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**Datasheet for the decision
of 4 April 2019**

Case Number: T 0800/15 - 3.2.06

Application Number: 02782187.5

Publication Number: 1438493

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F16J1/08

Language of the proceedings: EN

Title of invention:
CLOSED GALLERY MONOBLOC PISTON HAVING OIL DRAINAGE GROOVE

Patent Proprietor:
FEDERAL-MOGUL CORPORATION

Opponent:
KS Kolbenschmidt GmbH

Headword:

Relevant legal provisions:
EPC 1973 Art. 100(a)

Keyword:
Inventive step - (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0800/15 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 4 April 2019

Appellant: KS Kolbenschmidt GmbH
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 9 February 2015
rejecting the opposition filed against European
patent No. 1438493 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman M. Harrison
Members: M. Hannam
E. Kossonakou

Summary of Facts and Submissions

I. An appeal was filed by the appellant (opponent) against the decision of the opposition division rejecting the opposition to European patent No. 1 438 493. It requested that the decision be set aside and the patent be revoked.

II. In its letter of response, the respondent (patent proprietor) requested that the appeal be dismissed.

III. The following documents, referred to by the appellant in its grounds of appeal, are relevant to the present decision:

E1 GB-A-1 501 387

E2 US-A-6 155 157

IV. The Board issued a summons to oral proceedings and a subsequent communication containing its provisional opinion, in which it indicated *inter alia* that the subject-matter of both claims 1 and 7 appeared to involve an inventive step.

V. Oral proceedings were held before the Board on 4 April 2019. The final requests of the parties were unchanged from those indicated above.

VI. Claim 1 of the patent as granted reads as follows (with paragraph annotation as used by the parties in their submissions):

"M1 A monobloc piston (10) assembly comprising:
a piston head (12) having a combustion bowl (28) formed in an upper surface (16) thereof and a ring belt (14) formed with a plurality of ring grooves (20, 22, 24) in

an outer surface (26) of said ring belt (14);

M2 a plurality of piston rings (58, 62) disposed in said ring grooves (20, 22, 24);

M3 a pair of pin bosses (38) extending from said piston head (12) formed with axially aligned pin bores (44) and having axially oppositely facing outer surfaces;

M4 a piston skirt (46) formed as one immovable piece with said pin bosses (38) and united at an upper end thereof to said ring belt (14); and

M5 an oil drainage groove (52) formed in said piston head (12) at a location below said ring grooves (20, 22, 24),

M5.1 said oil drainage groove (52) being free of any piston rings (58, 62) and

M5.2 being open to said outer surfaces of said pin bosses (38);

characterized by

M6 an oil cooling gallery (32) formed in said piston head (12) adjacent said combustion bowl (28) and said ring belt (14); and in that

M7 said outer surfaces are planar surfaces (56) recessed inwardly of the outer surface of the ring belt (14);

M8 said oil drainage groove (52) is closed to said oil cooling gallery (32) and to an interior of said skirt; and

M9 said oil drainage groove (52) has a bottom wall floor surface spaced above said pin bores (44)."

Claim 7 as granted reads as follows:

"A method of fabricating a monobloc piston (10), comprising:

- forming a piston head (12) having a combustion bowl (28) in a top surface (16) and forming a plurality of

ring grooves (20, 22, 24) in an outer surface (26) of a ring belt (14);

- forming an oil cooling gallery (32) in the piston head (12) and providing pin bores (44) in a pair of pin bosses (38) extending from the piston head (12)

opposite the combustion chamber;

- forming a piston skirt (46) as a one piece immovable structure relative to the piston body and pin bosses (38);

- forming an oil drainage groove (52) in the piston head (12) that is continuous between the pin bosses (38) and is discontinuous and open across the side surfaces of the pin bosses (38); and

- disposing piston rings (58, 62) in the ring grooves (20, 22, 24) while leaving the oil (52) drainage groove free of any piston rings (58, 62);

characterized by

- forming planar outer side surfaces (56) on the pin bosses (38) that are recessed inwardly of the outer surface (26) of the ring belt (14);

and in that

- said oil drainage groove (52) is closed to said oil cooling gallery (32) and to an interior of said piston skirt (46); and

- said oil drainage groove (52) has a bottom wall floor surface spaced above said pin bores (44)."

VII. The appellant's arguments may be summarised as follows:

The subject-matter of claim 1 lacked an inventive step. There was agreement between the parties that E1 disclosed features M1 to M5, M6, M8 and M9. The lowest of the grooves, referenced 22 in Fig. 1, was free of any piston rings at least before the piston was installed into its cylinder, such that feature M5.1 was also known from E1. The objective technical problem

based on features M5.2 and M7 could be seen as how to improve management of the oil adhering to the cylinder wall. The skilled person would consider E2 for finding a solution to the problem since it disclosed a two-piece piston reflecting modern day requirements which was capable of improving oil control. Replacing the cylinder skirt of E1 with the lower part of the two-piece piston of E2, which a skilled person would do when constructing a modern piston, would solve the objective problem and automatically result in the groove 22 of E1 being open to the outer surfaces of the pin bosses.

The same arguments applied *mutatis mutandis* to the subject-matter of claim 7 such that this also lacked an inventive step.

VIII. The respondent's arguments may be summarised as follows:

The subject-matter of claim 1 involved an inventive step. The appellant's arguments were based on *ex post facto* knowledge of the claimed invention. Based on features M5.2 and M7 differentiating claim 1 from E1, the objective problem was to improve oil management by the piston. Adopting the lower piston half of E2 into the piston known from E1 would not directly result in the groove 22 being open to the pin bosses, not least since this would negate the groove's functioning as the seat for a piston ring (see E1, page 1, lines 74 to 80).

For the same reasons, the subject-matter of claim 7 also involved an inventive step.

Reasons for the Decision

1. *Article 100(a) EPC in conjunction with Article 56 EPC*

The ground for opposition under Article 100(a) EPC does not prejudice maintenance of the patent as granted as the subject-matter of both claims 1 and 7 involves an inventive step.

1.1 The sole starting point presented by the appellant for an inventive step attack was E1. The Board finds, and there was also no disagreement between the parties, that E1 discloses at least features M1 to M5, M6, M8 and M9 of claim 1.

1.2 Feature M5.1 is also known from E1 by way of oil control ring groove 22 (see page 1, lines 74 to 80; Fig. 1). In this regard it is noted that claim 1 is directed to a piston assembly without any limitation related to the cylinder in which it may be used. Fig. 1 of E1 discloses piston 10 in just such isolation, before insertion into a cylinder and before fitting any piston rings. The respondent notably did not contest groove 22 of E1, as depicted in Fig. 1 without inclusion of a piston ring, being regarded as an oil drainage groove (as in feature 5). As such, groove 22 of E1 thus indeed discloses 'an oil drainage groove being free of any piston rings' (feature M5.1).

1.3 E1 thus fails to disclose solely:

M5.2 (the oil drainage groove) being open to said outer surfaces of said pin bosses; and
M7 said outer surfaces (of said pin bosses) being planar surfaces recessed inwardly of the outer surface

of the ring belt.

- 1.4 Based on these differentiating features the Board finds, and the parties both agreed, that the objective technical problem could be seen as how to improve the management of the oil scraped from the cylinder walls.

- 1.5 The sole document argued by the appellant to provide the solution to the posed problem is E2. This discloses (see Figs. 2 to 4; col. 3, lines 11 to 27) a two-piece piston comprising a head member 42 and a skirt member 44. The head member includes three ring grooves (66, 68, 70; see Fig. 3); the skirt member includes a bore 118 to accept the gudgeon pin (see Fig. 2). In Figs. 2 and 4, planar outer surfaces 106 of the pin bosses can be recognised which are recessed inwardly from the ring belt 56. Modifying the piston of E1 with the skirt member 44 of E2 would however not result in the claimed subject-matter without the skilled person becoming inventively active in making oil drainage groove 22 of E1 open to the outer surfaces of the pin bosses in the skirt member of E2. With the ring grooves and the pin bore both being incorporated into a single body of the piston in E1, the adoption of the skirt member 44 from E2 into this assembly could occur at a number of positions along the axial direction of the piston. Providing it in such a specific position so as to result in the oil drainage groove 22 being open to the outer surfaces of the pin bosses is not considered obvious to the skilled person without prior knowledge of the invention defined in claim 1.

- 1.6 The appellant's argument that incorporating the skirt member 44 from E2 into the piston assembly of E1 would automatically result in the oil drainage groove 22 being open to the outer surfaces of the pin bosses is

not accepted, even if it were accepted that this combination is not the result of mere hindsight. For such combination to 'automatically' result, the skirt member would have to be incorporated into the piston assembly of E1 in a very specific position relative to the groove 22, for which there is simply no suggestion for the skilled person. Incorporation of the skirt member at this specific position would also require further modification of E1 due to the piston of E1, when in operation, having an oil control ring in groove 22 and the groove no longer providing a seat for the control ring in the same way if it were open to the outer surfaces of the pin bosses. Moreover, the appellant's suggestion that the inclusion of the lower part of the piston of E2 into E1 would be done while keeping all of E1 otherwise the same is not technically logical given that the lower ring groove in E1 and its position on the piston has been designed for a specific purpose and thus with a specific form.

- 1.7 It thus follows that, starting from E1 and wishing to reach the subject-matter of claim 1 whilst solving the objective technical problem would, in the light of E2, require the skilled person to exercise an inventive step.
- 1.8 Regarding the presence of an inventive step in the subject-matter of claim 7, no further arguments to those with respect to claim 1 were presented by the appellant. The Board thus similarly finds that the subject-matter of claim 7 also involves an inventive step when starting from E1 and combining this with the technical teaching of E2.
- 1.9 No further document combinations questioning the presence of an inventive step in the subject-matter of

claims 1 and 7 were presented by the appellant. The Board thus finds that the ground for opposition under Article 100(a) EPC does not prejudice maintenance of the patent as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



M. H. A. Patin

M. Harrison

Decision electronically authenticated