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**Datasheet for the decision
of 31 March 2009**

Case Number: T 1271/07 - 3.2.05

Application Number: 98122524.6

Publication Number: 0927844

IPC: F16J 15/08

Language of the proceedings: EN

Title of invention:

Metal gasket with edge support shim

Patentee:

ISHIKAWA GASKET CO. LTD.

Opponent:

ElringKlinger AG

Headword:

-

Relevant legal provisions:

EPC Art. 56, 123(2)

Relevant legal provisions (EPC 1973):

-

Keyword:

"Extension beyond the content of the application as filed
(main request) - yes"

"Inventive step (first and second auxiliary requests) - no"

Decisions cited:

-

Catchword:

-



Case Number: T 1271/07 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 31 March 2009

Appellant:
(Patent Proprietor)

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Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 09 Mai 2007
revoking European patent No. 0927844 pursuant
to Article 102(1) EPC 1973.

Composition of the Board:

Chairman: W. Zellhuber
Members: H. Schram
E. Lachacinski
W. Widmeier
C. Rennie-Smith

Summary of Facts and Submissions

I. The appeal is against the decision of the Opposition Division posted on 9 May 2007 revoking European patent No. 0 927 844 on the ground that the subject-matter of claim 1 of the main request and of the first to fifth auxiliary requests of the appellant (patent proprietor) did not involve an inventive step, Article 56 EPC.

Opposition was filed against the patent as a whole on the basis of Article 100(a) EPC (lack of novelty, Article 54 EPC, and lack of inventive step, Article 56 EPC).

II. Oral proceedings were held before the Board of Appeal on 31 March 2009.

III. The appellant requested that the decision under appeal be set aside and the patent in suit be maintained on the basis of one of the following documents: claims 1 and 2 of the main request, first auxiliary request, or second auxiliary request, all filed during the oral proceedings.

The respondent (opponent) requested that the appeal be dismissed.

IV. Claim 1 of the main request reads as follows:

"1. A metal cylinder head gasket (B) for an internal combustion engine, comprising:

a metal plate (20) extending substantially throughout an entire area of the engine to be sealed, said metal plate having two longitudinal edges

extending substantially along a longitudinal direction of the metal plate, two side edges extending substantially perpendicularly to the longitudinal direction of the metal plate, and four corner areas (20a, 20b) located at portions where the longitudinal edges and the side edges intersect together, wherein each of said corner areas (20a, 20b) is defined by a first line (L1) passing through a center of one of two cylinder bores located at longitudinal ends of the metal plate and extending along the longitudinal direction of the metal plate, and by a second line (L2) passing through the center of the cylinder bore where the first line passes and extending perpendicularly to the first line,

a plurality of cylinder bores (Hc) situated in the metal plate and arranged in the longitudinal direction of the metal plate,

a plurality of bolt holes (Hb) situated in the metal plate and arranged around the respective cylinder bores, and

a shim (23) located at a corner area (20b) of the metal plate without extending outwardly from the corner area where the shim is located, and

wherein said shim (23) includes only a first side (23a) with a first edge disposed on one of the longitudinal edges, and a second side (23b) with a second edge disposed on one of the side edges, without surrounding a bolt hole (Hb) situated in the corner area (20b), said first and second sides (23a, 23b) being integrally connected together at a corner thereof,

said metal cylinder head gasket (B) being characterized in that said second side (23b) has a width different from that of the first side (23a), and

in that the metal cylinder head gasket (B) further comprises an additional shim (22) located at another corner area (20a) adjacent to said corner area (20b) without extending outwardly from the another corner area where the additional shim is located and having a first side (22a) with a first edge disposed on one of the longitudinal edges and a second side (22b) with a second edge disposed on one of the side edges, said first and second sides (22a, 22b) of said additional shim (22) being integrally connected together at a corner thereof, and a curved portion (22c) surrounding a bolt hole (Hb) situated in this corner area (20a) and integrally connected to the two sides (22a, 22b)."

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the expression "*on one of the side edges, said first ...*" has been replaced by "*on the one of the side edges, said first ...*", and in that the feature "*wherein the shim (23) and the additional shim (22) are not formed continuously at the longitudinal end area where the corner area (20b) and the another corner area (20a) are situated adjacent from each other*" has been added at the end of the claim.

Claim 1 of the second auxiliary request differs from claim 1 of the main request in that the feature "*wherein the shim (23) and the additional shim (22) are spaced apart from each other*" has been added at the end of the claim.

V. The following documents were *inter alia* referred to in the appeal proceedings:

D2 US-A 5,538,263

O3 Drawing No. 0 19 169 of Elring Klinger GmbH (Kd.-
Zchn.-Nr. 96 231 382.80), dated 30.8.94

VI. The arguments of the appellant, in writing and during
the oral proceedings, can be summarized as follows:

Two corners of a rectangular plate were adjacent,
except when they were diagonally opposite. The feature
of claim 1 of the main request "another corner area
(20a) adjacent to said corner area (20b)" therefore
meant that corner areas 20a and 20b were both located
at the same longitudinal end of the plate (ie
immediately adjoining without intervening space, as
shown in Figure 3 of the application as filed
(published version)), or each corner area was located
at opposite ends of a longitudinal edge of the plate
(ie neighbouring but not touching). A basis for the
feature that shim 22 and shim 23 were generally located
at adjacent corner areas was paragraph [0018] in
combination with paragraph [0019] of the application as
filed, published version). From paragraph [0018] it
followed that shims 22 and 23 had sizes different from
each other, and from paragraph [0019] it followed that
two shims having sizes different from each other could
be located at any two adjacent corners. Claim 1 of the
main request thus met the requirements of
Article 123(2) EPC. A basis for the additional feature
of claim 1 of the second auxiliary request was Figure 3
of the application as filed (published version),
wherein it was clearly shown that shims 22 and 23 were
spaced apart. Claim 1 of the second auxiliary request

therefore also met the requirements of Article 123(2) EPC.

Claim 1 of the first auxiliary request related to a gasket for an internal combustion engine comprising a metal plate. The gasket shown in document O3 was made of a soft material, not of metal. For this reason document D2, rather than the gasket known from document O3, represented the closest prior art. In particular, the embodiment shown in Figure 3 of document D2 showed the left-hand longitudinal end of a rectangular metal plate with a shim 15 made of one piece, which covered two corners thereof, without surrounding any bolt hole. The subject-matter of claim 1 of the first auxiliary request differed therefrom in that two distinct, different shims were provided on each adjacent corner of the longitudinal end of the plate, and in that one shim had a curved portion surrounding a bolt hole. The invention therefore provided an additional degree of freedom for the designer of the shims of a gasket, who aimed at properly supporting the tightening pressures applied to the corner areas of the gasket, namely to use shims which surrounded a bolt hole and shims which did not. For a rectangular plate as shown in Figure 3 of document D2 there were not the kind of space restrictions for locating the shims as for a curved plate (as shown in Figure 4 of document D2). None of the shims shown in document O3 surrounded a bolt hole. The person skilled in the art starting from the gasket shown in Figure 3 of document D2 had therefore no incentive to provide a shim surrounding the bolt hole Hb1 in eg the upper left corner area, because there was enough space between the bolt hole and the edge of the

plate. The subject-matter of claim 1 of the first and second auxiliary requests therefore involved an inventive step.

VII. The respondent's arguments in writing and during the oral proceedings, can be summarized as follows:

There was no basis in the application as filed that shims 22 and 23 could be located at corner areas on the same longitudinal edge. What was disclosed in Figure 3 of the application as filed (published version), was that shims 22 and 23 were located immediately next to each other. The term "adjacent" as used in claim 1 of the main request was however not restricted to objects having a common boundary, but also referred to objects that were neighbours, independent of the distance in between them. There was also no basis in the application as filed that shims 22 and 23 were spaced apart. Claim 1 of the main request and of the second auxiliary request thus contravened the requirements of Article 123(2) EPC.

The gasket for an automobile engine shown in document 03 undisputedly belonged to the state of the art before the priority date of the patent in suit and represented the closest prior art. This gasket had spaced-apart shims 5 to 8 not surrounding a bolt hole located at the four corners of the plate. The purpose of the shims was to support the tightening pressures of the bolts applied to the lateral side portions of the gasket thereby to prevent deformation of the cylinder head and provide equally tightening pressure around the cylinder bores. The subject-matter of claim 1 of the auxiliary request differed from the known gasket in that one shim

had a curved portion surrounding a bolt hole, and in that the plate was made of metal. Document D2 disclosed a metal laminate gasket with edge support shims. That document taught that if there was not enough space outside the bolt hole, the shim could be extended around the bolt hole, see column 3, line 64, to column 4, line 9. Claim 1 of the first and second auxiliary requests therefore did not involve an inventive step, Article 56 EPC.

Reasons for the Decision

MAIN REQUEST

1. Admissibility of the amendments, Article 123(2) EPC

Claim 1 of the main request is directed to a metal cylinder head gasket for an internal combustion engine having a metal plate and comprising *inter alia* the following features:

- (i) "*a shim (23) located at a corner area (20b)*"
[including only a first side (23a) ... and a second side (23b) having a width different from that of the first side (23a), without surrounding a bolt hole], and
- (ii) "*an additional shim (22) located at another corner area (20a) adjacent to said corner area (20b)*"
[having a curved portion surrounding a bolt hole].

The plate has four corner areas located at portions where the two (contiguous) longitudinal edges and the

two side edges intersect, so that the pair of corner areas at a longitudinal end are contiguous as well, i.e. the "longitudinal end" corner areas meet at line L1 passing through a center of one of two cylinder bores located at longitudinal ends of the metal plate.

The "*another corner area (20a)*" is said to be adjacent to the "*corner area (20b)*" in claim 1 of the main request, cf. aforementioned feature (ii). A corner area of a rectangular plate has two corner areas adjacent to it: the (contiguous) corner area on the same side edge at the same longitudinal end, and the corner area on the same longitudinal edge at the opposite longitudinal end. Claim 1 of the main request thus encompasses two possibilities: 1. each shim is located at a different corner area of the same longitudinal end, or 2. one shim is located at a corner area of a longitudinal end and the other shim is located at a corner area at the opposite end of the plate (but not diametrically opposite). The Board concurs in this respect with the parties on the interpretation of the term "adjacent" in feature (ii) of claim 1 of the main request.

An embodiment of the metal gasket of the invention (which is referred to as embodiment B, or gasket B) comprising a shim 23 not surrounding a bolt hole located at corner area 20b and an additional shim 22 having a curved portion surrounding a bolt hole located at the contiguous corner on the same side edge, is disclosed in paragraphs [0029] to [0034] and is shown in Figure 3 of the application as filed (published version). The aforementioned possibility 1 corresponds to embodiment B and is thus disclosed in the application as filed, Article 123(2) EPC.

In paragraph [0018] of the application as filed (published version) it is stated: *The shim may be formed of only the first and second sides without surrounding a bolt hole situated in the corner area. On the other hand, the shim may include a curved portion surrounding a bolt hole situated in the corner area in addition to the first and second sides.* In paragraph [0019] the text continues: *The shim may be located at only one of the four corner areas, or may be located at two, three or all four corner areas. When two shims are located at two corner areas of the metal plate situated adjacent to each other, the two shims have sizes different from each other to support different tightening pressures applied thereto.*

The passage in paragraph [0019] of the application as filed (published version) refers to "two shims have sizes different from each other", cf. claim 6 as originally filed. It cannot be inferred from this passage, or from any of the claims 1 to 6 as filed, that this expression can be construed as meaning that the two shims are of a different type (of the type, which has only first and second sides without surrounding a bolt hole, or of the type, which includes a curved portion surrounding a bolt hole). On the contrary, in paragraph [0034] of the application as filed (published version), wherein shims 22, 23 of a different type are discussed, it is stated that "In the gasket B ... the sizes of the shim 22, 23 are made different" (emphasis added by the Board).

In the judgement of the Board, a gasket comprising two shims 22, 23 of a different type located at a corner

area and at the adjacent corner area at the opposite longitudinal end (possibility 2) is therefore not disclosed in the application as filed.

It follows that claim 1 of the main request introduces subject-matter that extends beyond the content of the application as filed, contrary to Article 123(2) EPC.

FIRST AUXILIARY REQUEST

2. *Admissibility of the amendments, Article 123(2) EPC*

The additional feature of claim 1 of the first auxiliary request (see point IV above) makes it clear that the shim (23) and the additional shim (22) located at corner areas 20a and 20b, respectively, have separate identities (they are not formed continuously in one piece, see paragraph [0014] of the application as filed, published version). The additional feature also specifies that the corner areas 20a and 20b are at the same longitudinal end, thus overcoming the objections under Article 123(2) EPC against claim 1 of the main request mentioned in point 1 above. The last part of that additional feature, viz. "*adjacent from each other*" is understood by the Board as meaning "*adjacent to each other*". Since the formal admissibility of claim 1 of the first auxiliary request was not disputed by the respondent, there is no need for further substantiation of this matter.

3. *Objection of lack of inventive step, Article 56 EPC*

The gasket for an automobile engine shown in document 03 represents the closest prior art. The

Opposition Division held in the decision under appeal that the delivery of that gasket was proven and that it belonged to the state of the art before the priority date of the patent in suit (see point 2 of the reasons for the decision). This has not been contested by the appellant.

Document O3 discloses (see top-right drawing) a gasket plate having four separate shims 5 to 8 ("Blenden") located at the four corners of the plate. The shape of each shim is different due to the fact that the locations of cylinder, water, oil and bolt holes in that gasket are not symmetrical, they are different for each corner.

The subject-matter of claim 1 of the auxiliary request differs from the known gasket in that the plate is made of metal, and in that one shim had a curved portion surrounding a bolt hole.

Using a metal plate as material for a gasket is well-known in the art, see eg document D2, which discloses (see eg Figures 1 to 4 and claim 1) a metal cylinder head gasket for an internal combustion engine comprising at least two metal plates laminated together having two edge support shims 12, 15, 16 sandwiched between the two plates and disposed at the lateral side portions thereof.

In the judgement of the Board, providing a shim having a curved portion surrounding a bolt hole is a normal design option for the person skilled in the art seeking to solve the problem of supporting substantially equally tightening pressures present in different

corner areas of the metal plate and at the same time making use of the space available. Document D2 teaches that if there is not enough space outside the bolt hole, the shim may extend around the bolt hole, see Figure 4, and column 3, line 64, to column 4, line 9.

The subject-matter of claim 1 of the first auxiliary request therefore does not involve an inventive step, Article 56 EPC.

SECOND AUXILIARY REQUEST

4. Objection of lack of inventive step, Article 56 EPC

The added feature of claim 1 of the second auxiliary request, viz. *"wherein the shim (23) and the additional shim (22) are spaced apart from each other"*, is already known from document O3. The subject-matter of claim 1 of the second auxiliary request therefore does therefore not involve an inventive step, Article 56 EPC.

There was hence no need for the Board to examine whether claim 1 of the second auxiliary request met the requirements of Article 123(2) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Meyfarth

W. Zellhuber