



PATENTS ACT 1977

APPLICANT	Viteco Technologies GmbH
ISSUE	Patents Act 1977 section 1(1)(b)
HEARING OFFICER	Peter Mason

DECISION

Introduction

- 1 This decision concerns patent application number GB 1711516.3 “Swirl inducing seat body for a fluid injection valve and fluid injection valve” in the name of Vitesco Technologies GmbH (previously Continental Automotive GmbH), and primarily whether the invention, as defined by the claims, comprises an inventive step as required by section 1(1)(b) of the Patents Act 1977 (herein after the “Act”). The application was filed on 18 July 2017 and was published on 23 January 2019 as GB2564664.
- 2 In their examination report dated 30 September 2019 the examiner presented their view that the independent claim did not involve the inventive step required by section 1(1)(b) of the Act, in respect to cited prior art documents. No amendments have been made since the exam report of 30 September 2019, and the agent has not presented any counter argument or comment.
- 3 The examination report of 30 September 2019 set a latest date for reply of 2 December 2019. In their letter of 16 October 2019, the agent filed a request for a two month extension of the reply date, taking the reply date to 3 February 2020. The agent subsequently filed a letter dated 3 February 2020, but received by the Office on 11 February 2020, requesting a decision to be made based on the documents on record. It is on this basis that my following decision is made.

Preliminary matters

- 4 The agent’s response to the examination report was not received by the Office within the specified time, and no request for exercising discretion to allow the late filing of the reply has been received. It is the normal course of action in such a situation to ask for a reason for the late filing of the response. This has not yet occurred even though some time has passed since the date of the agent’s letter. However, as a

hearing has been requested, this point is considered mute and discretion can be exercised to allow the application to proceed to this hearing.

- 5 The only substantive matter before me therefore, is whether the invention involves an inventive step with respect to the cited prior art. If I find that the claimed invention comprises an inventive step, I will return the application to the examiner to complete the substantive examination.

The Invention

- 6 The application relates to a seat body for a fluid injection valve for an internal combustion engine. The object of the invention is to provide a precise and repeatable dose of fluid.
- 7 The current set of claims, filed on 16 July 2019, has a single independent claim, reproduced below:

Seat body (15) for a fluid injection valve (1) having a longitudinal axis (L) and comprising a sidewall portion (17) and a bottom portion (19), wherein the sidewall portion (17) defines a recess (21) that extends from a fluid inlet opening (23) at a first axial end (25) of the seat body (15) to the bottom portion (19) at a second axial end (27) of the seat body (15), the bottom portion (19) closing the recess (21) at the second axial end (27); the bottom portion (19) is perforated by a plurality of orifices (29) configured for dispensing fluid from the seat body (15) and has a seat surface (31) upstream of the orifices (29) configured for interacting with an axially displaceable sealing element (13) of the fluid injection valve (1) for sealing and unsealing the second axial end (25) of the seat body (15); the sidewall portion (17) has an inner circumferential surface (33) comprising guide sections (35) configured to be in sliding mechanical contact with the sealing element (13) and further comprising a plurality of grooves (37); the grooves (37) alternate with the guide sections (35) in circumferential direction, follow the guide sections (35) in radial outward direction, and extend in axial direction along the guide sections (35) for fluidly connecting the fluid inlet opening (23) with the seat surface (31); the grooves (37) are inclined with respect to the longitudinal axis (L); and the orifices (29) are radially spaced apart from and distributed circumferentially around the longitudinal axis (L).

The law - Inventive step

Section 1(1) of the Act sets out the requirements which need to be met for a patent to be granted (my emphasis):

A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –

(a) the invention is new;

(b) it involves an inventive step;

(c) is capable of industrial application;

(d) the grant of a patent for it is not excluded by subsections (2) and (3) or section 4A below;

and references in this Act to a patentable invention shall be construed accordingly.

8 Section 3 of the Act sets out how inventive step is determined:

An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).

9 Matter which “forms part of the state of the art by virtue only of section 2(2)” is all matter which was made available to the public before the priority date of the application in question. In this case all matter published before 18 July 2017.

10 It is well-established that the approach to adopt when assessing whether an invention involves an inventive step or not is to follow the steps originally set out by the Court of Appeal in *Windsurfing* and reformulated by the Court in *Pozzoli* :

(1)(a) Identify the notional “person skilled in the art”

(1)(b) Identify the relevant common general knowledge of that person

(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it

(3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

Arguments and analysis

11 The issue I must now consider is whether the invention as defined by the claims comprises an inventive step as required by section 1(1)(b) of the Act. As such, I will follow the reformulated *Windsurfing* steps set out above.

Step 1 - Identify the notional person skilled in the art and their common general knowledge.

12 Although the examiner has not formally set out their inventive step objection following the four steps, they do touch on each of them. To their mind, the notional person skilled in the art is a designer/manufacturer of fuel injectors and their common general knowledge would include understanding the importance of introducing swirl when injecting fluids (including being aware that this could be achieved in many different ways including through the use of inclined grooves). I

would add that this person would be familiar with general fluid dynamics and the advantages of different flow profiles and how to achieve them in practice.

- 13 With no contrary statement from the applicant on this point, I have no persuasive reason to depart from the examiners view as to the identity of the notional person skilled in the art and their common general knowledge .

Step 2 - Identify the inventive concept of the claim in question or if that cannot readily be done, construe it

- 14 In regard to step (2), the examiner, without specifically calling it as such, identifies the inventive concept of the claim in question in both paragraphs 3 and 4 of their examination report.

- 15 The inventive concept being a fuel injection valve seat body having a longitudinal axis and comprising a sidewall portion and a bottom portion, wherein the sidewall portion defines a recess that extends from a fluid inlet opening at a first axial end of the seat body to the bottom portion at a second axial end of the seat body, the bottom portion closing the recess at the second axial end; the bottom portion is perforated by a plurality of orifices configured for dispensing fluid from the seat body and has a seat surface upstream of the orifices configured for interacting with an axially displaceable sealing element of the fluid injection valve for sealing and unsealing the second axial end of the seat body; the sidewall portion has an inner circumferential surface comprising guide sections configured to be in sliding mechanical contact with the sealing element and further comprising a plurality of grooves; the grooves alternate with the guide sections in circumferential direction, follow the guide section in radial outward direction, and extend in axial direction along the guide sections for fluidly connecting the fluid inlet opening with the seat surface; the grooves are inclined with respect to the longitudinal axis; and the orifices are radially spaced apart from and distributed circumferentially around the longitudinal axis.

- 16 With no contrary statement from the applicant on this point, I am in agreement with the examiner as to the inventive concept and as such will proceed on that basis.

Step 3 - Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed

- 17 The examiner cites EP 2975255 which clearly discloses almost all of the constructional features of the present invention. The examiner states that this document fails to disclose grooves that are inclined with respect to the longitudinal axis of the seat body, and it is this feature which distinguishes the present invention from this citation.
- 18 EP 1795744 disclosed as being an illustrative example of the known feature of using inclined grooves as a means of introducing the beneficial feature of 'swirl' when injecting fuel. One embodiment is shown in figure 7 where inclined grooves, called 'guide grooves' 19 are shown positioned near the end of the nozzle body 10.

- 19 The applicant has made no argument or observation on what differences exist between the state of the art and the inventive concept.

Step 4 – Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention

- 20 EP '255 discloses a valve seat body sharing nearly all the features of the inventive concept. As discussed above, the only difference between this citation and the inventive concept is the orientation of the grooves.

- 21 EP '744 is cited as one example of the well known feature of using inclined, or sloping, grooves to impart swirl on injected fuel.

- 22 With no contrary statement from the applicant, I am in agreement with the examiner that the use of inclined or sloping grooves in fuel injectors would be very well known to a person skilled in the art. I am also in agreement that modification of the valve seat body in EP '255 from one having vertical grooves with respect to the longitudinal axis to one having inclined vertical grooves with respect to the longitudinal axis to achieve the required flow would be obvious and require no degree of innovation.

Conclusion

- 23 It is my decision that the invention claimed in claim 1 is not patentable because it lacks an inventive step under s1(1)(b) and as such I refuse it under s.18(3).

Appeal

- 24 Any appeal must be lodged within 28 days after the date of this decision.

Peter Mason

Deputy Director, acting for the Comptroller