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Datasheet for the decision of 22 November 2007

Case Number: T 0151/05 - 3.2.04

Application Number: 97108803.4

Publication Number: 0811760

IPC: F02F 3/00

Language of the proceedings: EN

Title of invention:
Method of producing a piston through casting

Patentee:
Toyota Jidosha Kabushiki Kaisha

Opponent:
MAHLE GMBH

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84, 111(1), 114(2)

Keyword:
"Common general knowledge - late-filed evidence (admitted) - remittal (no)"
"Inventive step - all requests (no) - interpretation of claims"

Decisions cited:
T 1002/92, T 1019/92, T 0988/02, T 0908/04, T 0644/97

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0151/05 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 22 November 2007

Appellant: (Opponent)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 6 December 2004 concerning maintenance of European patent No. 0811760 in amended form.

Composition of the Board:

Chairman: M. Ceyte
Members: M. Poock
C. Heath

Summary of Facts and Submissions

I. In its interlocutory decision posted on 6 December 2004 the Opposition Division decided that European patent no. 0 811 760 could be maintained in the form of the third auxiliary request filed on 16 August 2004.

The Opposition Division held that the subject-matter of claim 1 of this request involved an inventive step because the available prior art did not give an indication for the use of a single central core mold in the method known from a public prior use (hereinafter prior use 1) which was substantiated with the following documents:

A: Drawing no. 45L30 of a blank piston, MAHLE GmbH, 1983;
B: Detailed view of drawing no.45L30, MAHLE GmbH, 1983;
C: Drawings no. WG2M3-45L30, WG4M3-45L30 of piston casting equipment, MAHLE GmbH, 1983;
D: Photo of a piston, MAHLE GmbH;
G: Affidavit concerning the piston consigned at the oral proceedings with the opposition division.

II. The Opponent lodged the notice of appeal on 29 January 2005 and paid the prescribed fee simultaneously. The statement of grounds of appeal was received on 13 April 2005.

In the statement of grounds of appeal, the Appellant (Opponent) cited a further prior use (hereinafter prior use 2) and referred to the following documents:

X0: Catalogue of MAHLE GmbH, 1994, page 663;
X01: Drawing WG4M9-1O4L11.3 of MAHLE GmbH;
X: Schematical drawing of piston casting form;
X1 to X5: Drawings W4M3—38 L 64/1 and 38 L 64, WG4M3-38 L 59 and 38 L 59, WG4L3-38 L 36 and 38 L 36, W4N3-52 L 68 and 52 L 6, WG4M3—52 L 65 and 52 L 65 of MAHLE GmbH.

III. With the summons to oral proceedings dated 31 May 2007, the Board expressed doubts whether prior use 2 was sufficiently substantiated. In its reply, the Appellant then referred to the following documents:

H: US—A—517 4 357;
I: DE—A—1 037 663;
K: US—A—2 287 524;
L: US—A—2 780 849;
M: US—A—1 663 693;
O: US—A—1 551 193;
P: US—A—1 952 199;
Q: US—A—2 835 006;
R: US—A—2 124 529;
S: US—A—2 070 649;
T: US—A—2 621 380.

IV. The oral proceedings before the Board took place on 22 November 2007 and focused on the discussion whether documents H to T should be admitted into the proceedings and whether the subject-matter of claim 1 involves an inventive step over the method known from prior use 1 taking into consideration the general technical knowledge of the skilled person.

V. The Appellant (Opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent (Patent Proprietor) requested with a main request that the appeal be dismissed, in the alternative that the patent be maintained based on one of the auxiliary requests 1 to 3 as filed with the letter of 18 October 2007. Further, the Respondent requested that documents X, X0, X01, X1 to X5 and documents H to T not be admitted into the procedure, in the auxiliary, that the case be remitted to the first instance for further prosecution, if these documents were to be admitted.

VI. Claim 1 reads:

(a) Main request

"A method of producing a piston through casting, wherein the piston (10) has a piston head (12), a pair of skirt areas, a pair of pin bosses and a pair of supporting areas, the supporting areas connecting peripheries of the pin bosses (23) with the skirt areas, said method comprising the steps of: arranging a main mold (40), a pair of external molds, a pair of side core molds (72, 76) and a central core mold such that said main mold, said external molds, said side core molds (72, 76) and said central core mold form cavities corresponding to a configuration of the piston (10); arranging mold matching surfaces between the external molds and the side core molds (72, 76) such that the external molds and the side core molds are contacted at positions different from corners of the supporting

areas of the piston; arranging mold matching surfaces between the side core molds (72, 76) and the central core mold such that the side core molds (72, 76) are contacted by the central core mold (74), and external ends of the_mo1d matching surfaces between the side core molds and the central core mold (74) are located at positions different from central portions of the skirt areas; and performing the casting by using the main mold, the external molds, the side core molds (72, 76) and the central core mold (74) so that the piston is produced, wherein inside surfaces of the skirt areas are shaped by the central core mold which is a single mold".

(b) In comparison with this request, claim 1 of the auxiliary requests was amended as follows:

(i) Auxiliary request 1

The feature: "wherein the external ends of the mold matching surfaces between the side core molds (72, 76) and the central core mold (74) are located at positions outward from the central portions of the skirt areas (18, 19) which correspond to a distance between inner end surfaces of the pin bosses (22, 23)" was added.

(ii) Auxiliary request 2

The last feature was amended to read: "wherein the inner surface of one of the skirt areas (18) is shaped by the one end surface of the central core mold (74) and the inner surface of the other of the skirt areas (19) is shaped by the other

end surface of the central core mold (74) which is a single mold".

(iii) Auxiliary request 3

The feature: "wherein a mold matching surface between the central core mold (74) and the one of said side core molds (72) is outwardly curved and directed to the peripheral edges of the skirt areas (18, 19), and a mold matching surface between the central core mold (74) and the other of said side core molds (76) is outwardly curved and directed to the other peripheral edges of the skirt areas (18, 19)" was added.

VII. The Appellant essentially argued as follows:

(a) Documents H to T should be admitted into the proceedings because they are, prima facie, relevant for the decision to be taken.

Only with the decision of the Opposition Division the necessity arose to submit evidence for the common general knowledge in the field of casting of pistons for combustion engines. In a first attempt prior use 2 was cited in the statement of grounds of appeal. However, after the Board's communication and because the delivery receipts could not be retrieved any more after ten years, it appeared that this prior use was not sufficiently substantiated. Therefore, in a second attempt, it was necessary to refer to documents H to T.

(b) The claimed subject-matter does not involve an inventive step over the method known from prior use 1.

(i) The wording of claim 1 of all requests is clear and therefore does not need to be interpreted. It does not exclude that the inside surfaces of the skirt areas are partially shaped by the side core molds, which aspect is known from any of documents H to T. A different understanding of claim 1 would contradict the description of the patent.

(ii) The subject-matter of claim 1 is distinguished from the known method only by the feature that the central core mold is a single mold. This avoids the formation of flashes during casting of the piston from which cracks may propagate at high stresses. The problem is to avoid the formation of cracks in the piston skirt areas.

On the priority date, as is evidenced by the vast number of patent documents H to T, it was common general knowledge in the field of piston casting for combustion engines that a single central core mold can be used. Therefore, the design of the central core mold as a single (see documents H to T) or multiple piece mold (see prior use 1) is only a matter of choice for the person skilled in the manufacture of pistons and depends on the piston design.

VIII. The Respondent contested essentially as follows:

(a) Documents H to T were filed too late and are, prima facie, not of sufficient relevance to be admitted into the proceedings.

(i) The feature of the single center core was part of granted dependent claim 9. Therefore, the Appellant, then Opponent, must have been aware that this feature might become relevant in the opposition proceedings.

Moreover, after the Respondent by letter of 29 August 2005 had contested that this feature was available to the public in prior use 2, the Appellant, then Opponent, must already have been aware at this stage and not only with the communication of the Board that he will not be successful with this prior use, because the delivery receipts could not be retrieved.

Finally, a negative opinion expressed in a Board's communication cannot be a general reason for admitting new documents into opposition proceedings.

Hence, the filing of these documents only shortly before the oral proceedings in the appeal was late.

(ii) In the main request, the last feature of claim 1 does not merely require that the

central core mold is a single mold. It also requires that the inside surfaces of the skirt areas are shaped by the central core mold. This means that the inside surfaces of the skirt areas are not shaped by the side core molds. None of documents H to T discloses this aspect.

Hence and with reference to decision T 1002/92, there are, prima facie, no clear reasons to suspect that such late-filed material would prejudice the maintenance of the European patent.

(iii) If the Board decides to admit these documents into the proceedings, the case should be remitted to the Opposition Division to give the Respondent the right to a full examination before two instances.

(b) The claimed subject-matter is new and involves an inventive step over the method known from prior use 1 which represents the closest prior art.

(i) It is common to all requests, that claim 1 has to be interpreted in the light of the description of the patent, in particular of paragraph [0049]. This interpretation reveals that the embodiment of figures 1 to 4 is not claimed. What is claimed is the embodiment of figures 5 and 6 in which the inside surfaces of the skirt areas are shaped only by the central core mold and not by the side core molds.

(ii) The skilled person, a graduated mechanical engineer with experience in the field of the design of combustion engines, would not combine the teaching of any of these documents H to T with the closest prior art method.

The reasons are: These documents do neither disclose light weight pistons nor do they address the problems to avoid flashes or to reduce the piston weight. Moreover, some of these documents do not disclose a pair of skirt areas as required by the claims but a continuous skirt.

But even if the teaching of any of these documents was combined with the closest prior art method, not all claimed features were revealed.

Reasons for the Decision

1. The appeal complies with the requirements of Article 106 to 108 and Rules 1(1) and 64 EPC. It is therefore admissible.

2. *Documents H to T*

2.1 Proof of purportedly common general knowledge is only required if it is challenged by another party or the EPO (see e.g. T 766/91 of 29 September 1993).

The Appellant argued that the necessity to furnish proof only emerged from the decision of the Opposition Division. Nevertheless, these documents were not filed with the statement of grounds of appeal, but only about one month prior to the oral proceedings before the Board. Consequently, these documents have to be considered as being late-filed.

2.2 Admissibility

2.2.1 It is established Case Law of the Boards of Appeal (see e.g. T 1002/92, OJ EPO 1995, 605) that in appeal proceedings new facts and in particular new evidence which go beyond the indication of the facts and evidence presented in the notice of opposition, should only very exceptionally be admitted into the proceedings. The decision to admit such material is at the Board's discretion.

An important criterion for deciding on the admissibility of late-filed evidence is if such new material is *prima facie* highly relevant in the sense that it is highly likely to prejudice the maintenance of the European patent in suit. However, other considerations might play a decisive role such as whether the late-filing represents an abuse of the proceedings (T 1019/92 of 9 June 1994, reasons, item 2.2; not published in OJ EPO).

2.2.2 The fact that the Appellant relied first on prior use 2 and then, after having realised that this argument was not sufficiently substantiated, on other evidence for demonstrating the common general knowledge is seen by the Board as a misjudgement but not as an abuse of the

proceedings. Consequently, the documents H to T cannot be disregarded without considering their relevance.

2.2.3 All these documents relate to the casting of pistons for combustion engines in which a single central core mold is used. Therefore, these documents are prima facie highly relevant in the sense that it can reasonably be expected to change the eventual result and are thus highly likely to prejudice maintenance of the European patent (see T 1002/92, mentioned above). Consequently, documents H to T are admitted into the proceedings pursuant to Article 114(2) EPC.

2.3 Remittal

2.3.1 Article 111(1) EPC stipulates that the Board of Appeal may either decide on the appeal or remit the case to the department which was responsible for the decision appealed.

(a) Hence, this Article does not establish any absolute right for parties to have all matters raised in appeal proceedings examined by two instances.

(b) The exercise of this discretion should balance the public interest to know about the eventual outcome of opposition proceedings in reasonable time with the entitlement of the parties to fair proceedings.

2.3.2 In the notice of opposition, the Appellant, then Opponent, stated that for the person skilled in the art of piston casting, the use of a single or multiple part

core mold would not involve inventive considerations. The opposition division has not explicitly commented on this point in their decision. However, since the Opposition Division held that the claimed solution involved an inventive step, it is implicit that, in their view, the distinguishing feature was not common general knowledge.

(a) The filing of documents H to T in response thereto was not late to such an extent that the Respondent could not adequately prepare his defence. In fact, they were filed more than one month prior to the oral proceedings before the Board and the Respondent commented in writing and in detail on it. Thus, the Respondent was not taken by surprise.

(b) Since the Opposition Division implicitly decided on this issue, the factual framework of the case has not been altered in a fundamental manner.

(c) On the other hand, a remittal of this case to the first instance would lengthen the opposition proceedings and considerably delay a final decision. In this context, the Board has also taken into account that this patent originates from a priority of 4 June 1996.

(d) Under these circumstances, the Board considered it appropriate to decide on the appeal rather than to remit the case to the first instance for further prosecution.

3. *Inventive step - main request*

3.1 With respect to patentability, the only issue at stake is whether the subject-matter of claim 1 involves an inventive step.

3.2 Closest prior art

3.2.1 The closest prior art for the claimed method is known from prior use 1. The parties agree that according to this prior use, a) the central core mold consists of two parts, and b) the inside surfaces of the skirt areas are not only shaped by a central core mold but also by two side core molds. However, the Respondent contested whether the latter disclosure anticipates the last feature of claim 1.

Hence, it has to be evaluated whether the subject-matter of claim 1 is restricted by its last feature to the inside skirt surfaces being shaped exclusively by the single central core mold or whether it also covers embodiments where the inside skirt surfaces are shaped by the single central core mold and the pair of side molds.

3.2.2 According to Article 84 EPC, the claims shall define the matter for which protection is sought (first sentence) and for this purpose they shall, inter alia, be clear and supported by the description (second sentence).

This implies that the claims must be clear in themselves when being read with the normal skills, but not including any knowledge derived from the

description of the patent application (see T 988/02 and T 908/04, both mentioned in "Special edition 6", page 38, OJ EPO 2007).

The Board has no doubts that the last feature of claim 1 is clear and requires that the inside skirt surfaces is shaped by the single central core mold. This, however, does not exclude that the inside skirt surfaces are also shaped by the pair of side molds.

This literal meaning also concurs with the rest of the patent. According to paragraph [0061] of the patent's specification, the mold matching surfaces between the central and side core molds are located between the central and peripheral edges of the skirt areas. This means in other words, that the inside skirt surfaces are shaped by the single central core mold and the pair of side molds as can be seen in figure 6 where the peripheral portions of the mold matching surfaces end in an outer part of the inside skirt area but not on the very end of the inside surfaces.

But even if the claims were not considered clear in themselves, this would not change the foregoing findings. In such case, they would have to be interpreted. As a general rule, any ambiguous text must be construed against the interest of the person responsible for drafting it (in the present case the proprietor), and in favour of the person on whom it is imposed (in the present case the appellant as a member of the public). This means that the feature has to be interpreted broadly and cannot be limited to "exclusively".

Therefore the Board concluded that the subject-matter of claim 1 is not restricted by its last feature to the inside skirt surfaces being shaped exclusively by the single central core mold but it also covers embodiments where they are shaped by the single central core mold and the pair of side molds.

3.2.3 Therefore, the subject-matter of claim 1 is distinguished from this closest prior art only by the feature that the central core mold is a single mold.

3.3 Derivation of the technical problem

3.3.1 It is established case law of the Boards of Appeal that an objective definition of the technical problem to be solved should normally start from the technical problem that is described in the patent in suit. Only if it turns out that an incorrect state of the art was used to define the technical problem or that the technical problem disclosed has in fact not been solved, can an inquiry be made as to which other technical problem objectively existed (see e.g. T 644/97 of 22 April 1999, point 2.3, not published in the OJ EPO).

3.3.2 The technical problem that results from the introductory portion of the patent (see paragraphs 2 to 10) is as set out in detail in paragraph [0011] of the patent specification, to provide a piston production method which effectively prevents the occurrence of flashes at positions of the piston where a great stress is very likely to be produced.

However, this problem was already solved by the closest prior art method mentioned above. There, the mold

matching surfaces between the external molds and the side core molds are arranged such that the external molds and the side core molds are contacted at positions different from corners of the supporting areas of the piston. Moreover, since the term "central portions" is not specifically defined, i.e. where the skirt portion ends, it is also known from this method that the external ends of the mold matching surfaces between the side core molds and the central core mold are located at positions different from central portions of the skirt areas. Thus, the occurrence of flashes at positions of the piston where a great stress is very likely to be produced is prevented.

Hence, it is necessary to reformulate the technical problem based on the method known from prior use 1 representing the closest prior art.

3.3.3 The only distinguishing feature has the primary effect that the manufacture of the central core mold is facilitated because it reduces for instance the necessity to prepare matching surfaces for cooperation. As a consequence, the claimed method ensures a more economical piston production.

In view of the foregoing, starting from the known prior use 1 as closest prior art, the technical problem can be seen in providing a simplified method of producing a piston through casting.

3.4 Obviousness of the solution

3.4.1 Documents H to T all relate to the casting of pistons for combustion engines. The plurality of patent

documents provides a consistent picture of the common general knowledge at the priority date of the opposed patent, i.e. it was commonly known in the field of piston casting to use single central core molds (see, for instance, document M, figures 8 to 10: "67"; O, figures 5, 6: "25"; P, figures 2, 7: "14"; R, figure 4: "22" and figure 12: "69"; K, figures 3, 8: "23"; T, figures 4, 5, 8: "36"; S, figure 8: "11").

Whether a single or multiple piece central core mold is used, is a matter of choice for the person skilled in the manufacture of pistons and depends on the piston design. As a matter of course, the skilled person will keep the number of core molds for casting a piston to a minimum. Where the geometry of the piston allows that the core mold can be pulled out, i.e. where no undercuts can block this movement, there is no need to use a multiple piece core mold.

3.4.2 Therefore it is obvious to the person skilled in the art to modify the method of prior use 1 according to its common general knowledge, i.e. to exchange the two part central core mold in the known method by a single central core mold.

3.4.3 In view of the problem stated above it is irrelevant whether the piston is provided with a continuous skirt or a pair of skirts. Nevertheless, it is observed that the pistons produced according to documents H and M are provided with a pair of skirts.

3.5 In view of the foregoing, the Board concludes that the subject-matter of claim 1 does not involve an inventive

step as required by Articles 52(1) and 56 EPC. Consequently, the main request is not allowable.

4. *Inventive step - auxiliary requests*

4.1 Auxiliary request 1

Documents K, M, O, P, R, S and T also demonstrate that the additional feature in claim 1 according to which the external ends of the mold matching surfaces between the side core molds and the central core mold are located at positions outward from the central portions of the skirt areas which correspond to a distance between inner end surfaces of the pin bosses forms part of the common general knowledge in this field on the priority date of the opposed patent.

Moreover, the skilled person will not position the mold matching surfaces in areas of high stress, because he is well aware that the flashes produced by these surfaces could cause the formation of cracks in the piston.

Therefore, the added feature in claim 1 of auxiliary request 1 cannot support the presence of an inventive step.

4.2 Auxiliary request 2

From prior use 1 a method is known in which the inner surface of one of the skirt areas is shaped by the one end surface of the two-part central core mold and the inner surface of the other of the skirt areas is shaped by the other end surface of the two-part central core

mold. Thus, the subject-matter of claim 1 of this request is distinguished from this closest prior art by the same feature as the subject-matter of claim 1 of the main request, i.e. by the single central core mold.

Therefore, the added feature in claim 1 cannot support the presence of an inventive step for the same reasons as set out above for claim 1 of the main request.

4.3 Auxiliary request 3

Documents K (page 2, lines 98 and 126), M, O, P, R and S also demonstrate that the additional feature in claim 1 according to which a mold matching surface between the central core mold and the one of said side core mold is outwardly curved and directed to the peripheral edges of the skirt areas, and a mold matching surface between the central core mold and the other of said side core mold is outwardly curved and directed to the other peripheral edges of the skirt areas, forms part of the common general knowledge in this field on the priority date of the opposed patent.

Therefore, the added feature in claim 1 cannot support the presence of an inventive step.

4.4 Consequently, also the auxiliary requests are not allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The European patent is revoked.

The Registrar: The Chairman:

G. Magouliotis M. Ceyte