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**Datasheet for the decision  
of 19 February 2008**

**Case Number:** T 0084/05 - 3.3.01

**Application Number:** 97106730.1

**Publication Number:** 0808878

**IPC:** C09B 67/20

**Language of the proceedings:** EN

**Title of invention:**

Process for producing pigment composition

**Patentee:**

TOYO INK MANUFACTURING CO., LTD.

**Opponent:**

BASF SE

**Headword:**

Pigment composition/TOYO INK

**Relevant legal provisions:**

EPC Art. 56

**Relevant legal provisions (EPC 1973):**

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**Keyword:**

"Inventive step (yes) - non-obvious solution of the technical problem underlying the patent in suit - could/would approach"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0084/05 - 3.3.01

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.01  
of 19 February 2008

**Appellant:** TOYO INK MANUFACTURING CO., LTD.  
(Patent Proprietor) No. 3-13, Kyobashi 2-chome  
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Tokyo (JP)

**Representative:** Koepe, Gerd L.  
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**Respondent:** BASF SE  
(Opponent) D-67056 Ludwigshafen (DE)

**Representative:** Paashaus, Sabine  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 3 November 2004  
revoking European patent No. 0808878 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** P. Ranguis  
**Members:** J. Jonk  
R. Menapace

## Summary of Facts and Submissions

I. The Appellant (Proprietor of the patent) lodged an appeal against the decision of the Opposition Division revoking the European patent No. 0 808 878 (European patent application No. 97 106 730.1). The independent Claim 1 as granted read as follows:

"A method for preparing a pigment composition relating to milling crude copper phthalocyanine, said method comprising the steps of

- adding a resin to crude copper phthalocyanine and
- performing dry-milling to a mixture of  $\alpha$ -form crystals and  $\beta$ -form crystals in an atmosphere which is selected from the group consisting of a deoxygenated atmosphere and an atmosphere containing an inert gas so as to reduce the oxygen concentration."

II. The opposition was filed against the patent as a whole, and based on the grounds of lack of inventive step as indicated in Article 100(a) EPC and lack of sufficiency within the meaning of Article 100(b) EPC. It was supported by several documents including:

- (1) EP-A-0 392 334,
- (2) DIN-Sicherheitsdatenblatt, BASF, Heliogen® Blau D 7080 (published July 1991),
- (3) VDI-Richtlinien 2263, Part 2, "Inerting", May 1992, and
- (4) ESCIS, Heft 5 (1993), "Milling of Combustible Solids".

III. The decision of the Opposition Division was based on the claims of the patent in suit as granted.

The Opposition Division held that the subject-matter of Claim 1 of the patent in suit as granted was novel, but did not involve an inventive step. The problem to be solved in the light of document (1) was the provision of a process for dry-milling of crude copper phthalocyanine in the presence of a resin. The solution of this problem according to Claim 1 as granted, in particular by performing the milling under an atmosphere having a reduced oxygen concentration, did not involve an inventive step, since the skilled person would apply this measure in order to prevent dust explosion and to avoid an oxidative degradation of the resin.

IV. Oral proceedings before the Board were held on 19 February 2008.

V. The Appellant argued that the subject-matter of Claim 1 as granted involved an inventive step, since the cited prior art did not provide any indication that it would be necessary to avoid dust explosion during dry-milling of a mixture of crude copper phthalocyanine and a resin, let alone that to this end the oxygen content of the atmosphere surrounding the milling area had to be reduced. In this context, he also pointed out that in order to avoid any risk of dust explosion numerous other suitable measures could be taken. Furthermore, the Appellant submitted that inks comprising pigment compositions obtained according to the process of the patent in suit had improved properties for offset printing. In support of this submission he referred to

his test-report filed on 3 March 2005 with the statement of grounds of appeal.

VI. The Respondent (Opponent) accepted that the subject-matter of present Claim 1 was novel. Furthermore, apart from his objections concerning the required inventive step, he did not raise any further ground, which would prohibit the patentability of the claimed subject-matter.

With respect to the question of inventive step he concurred with the argumentation of the Opposition Division that the process of the patent suit did not involve an inventive step, since the skilled person would perform the dry-milling under an atmosphere having a reduced oxygen concentration in order to prevent a dust explosion and to avoid an oxidative degradation of the resin. He submitted in support thereof document

(10) VDI-Richtlinien 2263, "Dust Fires and Dust Explosions", May 1992.

Concerning the Appellant's test-report showing improved properties of pigment compositions obtained according to present Claim 1 he considered that the test-results could not be verified, since no details of the milling conditions had been given. Moreover, he argued that any effect would not be surprising in view of the known tendency of a rosin modified phenolic resin to degrade by oxidation.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained as granted.

The Respondent requested that the appeal be dismissed.

VIII. At the conclusion of the oral proceedings the Board's decision was pronounced.

### **Reasons for the Decision**

1. The appeal is admissible.
2. Having regard to the decision under appeal and the submission of the parties to the proceedings the only issue to be dealt with is the question of inventive step.
3. For deciding whether or not a claimed invention meets this criterion, the Boards of Appeal consistently apply the problem and solution approach, which involves essentially identifying the closest prior art, determining in the light thereof the technical problem which the claimed invention addresses and successfully solves, and examining whether or not the claimed solution to this problem is obvious for the skilled person in view of the state of the art.
  - 3.1 The Board considers, in agreement with the parties to the proceedings, that the closest state of the art with respect to the claimed subject-matter of the patent in suit is the disclosure of document (1).

This document discloses a method for preparing a copper phthalocyanine pigment composition by dry-milling the crude copper phthalocyanine pigment together with 0,5 to 10 %, based upon the amount of pigment, of a resin to be applied for the preparation of the final printing ink, whereby the crude copper phthalocyanine pigment contains a mixture of  $\alpha$ -form crystals and  $\beta$ -form crystals (see page 2, column 1, lines 3 to 9, lines 25 to 35 and lines 46 to 51; page 2, column 2, lines 6 to 11; and the examples).

- 3.2 Having regard to this closest prior art the Appellant submitted that the pigment compositions obtained according to present Claim 1 provided final printing inks having improved emulsification characteristics leading to better offset printing results.
- 3.3 Therefore, the technical problem underlying the patent in suit in the light of document (1) can be seen in the provision of a process for preparing pigment compositions having enhanced properties in that they improve the emulsification characteristics of final offset printing inks.
- 3.4 The patent in suit suggests as the solution of this problem, a process for preparing a pigment composition by dry-milling a mixture of crude copper phthalocyanine and a resin, which is essentially characterised in that the milling is performed under an atmosphere having a reduced oxygen concentration.
- 3.5 In view of the technical information provided by the patent in suit, in particular column 6, lines 50 to 55, Examples 2 and 3 and the respective comparative Examples 2 and 3, as well as the test report submitted

by the Appellant on 3 March 2005 showing that a printing ink (A) containing a pigment composition obtained according to Claim 1 of the patent in suit showed a better emulsification performance and improved offset printing results compared to a printing ink (B) containing a pigment composition obtained according to document (1), the Board considers it plausible that the technical problem as defined above has been solved.

3.6 In this context, the Respondent disputed that the technical problem had been solved within the whole scope of present Claim 1, since in the examples of the patent in suit solely a rosin modified phenol resin had been used and because not all examples provided support with respect to the achievement of an improvement of the emulsification characteristics of the final printing inks. Moreover, the test results provided by the Appellant could not be reproduced and therefore were not useful as support for the alleged improvement.

3.6.1 However, the patent in suit does not only disclose the suitability of a rosin modified phenol resin in the process of the patent in suit, but also that other resins are appropriate, such as a rosin modified maleic acid resin, a petroleum resin and an alkyd resin. The Respondent has not put forward and Board does not see any reason why such other resins would not be suitable (see also document (1), page 2, column 2, lines 12 to 15, disclosing similar resins). Therefore, the submissions of the Respondent, who carries under these circumstances the burden of proof for what he alleges or contests, cannot be accepted by the Board in the absence of convincing evidence.



3.6.2 Furthermore, the Respondent's argument that not all examples provided support with respect to the achievement of an improvement of the emulsification characteristics of the final printing inks so that it was plausible that the problem as defined above was not solved within the whole scope of present Claim 1, is not valid either. In fact, the examples not relating to said problem showed the presence of other desirable effects of the claimed process, such as the achievement of a low fraction of  $\alpha$ -crystals, good colour properties, as well as the effectiveness of the process concerning energy consumption, duration and amount of work.

3.6.3 Finally, the Respondent's contention, that the Appellant's test-report does not support the alleged improvement, since the test results could not be reproduced in view of lack of information with respect to the milling conditions, also fails. It can be clearly derived from the patent in suit as a whole that the claimed invention is essentially based on the performance of the dry-milling under an atmosphere having a reduced oxygen concentration and that the milling can be carried out by conventional means known in the art such as a dry attritor, ball mill and vibration mill, and that, therefore, the successful carrying out of the invention does not decisively depend on the use of a particular milling device (see the patent in suit, page 4, lines 38 to 43). Furthermore, having regard to the examples of the patent in suit showing milling times and achieved particle sizes, the skilled person will have no difficulties in selecting an appropriate attritor.

- 3.7 The question now is whether the solution of the technical problem as defined above by the process of present Claim 1 would have been obvious to the skilled person in view of the cited prior art.
- 3.8 As indicated under point 3.1 above, document (1) discloses a method for preparing a copper phthalocyanine pigment composition by dry-milling the crude copper phthalocyanine pigment together with a resin to be applied for the preparation of the final printing ink. However, having regard to the fact that it does not provide any hint to the skilled person to the use of a milling atmosphere having a reduced oxygen concentration, it cannot render the claimed subject-matter obvious by itself.
- 3.9 The Respondent disputed the existence of an inventive step by arguing that it was known from document (2) that copper phthalocyanine was capable of causing a dust explosion and that it was also known from documents (3), (4) and (10) that in order to prevent a dust explosion the oxygen content of the atmosphere in the milling device had to be reduced to an amount which would not allow a dust explosion. The performance on industrial scale of dry-milling of copper phthalocyanine in the presence of a resin would rather raise the risk of a dust explosion, since it was known that resins had a tendency to form hot spots resulting into dangerous ignition points. In fact, he contended, there existed a so called "one way street situation", in which for safety reasons an atmosphere having a reduced oxygen content had to be applied to overcome the problem of dust explosion and in such a case the achievement of any surprising additional effect could not give this obvious measure an inventive quality.

3.9.1 It is true that document (2) discloses that a particular C.I. Pigment Blue 15:3, chemically characterised as copper phthalocyanine in the  $\beta$ -crystal form, would be able to cause a dust explosion. However, the cited prior art as a whole does not give any pointer to the skilled person that in performing dry-milling of copper phthalocyanine in the form of a mixture with a resin particular safety conditions for preventing a dust explosion would be **necessary**, let alone that the milling had to be performed under an atmosphere having a reduced oxygen concentration.

3.9.2 Moreover, even if the skilled person would desire to diminish the risk of a dust explosion in performing the dry-milling of a mixture of copper phthalocyanine and a resin, there would not exist a "one way street situation" as contended by the Respondent. Although documents (3) and (4) disclose the limitation of the oxygen concentration in spaces which need protection from dust explosions, they do not relate to the specific situation of the present case involving dry-milling of a mixture of copper phthalocyanine and a resin and they clearly indicate that "inerting" is only one measure for preventive explosion protection (see document (3), page 2, first paragraph under "Introduction" and document (4), page 8, paragraph 4.3.1). The same considerations as for documents (3) and (4) also apply to document (10). This document discloses test procedures for determining dust explosibility (see pages 17 to 19, under point 4.3) and it teaches that, depending on the test results, numerous protective measures could be applied, such as (a) those which prevent or limit the formation of

dangerous explosible atmospheres, whereby inerting with an inert gas is indicated as an example of suitable method, (b) those which prevent the ignition of dangerous explosible atmospheres due to their energy, temperature and duration of the exposure, i.e. by taking appropriate steps to avoid the ignition, and (c) those which limit the consequences of an explosion to an acceptable level through explosion pressure resistant design of the apparatus, e.g., in combination with explosion pressure relief, explosion suppression or explosion disengagement (see pages 24 to 41, under points 5.5 to 6.3.1.2).

- 3.9.3 In view of these considerations, the Board cannot accept the Respondent's arguments in this respect.
- 3.10 The Respondent also argued that the claimed process lacked inventive step, since the skilled person would perform the dry-milling of a mixture of copper phthalocyanine and a resin under an atmosphere having a reduced oxygen concentration in order to prevent an oxidative degradation of the resin.
- 3.10.1 However, he based his arguments in this respect on the description of the patent in suit, which does not represent prior art. Even if the Board would accept on the basis of the disclosure of the patent in suit that a rosin modified phenolic resin were known for its tendency to degrade by oxidation (see column 3, lines 18 to 22), it cannot be concluded that the effect of said degradation tendency, namely that the resulting ink products would have unsatisfying properties, also forms part of the state of the art. This point of view is actually confirmed by document (1), which

corresponds to the prior art document JP-A-2-294365 mentioned in the patent in suit (see column 3, lines 14 to 17). This document discloses, as indicated above, that by performing the dry-milling of copper phthalocyanine in the presence of a rosin modified phenolic resin a pigment composition is obtained having enhanced properties in that they improve the characteristics of final printing inks (see document (1), column 1, line 55 to column 2, line 5).

3.10.2 For these reasons, the Board cannot accept this argument either.

3.11 The Board notes that in view of the teaching of the cited documents and for the reasons as submitted by the Respondent, the skilled person **could** have performed the preparation of the pigment composition in accordance with the patent in suit. However, according to the consistent case law of the Boards of Appeal for determining lack of inventive step, it is necessary to show that considering the teaching of the prior art as a whole, without using hindsight based on the knowledge of the claimed invention, the skilled person **would** have arrived at the claimed solution of **the technical problem to be solved**. However, as indicated above, the skilled person, when trying to solve the technical problem underlying the patent in suit, would not have expected that a process such as the one now claimed would solve the present technical problem with a reasonable chance of success.

3.12 In conclusion the Board finds that the subject-matter of Claim 1 as granted involves an inventive step in the sense of Article 56 EPC.

Claims 2 to 11 as granted relate to particular embodiments of the subject-matter of Claim 1. They are therefore also allowable.

**Order**

**For these reasons it is decided that:**

The decision under appeal is set aside and the patent is maintained as granted.

The Registrar:

The Chairman:

N. Maslin

P. Ranguis