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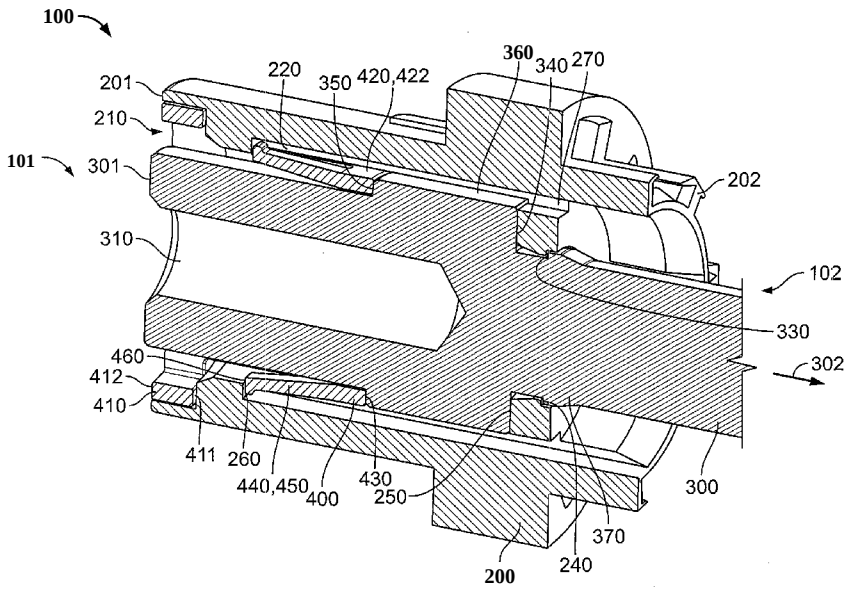

Fig. 4

(57) Abstract: An electrical plug type connector (100) comprises a plug type connector housing (200) having a conductor side (201) and an insertion side (202), a contact insert (300) which can be arranged in the plug type connector housing, and a contact securing means (400) which can be arranged in the plug type connector housing in order to fix the contact insert in the plug type connector housing. The contact securing means has a resiliently deformable contact lance (440) having an eighth abutment face (460). The plug type connector housing has a sixth abutment face (260). The eighth abutment face can be engaged with the sixth abutment face when the contact securing means is arranged in the plug type connector housing.

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ELECTRICAL PLUG CONNECTOR WITH FIXATION ELEMENT

The present invention relates to an electrical plug type connector having a contact securing means according to patent claim 1.

Numerous configurations of electrical plug type connectors are known in the prior art. Many known plug type connectors comprise a plug type connector housing and a contact insert which is arranged therein. It is known to provide such plug type connectors with contact securing means which serve to fix the contact insert in the plug type connector housing.

An object of the present invention is to provide an improved electrical plug type connector having a contact securing means. This object is achieved with a plug type connector having the features of claim 1. Preferred developments are set out in the dependent claims.

An electrical plug type connector according to the invention comprises a plug type connector housing having an insertion side and a conductor side, a contact insert which can be arranged in the plug type connector housing and a contact securing means which can be arranged in the plug type connector housing in order to fix the contact insert in the plug type connector housing. The contact securing means has a resiliently deformable contact lance having an eighth abutment face. Furthermore, the plug type connector housing has a sixth abutment face. The eighth abutment face can be engaged with the sixth abutment face when the contact securing means is arranged in the plug type connector housing. Advantageously, with this electrical plug type connector, an electrical conductor can be connected to the contact insert in various manners.

The contact securing means preferably has a ring having an outer side and an inner side, a wing being arranged at the inner side of the ring. The contact lance is arranged on the wing in such a manner that the contact lance and the eighth abutment face are orientated in the direction of the ring. Advantageously, this contact securing means can be readily inserted into the plug type connector housing and ensures reliable fixing of the contact insert in the plug type connector housing.

In a particularly preferred embodiment of the electrical plug type connector, the contact securing means has four wings which are distributed in a uniform manner around the ring in a peripheral direction. Advantageously, the abutment faces of the contact lances then engage all the wings of

the sixth abutment face of the plug type connector housing, whereby a particularly reliable fixing of the contact insert in the plug type connector housing is ensured.

In a development of the electrical plug type connector, the contact securing means is composed of two individual pieces. Alternatively, the contact securing means may also be composed of four individual pieces. Advantageously, the dimensions of the individual pieces from which the contact securing means is composed are thereby reduced. Advantageously, the symmetry of the contact securing means is utilised.

In a particularly preferred embodiment of the electrical plug type connector, the individual pieces are constructed in an identical manner. Advantageously, the costs for the production of the contact securing means are thereby reduced.

In an advantageous development of the electrical plug type connector, the contact insert has a third abutment face which is orientated in the direction of an insertion side of the contact insert. The plug type connector housing further has a fourth abutment face which is orientated in the direction of the conductor side of the plug type connector housing. The third abutment face in this instance abuts the fourth abutment face when the contact insert is completely introduced into the plug type connector housing. Advantageously, the insertion of the contact insert into the plug type connector housing is thereby simplified. The contact insert must advantageously be introduced so far into the plug type connector housing that the third abutment face moves into abutment with the fourth abutment face.

In a preferred development of the electrical plug type connector, the eighth abutment face can be engaged with the sixth abutment face only when the third abutment face is in abutment against the fourth abutment face. Advantageously, this allows verification of whether the contact insert is correctly arranged in the plug type connector housing. The contact securing means can advantageously be engaged in the plug type connector housing only when the contact insert is located in the correct position in the plug type connector housing. The contact securing means thereby advantageously serves not only to fix the contact insert but also to control correct assembly of the electrical plug type connector.

In an additional development of the electrical plug type connector, the contact insert has a first abutment face which is orientated in the direction of a conductor side of the contact insert. The plug type connector housing has a second abutment face which is orientated away from the conductor side of the plug type connector housing. The first abutment face can be engaged with the second

abutment face when the contact insert is arranged in the plug type connector housing. Advantageously, the first abutment face and the second abutment face then form an additional contact securing means for **fixing** the contact insert in the plug type connector housing.

In a preferred embodiment of the electrical plug type connector, the wing of the contact securing means has a seventh abutment face which is orientated away from the ring of the contact securing means. In this instance, the contact insert has a fifth abutment face which is orientated in the direction of a conductor side of the contact insert. The seventh abutment face is then in abutment against the fifth abutment face when the contact insert and the contact securing means are completely introduced into the plug type connector housing. Advantageously, this allows verification of whether the contact securing means has been correctly installed in the plug type connector housing.

In one embodiment of the electrical plug type connector, the engagement between the eighth abutment face and the sixth abutment face can be released from the insertion side. Advantageously, the release of the contact securing means is not then impeded by an electrical conductor which is secured to the contact insert.

In another embodiment of the electrical plug type connector, the engagement between the eighth abutment face and the sixth abutment face can be released from the conductor side of the plug type connector housing. Advantageously, this allows particularly simple release of the contact securing means.

It is advantageous for the contact insert to have a contact region which is provided to contact another contact region of a plug type connector counter-piece. Advantageously, the electrical plug type connector may then simply be assembled with a plug type connector counter-piece.

In one embodiment of the electrical plug type connector, the contact region of the contact insert is constructed as a socket opening. Advantageously, the socket opening can then be used to receive a contact pin of a plug type connector counter-piece.

It is advantageous for the plug type connector housing to comprise an electrically insulating material, in particular a plastics material. Advantageously, it is thereby ensured that a user of the electrical plug type connector cannot come into contact with live portions of the electrical plug type connector.

It is also advantageous for the contact insert to comprise an electrically conductive material, in particular a metal. Advantageously, the contact insert can then be used to conduct an electrical current.

The invention is explained in greater detail below with reference to Figures, in which:
Figure 1 is a first perspective view of various components of an electrical plug type connector;
Figure 2 is another perspective view of the components of the plug type connector;
Figure 3 shows the electrical plug type connector in a partially mounted state;
Figure 4 shows the electrical plug type connector in the completely mounted state.

Figure 1 is a perspective view of individual components of an electrical plug type connector 100. Figure 2 shows another perspective view of the components of the electrical plug type connector 100. In Figures 1 and 2, the electrical plug type connector 100 is shown from various viewing directions.

The electrical plug type connector 100 may serve, for example, to transmit high voltages. The plug type connector 100 may be used, for example, in a motor vehicle, for example, in a motor vehicle having an electric drive or hybrid drive.

The electrical plug type connector 100 has a conductor side 101 and an insertion side 102. The insertion side 102 of the plug type connector 100 is provided to be assembled with a suitable plug type connector counter-piece in order to produce an electrically conductive connection between the plug type connector 100 and the plug type connector counter-piece. At the conductor side 101 of the electrical plug type connector 100, an electrical conductor can be connected. The plug type connector 100 then serves to produce an electrically conductive connection with respect to the electrical conductor.

The electrical plug type connector 100 has a plug type connector housing 200. The plug type connector housing 200 comprises an electrically insulating material, for example, a plastics material. The plug type connector housing 200 of the electrical plug type connector 100 also has a conductor side 201 and an insertion side 202. If the electrical plug type connector 100 is completely assembled, the conductor side 201 of the plug type connector housing 200 coincides with the conductor side 101 of the plug type connector 100. The insertion side 202 of the plug type connector housing 200 then further corresponds to the insertion side 102 of the plug type connector 100. The plug type connector housing 200 is illustrated in Figures 1 and 2 only in sections so that the insertion side 202 of the plug type connector housing 200 is not completely visible.

The plug type connector housing 200 has a hollow-cylindrical basic shape. At the conductor side 201 thereof, the plug type connector housing 200 has an opening 210. The opening 210 is constructed as an opening in a covering face of the cylindrical plug type connector housing 200. A receiving region 220 which is arranged inside the plug type connector housing 200 is accessible through the opening 210. The receiving region 220 of the plug type connector housing 200 ,serves to receive other components of the plug type connector 100, as will be explained below.

The opening 210 has a total of four teeth 230 which extend in a radial direction from an outer wall of the plug type connector housing 200 perpendicularly in the direction of the centre of the opening 210. However, the length of the teeth 230 in a radial direction is smaller than the radius of the opening 210 so that the teeth 230 do not reach the centre of the opening 210. The teeth 230 are distributed around the opening 210 with uniform angular spacing from each other of 90° in a peripheral direction.

The plug type connector 100 further has a contact insert 300. The contact insert 300 comprises an electrically conductive material, preferably a metal. The contact insert 300 is provided to be arranged in the receiving region 220 of the plug type connector housing 200 of the electrical plug type connector 100. The contact insert 300 serves to produce an electrically conductive connection between an electrical conductor and an electrical contact of a plug type connector counter-piece which fits the electrical plug type connector 100.

The contact insert 300 has a basic shape which is also cylindrical and which has a conductor side 301 and an insertion side 302. If the contact insert 300 is arranged in the receiving region 220 of the plug type connector housing 200, the conductor side 301 of the contact insert 300 is substantially congruent with the conductor side 201 of the plug type connector housing 200 which then together form the conductor side 101 of the plug type connector 100. The insertion side 302 of the contact insert 300 then substantially coincides with the insertion side 302 of the plug type connector housing 200 which together form the insertion side 102 of the plug type connector 100. In the illustrations of Figures 1 and 2, the insertion side 302 of the contact insert 300 is already partially arranged in the receiving region 220 of the plug type connector housing 200 and is therefore not completely visible.

The conductor side 301 of the contact insert 300 is provided to be connected in an electrically conductive manner to an electrical conductor. The electrical conductor may, for example, be a conductor of a cable or a conductor rail. The connection between the conductor and the conductor

side 301 of the contact insert 300 may be a crimp connection, a weld connection, a solder connection, a screw connection or another electrically conductive connection.

The contact insert 300 has a first thickened portion 360 and a second thickened portion 370 which are arranged one behind the other in the longitudinal direction of the contact insert 300. Each of the thickened portions 360, 370 is constructed as a cylindrical portion of the contact insert 300, the cylindrical contact insert 300 having a larger radius in the region of the thickened portions 360, 370 than in other longitudinal portions of the contact insert 300. The first thickened portion 360 of the contact insert 300 is arranged closer to the conductor side 301 of the contact insert 300. The second thickened portion 370 of the contact insert 300 is arranged closer to the insertion side 302 of the contact insert 300.

At the transitions between the first thickened portion 360 of the contact insert 300 and non-thickened longitudinal portions of the contact insert 300, the first thickened portion 360 has a first end face which forms a fifth abutment face 350, and a second end face which forms a third abutment face 340. In this instance, the fifth abutment face 350 is orientated in the direction of the conductor side 301 of the contact insert 300. The third abutment face 340 is orientated in the direction of the insertion side 302 of the contact insert 300.

At the transition between the second thickened portion 370 and the adjacent, non-thickened longitudinal portions of the contact insert 300, there is formed an end face which forms a first abutment face 330. The first abutment face 330 is orientated in the direction of the conductor side 301 of the contact insert 300. At the end thereof facing the insertion side 302, the second thickened portion 370 is chamfered in such a manner that it continuously merges into the non-thickened longitudinal portion of the contact insert 300.

The contact insert 300 further has four channels 320 which extend in the longitudinal direction of the contact insert 300 at the outer periphery of the contact insert 300. In the region of the channels 320, the radius of the contact insert 300 is reduced. The channels 320 also intersect with the first thickened portion 360 of the contact insert 300. The channels 320 are sized in such a manner that they can receive the teeth 230 of the plug type connector housing 300. The channels 320 are spaced apart from each other by 90° and distributed in a uniform manner around the outer periphery of the contact insert 300. If the contact insert 300 is arranged in the receiving region 220 of the plug type connector housing 200, the channels 320 of the contact insert 200 and the teeth 230 of the plug type connector housing 200 together prevent torsion of the contact insert 300 which prevents relative

torsion between the contact insert 300 and the plug type connector housing 200 about the common longitudinal axis.

The electrical plug type connector 100 further comprises a contact securing means 400. The contact securing means 400 serves to fix the contact insert 300 in its predetermined position in the receiving region 220 of the plug type connector housing 200 of the electrical plug type connector 100. The contact securing means 400 may, for example, comprise a plastics material. However, it is also possible to construct the contact securing means 400 from a different material, for example, a metal.

The contact securing means 400 has a ring 410 which is in the form of a short hollow cylinder. The ring 410 has an inner side 411 and an outer side 412. The inner side 411 and the outer side 412 form annular covering faces of the hollow-cylindrical ring 410.

The contact securing means 400 further has four wings 420. The four wings 420 are arranged at the inner side 411 of the ring 410 and extend parallel with the axis of symmetry of the ring 410. Each of the wings 420 is U-shaped and has two mutually parallel arms 421 which are connected to each other by means of a centre piece 422. The longitudinal ends of the arms 421 which are not connected by means of the centre piece 422 form the open end of the respective U-shaped wing 420 in each case and are arranged at the inner side 411 of the ring 410 of the contact securing means 400.

The four wings 420 are each offset through 90° relative to each other and distributed in a uniform manner in a peripheral direction around the ring 410. Between each two adjacent wings 420, there is formed a gap whose width substantially corresponds to the width of the channels 320 of the contact insert 300. If the contact insert 300 and the contact securing means 400 are arranged in the receiving region 220 of the plug type connector housing 200, the gaps between the wings 420 of the contact securing means 400 are congruent with the channels 320 of the contact insert 300. The teeth 230 in the opening 210 of the plug type connector housing 200 then engage in the gaps between the wings 420 of the contact securing means 401 and prevent torsion of the contact securing means 400. The contact securing means 400 then cannot be rotated relative to the plug type connector housing 200 about the centre axis of the ring 410 of the contact securing means 400.

Each of the wings 420 of the contact securing means 400 has a contact lance 440 which is secured to the centre piece 422 of the respective wing 420 and extends into the spatial portion delimited by the two arms 421 of the respective wing 420, the centre piece 422 of the respective wing 420 and

the inner side 411 of the ring 410 of the contact securing means 400. Each contact lance 440 is constructed as an elongate resilient bar 450 and is resiliently deformable within limits. At a free end-face end of each contact lance 440, there is formed an eighth abutment face 460 which is orientated in the direction of the ring 410. The contact lances 440 are constructed in such a manner that they are directed slightly radially outwards in the non-clamped state and protrude beyond the outer face of the respective wing 420.

The centre pieces 422 of the wings 420 each have, at the sides thereof facing away from the ring 410 of the contact securing means 400, a seventh abutment face 430. The seventh abutment face 430 is consequently orientated in the same spatial direction as the inner side 411 of the ring 410. The seventh abutment face 430 and the eighth abutment face 460 are orientated in opposing spatial directions.

Figure 3 is a perspective and sectioned illustration of the electrical plug type connector 100. In the illustration of Figure 3, the contact insert 300 is arranged in the receiving region 220 of the plug type connector housing 200. To this end, the contact insert 300 has been introduced with its insertion side 302 at the front through the opening 210 of the plug type connector housing 200 into the receiving region 220 of the plug type connector housing 200. The contact securing means 400 is not yet arranged in the plug type connector housing 200 of the electrical plug type connector 100.

Figure 3 shows that, in the receiving region 220 of the plug type connector housing 200, a fourth abutment face 250 is constructed and is orientated in the direction of the conductor side 201 of the plug type connector housing 200. The fourth abutment face 250 is in abutment with the third abutment face 340 of the contact insert 300. The fourth abutment face 250 thereby limits the movability of the contact insert 300 in the direction of the insertion side 202 of the plug type connector housing 200. The contact insert 300 was introduced through the opening 210 of the plug type connector housing 200 into the receiving region 220 of the plug type connector housing 201 until the third abutment face 340 of the contact insert 300 came into contact with the fourth abutment face 250 of the plug type connector housing 200.

Figure 3 further shows that, in the receiving region 220 of the plug type connector housing 200, there is constructed a second abutment face 240 which is orientated in the direction of the insertion side 202 of the plug type connector housing 200. The second abutment face 240 of the plug type connector housing 200 is in abutment with the first abutment face 330 of the contact insert 300. In this instance, the first abutment face 330 of the contact insert 300 is orientated in the direction of the conductor side 201 of the plug type connector housing 200. The second abutment face 240 of

the **plug** type connector housing **200** is orientated in the direction of the insertion side 202 of the plug type connector housing 200. At the same time, however, the first abutment face 330 of the contact insert 300 is arranged closer to the insertion side 202 of the plug type connector housing 200 than the second abutment face 240 of the plug type connector housing 200. Consequently, the first abutment face 330 of the contact insert 300 is engaged with the second abutment face 240 of the plug type connector housing 200. The engagement between the second abutment face 240 of the plug type connector housing 200 and the first abutment face 330 of the contact insert 300 prevents undesirable removal of the contact insert 300 from the plug type connector housing 200 in the direction of the conductor side 201 of the plug type connector housing 200. Consequently, the engagement between the second abutment face 240 of the plug type connector housing 200 and the first abutment face **330** of the contact insert **300** forms a first contact securing means for fixing the contact insert 300 in the receiving region 220 of the plug type connector housing 200. However, the first contact securing means may also be dispensed with in a simplified embodiment of the plug type connector 100.

The first abutment face 330 of the contact insert 300 is formed on the second thickened portion 370 of the contact insert 300. At the side of the second thickened portion 370 orientated in the direction of the insertion side 302 of the contact insert 300, the second thickened portion 370 of the contact insert 300 is chamfered. This chamfering has enabled the contact insert 300 to be inserted into the plug type connector housing 200 to a sufficient degree and the second thickened portion 370 of the contact insert 300 to be moved past the second abutment face 240 of the plug type connector housing 200 before the first abutment face 330 of the contact insert 300 is engaged with the second abutment face **240** of the plug type connector housing.

Figure 3 further shows that the plug type connector housing 200 has a sixth abutment face 260 which is arranged in the receiving region 220 of the plug type connector housing 200 close to the opening 210 and which is orientated in the direction of the insertion side 202 of the plug type connector housing 200.

It can further be seen from Figure 3 that the contact insert **300** has a contact region 3**10** which is accessible from the conductor side 301 of the contact insert 300. The contact region 310 is constructed in the example illustrated in Figure 3 as a substantially cylindrical hollow space. The contact region 310 serves to connect the contact insert 300 to an electrical conductor. For example, there may be screwed in the contact region 310 a screw which is connected to an electrical conductor in an electrically conductive manner. Alternatively, an electrical conductor could also be soldered in the contact region 310. For a person skilled in the art, other possibilities are obvious for

connecting an electrical conductor to the contact region 310 of the contact insert 300 in an electrically conductive manner. The contact region 310 does not have to be constructed in all embodiments as a cylindrical hollow space.

The insertion side 302 of the contact insert 300 serves to produce an electrically conductive contact with a contact element of a plug type connector counter-piece when the plug type connector 100 is connected to the plug type connector counter-piece. In the embodiment illustrated, the insertion side 302 of the contact insert 300 is constructed as a male contact pin and is provided to be introduced into a socket opening of the contact element of the plug type connector counter-piece. However, the insertion side 302 of the contact insert 300 could also be constructed as a female contact socket and be provided to be connected to a contact element of a plug type connector counter-piece that is constructed as a male contact pin. Other embodiments of the insertion side 302 of the contact insert 300 are also conceivable.

Figure 4 is a sectioned and perspective illustration of the plug type connector 100 in the completely mounted state. With respect to the illustration of Figure 3, the contact securing means 400 has also been arranged in the receiving region 220 of the plug type connector housing 200. The contact securing means 400 acts as a second contact securing means for fixing the contact insert 300 in the receiving region 220 of the plug type connector housing 200 of the electrical plug type connector 100.

The contact securing means 400 was introduced with the wings 420 at the front through the opening 210 into the receiving region 220 of the plug type connector housing 200. The contact securing means 400 was pushed into the receiving region 220 until the seventh abutment face 430 of the contact securing means 400 moved into abutment with the fifth abutment face 350 of the contact insert 300 and further inward movement of the contact securing means 400 into the receiving region 220 of the plug type connector housing 200 was no longer possible.

During the introduction of the contact securing means 400 into the receiving region 220 of the plug type connector housing 200, the contact lances 440 of the contact securing means 400 were resiliently pressed in the region of the resilient bar 450 thereof through a tapered portion in the receiving region 220 of the plug type connector housing 200 into the region surrounded by the wings 420 of the contact securing means 400 until, after passing the tapered portion of the plug type connector housing 200, they resiliently returned in an outward radial direction into the rest position thereof.

The eighth abutment faces 460 on the contact lances 440 of the contact securing means 400 are in abutment with the sixth abutment face 260 of the plug type connector housing 200. Unintentional removal of the contact securing means 400 from the receiving region 220 of the plug type connector housing 200 is thereby prevented and thereby also removal of the contact insert 300 from the receiving region 220 of the plug type connector housing 200. The contact securing means 400 consequently constitutes a second contact securing means which, in addition to the first contact securing means formed from the second abutment face 240 and the first abutment face 330, ensures a fixing of the contact insert 300 in the receiving region 220 of the plug type connector housing 200.

If the contact insert 300 is not introduced to a sufficient extent into the receiving region 220 of the plug type connector housing 200 during the assembly of the electrical plug type connector 100 so that the third abutment face 340 of the contact insert 300 does not move into abutment with the fourth abutment face 250 of the plug type connector housing 200 and the first abutment face 330 of the contact insert 300 does not engage behind the second abutment face 240 of the plug type connector housing 200, the contact securing means 400 thus cannot be pushed in the subsequent assembly step of the plug type connector 100 completely into the receiving region 220 of the plug type connector housing 200. Since the contact insert 300 in this instance is located too far in the direction of the conductor side 201 of the plug type connector housing 200, the seventh abutment face 430 of the contact securing means 400 already moves into abutment with the fifth abutment face 350 of the contact insert 300 before the contact lances 440 of the contact securing means 400 have completely passed the thickened portion of the plug type connector housing 200. In this instance, there is thus no locking action possible between the eighth abutment face 460 of the contact securing means 400 and the sixth abutment face 260 of the plug type connector housing 200. This can readily be seen by a person mounting the electrical plug type connector 100, whereby this person can also recognise the incorrect arrangement of the contact insert 300 in the receiving region 220 of the plug type connector housing 200. Mechanical recognition is also possible. The contact securing means 400 consequently also serves to verify correct arrangement of the contact insert 300 in the receiving region 220 of the plug type connector housing 200.

If the contact insert 300 is intended to be removed again from the receiving region 220 of the plug type connector housing 200 after assembly of the electrical plug type connector 100, the contact securing means 400 must first be removed from the receiving region 220 of the plug type connector housing 200. To this end, it is necessary to release the locking between the contact lances 440 of the contact securing means 400 and the plug type connector housing 200. There are two possibilities for this.

One possibility is to introduce a suitable tool from the insertion side 202 of the plug type connector housing 200 into an unlocking slot 270 which is constructed between the contact insert 300 and a wall of the plug type connector housing 200 in order to deform the contact lances 440 in such a resilient manner that the eighth abutment faces 460 of the contact lances 440 of the contact securing means 400 are released from the sixth abutment face 460 of the plug type connector housing 200. Subsequently, first the contact securing means 400 and afterwards the contact insert 300 can be removed from the receiving region 220 of the plug type connector housing 200. This first unlocking possibility affords the advantage that the tool which is intended to be introduced into the plug type connector housing 200 is not impeded by an electrical conductor which is arranged at the conductor side 101 of the electrical plug type connector 100.

Another possibility for unlocking the contact lances 440 is to introduce suitable tools from the conductor side 201 of the plug type connector housing 200 into the space formed in a radial direction between the contact insert 300 and the wall of the plug type connector housing 200. This tool may engage in slots or openings formed in the contact lances 440 in order to resiliently deform the contact lances 440 and to release the engagement between the eighth abutment face 460 and the sixth abutment face 260. Subsequently, it is in turn possible to remove the contact securing means 400 and the contact insert 300 from the receiving region 220 of the plug type connector housing 200.

The contact securing means 400 is constructed in a mirror-symmetrical and rotationally symmetrical manner. This enables the contact securing means 400 to be assembled from two or four individual components. In the case of two individual components, each of the individual components comprises a portion of the ring 410 which extends over 180° and two of the wings 420.

In the case of four individual components, each individual component of the contact securing means 400 comprises a portion of the ring 410 which extends over 90° and a wing 420. The individual components may be constructed so as to be identical to each other. In order to assemble the individual components to form the contact securing means 400, the individual components of the contact securing means 400 may have suitable connection elements, for example, tongue and groove elements. Owing to the possibility of inserting the contact securing means 400 comprising mutually identical smaller individual components, the costs for producing the contact securing means 400 are reduced.

CLAIMS

1. Electrical plug type connector **(100)**
having a **plug** type connector housing **(200)** having a conductor side **(201) and a**n insertion side (202),
a contact insert (300) which can be arranged in the plug type connector housing (200),
and a contact securing means (400) which can be arranged in the plug type connector housing (200) in order to fix the contact insert (300) in the plug type connector housing (200),
the contact securing means (400) having a resiliently deformable contact lance (440) having an eighth abutment face (460),
the plug type connector housing (200) having a sixth abutment face (260),
the eighth abutment face (460) being able to be engaged with the sixth abutment face (260) when the contact securing means (400) is arranged in the plug type connector housing (200).

2. Electrical plug type connector (100) according to claim 1,
the contact securing means (400) having a ring (410) having an outer side (412) and an inner side (411),
a wing (420) being arranged at the inner side **(411)** of the ring (410),
the contact lance **(440)** being arranged **on** the wing **(420),**
the contact lance (440) and the eighth abutment face (460) being orientated in the direction of the ring (410).

3. Electrical plug type connector (100) according to claim 2, the contact securing means (400) having four wings **(420)** which are distributed **in** a uniform manner around the ring **(410) in** a peripheral direction.

4. Electrical plug type connector (100) according to either claim 2 or claim 3,
the contact securing means (400) being composed of two individual pieces.

5. Electrical plug type connector (100) according to claim 4, the two individual pieces being constructed identically.

6. Electrical plug type connector (100) according to any one of the preceding claims,
the contact insert (300) having a third abutment face (340) which is orientated **in** the direction of an insertion side (302) of the contact insert (300),

the **plug** type connector housing **(200)** having a fourth abutment face (250) which is orientated in the direction of the conductor side (201) of the plug type connector housing (200),
the third abutment face **(340)** being in abutment against the fourth abutment face **(250)** when the contact insert (300) is completely introduced into the plug type connector housing (200).

7. Electrical plug type connector (100) according to claim 6, the eighth abutment face (460) being able to be engaged with the sixth abutment face **(260)** only when the third abutment face **(340)** is **in** abutment against the fourth abutment face **(250).**

8. Electrical plug type connector (100) according to any one of the preceding claims,
the contact insert (300) having a first abutment face (330) which is orientated in the direction of a conductor side (301) of the contact insert (300),
the plug type connector housing (200) having a second abutment face (240) which is orientated away from the conductor side (201) of the plug type connector housing (200),
the first abutment face (330) being able to be engaged with the second abutment face (240) when the contact insert (300) is arranged in the plug type connector housing (200).

9. Electrical plug type connector (100) according to any one of the preceding claims,
the wing (420) of the contact securing means (400) having a seventh abutment face (430) which is orientated away from the ring (410) of the contact securing means (400),
the contact insert (300) having a fifth abutment face (350) which is orientated in the direction of a conductor side (301) of the contact insert (300),
the seventh abutment face **(430)** being **in** abutment against the fifth abutment face **(350)** when the contact insert (300) and the contact securing means (400) are completely introduced into the plug type connector housing **(200).**

10. Electrical plug type connector (100) according to any one of the preceding claims,
the engagement between the eighth abutment face (460) and the sixth abutment face (260) being able to be released from the insertion side (202) of the plug type connector housing (200).

11. Electrical plug type connector (100) according to any one of the preceding claims,
the engagement between the eighth abutment face (460) and the sixth abutment face (260) being able to be released from the conductor side (201) of the plug type connector housing (200).

12. Electrical plug type connector (100) according to any one of the preceding claims,

the contact insert (300) having a contact region (310) which is provided to contact another contact region of a plug type connector counter-piece.

13. Electrical plug type connector (100) according to claim 12,
the contact region (310) of the contact insert (300) being constructed as a socket opening.

14. Electrical plug type connector (100) according to any one of the preceding claims,
the plug type connector housing (200) comprising an electrically insulating material, in particular a plastics material.

15. Electrical plug type connector (100) according to any one of the preceding claims,
the contact insert (300) comprising an electrically conductive material, in particular a metal.

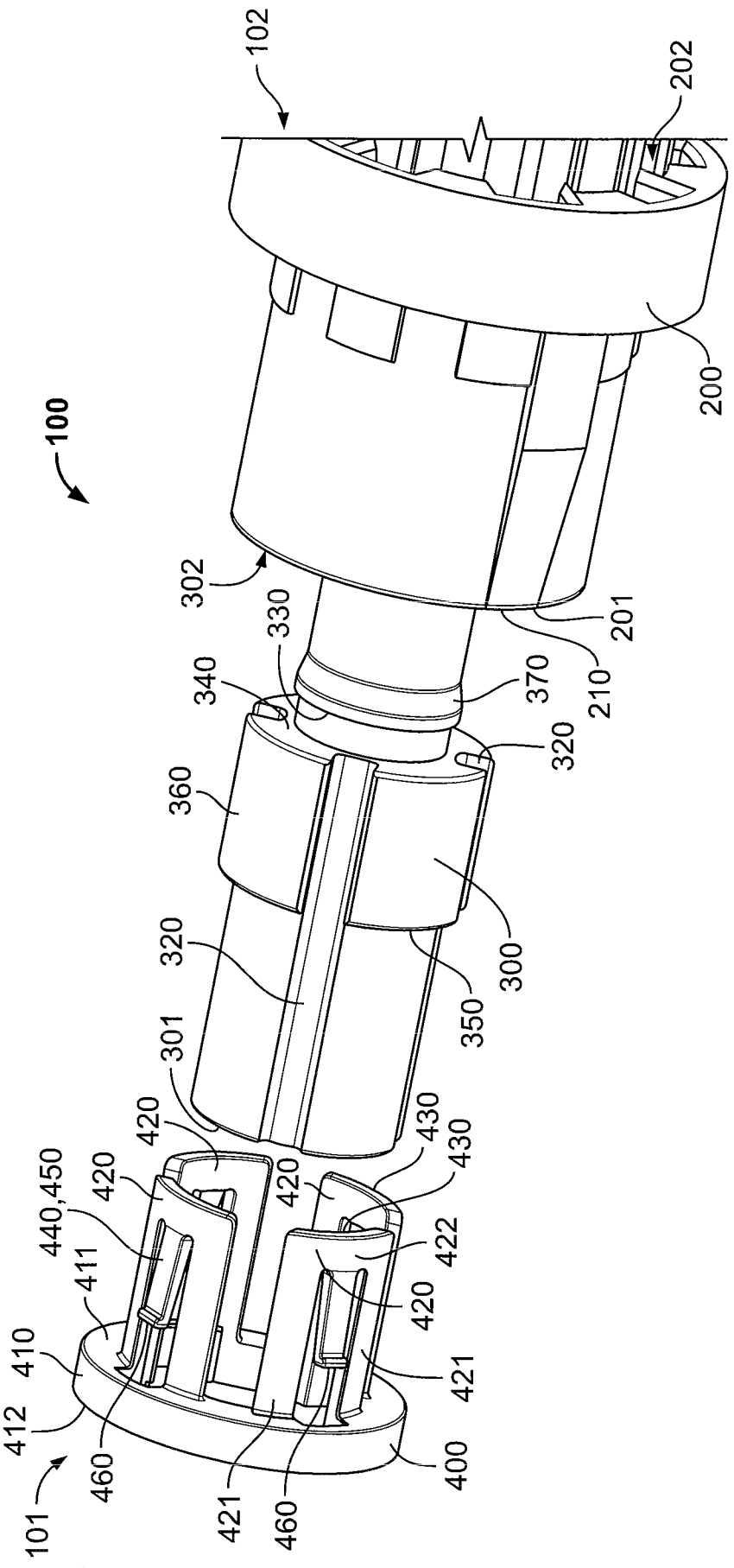
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Fig. 1

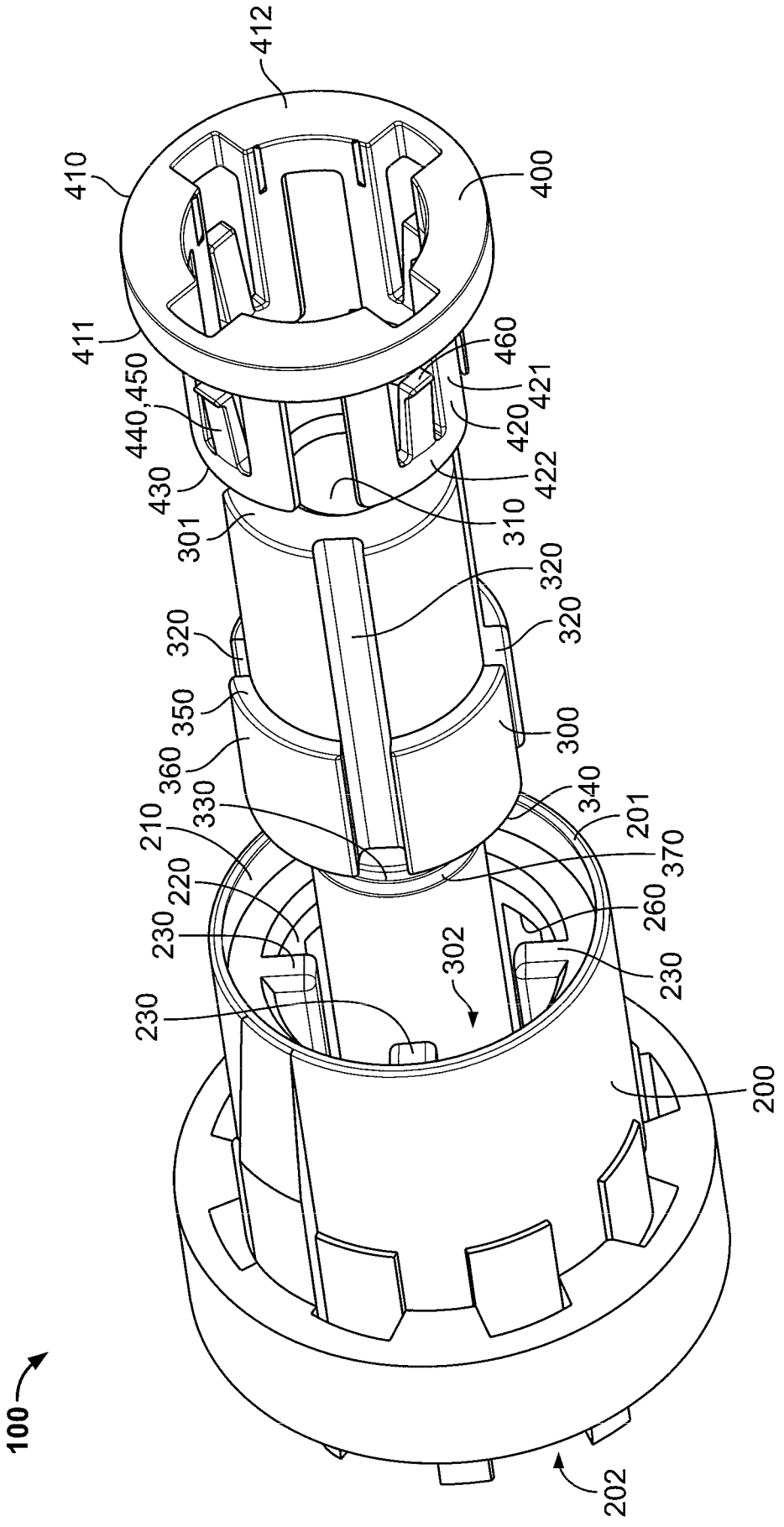
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Fig. 2

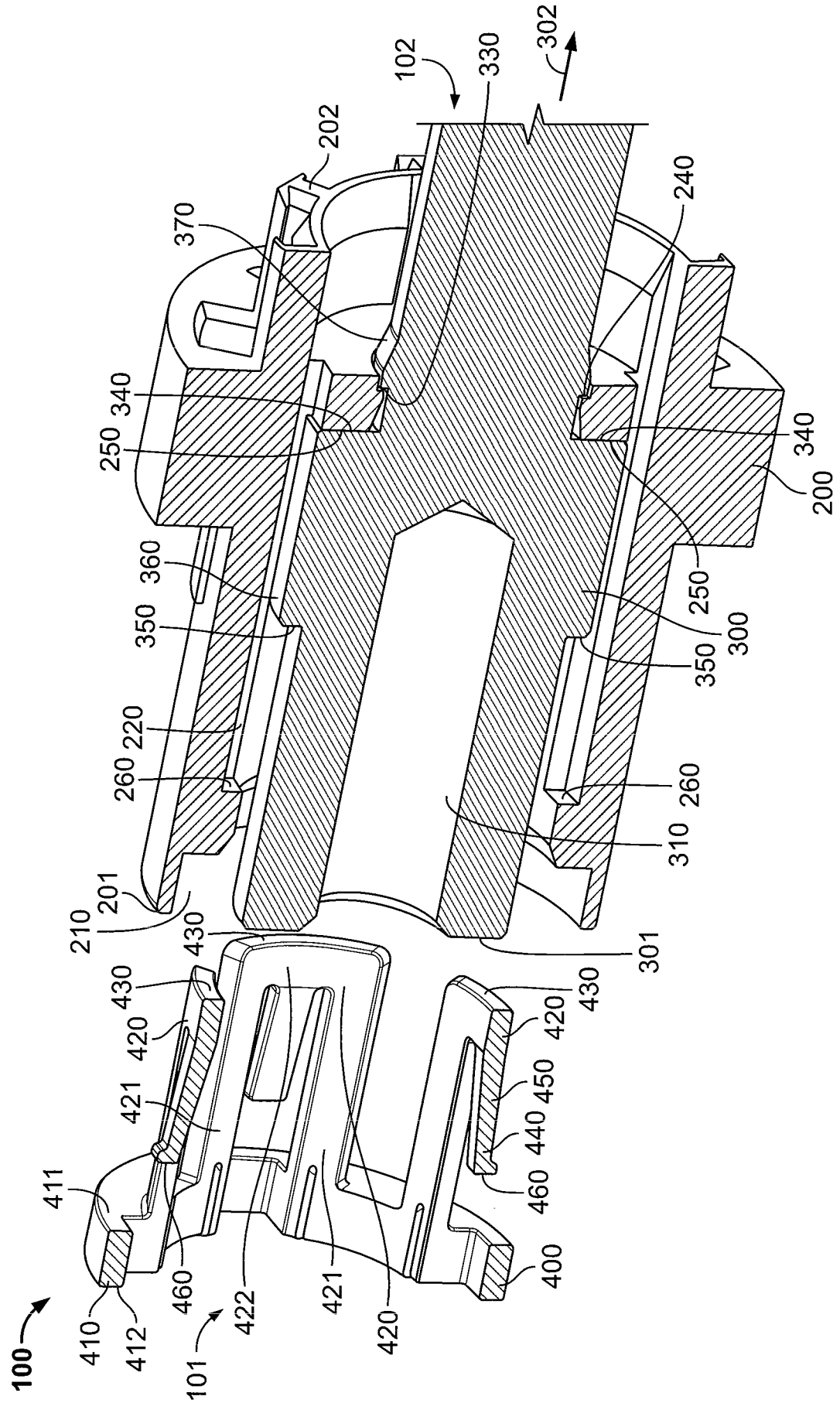
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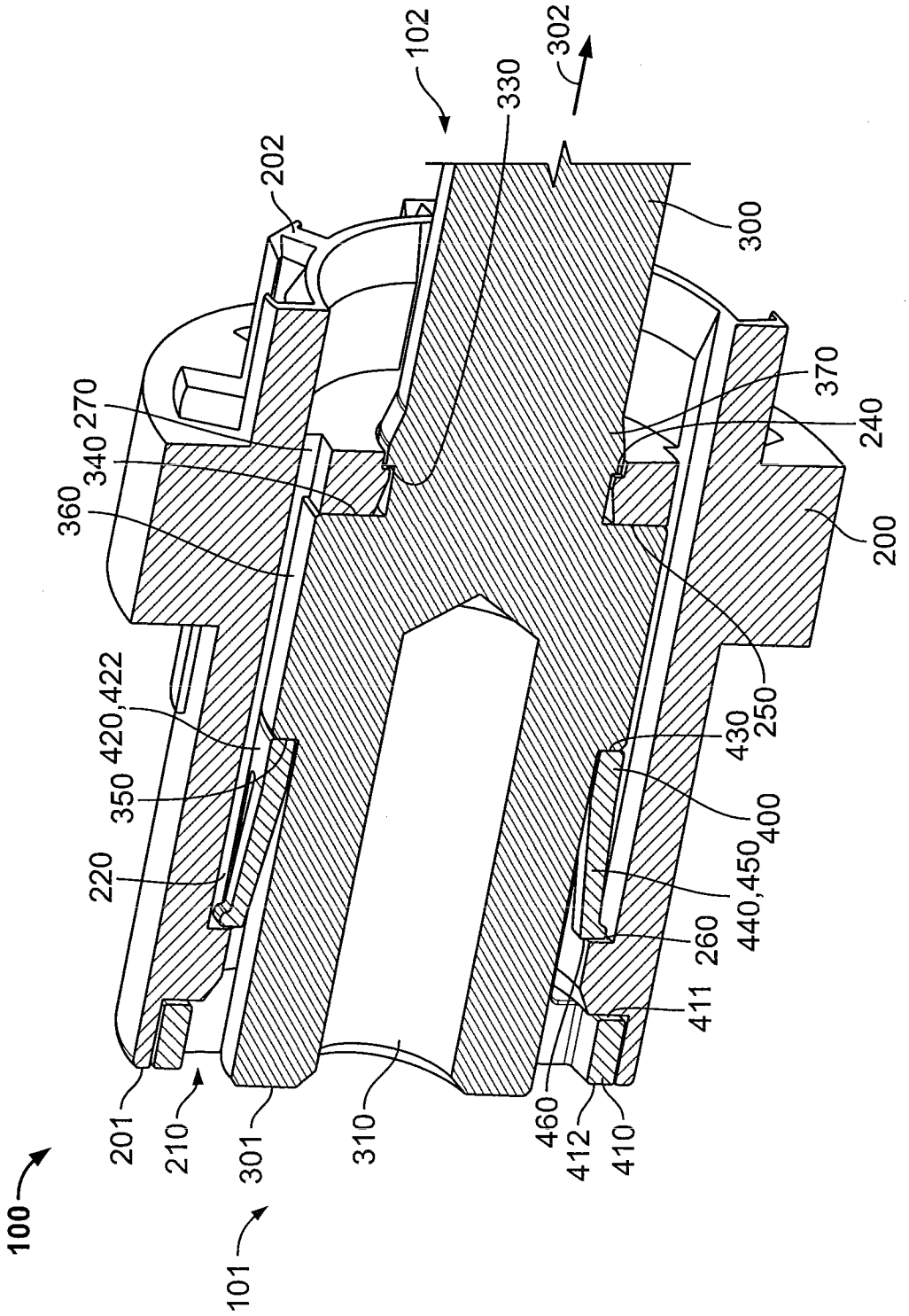
Fig. 3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460

Fig. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/073093

A. CLASSIFICATION OF SUBJECT MATTER
INV. H01R13/506 H01R13/426
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 20 2007 005073 Ul (C0NINVERS ELEKTROTECHNISCHE BA [DE]) 28 June 2007 (2007-06-28) cl aims paragraphs [0001] , [0022] , [0024] - [0029] f i gures	1-15
X	DE 20 2005 017979 Ul (C0NINVERS ELEKTROTECHNISCHE BA [DE]) 2 February 2006 (2006-02-02) cl aims 1-6 paragraphs [0010] , [0011] , [0013] , [0014] , [0021] , [0023] , [0025] , [0026] , [0029] f i gures	1, 2 ,4, 10, 12-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 February 2013	27/02/2013

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Sti chauer, Li bor

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2012/073093

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202007005073 Ul	28-06-2007	NONE	
DE 202005017979 Ul	02-02-2006	NONE	