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Pipe clamp for fastening a pipe to a wall

The present invention relates to a pipe clamp for fastening a pipe, in particular a downpipe, e.g. as a component of a roof drainage system, to a wall, wherein the wall is in particular at least substantially vertically oriented.

A generic pipe clamp is disclosed in DE 20 2014 000 265 U1. This pipe clamp has a wall-mounting section with a fastening means for wall fastening, as well as two clamping legs connected to one another in an articulated manner, the first ends of which can be detached from one another in order to slide the pipe clamp over a pipe, and the second ends of which are connected to one another in an articulated manner. A connecting means having a snap lock is provided for connecting the two first ends of the clamping legs when the clamping legs are slid over the pipe. The two clamping legs, which are C-shaped in cross-section as viewed in an axial section through the pipe, are lined internally with resilient compression elements which are sufficiently compliant to lock the snap connection.

A disadvantage of the above embodiment is that play between the pipe clamp and the pipe must be sufficiently large to achieve the desired locking of the snap connection. Since the elasticity of the pressure elements is limited in practice and the outside diameter of pipes to be fastened with the pipe clamp can vary, it is often not possible to achieve a sufficient frictional engagement of the pipe clamp or the pressure elements on the outside of the pipe with the pipe clamp that can absorb the weight forces of the pipe. As a result, a corresponding downpipe is in danger of coming loose at the upper end, for example from a gutter spigot, because it can slide down inside the pipe clamp. This makes it necessary to reconnect the downpipe to the top of the spigot, usually at a great height.

Further pipe clamps for fastening a pipe, herein also of pipes other than a downpipe, as relate in particular to the present invention, are described in EP 2 894 385 A1, DE 200 13 752 U1, DE 102 15 647 A1, DE 101 23 924 B4, DE 100 39 008 C2, EP 0 713 039 A1, EN 198 42 739 C1, CN 105570544 A, DE 20 2012 103 440 U1, DE 10 2017 124 068 A1, DE 10 2017 113 903 A1, DE 10 2015 112 963 A1, DE 10 2012 106 256 B4, DE 10 2008 047 787 B4 and DE 10 2004 032 053 B4 are disclosed, with all embodiments having in common either ratchet or snap closures with the disadvantages mentioned or radially outwardly curved bends which are interlocked with one another and which, on the one hand, are not particularly

visually appealing and, on the other hand, are collection points for dirt, as well as having proved in practice to be impact points that are prone to injury.

DE 20 2017 107 712 U1 discloses a pipe clamp having a joint, comprising an upper clamp part and a lower clamp part, which are connected to each other via the joint. The clamp parts are formed by insulating bodies in which clamping brackets are embedded that have bends radially outward.

EP 2 913 574 A1 discloses a pipe clamp with two separate C-shaped clamp parts that can be positively connected to each other.

GB 1 499 653 A discloses a clamping device for pipes with two parts screwed together.

WO 2017/168034 A1 discloses a clamping device for pipes with two clamping parts that have radially inwardly directed bends.

Another pipe clamp with bends radially outwards is disclosed in EP 0 115 246 A1.

The present invention is based on the object of specifying a pipe clamp for fastening a pipe, in particular a downpipe, e.g. for roof drainage, to a wall, in particular at least a substantially vertical wall, in which the disadvantages mentioned are avoided. The pipe clamp is to be characterized by an attractive design and secure holding of the pipe.

The object according to the invention is solved by a pipe clamp having the features of claim 1. In the dependent claims, advantageous and particularly useful designs of the invention are indicated.

The pipe clamp according to the invention for fastening a pipe, in particular a downpipe, for example a rainwater downpipe, to a wall has at least one wall-mounting section which comprises a fastening means for wall fastening. In a simple case, the fastening means may be a hammer pin or steel nail, respectively, or a bore hole. According to another embodiment, the fastening means comprises, for example, a thread, in particular an internal thread, so that the pipe clamp can be fastened to the wall with a threaded rod or screw screwed into the internal thread accordingly.

The pipe clamp according to the invention has two clamping legs which extend arcuately in each case from a first end to a second end, are connected to one another in an articulated or detachable manner at the second end, are arranged to engage around the pipe together in an arcuate manner and of which at least one comprises the wall-mounting section.

According to the invention, a connecting device is provided for releasably connecting the two first ends of the clamping legs.

According to the invention, the connecting device has a radially inwardly directed bend at each first end of the clamping legs, and the two bends are braced against each other in the circumferential direction by means of a screw connection extending in the circumferential direction, at least when the screw connection is tightened and, in particular, a pipe is held in the space enclosed by the clamping legs, also referred to in the present case as the pipe space, by the clamping legs in an advantageously frictionally engaged manner.

The screw connection allows flexible adaptation of the distance between the two bends to the respective application and thus adaptation of the inner diameter of the clamping legs connected to each other, so that pipes, in particular downpipes, can be held securely in a frictionally engaged manner regardless of a varying outer diameter.

In this case, the circumferential direction means the circumferential direction along the pipe, i.e. the circumferential direction of the pipe space enclosed by the clamping legs when they are fastened together at both ends.

According to an advantageous embodiment of the invention, one of the two bends has an internal thread at the first end and/or a counter element having an internal thread is connected to one of the two bends, and the other of the two bends has a through-hole. In a tightened state of the screw connection, a cap screw is inserted with its screw head resting directly or indirectly against the other of the two bends through the through-hole and screwed into the internal thread. Thus, a screw shank extends from its threaded free end, which is screwed into the internal thread, through the through-hole to the screw head positioned on the side of the bend having the through-hole facing away from the internal thread.

According to another advantageous embodiment, the two bends have an internal thread and/or a counter element having an internal thread. Thus, an internal thread can be provided in each of the two bends and/or a counter element with an internal thread is connected to each of the two bends. Alternatively, only one bend can have an internal thread and the counter element with the internal thread is connected to the other bend. In a tightened state of the screw connection, a threaded rod having a drive is screwed into the internal thread to form the screw connection.

Preferably, the drive is designed as an external drive and is arranged between the two bends. This means that the external drive can be designed as a hexagon, for example, and can thus be easily tightened with an open-end wrench inserted between the two bends.

In the embodiment with an internal thread and with a cap screw, the clamping leg, which has the bend with the through-hole at its first end, preferably has a drive opening in the form of an elongated hole in alignment with the through-hole, and the screw head has a drive in the form of an internal drive that can be actuated through the drive opening. Thus, for example, a hexagon socket wrench or a hexagon socket wrench/round key can be inserted from the outside through the drive opening into the internal drive in order to tighten the screw connection.

According to the invention, the clamping legs have a C-shape with radially inwardly directed folded edges extending along their circumference, between which elastic pressure elements, in particular made of dimensionally stable rubber, are arranged, which project inwardly in the radial direction beyond the folded edges and the bends for frictionally engaged contact with the pipe. The C-shape is thus obtained in an axial section through the pipe or through the pipe space. A single pressure element may be provided, extending along both clamping legs, or several pressure elements may be provided, in particular one pressure element per clamping leg.

The pressure elements can advantageously extend in each case from the second end to the first end and, in the region of the first ends, have end recesses in which in each case a part of the screw connection, in particular a counter element and a screw head or in each case a counter element, is accommodated. Alternatively, the pressure elements end in the circumferential direction at a sufficient distance in front of the bends to avoid collision with the connecting device or the screw connection.

The clamping legs can preferably be connected at their second end to a hinge so that they are held together in a captive manner. According to another embodiment, however, a releasable connecting device can also be provided here, which is then particularly advantageously designed in accordance with the connecting device at the first ends, in particular identically to the latter.

In particular, the two clamping legs extend in each case over more than 160° in the circumferential direction.

Different diameter tolerances of the pipe are preferably compensated for by a distance remaining between the bends in the circumferential direction when the bolted joint is tightened.

The invention will be described below by reference to exemplary embodiments and the figures, wherein:

- Fig. 1 shows a three-dimensional view of a pipe clamp designed according to the invention;
- Fig. 2 shows the pipe clamp from Fig. 1 in an axial schematic plan view;
- Fig. 3 shows an enlarged section showing the connecting device at the first ends of the clamping legs;
- Fig. 4 shows a different connecting device in a section corresponding to Fig. 3.

In Fig. 1, a pipe clamp 1 designed according to the invention is shown in a three-dimensional plan view. The pipe clamp 1 has a wall mounting section 2 with a fastening means 3 (see Fig. 2) for wall fastening. As can be seen from Fig. 2, the fastening means 3 in the present case is designed as an internal thread arranged in a hexagonal stud of the pipe clamp 1. However, other fastening means may be considered.

The pipe clamp 1 has two clamping legs 4, 5 which are arranged to grip around the pipe in a common arcuate manner and at least one of which, in this case the first clamping leg 4, comprises the wall-mounting section 2.

Each clamping leg 4, 5 has a first end 4.1, 5.1 and a second end 4.2, 5.2. At their second ends 4.2, 5.2, the two clamping legs 4, 5 are hingedly connected to each other, in this case by means of a hinge 21. Thus, the clamping legs 4, 5 can be folded apart in order to be slid over a pipe not shown in more detail here. Once they have been slid over the pipe, they can be folded together again so that they rest on the outside of the pipe surface and are connected at their first ends 4.1, 5.1 to a connecting device 6.

As can be seen from Fig. 1, the clamping legs 4, 5 are C-shaped and each have two folded edges 16, 17. In the axial direction of the pipe, which is not shown in more detail, the folded edges 16, 17 are arranged at opposite ends of the clamping legs 4, 5 in order to form the C-shape in the cross-section of the clamping legs 4, 5. A pressure element 18 is inserted in each of the C-shapes of the clamping legs 4, 5. The pressure elements 18 project radially inwards beyond the folded edges 16, 17 and are made of an elastic material, for example rubber. When the connecting device 6 is closed, the pressure elements 18 are pressed onto the pipe with their radially inner surface on the outside, so that a frictionally engaged connection is created which prevents the pipe from slipping inside the pipe clamp 1.

Embodiments of the connecting device 6 according to the invention are shown in Figs. 3 and 4. For example, the two clamping legs 4, 5 each have at their first ends 4.1, 5.1 a bend 7, 8 which is directed radially inwards, i.e. in the direction of the pipe space or the pipe. The bends 7, 8 are braced against each other in the circumferential direction by a screw connection, wherein a distance d remains advantageously between the bends 7, 8 even in the braced state.

In the embodiment according to Fig. 3, the bend 8 has a through-hole 11 and a counter element 10 provided with an internal thread 9 is arranged on the bend 7. For example, the counter element 10 is materially connected to the bend 7 or pressed therewith. A cap screw 12 is inserted through the through-hole 11 so that its screw head 20 rests at least indirectly against the bend 8 and its external thread is screwed into the internal thread 9 of the other bend 7.

The screw head 20 has a drive 13 in the form of an internal drive which can be driven through a drive opening 15 in the region of the second end 5.2 of the clamping leg 5, see also Fig. 1.

The design according to Fig. 4 differs from the design according to Fig. 3 in that both bends 7, 8 are each provided with an internal thread 9 or with a counter element 10 having an internal thread 9. A threaded rod 14 with a drive 13 in the form of an external drive, which is arranged between the bends 7, 8, is screwed into the internal thread 9. This means that there is no need for a drive opening in the clamping legs 4, 5 because the drive 13 can be actuated radially from outside via the gap between the bends 7, 8.

In order to prevent the connecting device 6 from colliding with the pressure elements 18, the latter each have a recess 19 at their ends associated with the first ends 4.1, 5.1. These recesses 19 extend, for example, only over a central region of the pressure elements 18, relative to the axial direction of the pipe or pipe space. Alternatively, the pressure elements 18 end at a corresponding distance in the circumferential direction in front of the bends 7, 8.

List of reference signs

1	Pipe clamp
2	Wall mounting section
3	Fastening means
4	Clamping leg
4	Clamping leg
4.1, 5.1	First end
4.2, 5.2	Second end
6	Connecting device
7	Bend
8	Bend
9	Internal thread
10	Counter element
11	Through-hole
12	Cap screw
13	Drive
14	Threaded rod
15	Drive opening
16	Folded edge
17	Folded edge
18	Pressure element
19	Recess
20	Screw head
21	Hinge
d	Distance

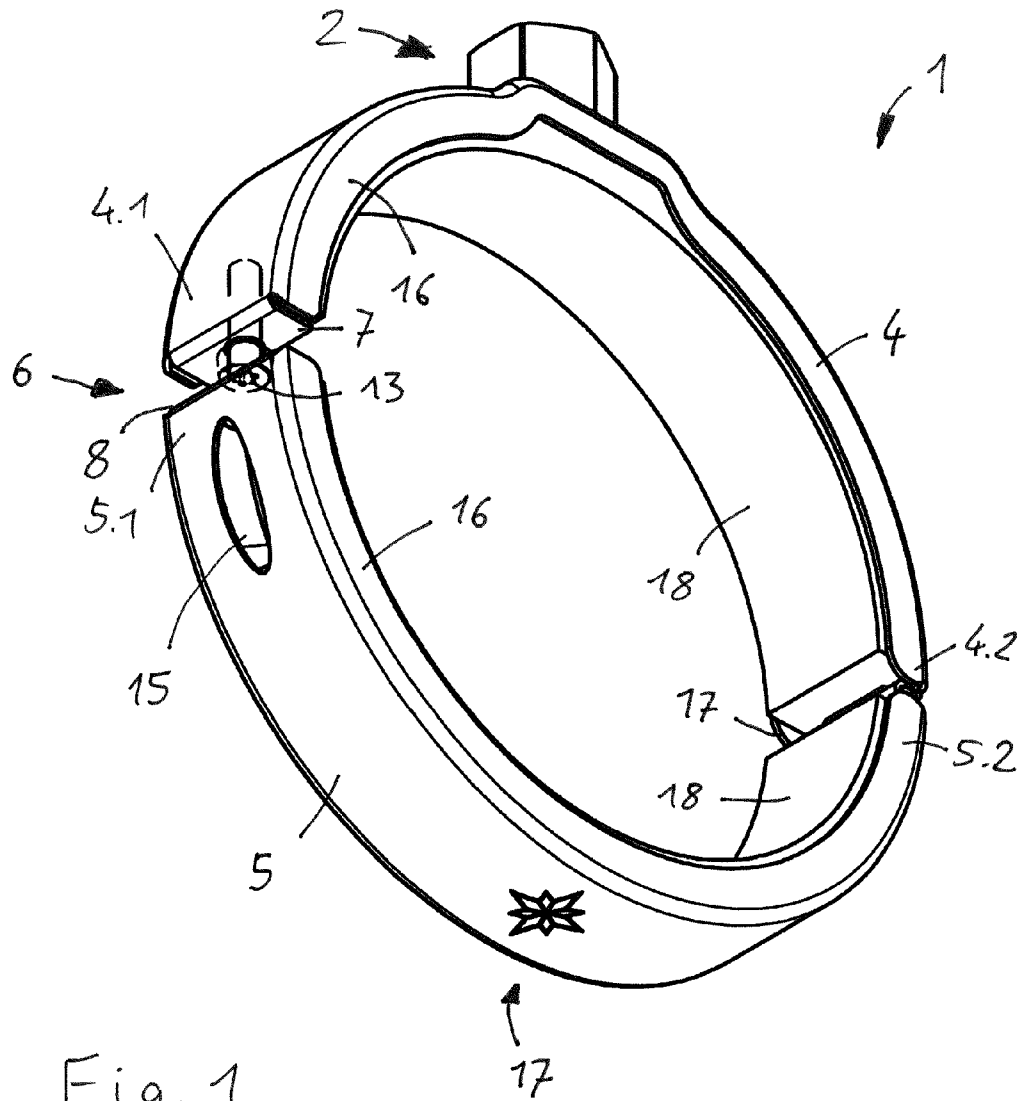
PATENTKRAV

1. Rørbøjle (1) til fastgørelse af et rør på en væg;
med et vægmonteringsafsnit (2), der omfatter et fastgørelsesmiddel (3) til
5 vægfastgørelse;
med to klemmeben (4, 5), som hver især strækker sig bueformet fra en
første ende (4.1, 5.1) til en yderligere ende (4.2, 5.2), som ved den
yderligere ende (4.2, 5.2) er forbundet leddelt eller aftageligt med
hinanden, og som er placeret med henblik på sammen at gribe rundt om
10 røret, og af hvilke i det mindste det ene omfatter vægmonteringsafsnittet
(2);
med en forbindelsesanordning (6) til en løsbar forbindelse af de to første
ender (4.1, 5.1) af klemmebenene (4, 5), hvor forbindelsesanordningen (6)
i hvert enkelt tilfælde har en fas (7, 8), der vender radialt indad, på hver
15 første ende (4.1, 5.1) på klemmebenene (4, 5), og de to faser (7, 8) ved
hjælp af en skrueforbindelse, der strækker sig i den periferiske retning, er
spændt i forhold til hinanden i den periferiske retning;
og hvor rørbøjlen indeholder et eller flere elastiske trykelementer, hvor
klemmebenene (4, 5) har en C-form, med bøjede kanter (16, 17), der
20 strækker sig langs deres periferi, som er orienteret radialt indad, og mellem
hvilke der er placeret et eller flere elastiske trykelementer (18), der rager
frem i indadgående radial retning via de bøjede kanter (16, 17) og faserne
(7, 8) i friktionskontakt med røret.
- 25 2. Rørbøjle (1) ifølge krav 1, kendetegnet ved, at den ene eller begge faser
(7, 8) er forsynet med et indvendigt gevind (9), og/eller at der på en af de
to faser (7, 8) er tilsluttet et kontraelement (10), der har et indvendigt
gevind (9), at den anden af de to faser (7, 8) har en gennemgangsboring
(11), og at en maskinskrue (12) i en spændt tilstand af skrueforbindelsen
30 med sit skruehoved (20) liggende op til den anden af de to faser (7, 8) er
stukket gennem gennemgangsboringen (11) og skruet ind i det indvendige
gevind (9).

3. Rørbøjle (1) ifølge krav 1, kendetegnet ved, at de to faser (7, 8) er forsynet med et indvendigt gevind (9) og/eller et kontraelement (10), der har et indvendigt gevind (9), og at en gevindstang (14), der indbefatter et drev (13), i en en spændt tilstand af skrueforbindelsen er skruet ind i det indvendige gevind (9).
4. Rørbøjle (1) ifølge krav 3, kendetegnet ved, at drevet (13) er placeret som et udvendigt drev mellem de to faser (7, 8).
5. Rørbøjle (1) ifølge krav 2, kendetegnet ved, at klemmebenet (4, 5), der ved sin første ende (4.1, 5.1) er forsynet med faser (7, 8) med gennemgangsboringen (11), har en drivåbning (15), der flugter med gennemgangsboringen (11), i form af et langhul, og at skruehovedet (20) indbefatter et drev (13) i form af et indvendigt drev, der kan aktiveres gennem drivåbningen (15).
6. Rørbøjle (1) ifølge et af kravene 1 til 5, kendetegnet ved, at de elastiske trykelementer (18) er fremstillet af formstabilt gummi.
7. Rørbøjle (1) ifølge krav 6, kendetegnet ved, at trykelementerne (18) hver især strækker sig fra den yderligere ende (4.2, 5.2) til den første ende (4.1, 5.1) og i området ved de første ender (4.1, 5.1) er forsynet med udspæringer (19) på endesiden, i hvilke i hvert enkelt tilfælde en del af skrueforbindelsen, særligt kontraelementet eller kontraelementerne (10) eller skruehovedet (20) er optaget.
8. Rørbøjle (1) ifølge et af kravene 1 til 7, kendetegnet ved, at klemmebenene (4, 5) ved deres yderligere ender (4.2, 5.2) er forbundet ved hjælp af et hængsel (21).

- 3 -

9. Rørbøjle (1) ifølge et af kravene 1 til 8, kendetegnet ved, at de to klemmeben (4, 5) hver især strækker sig over mere end 160° i den periferiske retning.
- 5 10. Rørbøjle (1) ifølge et af kravene 1 til 9, kendetegnet ved, at der i den spændte tilstand af skrueforbindelsen er tilvejebragt en afstand (d) mellem faserne (7, 8) i den periferiske retning.



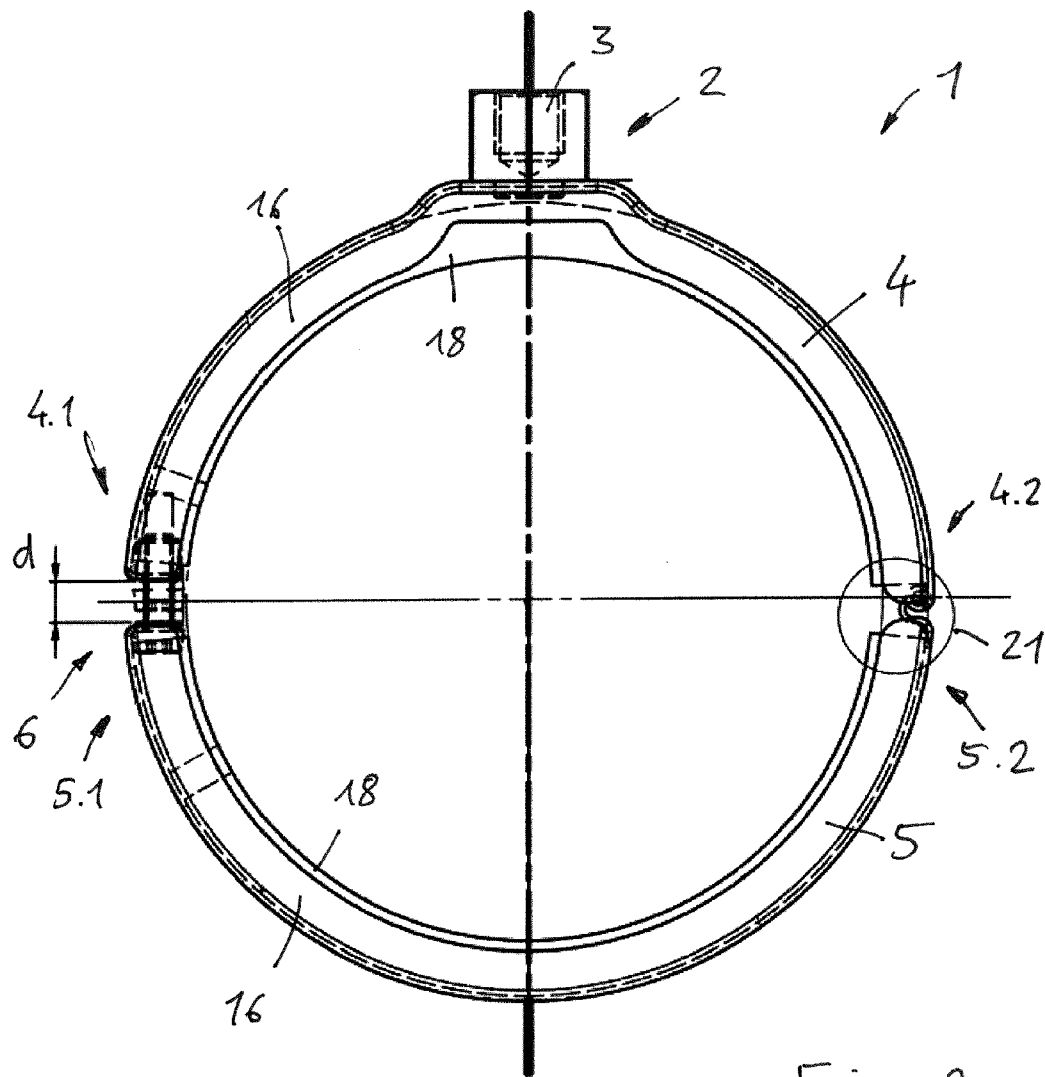


Fig. 3

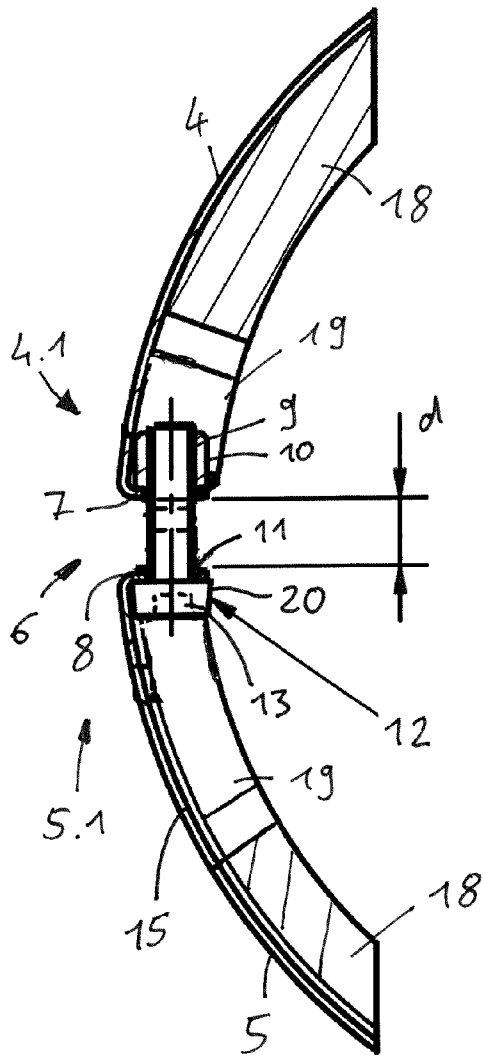


Fig. 4

