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Datasheet for the decision of 13 November 2020

Case Number: T 2767/18 - 3.2.03

Application Number: 14822219.3

Publication Number: 3020846

IPC: C23C4/06, F02F1/00, F16J10/04, C23C4/067

Language of the proceedings: EN

Title of invention:

IRON-BASED SPRAYED COATING, CYLINDER BLOCK FOR INTERNAL COMBUSTION ENGINE USING SAME, AND SLIDING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Applicant:

NISSAN MOTOR CO., LTD.

Headword:

Relevant legal provisions:

EPC Art. 123(2), 84, 111(1)
RPBA 2020 Art. 11

Keyword:
Amendments - intermediate generalisation (no)
Claims - support in the description (yes)
Appeal decision - remittal to the department of first instance (yes)

Decisions cited:
T 0201/83

Catchword:

Europäisches Patentamt
European Patent Office
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Beschwerdekammern

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Case Number: T 2767/18 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 13 November 2020

Appellant: (Applicant)	NISSAN MOTOR CO., LTD. 2 Takara-cho Kanagawa-ku Yokohama-shi, Kanagawa 221-0023 (JP)
Representative:	Grünecker Patent- und Rechtsanwälte PartG mbB Leopoldstraße 4 80802 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 11 June 2018 refusing European patent application No. 14822219.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Ashley
Members:	B. Miller
	E. Kossonakou

Summary of Facts and Submissions

I. The appeal lies from the decision of the examining division to refuse European Patent application No. 14822219.3 ("the application"). In its decision the examining division held that the subject-matter of claim 1 of the main request and auxiliary requests 1 to 5 did not fulfil the requirements of Article 123(2) EPC. Moreover, the subject-matter of claim 1 of the main request and auxiliary requests 1 to 3 was held not to comply with the requirements of Article 84 EPC.

II. The applicant (the "appellant") filed an appeal against this decision and requested that the decision be set aside and that a patent be granted on the basis of the claims according to the main request (essentially corresponding to the main request underlying the contested decision), alternatively on the basis of one of auxiliary requests 1 to 7, all requests filed with the statement setting out the grounds of appeal.

III. Claim 1 of the main request reads as follows. The amendments indicated in bold show the amendments on which the reasoning in the contested decision is based.

"An iron-based sprayed coating for coating a bore inner surface of a cylinder block for an internal combustion engine, wherein
a surface of the coating contains pits, and the amount of the pits is within a range of 0.01% to **0.21%** ~~2.1%~~, wherein the amount of pits means a total sum (percentage) of an area occupied by all the pits present in a unit coating surface area when observing the sprayed coating by plane observation;

an average roughness Ra of the coating surface is within a range of 0.01 µm to 0.15 µm;
the iron-based sprayed coating has pores, and whose cross section porosity is within a range of 0.01% to **0.75%** ~~2.1%~~, wherein the cross section porosity means a total sum (percentage) of an area occupied by all the pores present in the unit cross-section area when observing the sprayed coating as a cross section;
an average hardness of the iron-based sprayed coating is within a range of HV280 to HV500;
the iron-based sprayed coating, comprises: iron as its main component; and carbon in an amount of 0.05 mass% to 0.25 mass%."

Claim 2 reads as follows:

"A cylinder block for an internal combustion engine, comprising: a bore having the iron-based sprayed coating according to claim 1 on an inner surface thereof; and a cylinder block body having said bore."

Claim 4 reads as follows:

"A sliding mechanism for an internal combustion engine, comprising: a cylinder block for an internal combustion engine according to claim 2 or 3; and a piston slidable with a bore of this cylinder block, wherein
the piston has a piston ring, and
the piston ring has a chromium (Cr) coating, a chromium nitride (CrN) coating, or a diamond-like carbon (DLC) coating, on a sliding part with the bore."

IV. With a communication pursuant to Rule 100(2) EPC the Board indicated to the appellant its preliminary opinion of the case and its intention to remit the case to the examining division for further prosecution.

V. With a letter dated 18 October 2019 the appellant informed the Board that it did not raise objections against the remittal of the case.

VI. The reasons for the decision under appeal with respect to the main request may be summarised as follows:

Amending the upper limit of two parametric ranges on the basis of individual values disclosed only in the examples as originally filed created an intermediate generalisation which extended the claimed subject-matter beyond the teaching as originally filed.

The description did not describe a free standing coating and therefore did not support the coating as defined in claim 1.

The teaching in paragraphs [0019] and [0020] of the description was unclear, since it was not evident, how closed pores could contribute to a better oil retention.

VII. The corresponding arguments of the appellant may be summarised as follows.

Amending parametric ranges on the basis of values disclosed in the examples did not generate a new technical teaching, since the corresponding parameters were not in close relationship with the other features disclosed therein.

The application was directed to a coating for coating a bore inner surface, see paragraphs [0001], [0008] and [0013]. Therefore the coating defined by claim 1 was supported by the description.

Closed pores as addressed in paragraphs [0019] and [0020] of the description contributed to the oil retention, since they were opened by abrasion during the use of the coated article.

Reasons for the Decision

1. Article 123 (2) EPC - main request

1.1 Claim 1 is based on claims 1 to 4 as filed wherein definitions for the expressions "amount of pits" and "cross-section porosity" have been introduced on the basis of paragraphs [0018] and [0019] of the application as filed.

In addition, the upper limit in the ranges defining the amount of pits and the cross section porosity has been amended on the basis of individual values disclosed for examples 4 and 8 in table 1 on page 15 of the application as filed.

In particular,
the upper limit for the pit amount has been amended from 2.1 % to 0.21 % on the basis of example 4
and
the upper limit for the cross section porosity has been amended from 2.1 to 0.75 % on the basis of example 8.

1.2 The amendment of a range on the basis of a value described in a specific example can be admissible, provided that the skilled person could have readily recognised that this value was not so closely associated with the other features of the example (see

Case law of the Boards of Appeal, 9th edition, 2019, Chapter II.E.1.3.2, in particular T201/83).

1.3 Therefore it has to be evaluated whether there is a close structural or functional relationship between the amount of pits, the cross section porosity and the remaining features of the examples.

1.3.1 In each of the examples summarised in table 1 of the application as filed the surface pit amount and the cross section porosity are presented together with the surface roughness Ra, hardness and amount of carbon (C) in the iron-based coating:

[Table 1]

	Sprayed coating characteristics				
	Surface Roughness Ra µm	Surface Pit Amount %	Cross section porosity %	Hardness HV	C Amount %
Ex.1	0.01	0.03	0.04	380	0.11
Ex. 2	0.15	0.18	0.17	374	0.10
Ex. 3	0.02	0.01	0.03	385	0.11
Ex. 4	0.03	0.21	0.20	395	0.11
Ex. 5	0.03	0.02	0.01	364	0.09
Ex. 6	0.10	0.20	0.21	390	0.11
Ex. 7	0.08	0.14	0.14	280	0.06
Ex. 8	0.07	0.15	0.75	500	0.25
Ex. 9	0.06	0.13	0.13	282	0.05
Ex. 10	0.07	0.14	0.14	494	0.25
C. Ex. 1	0.17	0.23	0.23	380	0.10
C. Ex. 2	0.008	0.009	0.008	390	0.11
C. Ex. 3	0.17	0.22	0.22	395	0.11
C. Ex. 4	0.16	0.23	0.23	270	0.04
C. Ex. 5	0.17	0.24	0.23	510	0.26
C. Ex. 6	0.16	0.235	0.24	260	0.04
C. Ex. 7	0.16	0.26	0.267	520	0.26
Ex.: Example; C.Ex.: Comparative Example					

1.3.2 Neither the results presented in table 1 nor the accompanying description provide a technical teaching

that the individual parameters reported therein are closely related to each other.

1.3.3 By comparing examples 3 and 4 it can be rather observed that the amount of pits and the cross section porosity can be different while the surface roughness is about the same.

A similar observation can be made when comparing examples 7 and 8 which have a similar surface pit amount and surface roughness but a relatively different cross section porosity.

Further, it is not recognisable that the type of coating material is critical for the achievement of specific characteristics, since the comparison of examples 1 to 4 shows that the measured values for surface roughness, surface pit amount, cross section porosity, hardness and amount of carbon independently vary from example to example to a great extent, despite the fact that a coating material having a very similar hardness and the same or a comparable carbon content is used for the coating.

1.3.4 Hence, a skilled person would readily recognise that no close relationship exists between any of the parameters presented in table 1.

1.4 In these circumstances, the amendments of the parametric ranges in claim 1 do not extend beyond the teaching as originally filed, but focus the scope of protection on the exemplified embodiments.

The amendments to claim 1 therefore fulfil the requirements of Article 123(2) EPC.

2. Article 84 EPC - main request

2.1 In point 6 of the contested decision it is argued that the subject-matter of claim 1 is not supported by the description, since "the application is silent about a free-standing/existing coating".

The Board does not agree.

A sprayed coating is a layer of material applied to a support by spraying. Hence, the term "sprayed coating" inherently requires the presence of a support, on which the coating is applied by spraying.

Therefore claim 1 is not directed to a free standing coating on its own but refers to a coating to be applied to a substrate by spraying.

This interpretation of claim 1 is also confirmed by the description, which teaches that the coating can be obtained by plasma spray on a substrate such as a bore inner surface, see paragraphs [0001],[0008] and [0013] and the examples of the application.

The subject-matter of claim 1 is thus supported by the application as required by Article 84 EPC.

2.2 Paragraph [0019] of the description teaches that closed pores in the coating contribute to the improvement in oil retention. This contribution does not need to be obtained immediately but can be obtained only during the use of the coating due to abrasion which opens the closed pores.

Hence the disclosure in paragraph [0019] supports claim 1 and does not render its scope unclear.

3. Remittal to the first instance

Under Article 11 RPBA 2020 the Board may remit the case to the department whose decision was appealed if there are special reasons for doing so.

The examining division has not even addressed the patentability requirements of novelty and inventive step. In such circumstances, where not even an opinion has been discussed by the examining division, deciding these issues represents an undue burden for the Board. Thus a special reason exists for remittal of the case.

Therefore, the Board decided to remit the application in accordance with Article 111(1) EPC to the examining division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

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

The Registrar: On behalf of the Chairman (according to Art. 8(3) RPBA):

C. Spira E. Kossonakou

Decision electronically authenticated