ORIGINAL

INJECTOR MOUNT

Abstract of the Invention

The invention relates to an injector mount (1) for accommodating at least one injector (10) completely, comprising a housing (20) having at least one injector chamber (9), wherein the at least one injector chamber (9) comprises a first opening (2) and a second opening (3). It is possible for the first opening (2) of the injector chamber (9) to be connected to a region (12) of an exhaust line (8) that conducts exhaust gas, and for the second opening (3) of the injector chamber (9) to be closed repeatedly by means of a closure (6).

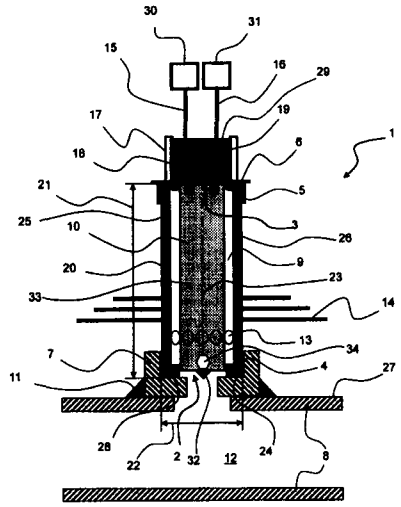

Fig. 1

We Claim:

1. An injector mount (1) for accommodating at least one injector (10) completely, comprising a housing (20) having at least one injector chamber (9), wherein the at least one injector chamber (9) has a first opening (2) and a second opening (3), wherein the first opening (2) of the injector chamber (9) can be connected to an exhaust-carrying region (12) of an exhaust line (8), and the second opening (3) of the injector chamber (9) can be closed by means of a closure (6).

2. The injector mount (1) as claimed in claim 1, wherein the closure (6) can be closed repeatably.

3. The injector mount (1) as claimed in claim 1 or 2, wherein an injector (10) is arranged in the at least one injector chamber (9), being supported in the injector chamber (9) by means of a first seal (4) and by means of a second seal (5).

4. The injector mount (1) as claimed in one of the preceding claims, wherein the first seal (4) is a radially acting seal, which is composed at least partially of mica.

5. The injector mount (1) as claimed in one of the preceding claims, wherein the injector chamber (9) has at least one aperture (13) in the housing (20).

6. The injector mount (1) as claimed in one of the preceding claims, wherein the injector mount (1) has at least one radiation collar (14).

7. The injector mount (1) as claimed in one of the preceding claims, wherein at least one supply line (15) or at least one control line (16) leads into the injector chamber (9).

8. The injector mount (1) as claimed in claim 7, wherein the at least one supply line (15) or the at least one control line (16) leads into the injector chamber (9) through the closure (6).

9. The injector mount (1) as claimed in one of the preceding claims, wherein the closure (6) has at least one connector holder (17).

10. An exhaust line (8) having a connecting element (7), which is fixed on the exhaust line (8), and an injector mount (1) according to one of the preceding claims, which is connected releasably to the connecting element (7).

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LEX ORBIS IP PRACTICE

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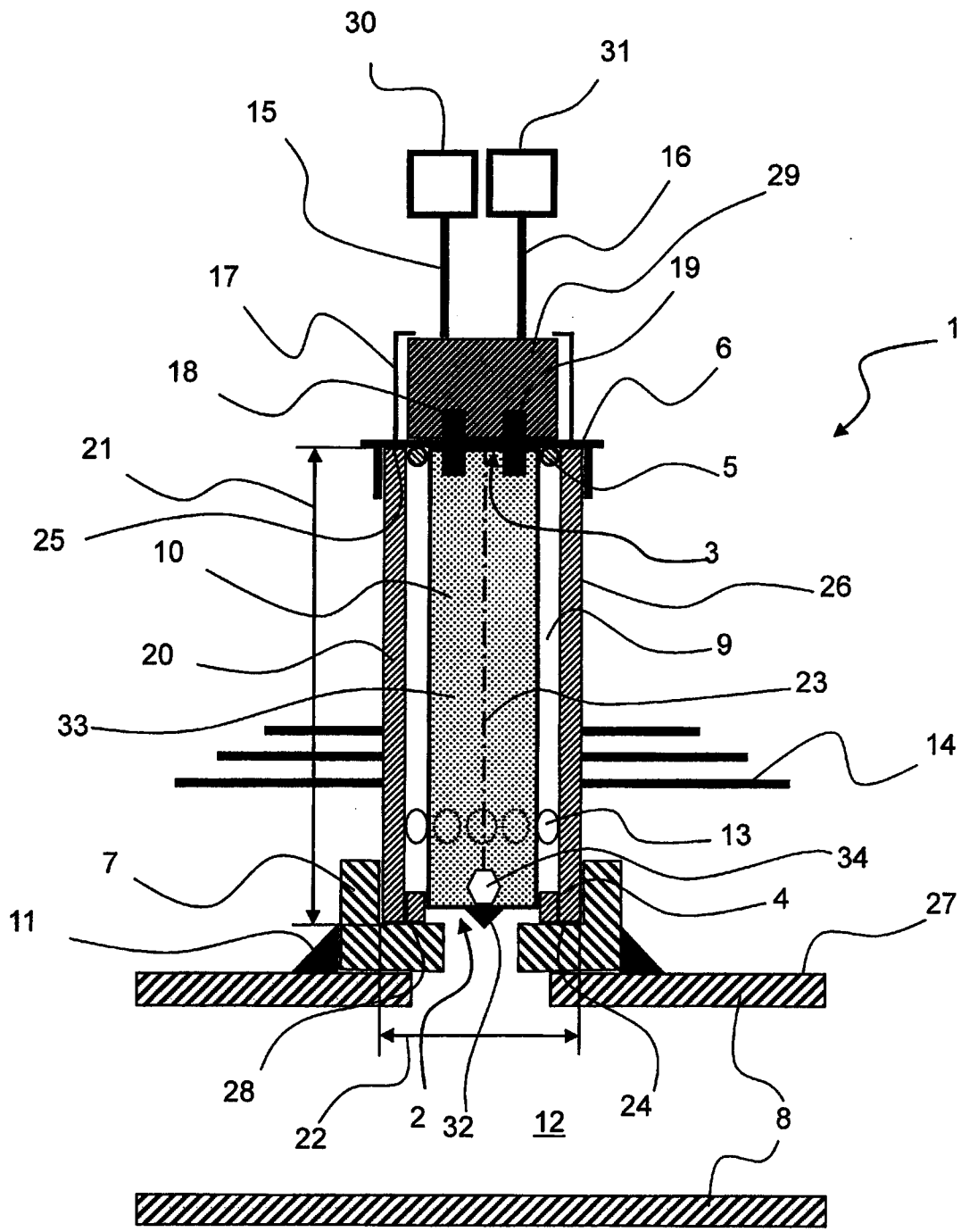

Fig. 1

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The present invention relates to an injector mount for accommodating an injector. Such injectors can be used, in particular, to add a reducing agent to an exhaust system.

The practice of reducing the nitrogen oxide content of the exhaust gas from an internal combustion engine by selective catalytic reduction (SCR) is known. In this process, a substance with a directly reductive action, such as ammonia or a precursor thereof, is fed into the exhaust gas. One example of a precursor that can be used is an aqueous urea solution. During selective catalytic reduction, ammonia is converted with nitrogen monoxide and nitrogen dioxide to molecular nitrogen and water. Selective catalytic reduction takes place in an SCR catalytic converter.

Reducing agent is introduced into the exhaust gas by means of an injector. As a rule, this injector has a fastening device, with the aid of which the injector is fastened on an exhaust line. The injector thus sprays the reducing agent directly into the exhaust line. As a rule, the injector is exposed to high thermal and mechanical stresses, and it must therefore be replaced when damaged. However, it is generally not possible to replace the injector in a simple and economical manner.

It is therefore an object of the invention to at least partially solve the problems explained with reference to the prior art and, in particular, to indicate an injector mount which reduces the thermal and mechanical loads on the injector and enables the injector to be changed in a simple and economical manner. The intention is furthermore also to indicate an exhaust line which enables an injector to be attached to an injector mount in a particularly simple manner.

These objects are achieved by means of an injector mount in accordance with the features of claim 1 and an exhaust line in accordance with the features of claim 11. Further advantageous embodiments of the invention are indicated in the claims drafted as dependent claims. It should be noted that the features presented individually in the claims drafted as dependent claims can be combined in any technologically meaningful way and define additional embodiments of the invention. Moreover, the features indicated in the claims are specified and explained in greater detail in the description, with further preferred embodiments of the invention thereby being described.

The injector mount according to the invention is used to accommodate at least one injector completely and comprises a housing having at least one injector chamber, wherein the at least one injector chamber has a first opening and a second opening, wherein the first opening of the injector chamber can be connected to an exhaust-carrying region of an exhaust line, and the second opening of the injector chamber can be closed by means of a closure.

The housing is, in particular, a metallic body, which preferably consists of a tubular hollow profile. However, other forms of housing are nevertheless also possible if this enables an injector to be accommodated completely in an injector chamber. The housing has a length which extends along a central axis or (in the case of a tubular housing) along a center line. In the case of a tubular housing, the length furthermore extends from a first front face of the housing to a second front face of the housing. The length is no more than 20 cm, preferably no more than 15 cm, and particularly preferably no more than 10 cm. The housing furthermore has a width or (in the case of a tubular housing) a diameter which extends orthogonally with respect to the length (or central axis or center line) and which is no more than 10 cm, preferably no more than 5 cm, and particularly preferably no more than 2.5 cm. The housing of the injector mount furthermore has at least one injector chamber, which is a cavity in which at least one injector can be completely arranged. "Completely" means, in particular, that the injector does not protrude beyond an

outer boundary of the housing (e.g. the openings) of the injector mount at any point. The injector consists at least of an injector housing having a reducing agent feed, a nozzle and a valve for controlling a reducing agent discharge by the injector. Moreover, the injector can also have a connection for control signals of an SCR controller.

The first opening of the injector chamber is arranged and configured in such a way that a reducing agent can be introduced into an exhaust line by the injector. In particular, the first opening is in alignment with a nozzle of the injector and, especially in the case of a tubular housing, is situated in the region of a first front face of the housing. The second opening of the injector chamber is furthermore arranged and configured in such a way that the injector is easily replaceable and/or accessible. For this purpose, the second opening is preferably situated opposite the first opening, in particular in the region of a second front face of the housing. The second opening can furthermore be closed by a closure, wherein the second opening is preferably closed during an operational state of the injector and opened during the maintenance of the injector. The closure can be fastened on the housing of the injector mount by known means, in particular by means of a crimped joint.

According to another embodiment, the closure can be closed repeatably. In order to obtain the possibility of repeatably closing the second opening, the closure can, in particular, be screwed to the housing of the injector mount in the region of the second opening. For this purpose, the housing has an appropriate thread in the region of the second opening and of the closure. However, the second opening of the injector chamber can also be fastened on the housing of the injector mount by clamping the closure or by means of a bayonet fastening on the closure.

In another embodiment, provision is made for an injector to be arranged in the at least one injector chamber, being supported in the injector chamber by means of a first seal and by means of a second seal.

The injector is supported in the injector chamber in such a way by means of the first seal and by means of the second seal that the injector is vibrationally damped or even vibrationally decoupled with respect to the housing of the injector mount. For this purpose, the injector is supported, in particular supported at a distance from the housing, with the aid of the first seal and the second seal. It is thereby possible to achieve an effective reduction in the mechanical loads, in particular vibrational loads, and/or thermal loads acting on the injector. The second seal is, in particular, an O-ring made of rubber.

It is particularly advantageous if the first seal is a radially acting seal, which is composed at least partially of rubber or at least partially of mica. In particular, the first seal is suitable for sealing off the injector chamber (together with the injector) from an exhaust-carrying region of an exhaust line. "Mica" is an aluminosilicate. Aluminosilicates are minerals in which silicon is surrounded by four oxygen atoms in a tetrahedral arrangement.

According to another expedient embodiment, the second seal is composed at least partially of rubber or at least partially of mica. In this context, rubber has proven to have a particularly good vibration damping effect and mica has proven to be particularly heat resistant.

According to a particularly preferred option, the first seal is formed (exclusively) with mica and the second seal is formed (exclusively) with rubber.

As a development of the invention, it is proposed that the injector chamber has at least one aperture, preferably a plurality of apertures, in the housing. These apertures start from the injector chamber and preferably extend completely through the housing of the injector mount. At the same time, the apertures are preferably distributed radially (and uniformly), in particular over 360°, over a circumferential surface of the housing. It has surprisingly been found that noise caused by vibration and/or noise caused by the injector can be reduced by such apertures.

Moreover, pressure equalization between the injector chamber and the surroundings can take place via these apertures when the injector is in the operational state, that is to say, in particular, when the injector mount is connected to an exhaust line via the first opening and the second opening is closed by the closure, if the injector chamber heats up during the operation of the injector.

It is particularly advantageous if the injector mount has at least one radiation collar. This at least one radiation collar is arranged radially on the circumferential surface of the housing of the injector mount and consists of a thermally conductive material, in particular metal. It is thereby possible, on the one hand, to achieve cooling of the housing of the injector mount and, on the other hand, to protect connection lines of the injector from heat radiation from the injector mount and/or exhaust line.

It is furthermore advantageous if at least one supply line or at least one control line leads into the injector chamber. The supply line is preferably a line which carries a reducing agent from a reducing agent reservoir to the injector and/or vice versa. The control line is preferably an electric lead which connects the injector to a control device of an SCR system for data transmission and/or electrically.

According to another expedient embodiment, the closure has at least one connector holder. This is, for example, a clamping device which secures against slipping a connector that fastens the supply line and/or control line on the closure. In this case, the connector is preferably seated on a supply connection of the closure and/or a control connection of the closure. The supply connection of the closure and the control connection of the closure serve to connect the supply line and/or control line to the injector arranged in the injector chamber.

According to another aspect of the invention, an exhaust line having a connecting element, which is fixed on the exhaust line, and an injector mount, which is connected releasably to the connecting element, is also proposed.

The connecting element is, in particular, a sleeve, a nut or some other element suitable for accommodating an injector mount, wherein the connecting element is, in particular, fixed on the exhaust line by means of a welded joint. An injector mount is connected releasably, by means of a screwed joint for example, to this connecting element.

The invention and the technical context are explained in greater detail below with reference to the figure. It should be noted that the figure shows a particularly preferred embodiment of the invention, but the invention is not limited thereto. In the drawing, which is schematic:

Fig. 1: shows an exhaust line having an injector mount.

Figure 1 shows an exhaust line 8, to the outer wall 27 of which a connecting element 7 is attached by means of a welded joint 11. This connecting element 7 has a receptacle 28 for an injector mount 1. For this purpose, the receptacle 28 of the connecting element 7 can have a thread (not shown here). The diameter of the receptacle 28 corresponds substantially to the width 22 of the housing 20 of the injector mount 1. In this embodiment, the housing 20 is of tubular design. The housing 20 of the injector mount 1 furthermore has a length 21 which extends from a first opening 2 to a second opening 3, or from a first front face 24 to a second front face 25, in the direction of a central axis 23, here illustrated as a center line. Within the housing 20 there is an injector chamber 9. This injector chamber 9 is connected by the first opening 2 to an exhaust-carrying region 12 of the exhaust line 8. The second opening 3 is closed repeatably by means of a closure 6. For this purpose, the housing 20 and the closure 6 have a thread (not shown here). An injector 10 is supported in the injector chamber 9 in such a way by means of a first seal 4 and by means of a second seal 5 that a nozzle 32 of the injector 10 is in alignment with the first opening 2 of the housing 20. Together with the injector 10, the first seal 4 seals off the injector chamber 9 from the exhaust-carrying re-

gion 12 of the exhaust line 8. The injector 10 has an injector housing 33 and a valve 34, which is connected to an SCR controller 31, although the connection of the valve 34 to the SCR controller 31 is not shown here.

In addition, the closure 6 has a supply connection 18 and a control connection 19. Via this supply connection 18 and this control connection 19, a supply line 15 and a control line 16 are connected to the injector 10 by means of a connector 29. In this arrangement, the supply line 15 is connected to a reducing agent reservoir 30, and the control line 16 is connected to the SCR controller 31. The closure 6 furthermore has a connector holder 15 for securing the connector 29 against slipping.

The housing 20 of the injector mount 1 has a plurality of radially arranged apertures 13, which extend from the injector chamber 9 to a circumferential surface 26 of the housing 20. Moreover, a plurality of radiation collars 14 are arranged on the circumferential surface 26 of the housing 20.

Starting from the exhaust line 8, the elements of the injector mount 1 are spaced apart from the exhaust line 8 in the following sequence, from the bottom upward: connecting element 7, first seal 4, apertures 13, radiation collar 14, second seal 5 and closure 6.

By means of the injector mount shown here, an injector can be protected effectively from thermal and mechanical stresses and can be changed in a particularly simple and economical manner.

List of reference signs

1	injector mount
2	first opening
3	second opening
4	first seal
5	second seal
6	closure
7	connecting element
8	exhaust line
9	injector chamber
10	injector
11	welded joint
12	exhaust-carrying region
13	aperture
14	radiation collar
15	supply line
16	control line
17	connector holder
18	supply connection
19	control connection
20	housing
21	length
22	width
23	central axis
24	first front face
25	second front face
26	circumferential surface
27	outer wall
28	receptacle

29 connector

30 reducing agent reservoir

31 SCR controller

32 nozzle

33 injector housing

34 valve