen putkiosan tiivisteen kanssa, jossa ohjausrenkaan (10) ulkohalkaisija kasvaa edelleen taaksepäin kehän kosketuslinjan yli.

6. Patenttivaatimuksen 4 tai 5 mukainen muhvisovitin (1), **tunnettu** siitä, että ohjausrenkaan (10) ulkopinta on koverasti kaarevan osan jälkeen kuperasti kaareva, jolloin myös ohjausrenkaan (10) ulkohalkaisija laajenee kuperasti kaarevassa osassa.

7. Jonkin edellisen patenttivaatimuksen mukainen muhvisovitin (1), **tunnettu** siitä, että ohjausrenkaan (10) ulkopinta on varustettu holkkisovittimen (1) radiaalisessa ja/tai aksiaalisessa suunnassa rivoilla ja/tai urilla.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