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**Description:**

5       **[0001]**   The invention relates to a sleeve adapter according to the preamble of claim 1.

10       **[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  
15       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  
20       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  
25       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.

30       **[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.

5 **[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  
10 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  
15 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  
20 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  
25 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  
30 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.

5 **[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.

10 **[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  
15 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.

20 **[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  
25 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  
30 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.

5 [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.

10 [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.

20 [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.

25 [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 30 14 of the sleeve adapter 1.

**[0019]** Reference numbers:

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

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**P A T E N T K R A V**

## 1. Muffeadapter (1),

- 5
- med et cylindrisk rørafsnit (2),
  - en tætning (3) af et elastisk deformerbart materiale, som omgiver rørafsnittet (2) periferisk udvendigt,

10 hvor tætningen (3) omfatter et første afsnit (15), med hvilket den slutter tæt op til rørafsnittet (2), samt et andet afsnit (16), som er bevægeligt radialt udad i forhold til rørafsnittet (2),

- 15
- og med mindst et udvidelseselement, som er placeret mellem rørafsnittet (2) og det andet afsnit (16) af tætningen (3), og som er bevægeligt radialt udad således, at den udvendige diameter af tætningen (3) er foranderlig i afhængighed af den respektive stilling af udvidelseselementet,
  - og med en indstiksende i området af tætningen (3), som er bestemt til at blive indført i en rørkomponent,

20

  - hvor tætningen (3) er bestemt til at blive lagt tæt an mod rørkomponenten,

**kendetegnet ved,**

25 **at** der på indstiksenden er placeret en styrering (10), som består af et hårdere materiale sammenlignet med tætningen (3), er lejret forrest i indføringsretningen for tætningen (3), og hvis ydre diameter udvider sig fra dens i indføringsretning forreste ende og bagud.

## 2. Muffeadapter (1) ifølge krav 1,

30 **kendetegnet ved,**

**at** styreringen (10) består af metal.

3. Muffeadapter (1) ifølge krav 1 eller 2,  
**kendetegnet ved,**  
**at** styreringen (10) består af PVC.

5 4. Muffeadapter (1) ifølge et af de foregående krav,  
**kendetegnet ved,**  
**at** den ydre diameter af styreringen (10) udvider sig konkavt buet.

10 5. Muffeadapter (1) ifølge et af de foregående krav,  
**kendetegnet ved,**

**at** styreringen (10) på sin forreste ende omfatter en forreste kant (11), hvis ydre diameter er dimensioneret så lille, at styreringen (10) er bestemt til først kraftfrit at blive indført i en tætning i rørkomponenten og at synke ind i tætningen med den forreste kant (11) frem til en periferisk kontakt af styreringen (10) med tætningen i rørkomponenten, hvor den ydre diameter af styreringen (10) øges endnu længere bagud ud over den periferiske kontaktlinje.

20 6. Muffeadapter (1) ifølge krav 4 eller 5,  
**kendetegnet ved,**

**at** den ydre overflade af styreringen (10) forløber konvekst buet i tilslutning til det konkavt buede afsnit,  
25 hvor den ydre diameter af styreringen (10) også stadig øges i det konvekst buede afsnit.

7. Muffeadapter (1) ifølge et af de foregående krav,  
**kendetegnet ved,**  
30 **at** den ydre overflade af styreringen (10) er forsynet med ribber og/eller riller i radial og/eller aksial retning af muffeadapteren (1).

