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**Datasheet for the decision
of 6 September 2019**

Case Number: T 0722/16 - 3.2.04

Application Number: 04743317.2

Publication Number: 1644625

IPC: F02B37/18, F02B37/22, F02B37/24

Language of the proceedings: EN

Title of invention:

TURBOCHARGER APPARATUS HAVING AN EXHAUST GAS SEALING SYSTEM
FOR PREVENTING GAS LEAKAGE FROM THE TURBOCHARGER APPARATUS

Patent Proprietor:

LEAVESLEY, Malcolm George

Opponents:

ElringKlinger AG
IHI Charging Systems International GmbH
BorgWarner Inc.

Headword:

Relevant legal provisions:

EPC Art. 100(c), 123(2), 111(1)

Keyword:

Grounds for opposition - added subject-matter (no)
Appeal decision - remittal to the department of first instance
(yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0722/16 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 6 September 2019

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 3 February 2016
revoking European patent No. 1644625 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman A. de Vries
Members: S. Oechsner de Coninck
 W. Van der Eijk

Summary of Facts and Submissions

- I. The appellant (proprietor) lodged an appeal received on 18 March 2016 against the decision of the opposition division dispatched on 3 February 2016 revoking European patent EP 1 644 625, and simultaneously paid the appeal fee. The statement setting out the grounds of appeal was received on 27 April 2016.
- II. The opposition was based on Article 100(a) together with 52(1), 54(1) and 56 EPC, Article 100(b) together with 83 EPC and Article 100(c) together with 123(2) EPC. The opposition division came to the conclusion that the subject-matter of the independent claim 1 according to the main and auxiliary requests 1-4,7,8 contained subject-matter extending beyond the content of the application as filed, and that claim 1 according to the auxiliary requests 5, 6 violated the provisions of Art 123(3) EPC.
- III. Oral proceedings were held on 6 September 2019.
- IV. The appellant (patent proprietor) requests that the decision under appeal be set aside and the patent be maintained as granted (main request) or, alternatively, be maintained on the basis of one of auxiliary requests 1-8, filed during opposition proceedings with letter of 18 September 2015.
- V. The respondents (opponents 1-3) requested that the appeal be dismissed.
- VI. The wording of the independent claim 1 of the main request (as granted) reads as follows:

"Turbocharger apparatus (1) comprising a housing (4), a compressor mounted for rotation in the housing (4), a turbine (40) mounted for rotation in the housing (4), a first inlet for enabling air to be conducted to the compressor, an outlet for enabling air from the compressor to be conducted to an engine, a second inlet (53) for enabling exhaust gases from the engine to be conducted to the turbine (40) in order to rotate the turbine (40), a chamber which surrounds the turbine (40) and which receives the exhaust gases from the second inlet (53) before the exhaust gases are conducted to the turbine (40), a bearing assembly for permitting the rotation of the turbine (40), and a control system for controlling the speed of the turbine (40); the control system comprising a fixed bush (8) which has a first end (8a) and a second end (8b), a control rod (5) which is mounted in the bush (8), a control lever (10) for rotating the control rod (5) backwards and forwards, and an exhaust gas sealing system for preventing exhaust gas leakage from the turbocharger apparatus (1) and for allowing expansion of parts within the exhaust gas sealing system when the turbocharger apparatus (1) is working at high temperatures; characterized in that the bush (8) comprises a solid cylindrical portion, and a bore which extends through the solid cylindrical portion and which is defined by an inner surface of the solid cylindrical portion, the inner surface being in direct contact with the control rod (5); and the exhaust gas sealing system comprises a disc spring (15) which:

- (i) is mounted on the control rod (5) at a position between the first end (8a) of the bush (8) and the control lever (10); and
- (ii) causes a spring load to be applied to the second end (8b) of the bush (8) and thereby exhaust gas sealing at the second end (8b) of the bush (8)."

- VII. The appellant argues as follows:
- The skilled person knows that in order to work properly the bush has to be fixed, both to prevent rotation of the coil spring and displacement of the actuator of the control rod. Any other cooperation would allow leakage from the turbocharger to the outside, therefore against the aim of the invention. To their knowledge turbochargers always have a fixed bush at that location.
 - It is clearly visible in the figures that the bush comprises a solid cylindrical portion with a bore, which as bearing support needs to have with an inner surface in direct contact with the control rod.

- VIII. The respondents argue as follows:
- Absent any explicit information, it cannot be excluded that the embodiment of the turbocharger equipped with a disc spring also works with a bush mounted with a certain degree of freedom in the housing. In such a case the bush is not absolutely fixed in the housing. If in the present day it has become standard practise to press or shrink fit a bush into a housing, this was not the case when the application was filed.
 - The application as filed also lacks any direct and unambiguous disclosure concerning the bush comprising a solid cylindrical portion with a bore with inner surface in direct contact with the control rod.

Reasons for the Decision

1. The appeal meets the requirements of Article 108 and Rule 99(2) EPC 2000, and is therefore admissible.
2. Added subject-matter - Article 100 c) EPC

- 2.1 The present European patent EP 1 644 625 B1 was filed as an international application PCT/GB2004/002976 which was published as WO-A-2005/008041, taking the place of the publication of the European application, Art 153(3) EPC. The content of the published international application is identical to the content of the application as filed for the purpose of checking compliance with Art 123(2) EPC.
- 2.2 Claim 1 as granted contains additional and amended features with respect to independent claim 1 of the originally filed and published application. In particular the following amended or added features that further limit the configuration of the bush have been objected to for extended subject-matter:
- The bush should be **"fixed"**
 - It should comprise a **"solid cylindrical portion"**
 - Further comprise **"a bore"**
 - Its inner surface being **"in direct contact"** with the control rod.
- 2.3 Concerning the first of these disputed amendments it is common ground that the original application as filed does not contain an explicit, literal basis for acknowledging that the bush 8 is fixed. It is furthermore undisputed that the term fixed is understood to mean non movable with respect to the housing.
- 2.4 According to established case law, the requirements laid down in Art. 123(2) EPC are understood to mean that an amendment may only be made within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from

the whole content of the description, claims and drawings (see Case Law of the Boards of Appeal of the European Patent Office, 9th edition 2019 (CLBA), II.E. 1.3.1, with further reference to the "gold standard" cited in decision G 2/10). In the present case where no explicit basis is present in the application as filed, it should be established whether there existed an implicit disclosure of a bush being fixed. An implicit disclosure is established as being what any person skilled in the art, using common general knowledge, would consider was necessarily implied by the patent application as a whole, e.g. in view of basic scientific laws (CLBA 9th edition 2019 (CLBA), II.E. 1.3.3).

2.5 Considering the whole of the content of the original application read contextually, the skilled person sees that three main types of turbine control of the turbocharger are contemplated. The first with a wastegate is shown in figures 1, 2 and 6; the second with a sliding piston is shown in figure 3; and the third type with variable nozzle is shown in figures 4 and 5. The invention concerns an exhaust gas sealing system and seeks to prevent gas leakage from the turbocharger apparatus, and especially "has been designed so exhaust gases do not leak past the bush 8 so all of the exhaust gases may be treated by the exhaust after-treatment system" (sentence bridging pages 6 and 7).

2.6 A central aspect of the sealing system of the application as filed, as readily understood by the skilled person, is the use of a spring to spring load the control rod 5 vis-a-vis the bush 8 so as to seal the end of bush and the control rod, cf. page 7, lines 5 to 8. In all embodiments the spring, either a coil

spring 7 or a disc spring 15, is located at the outside end of the bush between the bush 8 and control lever 10, and, as is evident from the figures, will urge the other end of the rod, either a flange (figures 1, 2 and 6) or inner control element (figures 3, 4 and 5) towards the inner end of the bush into close contact with each other, either directly or via wear washers 21, 26 which are positioned between the control rod 5 and bush 8. The spring thus compensates for wear and different expansion rates in the system, as well as preventing exhaust gas leakage (first paragraph of page 7).

2.7 In relation to figures 3 and 4 of the published application, see the paragraph bridging pages 7 and 8, it is explained that "when the control rod 5 rotates, the control rod only has to rotate up to about 20° so when a coil spring is used this movement is taken up in the coil of the spring so the spring does not rotate."

From this statement the skilled person, using normal interpretation skills, reading it in context and with the intent of making technical sense of the passage, infers that in the embodiments of figures 3, 4 and 7, the coil spring itself should not carry out rotational movement. This is so irrespective of whether the bushing has a flange (as in figure 4) or not (as in figure 3). The skilled person can infer how this works exactly from figures 1 and 2, which show a waste gate control that also features a coil spring 7 between bush 8 and control lever 10 similar to that shown in figures 3 and 4. One end of the coil spring rests on the lever 10 and is therefore entrained in rotation by the lever, whereas the other end of the coil spring is retained in a recess of the bush. For the coil spring not to rotate during rotation of the control rod, the bush

must counter the elastic force exercised by the tensioned spring on the end received in the bush. In order to do so the bush must itself be fixedly retained in the housing 4. The embodiments with a coil spring are thus seen to directly and unambiguously disclose a fixed bush, with or without flange. It has indeed been acknowledged by the respondents that in the coil spring embodiments the bush 8 is fixed.

2.8 However, the respondents submit that the bush need not be fixed in the embodiments with a disc shaped spring, to which granted claim 1 has now been limited. Although it is acknowledged that it may now be standard practise to press or shrink fit a bush into a housing in the turbo control systems, they argue this was not necessarily the case at the priority date of the application. It is conceivable that indeed t that time, due to less strict specifications, bushes were not fixed. Consequently, the skilled person could not be in a position to state with certainty that in the disc spring embodiment the bush is fixedly attached to the housing.

2.9 The Board notes that the embodiments of figures 1 and 6 are identical but for the coil spring 7 being replaced by a disc spring 15. In particular both are waste gate controls with a control lever 10 activating a waste gate 31 via the control rod 5 within the bush 8. Both also feature two wear washers 21 and 26 which, according to page 7, lines 15 to 29, "should be prevented from rotation [with respect to] the parts that they are mounted on", and therefore have correspondingly shaped holes or sides, figures 7 to 12. Any rotation is between the wear washers and thus between the respective parts with respect to which they are prevented from rotating, i.e. between bush 8 and

control rod 5. In these embodiments the bush 8 and the control rod 5 thus rotate with respect to each other. Indeed, the immediately following sentence on page 7, lines 19 and 20, stating that the spring 7 compensates for wear and different expansion rates in the system, as well as preventing exhaust leakage, must be read in this specific context. The wear washers are "of a material that can withstand high temperatures, and have low wear rates ... [but these materials have] expansion rates that are different from the materials that are used within other parts of the turbocharger, and the design has to allow for the different expansion rates in order to prevent gas leakage", page 7, lines 10 to 15. Thus, spring 7 can be understood to compensate for the wear of the washers and different expansion rates associated with their use, and which would otherwise result in gas leakage.

For the skilled person, using normal skills of reading and understanding a technical text and accompanying figures as well as the relationship between different embodiments, it will be immediately clear from the fact that all else, other than the springs, is the same in these embodiments, that they must function in the same manner. As in the embodiment of figure 1, as acknowledged by all, the control rod 5 without any doubt rotates within the fixed bush 8 with the wear washers taking up the wear due to the relative movement of the two parts, it must therefore be the same also in the embodiment of figure 6. There is no plausible technical reason for the skilled person to expect that the same bush located in the same housing for controlling the same type of waste gate would be installed differently because a different spring is used. Thus the skilled person will conclude that as in

the embodiment of figure 1 in the embodiment of figure 6 also the bush 8 is fixed.

2.9.1 The fact that figure 6 does not show the bush 8 within a housing 53 as in figure 1 cannot detract from this conclusion. In the board's view this is merely meant to focus attention on the sole difference vis-a-vis figure 1, namely the disc spring 15. It does not imply in the skilled person's understanding that the arrangement of rod 5, bush 8 and waste gate 31 is to be considered as a composite component that is loose and separate of the housing. Clearly, this arrangement shows these parts as they are assembled in the housing.

2.10 This understanding is also in perfect alignment with the skilled person's understanding of the constraints and conditions that apply to the normal operation of control turbocharger, more particularly if it is to successfully address the problem of exhaust gas leakage. Thus, as a result of high vibration conditions due to the high rotational speeds a bush that is not fixed throughout the entire operational temperature range (which may be up to and above 1000° C; page 7, line 3) would not be workable in the long run. Under the considerable forces and vibrations that are at play a loose bush would allow axial displacement of the entire control mechanism ultimately causing the waste gate valve to be displaced from its seat, or the sliding piston to seize.

Nor can the idea of a non-fixed and loosely fitted bush which necessarily results in a lack of tightness allowing exhaust gas leakage between bush and housing, be reconciled with the stated purpose of the application as filed, namely to prevent exhaust gas leakage from the turbocharger, see title; page 1, 1st

paragraph; page 2, 2nd paragraph; page 3. The Board does not consider it plausible that the skilled person would strive to prevent leakage between rod and bush while allowing for a relatively larger outflow of gas (due to the larger relative dimensions) between bush and housing.

- 2.11 From the above, the Board concludes that the addition of the feature of fixed bush in conjunction with a disc spring does not add subject-matter that extends beyond the content of the application as filed, Art 100(c) EPC.

3. The other objections brought forward in relation to the ground of added subject-matter under Art 100 c) EPC are also not convincing for the following reasons:
 - 3.1 The fact that the bush comprises a solid cylindrical portion is directly inferable from the drawings, for example figures 7 and 8 which show circular wear washers meant to fit the bottom of the bush and shown in figures 1, 2 and 6 as having a circular cross section. For the skilled person familiar with normal drawing conventions and with a good knowledge of solid geometry this can but mean that the bush is solid cylindrical, i.e. a standard bush.

 - 3.2 Figures 8, 10 and 11 furthermore show the wear washers to have a circular opening for the passage of the rod which must correspond to a similar opening of circular cross-section extending the length of the bush, figures 1 to 6. Again the skilled person can only conclude that this corresponds to a bore.

3.3 Finally, figures 1 to 6 show the rod 5 received within the bore of bush 8 without an intermediate element and thus directly adjacent and in direct contact with its inner surface. This surface of direct contact forms the bearing surface which through direct contact constrains the movement of the rod. That the figures do not show any clearance, which will be necessary to allow for thermal expansion, is irrelevant, as they are not manufacturing blueprints meant to give exact dimensions.

3.4 It follows from the above, that also the remaining contested amendments to granted claim 1 do not contain subject-matter extending beyond the content of the application as filed and the ground for opposition mentioned in Article 100(c) EPC does not prejudice the maintenance of the patent as granted.

4. Remittal

4.1 The Board has considered the opposition ground based on Art 100(c) together with 123(2) EPC, as decided by the opposition division in its decision and challenged in the appeal. However, the opposition division did not examine and decide on the grounds of Art 100(b) and (a) in relation with novelty and inventive step also raised in opposition. These issues were neither the subject of the appeal, nor have they been addressed fully by the parties in their submissions to date.

4.2 The Board therefore considers it appropriate to exercise its discretion under Article 111(1) EPC to remit the case to the opposition division, so that it may examine these remaining opposition grounds. This is particularly so as the appellant and the respondents agree with this course of procedure.

Order

For these reasons it is decided that:

1. **The decision under appeal is set aside.**

2. **The case is remitted to the opposition division for further prosecution.**

The Registrar:

The Chairman:



G. Magouliotis

A. de Vries

Decision electronically authenticated