

[54] FUEL INJECTION NOZZLE

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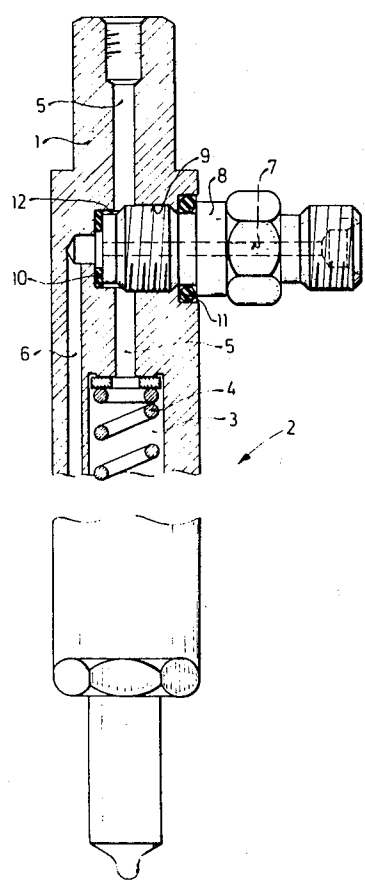
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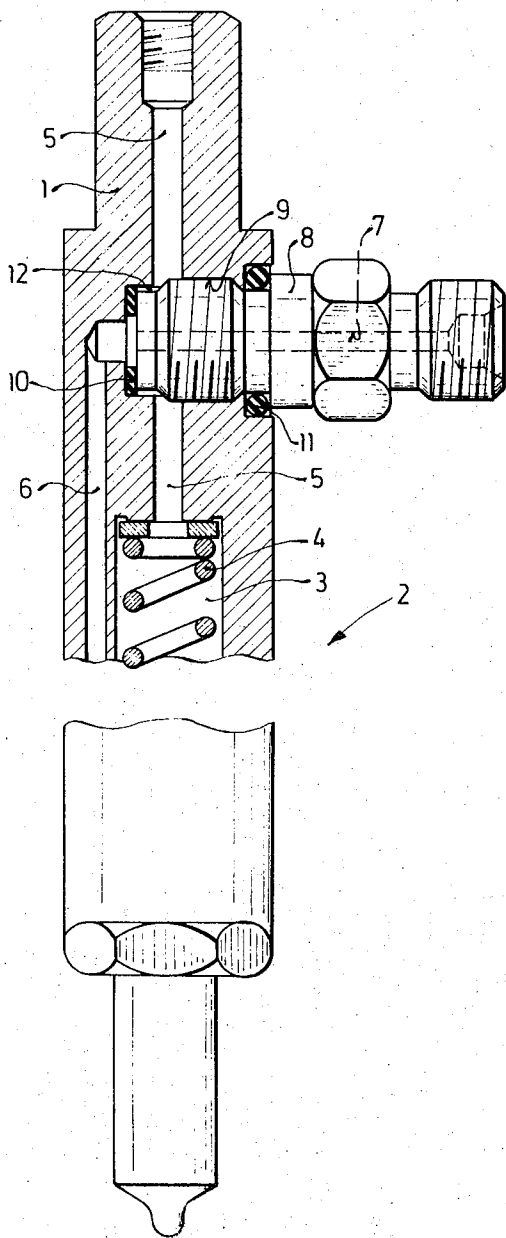
[57] **ABSTRACT**
A fuel injection nozzle for internal combustion engines includes a nozzle holder. A pressure channel leads, in sections, to a nozzle pressure chamber, along a spring chamber and passes eccentrically in the nozzle holder. The pressure channel has a connecting bore passing radially to the longitudinal axis of the nozzle holder. A drain channel of the spring chamber passes in the vicinity of a pressure channel connection bore in a longitudinal direction of the nozzle holder. An intersection is provided between the pressure channel and the drain channel. A pressure socket is arranged in the connecting bore for separating the pressure channel and the drain channel. An end portion of the socket protrudes into the nozzle holder axially before and after the intersection. Sealing members are provided in each side of the intersection, and a recess means having a surface and defining a passageway for leak channel traverse flow is provided in the intersection.

4 Claims, 1 Drawing Figure



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3,860,178



FUEL INJECTION NOZZLE

BACKGROUND OF THE INVENTION

The invention relates to a fuel injection nozzle for internal combustion engines. The invention, relates more particularly, to a fuel injection nozzle for internal combustion engines having a pressure channel sectionally passing beside the spring chamber and eccentrically in the nozzle holder, the pressure channel having a connecting bore leading radially to the longitudinal axis of the nozzle holder, and having a drain channel of the spring chamber passing in the vicinity of the pressure channel connection bore in the longitudinal direction of the nozzle holder.

In fuel injection nozzles of this type, it is very difficult to attach the pressure connecting socket to the nozzle holder due to the often very small diameter of the nozzle holder. Adjacent to the pressure socket, there must additionally be provided a drain line transversely through a nozzle holder, this having been solved in the known injection nozzles by means of comparatively, upwardly leading transverse bores. In another known fuel injection nozzle the connecting socket is soldered in other to avoid threading. In a further known fuel injection nozzle, the nozzle holder is reinforced at the connection location. In a construction of such a type, however, none of the convenient rod stock can be used for the production of nozzle holders, by means of simple turning lathe.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a fuel injection nozzle which is convenient to produce.

It is another object of the present invention to provide a fuel injection nozzle which includes a radial pressure connection which avoids the need for special attachment techniques, even when using nozzle sockets of the smallest diameter.

It is a further object of the present invention to provide a fuel injection nozzle which avoids the need for extensive calibration, even when using nozzle sockets of the smallest diameter.

The foregoing objects, as well as others which are to be made clear from the text below, are achieved in accordance with the present invention by providing a fuel injection nozzle for internal combustion engines which includes a nozzle holder. A pressure channel leads, in sections, to a nozzle pressure chamber, along a spring chamber and passes eccentrically in the nozzle holder. The pressure channel has a connecting bore passing radially to the longitudinal axis of the nozzle holder. A drain channel of the spring chamber passes in the region of a pressure channel connection bore in a longitudinal direction of the nozzle holder. An intersection is provided between the pressure channel and the drain channel. A pressure socket is arranged in the connecting bore for separating the pressure channel and the drain channel. An end portion of the socket protrudes into the nozzle holder axially before and after the intersection. Sealing members are provided in each side of the intersection, and a recess means having a surface and defining a passageway for leak channel traverse flow is provided in the intersection.

It is a salient feature of the present invention that the pressure channel and the drain channel intersect. The separation of the channels is achieved by means of a pressure socket arranged in the connection bore, pref-

erably developed as a screw. On the extremity of the pressure socket which protrudes into the nozzle holder, a seal is positioned axially before and after the intersection. A truing on an internal surface of the nozzle holder allows for traverse flow through the drain channel. Preferably, the bores pass from pressure channel and drain channel in the direction of the longitudinal axis of the nozzle holder or perpendicularly thereto. Thus the nozzle does not have to be positioned transversely to the bore spindle during the boring of the channels but, instead, several axially parallel bores may be bored concurrently. Because of the fact that more than a half of the diameter of the nozzle support is available for the section of the pressure socket protruding into the nozzle holder, the attaching of the pressure socket by screwing it into the pressure channel does not present any problems.

BRIEF DESCRIPTION OF THE DRAWING

The sole drawing FIGURE is a pictorial view, partially in section, of a fuel injection nozzle according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As illustrated, a fuel injection nozzle 2, according to the present invention, includes a chamber 3 of a closing spring 4 in a nozzle support 1 of the injection nozzle 2, which chamber 3 is connected with a drain line (not shown) via a drain channel 5 arranged coaxially to the nozzle support 1. Parallel to the longitudinal axis of the fuel injection valve, and adjacent to the chamber 3 in the nozzle holder 1, a pressure channel 6 passes to a pressure chamber (not shown) of the injection nozzle 2. The pressure channel 6 proceeds through a bore 7 in a pressure socket 8 which is screwed into a radial bore 9 which traverses the fuel drain bore 5. Seals 10 and 11 are provided between the socket 8 and the nozzle holder 1 before and after the intersection. A pressure line (not shown) leads from a fuel injection pump to the socket 8. Both sections of the fuel drain channel 5, interrupted in the bore 9, are connected to one another by a recess 12 formed between a portion of the socket 8 and an inner surface of the nozzle holder 1 near the seal 10. The recess 12, as illustrated, is formed by space provided by turning (machining) off a portion of the outer surface of the socket 8 so as to provide a portion of reduce diameter, which portion of reduced diameter extends into a portion of the bore 9 shown to the left of the drain channel 5. The diameter of the bore 9 into which the portion of the socket 8 of reduced diameter extends is larger than the reduced diameter.

It is to be understood that the foregoing description is of an illustrative embodiment of the present invention. Moreover, variants and other embodiments are possible within the scope of the invention as defined in the appended claims.

What is claimed is:

1. In a fuel injection nozzle for internal combustion engines having a nozzle holder, a pressure channel leading in sections to a nozzle pressure chamber, along a spring chamber, and passing eccentrically in the nozzle holder, the pressure channel having a connecting bore passing radially to the longitudinal axis of the nozzle holder, and having a drain channel of the spring chamber which passes in vicinity of a pressure channel connection bore in a longitudinal direction of the nozzle holder, the connecting bore being arranged in the intersection of the pressure channel and the drain channel, and a pressure socket being arranged in the connecting bore, the pressure socket having a truing on an internal surface of the nozzle holder, and a seal being positioned axially before and after the intersection of the pressure channel and the drain channel, the pressure socket being arranged in the connecting bore, the pressure socket having a truing on an internal surface of the nozzle holder, and a seal being positioned axially before and after the intersection of the pressure channel and the drain channel.

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zle holder, the improvement comprising an intersection between said pressure channel and said drain channel, a pressure socket arranged in said connecting bore for separating said pressure channel and said drain channel, said socket having an end prtion protruding into said nozzle holder axially before and after said intersection, sealing means provided on each side of said intersection, and recess means having a surface and defining a passage for leak channel transverse flow is provided in the intersection.

2. A fuel injection nozzle according to claim 1, wherein said sealing means includes one seal disposed

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on a face of said pressure socket protruding into said nozzle holder, and a second seal arranged on an inner face formed within said nozzle holder.

3. A fuel injection nozzle according to claim 2, wherein said intersection is formed by a bore which passes substantially perpendicular to the longitudinal axis of said nozzle holder.

4. A fuel injection nozzle according to claim 1, wherein said intersection is formed by a bore which passes substantially perpendicular to the longitudinal axis of said nozzle holder.

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