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**Datasheet for the decision
of 25 May 2016**

Case Number: T 1469/12 - 3.2.07

Application Number: 04735373.5

Publication Number: 1628780

IPC: B05D5/06, B05D7/00

Language of the proceedings: EN

Title of invention:

METHOD FOR FORMING BRILLIANT COATING FILM AND COATED ARTICLE
SHOWING METALLIC EFFECT

Patent Proprietors:

HONDA MOTOR CO., LTD.
Nippon Paint Co., Ltd.

Opponent:

BASF Coatings GmbH

Headword:

Relevant legal provisions:

EPC Art. 56

Keyword:

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1469/12 - 3.2.07

D E C I S I O N
of Technical Board of Appeal 3.2.07
of 25 May 2016

Appellant: BASF Coatings GmbH
(Opponent) Glasuritstrasse 1
48165 Münster (DE)

Representative: Leifert, Elmar
Leifert & Steffan
Patentanwälte
Postfach 10 40 09
40031 Düsseldorf (DE)

Respondent: HONDA MOTOR CO., LTD.
(Patent Proprietor 1) 1-1, Minamiaoyama 2-chome,
Minato-ku
Tokyo 107-8556 (JP)

Respondent: Nippon Paint Co., Ltd.
(Patent Proprietor 2) 1-2, Oyodokita 2-chome, Kita-ku
Osaka-shi,
Osaka 531-8511 (JP)

Representative: Cabinet Plasseraud
66, rue de la Chaussée d'Antin
75440 Paris Cedex 09 (FR)

Decision under appeal: **Interlocutory decision of the opposition
division of the European Patent Office posted on
17 April 2012 concerning maintenance of the
European Patent No. 1628780 in amended form.**

Composition of the Board:

Chairman H. Meinders
Members: V. Bevilacqua
 I. Beckedorf

Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the decision of the opposition division concerning European patent No. 1 628 780.

According to the minutes of the oral proceedings before the opposition division it was announced that the patent and the invention to which it related, based on the amendments submitted during the proceedings, were found to meet the requirements of the EPC.

This corresponded with the reasons of the written decision dated 17 April 2012, but did not correspond to the order (EPO Form 2339) nor the cover page (EPO Form 2338) of the decision.

This error was corrected by the opposition division under Rule 140 EPC on 23 May 2013.

- II. Opposition had been filed against the patent as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC (insufficient disclosure).
- III. The opposition division found that the subject-matter of claims 1 to 5 filed during the oral proceedings as auxiliary request 1 met the requirements of the EPC.
- IV. The appellant requests that the decision under appeal be set aside and the patent be revoked in its entirety.
- V. The respondents (patent proprietors) request that in setting aside the decision under appeal, the patent be maintained in amended form on the basis of the main request, or alternatively, on the basis of the

auxiliary request, both filed with letter of 8 March 2013.

VI. The present decision is based on the following documents:

- D1: EP 881 954 B1;
- D2: EP 89 497 A2;
- T2: Declaration of Mr. Masuda with additional experimental results;
- B1: Brochure "SICOPAL", dated December 2005, from BASF.

VII. The text of independent claim 1 according to the **main request** is as follows:

"A method for forming a brilliant film on a substrate, comprising the steps of:

- (1) applying an aqueous first brilliant base coating composition containing a brilliant pigment to the substrate to form a first base coating at a first stage in a base coating zone;
- (2) applying an aqueous second brilliant base coating composition containing a brilliant pigment to the first base coating to form a second base coating at a second stage in the base coating zone;
- (3) applying a clear coating composition to the second base coating formed in the step (2) to form a clear coating in a clear coating zone; and
- (4) simultaneously heating the uncured coatings formed in the steps (1), (2) and (3) to cure the coatings, with the following provisos I and II:

the proviso I of a condition (A-1) that the aqueous first brilliant base coating composition has a solid content of 10 to 45% by mass and the aqueous second

brilliant base coating composition has a solid content of 10 to 40% by mass, and a condition (B-1) that the ratio of the solid content of the aqueous first brilliant base coating composition to the solid content of the aqueous second brilliant base coating composition is 1.1/1 to 4/1;

the proviso II of a condition (A-2) that the aqueous first brilliant base coating composition has a brilliant pigment mass concentration of 3 to 25 % and the aqueous second brilliant base coating composition has a brilliant pigment mass concentration of 7 to 30% and a condition (B-2) that the ratio of the brilliant pigment mass concentration of the aqueous first brilliant base coating composition to the brilliant pigment mass concentration of the aqueous second brilliant base coating composition is 1/3.5 to 1/1.5, and with the proviso that the brilliant pigment is selected from brilliant pigments having flip-flop property, which means that the reflection light intensity is changed depending on the observation angle or the light-receiving angle."

The only difference between independent claim 1 of the **auxiliary request 1** and independent claim 1 of the main request is that the aqueous second brilliant base coating composition has (amendments with respect to claim 1 of the main request are highlighted by the Board):

"a brilliant pigment mass concentration of 7 **15** to 30%".

VIII. Insofar as relevant to the present decision the appellants argue substantially as follows:

The subject-matter of claim 1 of the main request does not involve an inventive step, starting from D1,

example 3, and taking into account the general knowledge of a person skilled in the art of formulating effect paint compositions as well as the teaching of document D2.

The differences between the invention recited in claim 1 of the main request and the method mentioned in this example of D1 are, using the language of that claim, that:

- (a) the second aqueous brilliant base coating composition has a brilliant pigment mass concentration of 7 to 30% (proviso II, condition A-2);
- (b) and that (condition B-2) the ratio of the brilliant pigment mass concentration of the aqueous first brilliant base coating composition to the brilliant pigment mass concentration of the aqueous second brilliant base coating composition is lower than in example 3 (1/1.28) and ranges from 1/3.5 to 1/1.5.

Raising the mass concentration of brilliant pigment in example 3 of D1 from 5.7 to 7% (difference (a)) also automatically results in a method in which the RPWC ratio becomes 1/1.57. It therefore falls within the claimed range (difference (b)). The discussion therefore need only concentrate on the mass concentration of brilliant pigment in the second base coating composition.

Such a slight increase in mass concentration does not have any particular effect on the method known from D1. As a consequence of that the problem to be solved merely resides in the provision of an alternative to this known method.

The experimental results submitted by the respondents in the appeal proceedings (T2) cannot provide evidence of a special effect of these distinguishing features, because the materials used therein do not correspond to those of example 3 of D1.

The claimed method is also obvious for the skilled person because a slight increase in the concentration of brilliant effect pigment in the second composition comes within what he would do, without the need of an inventive step, to adapt the paint formulation of the known method to a particular situation.

There is no reason to interpret the recommendation contained in D1 that the volumetric ratio RPVK should be above 1/1.43 (=0.7) as a teaching forbidding any increase of brilliant effect pigment in the second composition.

A negative conclusion on inventive step is also reached in case that this slight increase in the concentration of effect pigment is considered sufficient to improve the existing flip-flop properties of the brilliant film of example 3 of D1.

This is because D2 teaches that the effect pigment concentration should be chosen in such a way that the desired metallic and flip-flop effect is not suppressed by the presence of other pigments.

The skilled person starting from the method of example 3 of D1 would, by following this teaching and in order to make the metallic and flip-flop effect more visible, increase the effect pigment concentration in the second composition.

It only needed an increase from 5.7 to 7% to arrive at the subject-matter of claim 1 of the main request without inventive step.

Nothing prevents the skilled person from raising the mass concentration of brilliant pigment in example 3 of D1 even further to 15%, especially because D2 mentions higher concentrations, up to 25%.

By doing so, the metallic appearance and flip-flop effect are further improved, and a method in which the RPWC ratio falls within the range claimed in claim 1 of the auxiliary request would be automatically achieved, thereby arriving, without the need of inventive step.

The appellant also raises the issue that a substantial procedural violation has occurred, because with regard to inventive step the impugned decision is based on calculations and arguments of which the appellant was not aware, because they have not been discussed during oral proceedings. However, neither reimbursement of the appeal fee nor remittal to the opposition division have been requested.

IX. Insofar as relevant to the present decision the respondents argue substantially as follows:

When comparing the subject-matter of the claims with example 3 of D1 only the pigment and the binder of example 3 of D1 are to be considered as "solids".

The differences between the subject-matter of claim 1 of the main request and the method disclosed at example 3 of D1 have been correctly identified by the appellant.

However both should be taken into consideration when discussing inventive step.

These differences clearly have the effect of improving metallic appearance and flip-flop property as shown in T2. T2 faithfully reproduces the method of example 3 of D1 for this purpose, because the different binder and clear coat used in the tests do not have any influence on metallic appearance or flip-flop effect.

The problem underlying this invention is to improve metallic appearance and flip-flop property of the brilliant film obtained with the known method.

D1 teaches away from increasing the concentration of brilliant pigment in the second coating composition, and D2 does not teach that the finished appearance and the flip-flop effect can be improved by modifying the concentration of effect pigment as claimed in claim 1.

The subject-matter of claim 1 of the auxiliary request also involves an inventive step, additionally because a person skilled in the relevant art would refrain, based on his standard knowledge, from using the high concentrations claimed therein.

There is no procedural violation in the present case. The submissions of the appellant in this respect only show that the opposition division assessed in depth the arguments which were put forward by the appellant.

Reasons for the Decision

1. Denial of the right to be heard
 - 1.1 The appellant argues that an infringement of the right to be heard took place, because the opposition division failed to discuss (at the latest at the oral proceedings) its reasons for following the line of argument of the patent proprietor, according to which D1 teaches away from changing the concentrations of example 3 in such a way that the RPWC (**weight ratio**) decreases under 1/1.5, because paragraphs [35]-[37] of this document teach to keep the **volumetric ratio** RPVK above 1/1.43.

As the opposition division explained only in the written decision, the reasons for accepting these considerations of the respondents were that, based on an approximated correlation between RPWC and RPVK (possible because in example 3 of D1 the pigments and fillers have a significantly higher density than the binder, and their weight ratio is much lower than that of the binder), increasing the brilliant pigment in the second coating composition would raise the corresponding PVK and therefore go against the teaching given in D1.

- 1.2 The Board disagrees and does not see any ground for remitting the case to the opposition division under Article 11 RPBA.

Under Article 113(1) EPC the decisions of the EPO may only be based on "grounds or evidence" on which the parties concerned have had an opportunity to present their comments.

"Grounds or evidence" are to be understood as meaning the essential legal and factual reasoning on which the EPO has based its decision (see Case Law of the Boards of Appeal, 7th Edition 2013, III.B.1.2).

The allegation of the presence of a link between RPWC and RPVK was already part of the arguments of the respondents (see point 2.5 of reasons of the decision under appeal) discussed during oral proceedings.

These arguments were that the skilled person would not add pigment to the second coating composition because this would end up in increasing the difference between the respective PVK, i.e. that D1 teaches away from this.

The minutes refer to this discussion in points 43 to 47 ("dissuaded by the teaching from document D1"). The paragraphs of D1 in question, where the relevant features are described, are also mentioned: [0036], [0037], [0040], [0043].

It is clear from the minutes that the appellant has had the opportunity to address these issues at the oral proceedings. This suffices for the right to be heard, such that no fundamental deficiency in the first instance proceedings can be established.

2. Main request, claim 1 - Inventive step

2.1 Content of the disclosure of D1

Examples 1-3 of D1 all relate to methods for forming a brilliant film (see page 7, line 40: "Blau Metallic" and line 50: "Aluminiumbronze") on a substrate (see again line 40: "Karosserieblech").

The method of example 3 comprises the steps of:

(1) applying an aqueous first brilliant base coating composition containing a brilliant pigment (see page 8, line 17: "modifizierten Wasserbasislack") to the substrate to form a first base coating at a first stage in a base coating zone;

(2) applying an aqueous second brilliant base coating composition (see page 8, line 18: "Wasserbasislack") containing a brilliant pigment (see page 7, line 50) to the first base coating to form a second base coating at a second stage in the base coating zone;

(3) applying a clear coating composition (see page 8, line 10: "Autoserieklarlack") to the second base coating formed in the step (2) to form a clear coating in a clear coating zone; and

(4) simultaneously heating (at 130°, see page 8, line 11) the uncured coatings formed in the steps (1), (2) and (3) to cure the coatings.

The Board concurs with the respondents on the point that the pigment and the binder (resin, curing and crosslinking agents forming the coating film) are to be considered as the "solids" of claim 1, whereby other additives (defoamer, wetting agent. etc.) do not form part thereof.

Based on that, the aqueous first brilliant base coating composition (proviso I) has a solid content comprised between 10 and 45% by mass (20.315%, coming from 16.4% "Gewichtsgehalt" resin, see page 8, line 28, $(3.5 \cdot 0.87\%$ pigments and 0.87% additives) and

the aqueous second brilliant base coating composition has a solid content of 10 to 40% by mass (18.3%, coming from 13.8% resin, see page 8, line 1, 3.5% pigments, 0.5% crosslinking agent and 0.5% defoaming agent),

and whereby (condition B-1) the ratio of the solid content of the aqueous first brilliant base coating composition to the solid content of the aqueous second brilliant base coating composition is 1.1/1 to 4/1 (the calculated value is 1.11/1).

The brilliant pigment used in this example is "Aluminiumbronze", which is one of many brilliant pigments having flip-flop property, which means that the reflection light intensity is changed depending on the observation angle or the light-receiving angle.

The aqueous first brilliant base coating composition disclosed in this passage of D1 has a brilliant pigment mass concentration (PWC) of 4.4% (coming from $(1 \times 0.87(\text{brilliant pigment}) / \{[(3.5 (\text{total pigment}) + 0.5(\text{crosslinking agent})] \times 0.87 + 16.4 (\text{resin})\})),$ which is therefore comprised within 3 to 25 %.

The second brilliant base coating composition has a brilliant pigment mass concentration of 5.6% $(1(\text{brilliant pigment}) / (3.5 (\text{total pigment}) + 0.5 (\text{crosslinking agent}) + 13.8 (\text{resin})))$

This value is lower than the claimed minimum of 7%.

The ratio of the brilliant pigment mass concentration of the aqueous first brilliant base coating composition to the brilliant pigment mass concentration of the aqueous second brilliant base coating composition is

therefore, in the case of example 3, equal to $1/1.28$ ($4.4/5.6=0.78$).

This value also does not fall within the claimed range.

2.2 Differences

As discussed above, and as acknowledged by both parties, the subject-matter of claim 1 of the main request differs from this known method

- (a) in that the second aqueous brilliant base coating composition has a brilliant pigment mass concentration of 7 to 30% (proviso II, condition A-2) and
- (b) in that (condition B-2) the ratio of the brilliant pigment mass concentration of the aqueous first brilliant base coating composition to the brilliant pigment mass concentration of the aqueous second brilliant base coating composition is lower than in example 3 ($1/1.28$) and ranges from $1/3.5$ to $1/1.5$.

The Board concurs with the appellant on the point that these two features are strictly intertwined: once the mass concentration of brilliant pigment in example 3 of D1 is raised to 7%, the ratio RPWC automatically falls within the claimed range as it becomes $1/1.57$ (0.638).

The following discussion of inventive step will therefore concentrate on the first difference, knowing that if the skilled person would raise this second brilliant pigment concentration without the need of an inventive step, he would also (automatically) realize the claimed RPWC ratio. In this way both distinguishing features are duly taken into consideration, as expressly requested by the respondents.

2.3 Effect

- 2.3.1 The Board concurs with the appellant on the point that T2 cannot be regarded as providing evidence that the above mentioned distinguishing features have a special effect over the prior art selected.

This is because according to the established jurisprudence (see Case Law of the Boards of Appeal, 7th Edition 2013, I.D.10.9), an effect demonstrated in a comparative test like the one shown in table 3 of T2, can be referred to in an inventive step discussion only if it is convincingly shown that such an effect has its origin **exclusively** in the distinguishing feature of the invention compared with the closest state of the art. In this case this is example 3 of D1.

The appellant argues that this is not the case because (see page 3, last three lines of T2) the clear coating applied does not correspond to the clear coating applied according to example 3 of D1, and (see page 5, lines 1-3 after table 2) also the binder is different.

In such a situation it is not possible to exclude that the effect shown in Table 3 of T2 has (also) its origin in the different clear coating, in the different resin, or in their interaction with the distinguishing features of claim 1 of the main request.

This is because it is generally known to the skilled person that the metallic and flip flop effect are not only dependent from the type and concentration of pigment in a coating composition, but also from the orientation of the pigment particles, and said

orientation may be influenced, for example, by the shrinkage of the binder used in the coating.

The respondents argue that the clear coat and the binder used for the comparative tests, although being different from those of example 3 of D3, do not alter the validity of the results.

However, as no evidence in support of this allegation has been produced by the respondents, the Board shares the doubts of the appellant and concludes that T2 does not provide valid evidence of any special effect of the distinguishing features of the invention when compared with example 3 of D1.

2.4 According to the description of the patent in suit (see paragraph [46], lines 48-53) there is a direct link between the brilliant pigment PWC of the aqueous second base coating composition and brilliantness of the coating, because when the brilliant pigment PWC of the aqueous second base coating composition is less than 5% the brilliantness may be insufficient. This corresponds to the knowledge of a person skilled in this technical field, which is also presented in the statement of D2, page 14, lines 14-16, according to which to obtain sufficient brilliantness, a minimal quantity of brilliant pigment should be used.

2.5 Problem to be solved

The Board therefore concurs with the respondents on the formulation of the problem to be solved as: how to modify the known method (D1, example 3) in order to obtain products with increased metallic appearance and flip-flop property.

2.6 Discussion of inventive step

2.6.1 As discussed above, the skilled person is well aware that metallic appearance and flip-flop property are both achieved by adding the so-called "effect pigments" to coating compositions in a suitable quantity, and that the intensity of these effects grows with the quantity of effect pigment used in the second coating composition.

Document D2 (see page 14, lines 1-16) teaches the use of metallic pigments in such a coating, in a weight concentration up to 25% in relation to the binder solids content, and explains that said concentration should be chosen based on the desired intensity of the metallic effect.

Based on these informations the Board is convinced that a skilled person, starting from the method of example 3 of D1, would, in order to improve metallic appearance and flip-flop property, increase the concentration of effect pigment in the second composition of D1 up to 7%.

The subject-matter of claim 1 of the main request is therefore considered as lacking inventive step (Articles 52 and 56 EPC) over the combination of the teachings of documents D1 and D2.

2.6.2 Aforementioned finding is not put into doubt by the respondents' submission that the teaching given in D1 (from page 4, line 57 to page 5 line 5) according to which the pigment **volume** concentration of the first and of the second coating composition should not differ by more than 30%, would prevent the skilled person from

using increased concentrations of brilliant pigment in the second coating composition of example 3.

As D1 itself explains, it is the coating composition applied before the clear coat (corresponding to the second coating composition) which determines the visual impression in the absence of stone impacts.

Traditional vehicle paints usually consist of a base lacquer/clear lacquer top coat which is applied to a body which has been provided with a filler layer.

According to D1, if there is no filler layer, damage due to impacting stones is particularly conspicuous since the primer layer is revealed when the impact of a stone dislodges the top coat. Although corrosion protection is still guaranteed, the reduced visual impression cannot be tolerated.

The object of D1 is to provide a process for producing such lacquering, in particular vehicle lacquering, with a thinner overall layer structure for the total lacquer application, but with comparable overall properties, both in the sense of appearance and resistance to stone impacts as compared with the prior art.

This object is achieved when a coating composition is first applied to the body, and then a subsequent coating composition is applied on it before the clear coating agent, and the first composition is richer in polyurethane resin, and the second is richer in pigments.

This achieves good coating properties without the need of a conventional filler, because when the impact of a

stone dislodges the top coat, the first coating composition is still there.

If this first coating composition is similar, in its appearance, to the second coating composition (as taught in paragraphs [36] and [37] of D1, where the use of similar pigments in volume concentrations which are not too different from each other) the visual impression of damage is reduced.

The recommendation contained in D1 that the PVK value of the second composition should not be above 30% of the PVK value of the first composition should therefore be read and understood in this context, where the aim is reducing the visual appearance of scratches and impacts.

However, as for claim 1 of the main request this is not the problem to be solved, the skilled person would not regard the teaching concerning the use of similar pigments in volume concentrations which are similar from each other as mandatory.

In addition the Board notes that in the passage of D1 where this recommendation is given, reference is made to the **totality of pigments** (aluminium flakes, organic pigment and talc in the case of example 3), and not specifically to the volume concentration of the brilliant pigment alone.

As a consequence of that, increasing the brilliant pigment in the second coating composition does not automatically result in not following this recommendation, because with a reduction in the organic pigment content the ratio of PVK values can be kept within the recommended limits.

3. Auxiliary request 1, claim 1 - inventive step

3.1.1 The method of claim 1 of the first auxiliary request differs from the method according to example 3 of D1 in that the second aqueous brilliant base coating composition has a brilliant pigment mass concentration of 15 to 30% (proviso II, condition A-2)

and in that (condition B-2) the ratio of the brilliant pigment mass concentration of the aqueous first brilliant base coating composition to the brilliant pigment mass concentration of the aqueous second brilliant base coating composition is lower than in example 3 (1/1.28) and ranges from 1/3.5 to 1/1.5.

3.1.2 Again, as already discussed in relation to the main request, these two features are intertwined, because once the mass concentration of brilliant pigment in example 3 of D1 is raised to 15%, the ratio RPWC falls within the claimed range as it becomes 1/3.4 ($4.4/15 = 0.29$).

The effects linked to this increased concentration in the second coating composition are again (see above the discussion for claim 1 of the main request) that metallic appearance and the flip-flop effect are improved. As a consequence of that, the problem to be solved is formulated again as how to modify the known method in order to achieve better metallic appearance and flip-flop effect of the film produced.

3.1.3 As already discussed, the skilled person is made aware by D2 that metallic appearance effect is achieved by adding the so-called "effect pigments", **until the desired effect is achieved.**

As a consequence of that the skilled person would add the required quantity of effect pigment to the second composition without needing inventive skills.

The subject-matter of claim 1 of the first auxiliary request therefore lacks inventive step over the combination of the teachings of documents D1 and D2.

- 3.1.4 The respondents argue that D2 does not give any information of the upper PWC value, and that a person skilled in the relevant art would refrain from using effect pigment in the high PWC concentrations claimed in claim 1 of auxiliary request 1, because, based on his knowledge, this would not improve, but rather deteriorate the visual appearance of the film.

This is because D2 teaches that effect pigments can be used in an amount up to 25% by weight, but this is not a PWC value, because this percentage is only relative to the total binder solids content of the coating agents, whereby PWC is expressed in relation to both the pigment solids and the binder solids.

The Board disagrees.

The statement that a skilled person, based on his knowledge, would not add effect pigment up to 15% PWC because this would not improve, but rather deteriorate the visual appearance of the film is not supported, but rather contradicted by the evidence on file.

D2 teaches that effect pigments can be used in an amount up to 25% by weight, relative to the total binder solids content of the coating agents.

This corresponds, in the the second coating composition of example 3 of D1, having 13.8 g of binder solids per 100 g of composition, to 3.45 g (13.8/4) of effect pigment, resulting in a PWC value of 19.4% (3.45/17.8 (total solids)).

The skilled person, starting from example 3 of D1 and following the teaching of D2 would therefore see this PWC value as the upper limit, and therefore have no problems in raising the value up to the one claimed in claim 1 auxiliary request 1 (15%), if the circumstances require it.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The patent is revoked.

The Registrar:

The Chairman:



G. Nachtigall

H. Meinders

Decision electronically authenticated