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(54) **Injector, fuel cup and holder**

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Injecteur, gobelet pour l'alimentation en carburant et support

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Description

[0001] The invention relates to a holder for fixing an injector to a fuel cup. Further, the invention relates to the injector and the fuel cup.

[0002] EP 0 969 204 A1 discloses a coupling system between an engine head, an injector and a fuel manifold. The engine head has a seating designed to house the injector. The fuel manifold extends above the engine head and is connected to the injector through a bush projecting from the fuel manifold. The injector is coupled to the seating by means of a ball coupling. The fuel manifold is rigidly secured to the engine head of the engine. An opposing spring is interposed between the fuel manifold and the injector to compress the injector inside the seat.

[0003] WO 03/054383 A1 discloses a fixing device for reciprocally fixing a fuel injection valve to a cylinder head in an internal combustion engine and for fixing the fuel injection valve to a fuel distribution line. The fixing device is embodied in the form of a spring clip comprising undulated spring shackles which press against a shoulder of the fuel distribution line.

[0004] WO 00/42315 A1 discloses a spring clip which includes a first portion including a bridge connecting spaced elongate fingers adapted to straddle a body portion of a fuel injector and be receivable in a receiving portion of a fuel rail cup. The elongate fingers include a reverse bend at a midpoint therealong and terminate in a bridging portion. The bent elongate defines finger segments on each side of the reverse bend. The finger segments diverge from the reverse bend part way toward the bridge and bridging portions and converge thereafter to form generally diamond shaped spring elements. A second portion of a generally planar shape having spaced legs engages slots in the injector body. The second portion includes a wall portion extending generally perpendicular to the spaced legs and connects with the bridging portion. When the injector is mounted in the fuel rail cup, the legs are received in slots in the injector body and the elongate finger segments are compressed between the fuel rail cup and the injector body. The fuel injector is clamped between the legs and the fingers with a force toward the head of the engine by the compressive load of the finger segments. The clip is yieldable to avoid overloading the injector during installation in the engine.

[0005] WO 03/038267 A1 discloses a fixing device for reciprocally fixing a fuel injection valve to a cylinder head of an internal combustion engine and for fixing the fuel injection valve to a fuel distribution line. The fixing device comprises two spring tongue elements which can be inserted into a retaining groove of the fuel injection valve or the fuel distributor line. A center distance of the spring tongue elements is less than the largest diameter of the opening surface surrounded thereby and the spring tongue elements are resilient in a radial direction in relation to an axis of the fuel injection valve. At least two spring elements are formed in an axial direction in relation

to the spring tongue elements and are resilient with respect to traction and pressure. The spring elements can be detachably linked to the opposite lying fuel injector valve or fuel distributor line in an axial non-positive fit by means of a locking connection.

[0006] The object of the invention is to create a fuel cup, a holder for fixing an injector to the fuel cup and an injector assembly which enable a proper coupling of the injector to the fuel cup.

[0007] The object of the invention is achieved by the independent claims 1, 7, and 9. Advantageous embodiments are given in the sub-claims.

[0008] The invention is distinguished concerning a first aspect of the invention by a holder for fixing an injector to a fuel cup. The holder comprises a bottom portion, a first side portion, a notch of the holder, an injector recess, and at least one elastic element. The first side portion extends away from a first side of the bottom portion and comprises the notch of the holder. The notch of the holder is arranged for engaging the notch of the holder to a notch of the fuel cup. The injector recess is formed in the bottom portion of the holder for taking in the injector. The injector recess of the holder is formed and arranged in such a way that the holder may be fixed to the injector at the injector recess of the holder by a positive connection. The elastic element is arranged at the bottom portion of the holder for forcing the holder away from the fuel cup. The notch of the holder comprises a fuel cup recess for taking in the notch of the fuel cup. The fuel cup recess has an open end of the fuel cup recess facing away from the bottom portion for introducing the notch of the fuel cup into the fuel cup recess of the holder. The fuel cup recess of the holder comprises a diminution of the fuel cup recess of the holder. The diminution of the fuel cup recess of the holder is formed at the open end of the fuel cup recess of the holder for engaging the notch of the fuel cup into the fuel cup recess of the holder.

[0009] The notch of the holder enables a simple coupling of the holder to the fuel cup. This contributes to a simple assembling of the injector to an internal combustion engine. The injector recess enables the positive connection between the holder and the injector. This contributes to a simple assembling of the holder to the injector. If the injector with the holder and the fuel cup is arranged in the internal combustion engine, the elastic elements are preloaded. So, the elastic elements apply a given force to the injector towards a combustion chamber of the internal combustion engine. This contributes to that the injector is pressed into a seat of the injector at the internal combustion engine despite a pressure which may be applied on the injector towards the fuel cup because of a pressure in the combustion chamber. The fuel cup recess with its diminution contributes to a simple design of the notch of the holder and so to a low-cost production of the notch of the holder. This is especially advantageous, if the notch of the fuel cup comprises a T-shaped fixing element which may be introduced into the fuel cup recess for engaging the holder to the fuel cup.

Preferably, the fuel cup is coupled to a fuel rail and/or a part of the fuel rail.

[0010] In an advantageous embodiment of the first aspect of the invention, the holder comprises a second and a third side portion. The second and the third side portions are coupled to a second and, respectively, a third side of the bottom portion of the holder. The second and the third side portions are arranged opposite to each other and each comprise at least one elastic element. This may contribute to apply an even load on the injector through the elastic element. This contributes to a proper coupling of the injector to the injector seat of the internal combustion engine.

[0011] In a further advantageous embodiment of the first aspect of the invention, the elastic elements each comprise at least one bended arm. Each bended arm is coupled to the bottom portion at a first end of the bended arm. The bended arm extends away from the bottom portion and then bends back towards the bottom portion. Each bended arm has a second end of the bended arm. The second end of the bended arm has a given distance to the bottom portion. This contributes to a simple design of the elastic elements. Further, this enables to form the holder and the elastic elements of one piece. This enables a low-cost production of the holder and in particular of the elastic elements.

[0012] In a further advantageous embodiment of the first aspect of the invention, each bended arm comprises an extension at a bended part of the bended arm for a coupling of the extensions to shoulders of the fuel cup. This contributes to a proper coupling of the bended arms to the fuel cup. This contributes to apply the given force on the injector properly.

[0013] In a further advantageous embodiment of the first aspect of the invention, the injector recess of the holder is open towards a fourth side of the bottom portion facing away from the first side of the bottom portion of the holder. The injector recess comprises an orientation element of the holder for avoiding a rotation of the holder relative to the injector around an axis of the injector. This enables the positive connection of the holder to the injector in a simple way. So, this contributes to a proper fixation of the holder to the injector.

[0014] In a further advantageous embodiment of the first aspect of the invention, the holder comprises back stops for each of the bended arms. The back stops extend away from the bottom portion towards the second ends of the bended arms. The back stops of the bottom portion have the given distance to the second ends of the bended arms. This may contribute to stabilize the bended arms of the holder. This contributes to a proper functionality of the holder over a long lifetime of the holder.

[0015] The invention is distinguished concerning a second aspect of the invention by the fuel cup for the injector. The fuel cup comprises a fuel cup body with an injector recess of the fuel cup for sealingly taking in the fluid connection of the injector. The fuel cup further comprises a notch of the fuel cup for engaging the notch of

the holder to the notch of the fuel cup. The notch of the fuel cup comprises a T-shaped fixing element. The T-shaped fixing element radially extends away from the outside of the fuel cup body for introducing the T-shaped fixing element into the fuel cup recess of the holder. The injector recess enables a proper sealed coupling of the injector to the fuel cup. The notch of the fuel cup enables the fixation of the fuel cup to the holder. The T-shaped fixing element is especially advantageous in combination with the fuel cup recess of the holder. The T-shaped fixing element comprises a first section and a second section. The second section is broader than the fuel cup recess of the holder. The first section is arranged between the fuel cup and the second section is slightly broader than the diminution of the fuel cup recess and smaller than the fuel cup recess. This enables to introduce the T-shaped fixing element into the fuel cup recess by slightly bending the first side portion of the holder in such a way that the diminution gets at least as broad as the first section of the T-shaped fixing element. This enables to form the notches in a very simple way.

[0016] In an advantageous embodiment of the second aspect of the invention, the fuel cup comprises at least two shoulders. The two shoulders are formed and arranged at the outside of the fuel cup opposite to each other for a coupling with the elastic elements of the holder. This contributes to a proper coupling of the bended arms to the fuel cup. This contributes to apply the given force on the injector properly.

[0017] The invention is distinguished concerning a third aspect of the invention by an injector assembly. The injector assembly comprises the holder, the injector, and the fuel cup. The holder is clamped to the injector in such a way that the border of the injector recess of the holder is at least partly arranged in the groove of the injector. The fuel cup is arranged in such a way that the fuel cup partly takes in the fluid connection of the injector. The notch of the fuel cup is engaged to the notch of the holder. The elastic elements of the holder are coupled to the fuel cup. The T-shaped fixing element of the fuel cup is arranged in the fuel cup recess of the holder. This enables the fixation of the holder to the fuel cup.

[0018] In an advantageous embodiment of the third aspect of the invention, the orientation element of the holder is coupled to the orientation element of the injector. This enables to avoid the rotation of the injector relative to the holder and via the notches to avoid a rotation of the injector relative to the fuel cup.

[0019] In a further advantageous embodiment of the third aspect of the invention, the extensions of the bended arms of the holder are coupled to the shoulders of the fuel cup.

[0020] The invention is explained in the following with the help of schematic drawings.

[0021] These are as follows:

figure 1 an injector assembly,

figure 2 an exploded view of the injector assembly,

figure 3 a holder of the injector assembly,

figure 4 a cutted view through an injector of the injector assembly according to figure 2.

[0022] Elements with the same design or function that appear in the different illustrations are identified by the same reference characters.

[0023] An injector assembly (figure 1) comprises an injector 2, a holder 4, and a fuel cup 6. Preferably, the injector assembly is arranged at an internal combustion engine for injecting fluid into a combustion chamber of the internal combustion engine. Preferably, the fuel cup 6 is coupled to a fuel rail and/or a part of the fuel rail.

[0024] The injector 2 comprises an injector tip 3 facing away from the fuel cup 6. The injector tip 3 comprises at least one injector opening through which the fuel may be injected into the combustion chamber. Preferably, the injector 2 is arranged at the internal combustion engine in such a way that a step 5 of the injector is coupled to an injector seat of an engine head of the internal combustion engine.

[0025] The holder 4 comprises a notch of the holder 4. The notch of the holder 4 is arranged for engaging the notch of the holder 4 to an notch of the fuel cup 6. Preferably, the notch of the holder 4 is formed by a first side portion 8 of the holder 4. The first side portion 8 comprises a fuel cup recess 10. The fuel cup recess 10 is arranged for introducing the notch of the fuel cup 6 into the fuel cup recess 10 of the holder 4.

[0026] For engaging the notch of the fuel cup 6 into the fuel cup recess 10 of the holder 4, the fuel cup recess 10 comprises a diminution 12 of the fuel cup recess 10. The diminution 12 is formed in such a way that, while the notch of the fuel cup is introduced into the fuel cup recess 10 of the holder 4, the first side portion 8 is bended in such a way that the diminution 12 gets broader. If the notch of the fuel cup 6 is introduced further into the fuel cup recess 10, the first side portion 8 bends back in its normal position and the notch of the fuel cup 6 is engaged into the fuel cup recess 10 of the first side portion 8 of the holder 4.

[0027] The holder 4 further comprises at least one elastic element. The elastic element is arranged in such a way that, if the injector assembly is arranged at the internal combustion engine, the injector 2 is pressed in its injector seat by the elastic element. Preferably, the holder 4 comprises two elastic elements which are arranged at two opposite sides of the holder 4. This contributes to an even load on the injector 2.

[0028] Preferably, the elastic elements each comprise a bended arm. In particular, the holder 4 comprises a bended arm 14 of a second side portion of the holder 4 and a bended arm 16 of a third side portion of the holder 4. The bended arms firstly extend away from a bottom portion 31 of the holder 4 (figure 2, figure 3). The bended

arms each comprise a bend at which the bended arms secondly bend towards the bottom portion 31.

[0029] Preferably, the bended arm 14 of the second side portion of the holder 4 comprises a second end 39 of the bended arm 14 of the second side portion and the bended arm 16 of the third side portion comprises a second end 37 of the bended arm 16 of the third side portion of the holder 4. The second ends may be formed in such a way that the second ends extend parallel to the bottom portion 31 of the holder 4.

[0030] Additionally, the bottom portion 31 may comprise a first and a second back stop 41, 43 for the bended arms. The second ends have a given distance to the bottom portion 31 and, in particular, to the first and second back stops 41, 43.

[0031] Preferably, the holder 4 further comprises an extension 18 of the bended arm 14 of the second side portion and an extension 20 of the bended arm 16 of the third side portion. The extensions are formed for improving the coupling of the elastic elements to the fuel cup. In particular, the extensions are formed for improving the coupling of the extensions to a first and, respectively, a second shoulder 22, 24 of the fuel cup 6. The extensions and the shoulders enlarge a coupling surface between the holder 4 and the fuel cup 6. This contributes to a proper load transfer from the fuel cup 6 to the injector 2, if the injector assembly is arranged at the internal combustion engine. For example, if the coupling surface between the elastic elements and the fuel cup 6 would be too small, the contact of the elastic elements to the fuel cup 6 may be lost during operation of the internal combustion engine because of vibrations of the internal combustion engine.

[0032] Preferably, the notch of the fuel cup 6 comprises a T-shaped fixing element 26. The T-shaped fixing element comprises a first section 28 of the T-shaped fixing element 26 and a second section 30 of the T-shaped fixing element 26. The T-shaped fixing element 26 is formed in such a way that the first section 28 is slightly broader than the diminution 12 of the fuel cup recess 10 and that the second section 30 is broader than the fuel cup recess 10 of the holder 4. This enables the engaging of the T-shaped fixing element 26 into the fuel cup recess 10 of the holder 4.

[0033] Preferably, the injector 2 comprises a fuel connection 34. The fuel connection 34 is arranged for sealingly coupling the injector 2 to the fuel cup 6. The fuel connection 34 may be introduced into an injector recess of the fuel cup 6. To improve the sealing between the injector 2 and the fuel cup 6, the injector 2 may comprise a sealing 36.

[0034] The injector 2 comprises a groove 38 of the injector 2. The groove 38 of the injector 2 is arranged at the fluid connection 34. The groove 38 may at least partly extends around the circumference of the fluid connection 34. Preferably, the groove 38 comprises two C-shaped parts (figure 4) and at least one orientation element 40 of the injector 2. The orientation elements 40 may com-

prise a rectangular shape. The orientation elements 40 of the injector 2 are arranged for a coupling with an orientation element 35 of an injector recess 33 of the bottom portion 31 of the holder 4. If the orientation elements 40 of the injector 2 are coupled to the orientation element 35 of the injector recess 33 and if the holder 4 is clamped to the injector 2, the orientation elements avoid a rotation of the holder 4 around an axis of the injector 2. The injector recess 33 of the holder 4 and the groove 38 of the injector 2 are formed and arranged in such a way that the holder 4 may be clamped to the injector 2 in such a way that a border of the injector recess 33 may be arranged partly in the groove 38. For this reason, the injector recess 33 of the holder 4 comprises an open end facing away from the first side portion 8 of the holder 4.

[0035] While assembling the injector assembly, for example, at an assembly line, the holder 4 may be clamped to the injector 2. Afterwards, the fluid connection 34 of the injector 2 is introduced into the fuel cup 6 and the T-shaped fixing element 26 is introduced into the fuel cup recess 10 of the holder 4. If the T-shaped fixing element 26 is engaged in the fuel cup recess 10, the fuel cup 6, the holder 4, and the injector 2 may be handled as one part. This is especially advantageous for the assembling of the injector assembly to the internal combustion engine. Preferably, the whole fuel rail of the internal combustion engine may be assembled in such a way that all injectors 2 of the fuel rail are clamped at their fuel cups 6 of the fuel rail and that the whole fuel rail with the injectors 2 may be handled as one piece.

[0036] If the injector 2 is arranged in its injector seat of the engine head of the internal combustion engine, for example, a screw may be stuck through a fixing recess 32 of the fuel cup 6. If the fuel cup 6 is fixed by the screw at the engine head, the notches lose their sense and do not further contribute to fix the injector 2 to the fuel cup 6. However, then the fuel cup 6 loads the elastic elements of the holder 4. The load on the elastic elements leads to a bending of the bended arms towards the bottom portion 31. The back stops may contribute to that the bended arms are not bended in such a way that the bended arms break. Further, if the second ends of the bended arms are in contact with the back stops and if the load further increases, the back stops may also be bended and contribute to increase the elastic force of the elastic elements. The load is transferred to the injector 2 in such a way that the injector 2 is pressed against its injector seat in the engine head. This contributes to that the injector 2 stays in its injector seat despite a pressure which may force the injector 2 away from its injector seat and which may be produced by a pressure in the combustion chamber of the internal combustion engine.

[0037] The invention is not restricted by the explained embodiments but by the scope of the appended claims. For example, the holder 4 may comprise only one or more than two elastic elements. Further, the elastic elements may be formed alternatively, for example by springs. Further, the notches may comprise an alternative embodi-

ment and/or there may be arranged further notches. Further, the bended arms may be formed without the extensions and the fuel cup 6 may be formed without the shoulders, respectively.

Claims

1. Holder (4) for fixing an injector (2) to a fuel cup (6), the holder (4) comprising

- a bottom portion (31),
- a first side portion (8) which extends away from a first side of the bottom portion (31) and which comprises a notch of the holder (4) for engaging the notch of the holder (4) to a notch of the fuel cup (6),
- an injector recess (33) in the bottom portion (31) of the holder (4) for taking in the injector (2), wherein the injector recess (33) of the holder (4) is formed and arranged in such a way that the holder (4) may be fixed to the injector (2) at the injector recess (33) of the holder (4) by a positive connection,
- at least one elastic element which is arranged at the bottom portion (31) of the holder (4) for forcing the injector (2) away from the fuel cup (6),

characterized by the notch of the holder (4) comprising a fuel cup recess (10) for taking in the notch of the fuel cup (6), wherein the fuel cup recess (10) has an open end of the fuel cup recess (10) facing away from the bottom portion (31) for introducing the notch of the fuel cup (6) into the fuel cup recess (10) of the holder (4) and wherein the fuel cup recess (10) of the holder (4) comprises a diminution (12) of the fuel cup recess (10) of the holder (4) at the open end of the fuel cup recess (10) of the holder (4) for engaging the notch of the fuel cup (6) into the fuel cup recess (10) of the holder (4).

2. Holder in accordance with claim 1 comprising second and third side portions which are coupled to a second and, respectively, a third side of the bottom portion (31) of the holder (4) and which are arranged opposite to each other and which each comprise at least one elastic element.

3. Holder (4) in accordance with claim 2, with the elastic elements each comprising at least one bended arm which

- is coupled to the bottom portion (31) at a first end of the bended arm,
- extends away from the bottom portion (31) and which then bends back towards the bottom portion (31),
- each have a second end of the bended arm,

the second end of the bended arm has a given distance to the bottom portion (31).

4. Holder (4) in accordance with claim 3 with each bended arm comprising an extension at a bended part of the bended arm for a coupling of the extensions to shoulders of the fuel cup. 5
5. Holder (4) in accordance with one of the preceding claims, with the injector recess (33) of the holder (4) being open towards a fourth side of the bottom portion (31) facing away from the first side of the bottom portion (31) of the holder (4) and with the injector recess (33) comprising an orientation element (35) of the holder (4) for avoiding a rotation of the holder (4) relative to the injector (2) around an axis of the injector (2). 10
6. Holder (4) in accordance with one of the claims 3 to 5 comprising back stops for each of the bended arms, with the back stops extending away from the bottom portion (31) towards the second ends of the bended arms having the given distance to the second ends of the bended arms. 15
7. Fuel cup (6) for an injector (2) comprising a fuel cup body with an injector recess of the fuel cup (6) for sealingly taking in a fluid connection (34) of the injector (2) and comprising a notch of the fuel cup (6) for engaging a notch of a holder (4) as claimed in one of the preceding claims to the notch of the fuel cup (6) with the notch of the fuel cup (6) comprising a T-shaped fixing element (26) which radially extends away from the outside of the fuel cup body for introducing the T-shaped fixing element (26) into a fuel cup recess (10) of the holder (4). 20
8. Fuel cup (6) in accordance with claim 7 comprising at least two shoulders which are formed and arranged at the outside of the fuel cup (6) opposite to each other for a coupling with an elastic element of the holder (4). 25
9. Injector assembly comprising 30
 - the holder (4) according to one of the claims 1 to 6,
 - the injector (2),
 - the fuel cup (6) according to one of the claims 7 or 8, with the holder (4) being clamped to the injector (2) in such a way that the border of the injector recess (33) of the holder (4) is at least partly arranged in a groove of the injector (2) and with the fuel cup (6) being arranged in such a way that the fuel cup (6) partly takes in the fluid connection (34) of the injector (2) and that the notch of the fuel cup (6) is engaged to the notch of the holder (4) and that the elastic ele-

ments of the holder (4) are coupled to the fuel cup (6) and with the T-shaped fixing element (26) of the fuel cup (6) being arranged in the fuel cup recess (10) of the holder (4).

10. Injector assembly in accordance with claim 9 with the orientation element (35) of the holder (4) being coupled to an orientation element of the injector (2).
11. Injector assembly in accordance with one of the claims 9 to 10 with the extensions of the bended arms of the holder (4) being coupled to the shoulders of the fuel cup (6).

Patentansprüche

1. Halter (4) zum Befestigen eines Injektors (2) an einem Kraftstoffbecher (6), während der Halter (4) umfasst
 - einen unteren Bereich (31),
 - einen ersten Seitenbereich (8), der sich von einer ersten Seite des unteren Bereichs (31) weggestreckt und der eine Kerbe des Halters (4) aufweist, um die Kerbe des Halters (4) mit einer Kerbe des Kraftstoffbechers (6) in Eingriff zu bringen,
 - eine Injektorausspaarung (33) in dem unteren Bereich (31) des Halters (4) zum Aufnehmen des Injektors (2), während die Injektorausspaarung (33) des Halters (4) in einer Weise ausgebildet und angeordnet ist, dass der Halter (4) an dem Injektor (2) mittels einer formschlüssigen Verbindung an der Injektorausspaarung (33) des Halters (4) befestigt werden kann,
 - mindestens ein elastisches Element, das an dem unteren Bereich (31) des Halters (4) zum Wegdrücken des Injektors (2) von dem Kraftstoffbecher (6) angeordnet ist, **dadurch gekennzeichnet, dass** die Kerbe des Halters (4) eine Kraftstoffbecheraussparung (10) zum Aufnehmen der Kerbe des Kraftstoffbechers (6) umfasst, während die Kraftstoffbecheraussparung (10) ein offenes Ende der Kraftstoffbecheraussparung (10) aufweist, das von dem unteren Bereich (31) wegweist, um die Kerbe des Kraftstoffbechers (6) in die Kraftstoffbecheraussparung (10) des Halters (4) einzuführen und wobei die Kraftstoffbecheraussparung (10) des Halters (4) eine Verringerung (12) der Kraftstoffbecheraussparung (10) des Halters (4) an dem offenen Ende der Kraftstoffbecheraussparung (10) des Halters (4) aufweist, um mit der Kerbe des Kraftstoffbechers (6) in die Kraftstoffbecheraussparung (10) des Halters (4) einzugreifen.
2. Halter gemäß Anspruch 1, umfassend zweite und

dritte Seitenbereiche, die an eine zweite und eine dritte Seite des unteren Bereichs (31) des Halters (4) gekoppelt sind und die einander gegenüberliegend angeordnet sind und die jeweils mindestens ein elastisches Element umfassen.

3. Halter (4) gemäß Anspruch 2, während die elastischen Elemente jeweils mindestens einen gebogenen Arm umfassen, der

- an den unteren Bereich (31) mit einem ersten Ende des gebogenen Arms gekoppelt ist,
- sich von dem unteren Bereich (31) wegerstreckt und der dann zurück in Richtung des unteren Bereichs (31) gebogen ist,
- während jeder Arm ein zweites Ende des gebogenen Arms aufweist, wobei das zweite Ende des gebogenen Arms einen vorgegebenen Abstand zu dem unteren Bereich (31) aufweist.

4. Halter (4) gemäß Anspruch 3, bei dem jeder gebogene Arm eine Verlängerung an einem gebogenen Teil des gebogenen Arms für ein Koppeln der Verlängerungen an die Schultern des Kraftstoffbechers umfasst.

5. Halter (4) gemäß einem der vorhergehenden Ansprüche, während die Injektorausparung (33) des Halters (4) offen in Richtung einer vierten Seite des unteren Bereichs (31) ist, die sich von der ersten Seite des unteren Bereichs (31) des Halters (4) wegerstreckt, und wobei die Injektorausparung (33) ein Ausrichtelement (35) des Halters (4) zum Vermeiden einer Drehung des Halters (4) in Bezug auf den Injektor (2) um eine Achse des Injektors (2) umfasst.

6. Halter (4) gemäß einem der Ansprüche 3 bis 5, der hintere Anschläge für jeden der gebogenen Arme umfasst, wobei die hinteren Anschläge, die sich von dem unteren Bereich (31) in Richtung der zweiten Enden der gebogenen Arme wegerstrecken, den vorgegebenen Abstand zu den zweiten Enden der gebogenen Arme aufweisen.

7. Kraftstoffbecher (6) für einen Injektor (2), umfassend einen Kraftstoffbecherkörper mit einer Injektorausparung des Kraftstoffbechers (6) zum dichtenden Aufnehmen einer Flüssigkeitsverbindung (34) des Injektors (2) und der eine Kerbe des Kraftstoffbechers (6) umfasst, um eine Kerbe eines Halters (4) gemäß einem der vorhergehenden Ansprüche mit der Kerbe des Kraftstoffbechers (6) in Eingriff zu bringen, während die Kerbe des Kraftstoffbechers (6) ein T-förmiges Befestigungselement (26) umfasst, das sich radial weg von der Außenseite des Kraftstoffbecherkörpers zum Einführen des T-förmigen Befestigungselements (26) in eine Kraftstoffbe-

cherausparung (10) des Halters (4) erstreckt.

8. Kraftstoffbecher (6) gemäß Anspruch 7, umfassend mindestens zwei Schultern, die an der Außenseite des Kraftstoffbechers (6) einander gegenüberliegend zum Koppeln mit einem elastischen Element des Halters (4) ausgebildet und angeordnet sind.

9. Injektoranordnung, umfassend

- den Halter (4) gemäß einem der Ansprüche 1 bis 6,
- den Injektor (2),
- den Kraftstoffbecher (6) gemäß einem der Ansprüche 7 oder 8, während der Halter (4) an den Injektor (2) in einer solchen Weise geklemmt ist, dass die Grenze der Injektorausparung (33) des Halters (4) mindestens teilweise in einer Rille des Injektors (2) angeordnet ist, und wobei der Kraftstoffbecher (6) in einer solchen Weise angeordnet ist, dass der Kraftstoffbecher (6) teilweise die Flüssigkeitsverbindung (34) des Injektors (2) aufnimmt, und dass die Kerbe des Kraftstoffbechers (6) mit der Kerbe des Halters (4) in Eingriff gelangt und die elastischen Elemente des Halters (4) an den Kraftstoffbecher (6) gekoppelt sind und das T-förmige Befestigungselement (26) des Kraftstoffbechers (6) ist in der Kraftstoffbecherausparung (10) des Halters (4) angeordnet.

10. Injektoranordnung gemäß Anspruch 9, wobei das Ausrichtelement (35) des Halters (4) an ein Ausrichtelement des Injektors (2) gekoppelt ist.

11. Injektoranordnung gemäß einem der Ansprüche 9 bis 10, wobei die Verlängerung der gebogenen Arme des Halters (4) an die Schultern des Kraftstoffbechers (6) gekoppelt sind.

Revendications

1. Support (4) servant à fixer un injecteur (2) à un godet (6) à carburant, ce support (4) comprenant

- une partie inférieure (31),
- une première partie latérale (8) qui s'étend à partir d'un premier côté de la partie inférieure (31) et qui comprend une encoche du support (4) afin d'engager l'encoche du support (4) à une encoche du godet (6) à carburant,
- une cavité (33) d'injecteur située dans la partie inférieure (31) du support (4) et permettant de faire entrer l'injecteur (2), dans laquelle la cavité (33) d'injecteur du support (4) est formée et arrangée de manière à ce que le support (4) soit fixé à l'injecteur (2) au niveau de la cavité (33)

d'injecteur du support (4) par un raccordement de verrouillage,
 - au moins un élément élastique se trouvant au niveau de la partie inférieure (31) du support (4), afin d'éloigner l'injecteur (2) de manière forcée du godet (6) à carburant,

caractérisé en ce que l'encoche du support (4) comprend une cavité (10) de godet à carburant permettant de faire entrer l'encoche du godet (6) à carburant, la cavité (10) de godet à carburant comportant une extrémité ouverte de la cavité (10) de godet à carburant dirigée à l'opposé de la partie inférieure (31) afin d'introduire l'encoche du godet (6) à carburant dans la cavité (10) de godet à carburant du support (4), et la cavité (10) de godet à carburant du support (4) comprenant une diminution (12) de la cavité (10) de godet à carburant du support (4) au niveau de l'extrémité ouverte de la cavité (10) de godet à carburant du support (4), afin d'engager l'encoche du godet (6) à carburant dans la cavité (10) de godet à carburant du support (4).

2. Support selon la revendication 1, comprenant une deuxième et une troisième partie latérale, couplées à un deuxième et à un troisième côté respectivement de la partie inférieure (31) du support (4), et qui sont disposées en opposition l'une par rapport à l'autre et qui comprennent chacune au moins un élément élastique.
3. Support (4) selon la revendication 2, dont les éléments élastiques comprennent chacun au moins un bras courbé qui

- est couplé à la partie inférieure (31), au niveau d'une première extrémité du bras courbé,
- s'éloigne de la partie inférieure (31) et qui revient ensuite vers la partie inférieure (31),
- dont chacun comporte une deuxième extrémité de bras courbé, la deuxième extrémité du bras courbé étant à une distance donnée de la partie inférieure (31).

4. Support (4) selon la revendication 3, dont chaque bras courbé comprend une extension au niveau d'une partie courbée du bras courbé pour un couplage des extensions jusqu'aux épaulements du godet à carburant.
5. Support (4) selon l'une des revendications précédentes, dont la cavité (33) d'injecteur du support (4) est ouverte vers un quatrième côté de la partie inférieure (31) tournée à l'opposé du premier côté de la partie inférieure (31) du support (4), et la cavité (33) d'injecteur comprenant un élément (35) d'orientation du support (4) afin d'empêcher une rotation du support (4) par rapport à l'injecteur (2) autour d'un axe

de l'injecteur (2).

6. Support (4) selon l'une des revendications 3 à 5, comprenant des butées de protection pour chacun des bras courbés, les butées de protection s'éloignant de la partie inférieure (31) vers les deuxième extrémités des bras courbés dont la distance est fixée par rapport aux deuxième extrémités des bras courbés.
7. Godet (6) à carburant pour injecteur (2) comprenant un corps de godet à carburant doté d'une cavité pour injecteur du godet (6) à carburant, afin de laisser entrer avec serrage un raccord (34) pour fluide de l'injecteur (2), et comprenant une encoche du godet (6) à carburant afin de laisser entrer une encoche d'un support (4) conforme à l'une des revendications précédentes dans l'encoche du godet (6) à carburant, l'encoche du godet (6) à carburant comprenant un élément (26) de fixation en forme de T qui s'étend radialement à partir de l'extérieur du corps de godet à carburant afin d'introduire l'élément de fixation en forme de T (26) dans la cavité (10) de godet à carburant du support (4).
8. Godet (6) à carburant selon la revendication 7, comprenant au moins deux épaulements qui sont formés et disposés au niveau du côté extérieur du godet (6) à carburant, opposés l'un par rapport à l'autre pour former un couplage d'un élément élastique du support (4).
9. Ensemble à injecteur comprenant
 - le support (4) selon l'une des revendications 1 à 6,
 - l'injecteur (2),
 - le godet (6) à carburant conforme à l'une des revendications 7 ou 8, le support (4) étant serré contre l'injecteur (2) de manière que la bord de la cavité (33) d'injecteur du support (4) soit au moins en partie disposée dans une rainure de l'injecteur (2), et le godet (6) à carburant étant disposé de manière que le godet (6) à carburant laisse en partie entrer le raccord (34) pour fluide de l'injecteur (2), et que l'encoche du godet (6) à carburant soit engagée dans l'encoche du support (4), et que les éléments élastiques du support (4) soient couplés au godet (6) à carburant, et l'élément (26) de fixation en forme de T du godet (6) à carburant étant disposé dans la cavité (10) du godet à carburant du support (4).
10. Ensemble à injecteur selon la revendication 9, dont l'élément d'orientation (35) du support (4) est couplé à un élément d'orientation de l'injecteur (2).
11. Ensemble à injecteur selon l'une quelconque des

revendications 9 ou 10, dont les extensions des bras courbés du support (4) sont couplées aux épaule-ments du godet (6) à carburant.

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FIG 1

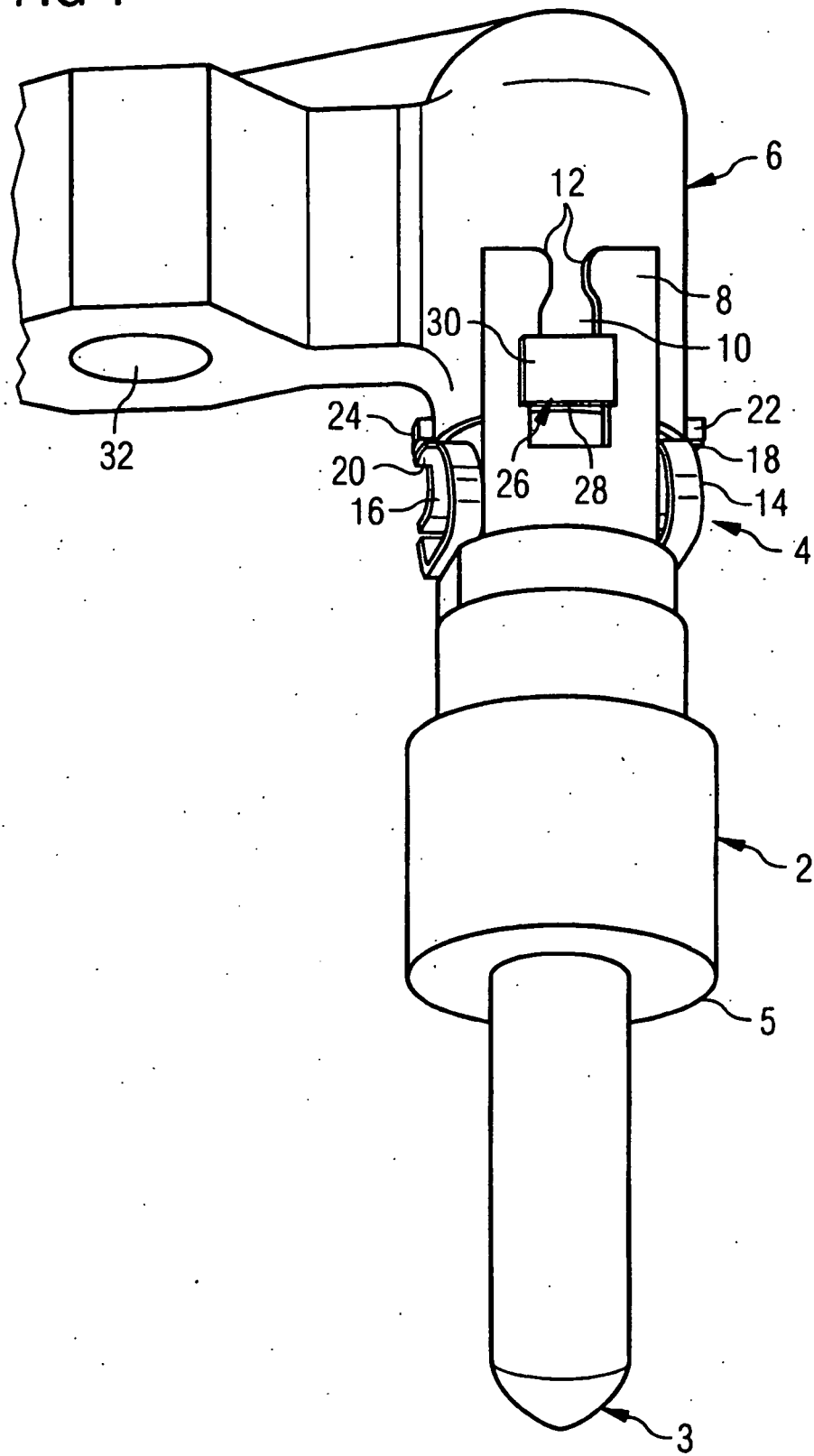


FIG 2

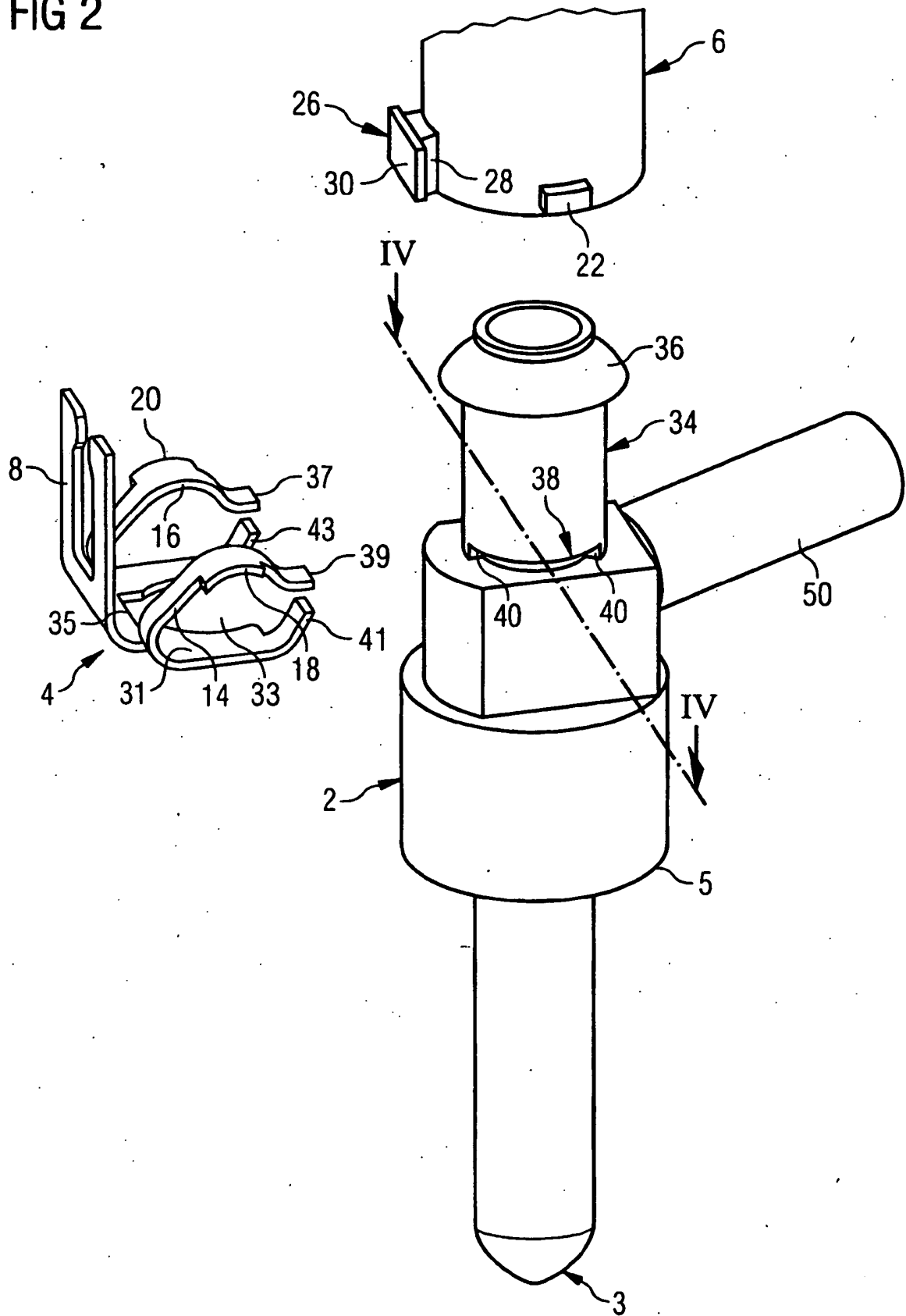


FIG 3

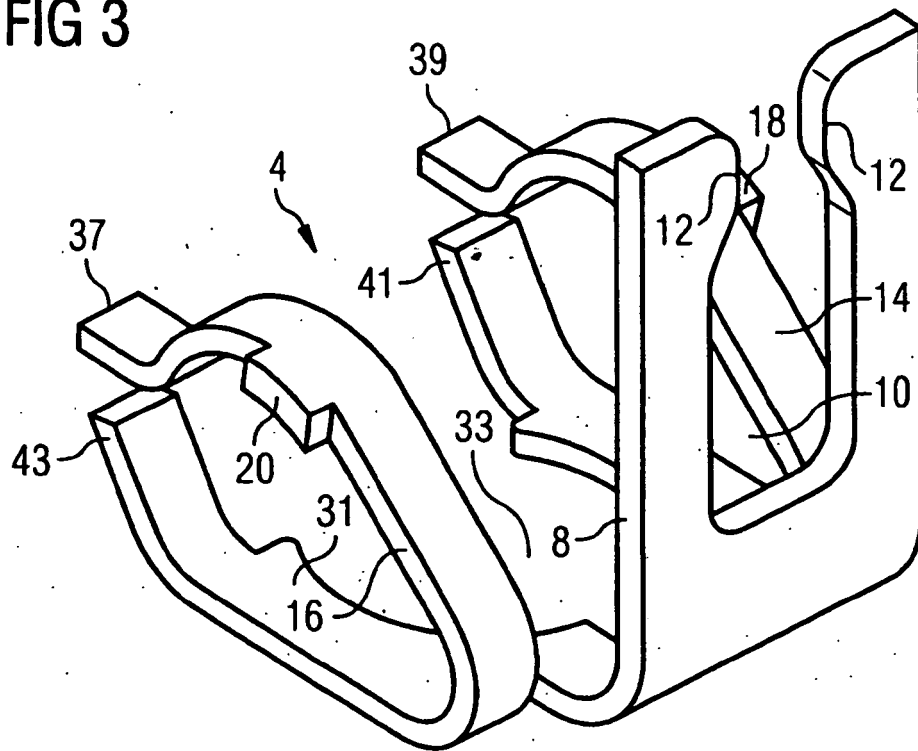
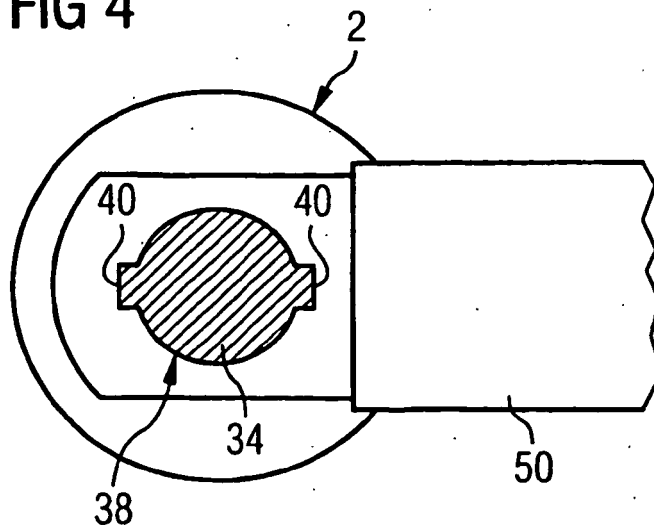


FIG 4



REFERENCES CITED IN THE DESCRIPTION

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