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**Datasheet for the decision  
of 28 February 2022**

**Case Number:** T 0333/19 - 3.2.04

**Application Number:** 08873087.4

**Publication Number:** 2193264

**IPC:** F02B37/013, F02B39/00

**Language of the proceedings:** EN

**Title of invention:**

TURBOCHARGER SYSTEM SUBASSEMBLIES AND ASSOCIATED ASSEMBLY  
METHODS

**Patent Proprietor:**

Garrett Transportation I Inc.

**Opponent:**

BorgWarner Inc.

**Headword:**

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 0333/19 - 3.2.04

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.04**  
**of 28 February 2022**

**Appellant:** BorgWarner Inc.  
(Opponent) 3850 Hamlin Road  
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**Representative:** Baur & Weber Patentanwälte PartG mbB  
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**Respondent:** Garrett Transportation I Inc.  
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**Representative:** Lucas, Peter Lawrence  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 11 December  
2018 rejecting the opposition filed against  
European patent No. 2193264 pursuant to Article  
101(2) EPC.**

**Composition of the Board:**

**Chairman** S. Oechsner de Coninck  
**Members:** C. Kujat  
C. Heath

## **Summary of Facts and Submissions**

- I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division of the European Patent Office posted on 11 December 2018 rejecting the opposition filed against European patent No. 2193264
- II. The Opposition Division held that the grounds for opposition mentioned in Articles 100 (a) and (b) EPC did not prejudice the maintenance of the patent as granted having regard to the following documents in particular:
- E1 WO 01/81744 A1
- E5 L. Walters et al.: "Kleben im Metalhandwerk".  
Institut für Kunststoffverarbeitung an der  
RWTH Aachen, pages 1-67
- E6 US 5 256 717
- E7 J. Schouten: "Hot Melt Assembly", presentation at  
ASC Hot Melt Short Course, 9 October 2005,  
pages 1-31
- D1 US 3 188 115
- III. Oral proceedings were held on 28 February 2022 by means of videoconference.
- IV. The appellant requests that the decision under appeal be set aside and the patent be revoked.
- V. The respondent requests that the appeal be dismissed, or that the decision under appeal be set aside and that the patent be maintained on the basis of one of Auxiliary Requests 1-3 filed with the response to the grounds of appeal dated 20 August 2019.

VI. The independent claim 1 according to the main request (patent as granted) reads as follows:

"A subassembly of a system that includes an exhaust gas turbocharger valve system coupled with an internal combustion engine exhaust system, the sub-assembly comprising:

a manifold and valve that are heated to an operational temperature by heat transfer from engine exhaust gases during engine operation, the manifold and valve being secured in predetermined positions relative to each other by a low-melt material whose melting temperature is less than said operational temperature such that the low-melt material melts upon operation of the engine and turbocharger system and no longer performs any fastening or positioning function for the components."

VII. The appellant argues as follows:

Starting from E1, the skilled person would have obviously used an low melt adhesive as a suitable way to pre-assemble two components of a turbocharger and manifold in an obvious manner.

VIII. The respondent argues as follows:

Starting from E1, the skilled person would not find in any of the cited documents an incentive to provide a low melt material fulfilling the securing and melting function as required by claim 1.

### **Reasons for the Decision**

1. The appeal is admissible.
2. Background - interpretation of granted claim 1.

2.1 The patent generally relates to turbocharger systems for internal combustion engines. More particularly when a valve is arranged between the exhaust manifold of the engine and a turbocharger for selectively allowing or preventing flow of exhaust gases, the valve typically has a housing bolted to the exhaust manifold and to the turbine housing of the turbocharger (paragraph 003). The patent seeks improvement in the way these two components are pre-assembled. This is reflected in claim 1 that defines a sub-assembly of a system that includes an exhaust gas turbocharger valve system coupled with an internal combustion engine exhaust system. Claim 1 further defines a manifold, understood to belong to a combustion exhaust system, and a valve of the turbocharger that are secured together in predetermined positions.

The first part of the claim does not merely address any kind of sub-assembly comprising valve members in a combustion engine but is instead more specific than submitted by the appellant in that it explicitly defines the connection between a turbocharger valve and the engine manifold as constituting the components of the claimed sub-assembly.

2.2 The core idea of the patent concerns the way both components are secured together as a pre-assembly before final assembly. Claim 1 requires the manifold and valve to be secured in predetermined positions relative to each other by a low-melt material whose melting temperature is less than said operational temperature such that the low-melt material melts upon operation of the engine and turbocharger system and no longer performs any fastening or positioning function for the components.

There again the claim is self-explanatory and includes clear functional limitations in that a fusible material

has to be provided for -temporarily- securing the manifold and valve in given -selected- relative positions, and the material furthermore needs to melt, and thereby also loose any coupling function, upon normal operation as soon as the manifold and valve are exposed to hot exhaust gases.

2.3 Whereas the specific type of material or its structural form is left open in claim 1, the above mentioned functional limitations effectively provide the skilled person with all necessary information to select a material. Such material may be chosen from thermoplastic polymers or low-melt metals indicated in paragraph 0025, having melting temperatures in the range known for combustion engines exhaust above 150°C (paragraph 0024), the material being formed as fasteners or as metallurgical bond or weld (paragraph 0028).

3. Main request - inventive step

3.1 E1 on page 5, last paragraph, discloses an exhaust gas turbocharger valve system comprising: a flange ("Anschlussflansch" 11) coupled to an internal combustion engine manifold and valve ("Klappengehäuse" 16 und "Stellorgan" 15). The sub-assembly of the manifold and valve is furthermore mentioned in the last but one paragraph on page 8 to be optionally pre-assembled ("vormontierte Baueinheit"). How these components are pre-assembled in practice is not further specified in E1.

3.2 It is undisputed that claim 1 differs from this disclosure by a manifold and valve being secured in predetermined positions relative to each other by a low-melt material whose melting temperature is less

than said operational temperature such that the low-melt material melts upon operation of the engine and turbocharger system and no longer performs any fastening or positioning function for the components.

3.3 The respondent relies on the technical effect indicated in paragraph 0023 of the patent that discusses the disadvantages of the prior type of positioning with small metal bolts, inter alia resulting in an undesirable "hyperstatic" assembly. According to them, the problem should incorporate avoidance of such "hyperstatic" assembly, and its solution as claimed would also be in line with paragraph 0024 explaining how the invention using temporary fasteners of a low melt material allows initial assembly.

3.4 The Board however notes that claim 1 only requires to secure the manifold and valve in predetermined positions relative to each other "by a low melt material". This is less specific than the explanation in paragraph 0024 made in the context of using fasteners. The introduction of the patent using the features as they are drafted in claim 1 describes the invention in the more general context of the first sentence of paragraph 0006 of pre-assembling components in an engine turbocharger, irrespective of its purpose (testing, pre-positioning or calibrating the valve, or transporting the assembly).

3.5 Therefore, the Board finds it more appropriate to reformulate the technical problem proposed by the respondent in that according to established jurisprudence the problem should be based on the technical effect of exactly those features distinguishing the claim from the prior art so as to



propose a suitable way of initially assembling or pre-assembling a valve and manifold before final assembly.

3.6 The Board is however convinced that striving to solve this somewhat less ambitious technical problem without necessarily intending to avoid a "hyperstatic" coupling upon final assembly, the skilled person without hindsight knowledge would not have provided a low-melt material that would melt and thereby loose any attachment property in operation by way of obviousness, as submitted by the appellant.

3.7 The appellant generally relies upon any known type of "third hand" used to temporarily hold two pieces together. Amongst these types of "third hand", they refer to adhesive tapes, hot melt adhesives as well as human assistance as straightforward means for securing components together in a non final way. The Board however observes that the appellant has failed to provide any evidence that such types of known provisional holding means have been used in the context of pre-assembling two components in a combustion engine environment, less so an engine manifold to a turbocharger valve housing as defined in claim 1. Lacking any such evidence this argument fails to convince the Board that the skilled person not only *could* have provided such a "third hand", but instead that they *would* have done so to pre-assemble a manifold and valve. Starting from the pre-assembly of E1, it would not only require some insight that a provisional or temporary assembly would suffice, but also that such a temporary assembly may advantageously loose grip or even disappear after final assembly upon normal operation of the engine without any further active removal step.

The Board adds that whenever incidentally considering any of the proposed means to pre-assemble the valve and manifold referred to by the appellant, the fusible character at turbocharger operating temperature is not necessarily achieved by the quoted types of "third hand". For example, an adhesive tape even if losing its adherence at higher temperature does not always melt and would not obviously have been left in operation. The Board also observes that there are some adhesives or glues that do not necessarily melt at high temperatures contrary to the specific limitation imposed by claim 1.

3.8 Documents E5, E6, E7 submitted by the appellant do not provide such evidence of common use of temporary coupling means in the field of turbocharged combustion engines. The hot melt adhesives disclosed therein as particular types of "third-hand" would not have been considered suitable by the skilled person to arrive at a sub assembly where the vane and manifold are temporarily secured in the way required by claim 1 for the following reasons.

3.8.1 E5 "Kleben im Metallhandwerk" is a publication of the "Institut für Kunststoffverarbeitung" in Aachen and generally discloses the use of different types of adhesives for application in metals. A low melt adhesive is described in chapter 3.2.2 on page 62, according to which it can be heated to melt and cooled to restore adherence. Its application in all thinkable fields of application ("in allen erdenklichen Anwendungsbereichen") is the first application mentioned. According to the particular use explained on the top of page 63, after heating for liquefying the adhesive, the adherence is obtained once the temperature returns to ambient. Therefore, this

teaching lacks any indication for its suitability to be used in the particular context of engines and turbochargers. Moreover, if any more particular teaching is gathered, it rather concerns a final assembly of two pieces at ambient temperature, remote from the operating temperature of a combustion engine that purposively achieves melting and loss of fastening function.

Thus, this teaching would not have been taken into consideration by the skilled person intending to propose a suitable way of initially assembling or pre-assembling a valve and manifold before final assembly.

3.8.2 E6 and E7 also fail to provide such useful hint to the skilled person.

- E6 discloses the use of temporary adhesives in lines 12 to 15 of column 1 called "hot melt adhesives" to provide a non destructive bond in applications such as packaging, bookbinding, personal care products, etc. (col 1, lines 27-30). This teaching is applicable in the context of lightweight, low temperature and low load applications, and thus, would not be regarded by the person skilled as a suitable way to provide an initial assembly of a valve and manifold in the field of internal combustion engines.

- E7 is a presentation entitled "Hot Melt Assembly" by J. Schouten on 9 October 2005. On slide 25, a "third-hand" or temporary bonding is generally presented to clamp or hold parts together for applications that need slower curing to produce structural strength. This specific example teaches to clamp or hold parts explicitly in conjunction with another form of adhesive, which other joining system needs time to build strength. No hint to consider other purposes or applications can be derived therefrom.

3.9 In writing, the appellant also relied on D1 as a further hint to use a low melt material as temporary supporting means. D1 discloses a fusible washer 50 made of plastics placed between a pressure plate 26 and springs 46 (col 3, lines 10-21) to apply a proper resilient preload on joints of an exhaust manifold (col 1, lines 10-14). These teachings would not be seen as suitable to provide an initial assembly of a valve and manifold by the skilled person because it concerns the function of preloading springs. The material used even if being able to melt does not serve to secure components together. The Board thus does not recognise any incentive for the skilled person to abstract the particular material of this fusible washer from its specific context of preloading springs, and instead seek to achieve initial and temporary assembly of a manifold and valve as claimed.

4. It follows that the Board confirms the Opposition Division's positive assessment of inventive step, and the Board confirms the Opposition Division's decision to reject the opposition under Article 101(2) EPC.

**Order**

**For these reasons it is decided that:**

**The appeal is dismissed.**

The Registrar:

The Chairman:



G. Magouliotis

S.Oechsner de Coninck

Decision electronically authenticated