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D E C I S I O N
of 22 December 2004

Case Number: T 0131/03 - 3.4.2

Application Number: 92117031.2

Publication Number: 0536692

IPC: G03G 5/06

Language of the proceedings: EN

Title of invention:
Photoconductor for electrophotografy

Patentee:
FUJI ELECTRIC CO., LTD.

Opponent:
Canon Kabushiki Kaisha

Headword:

-

Relevant legal provisions:
EPC Art. 54

Keyword:
"Novelty: main request: no: definition in terms of unusual
parameters: inherent disclosure burden of proof"
"Auxiliary requests: not admitted because late-filed and
raising new issues"

Decisions cited:
T 1003/96, T 0332/87, T 0186/99

Headnote:

In *inter-partes* proceedings the burden of proof rests primarily upon the opponent. However, when the latter has established a strong presumption that unusual parameters as used to define the claimed subject-matter are inherently disclosed in the prior art, the patent proprietor cannot merely claim the benefit of the doubt. It is incumbent upon him to contribute in establishing to which extent such parameters, which he freely chose to use in the definition of his invention, actually distinguish the claimed subject-matter from the prior art (points 2.3 to 2.8 of the Reasons).



Case Number: T 0131/03 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 22 December 2004

Appellant: FUJI ELECTRIC CO., LTD.
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Kanagawa 210 (JP)

Representative: Grünecker, Kinkeldey,
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Respondent: Canon Kabushiki Kaisha
(Opponent) 30-2, 3-chome, Shimomaruko
Ohta-ku, Tokyo 146 (JP)

Representative: Beresford, Keith Denis Lewis
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
18 November 2002 concerning maintenance of
European patent No. 0536692 in amended form.

Composition of the Board:

Chairman: A. G. Klein
Members: A. G. M. Maaswinkel
J. H. P. Willems

Summary of Facts and Submissions

I. The appellant (proprietor of the patent) lodged an appeal, received on 20 January 2003, against the interlocutory decision of the opposition division, dispatched on 18 November 2002, on the amended form in which the European patent No. 0 536 692 (application No. 92117031.2) could be maintained. The fee for the appeal was paid on 20 January 2003. The statement setting out the grounds of appeal was received on 27 March 2003.

II. An opposition had been filed against the patent as a whole on the basis of Articles 100(a) and (b) EPC, the objection under Article 100(a) EPC being substantiated by the grounds that the subject-matter of the patent was not patentable within the terms of Articles 52(1), 54 and 56 EPC.

The opposition division held that the proprietor's main request including the claims of the patent as granted was not allowable since Claim 1 did not meet the requirements of Articles 100(a) and 54 EPC in view of document E5 (EP-A-0 428 102) when considering the experimental data filed by the opponent with the letter of 9 August 2002 accompanied by a statement of Mr Fumio Sumino of Canon Kabushiki. The division was furthermore of the opinion that the claims according to the first auxiliary request were allowable.

III. With the letter setting out the grounds of appeal the appellant filed a declaration by Mr Kenichi Ohkura, a passage of page 266 from the book "Elucidation and Applied Technology of Dispersion and Aggregation",

edited by Fumio Kitahara (document E9) and a partial translation of Japanese Patent No. 3102904 (document E10) in order to rebut the experimental data filed by the opponent in the opposition procedure.

IV. In a letter filed 10 October 2003 the respondent (opponent) *inter alia* explained why in his opinion the declaration of Mr Ohkura did not cast doubts on the experimental results of Mr Sumino.

V. In response to a communication of the board annexed to the summons to oral proceedings, dated 10 September 2004, the respondent filed a letter dated 15 November 2004 including a further declaration by Mr Sumino, and the appellant a reply dated 19 November 2004 including a set of nine auxiliary requests. In a further letter received on 1 December 2004 the respondent raised an objection under Article 100(b) EPC against the characterisation of the oxytitanium phthalocyanine material by the peaks in its X-ray spectrum in the claims of auxiliary requests I to VI.

VI. Oral proceedings were held on 22 December 2004.

At the oral proceedings the appellant requested that the decision under appeal be set aside and that the patent be maintained as granted or, alternatively, on the basis of any of auxiliary requests I to IX, filed with the letter of 19 November 2004.

The respondent requested that the appeal be dismissed.

VII. The wording of Claim 1 according to the main request reads as follows:

"Use of a photoconductor for electrophotography in an electrophotographic apparatus which employs contact charging, said photoconductor comprising:

- a conductive substrate;
- a charge generating layer formed on said conductive substrate and containing the particles of an organic pigment as a charge generating agent and a binder; and
- a charge transporting layer formed on said charge generating layer;

wherein the largest value of the major axes of said particles is not more than 1000 nm, the smallest value of the minor axes of said particles is not less than 10 nm and the ratio of the largest value of the major axes to the smallest value of the minor axes is not more than 3."

The wording of Claim 1 according to auxiliary request I is as that of Claim 1 according to the main request with the following additional feature at the end of the claim:

"...wherein said charge generating agent in the photoconductor is selected from a metal-free phthalocyanine of an α -type and a β -type; a copper phthalocyanine of an α -type; a β -type and an ϵ -type; chloroaluminium phthalocyanine; vanadyl phthalocyanine; oxytitanium phthalocyanine having strong diffraction peaks at the Bragg angles ($2\theta \pm 0.2^\circ$) of 9.2° , 13.1° , 20.7° , 26.2° and 27.1° in the X-ray diffraction spectrum; a polycyclic quinone; a quinacridone pigment; a perylene pigment; and a perynone pigment".

Claim 1 according to auxiliary requests II to VI defines the use of a photoconductor as in Claim 1 according to the main request with *inter alia* an additional reference to oxytitanium phthalocyanine having strong diffraction peaks at the Bragg angles ($2\theta \pm 0.2^\circ$) of 9.2° , 13.1° , 20.7° , 26.2° and 27.1° in the X-ray diffraction spectrum as a charge generating agent.

The wording of Claim 1 according to auxiliary request VII is as that of Claim 1 according to the main request with the following additional feature at the end of the claim:

"...wherein said charge generating agent in the photoconductor is selected from a metal-free phthalocyanine of an α -type and a β -type, a copper phthalocyanine of an α -type, a β -type and an ϵ -type, chloroaluminium phthalocyanine, vanadyl phthalocyanine, a polycyclic quinone, a quinacridone pigment, a perylene pigment and a perynone pigment".

The wording of Claim 1 according to auxiliary request VIII is as that of Claim 1 according to the main request with the following additional feature at the end of the claim:

"...wherein said charge generating agent in the photoconductor is selected from a metal-free phthalocyanine of an α -type and a β -type, a copper phthalocyanine of an α -type, a β -type and an ϵ -type, chloroaluminium phthalocyanine, vanadyl phthalocyanine, and a polycyclic quinone".

Claim 1 according to auxiliary request IX reads as
Claim 1 according to the main request with the
following additional feature at the end of the claim:

"...wherein said charge generating agent in the photoconductor is selected from a copper phthalocyanine of an ϵ -type, chloroaluminium phthalocyanine, and 4,10-dibromanthrone".

VIII. The arguments of the appellant may be summarised as follows.

The opposition division had rejected Claim 1 of the main request under Article 54 EPC in view of document E5 when considering the experimental data of Mr Sumino filed by the opponent. Document E5 discloses a photosensitive member for electrophotography having a laminate structure as the photosensitive member used in Claim 1. The charge generating substance contains oxytitanium phthalocyanine pigment. On page 5, lines 36 to 38 document E5 discloses that "the photosensitive member may be uniformly charged ordinarily by corona discharge or by direct charging...". However, in the Examples specific oxytitanium phthalocyanine particles are prepared which are always used in an apparatus employing *corona* discharging. In fact, the document does not disclose that the specific pigments of the example are used in an apparatus employing *direct* or *contact* charging. Furthermore E5 is silent about the specific geometry of the particles as defined in Claim 1 whence the subject-matter of this claim is not anticipated by this document. The subject-matter of Claim 1 also involves an inventive step over document E5, which is considered as the closest prior art, since

there is no suggestion in E5 that if using a *contact* charging system the geometry of the particles is critical as is discussed in page 2, lines 55 to 57 of the patent specification. None of the other documents filed by the opponent deals with the problems to be solved when using a photoconductor containing particles of an organic pigment as the charge generating agent in the charge generating layer in an electrographic apparatus employing contact charging. Therefore these documents do not contribute to the solution defined in Claim 1 for the problem discussed above.

In its decision the opposition division noted that E5 is silent about the geometry of the oxytitanium phthalocyanine crystals. It accepted experimental data provided by the opponent according to which oxytitanium phthalocyanine pigment prepared by Mr Sumino as described in Synthesis Example 2 and used in Example 5 of E5 would have the particle geometry as required in Claim 1, implying that this was an inherent disclosure. However, in repeating Synthesis Example 2 of document E5 Mr Ohkura found that the X-Ray diffraction pattern of the crystals thus obtained is totally different from the X-ray diffraction pattern referred to in the preparation process on page 6, lines 17 to 19 of document E5 and shown in its Figure 1, which shows that the results are not unambiguously reproducible. Furthermore, in Example 5 of document E5 the milling temperature is not disclosed. In this respect reference is made to Preparation Examples 5 and 6 of the patent specification which illustrate that temperature and time used for the milling step significantly influence the geometry of oxytitanium phthalocyanine particles. The influence of temperature is addressed in document

E9 and in particular in E10, which discloses that "the dispersion temperature alters the weight-average particle diameter of particles in the coating liquid in which oxytitanium phthalocyanine is dispersed". Therefore the experimental data filed by the opponent should not be considered because it was not demonstrated beyond any doubt that document E5 inherently discloses the particle geometry as defined in Claim 1. Reference is made to Decision T 1003/96 according to which the patentee should be given the benefit of the doubt in case of uncertainty about a prior art disclosure.

As to the auxiliary requests, these have been filed in response to the observations filed by the respondent and the further declaration of Mr Sumino of November 2004. In the independent claims of these requests the used pigment particles are further restricted. In Claim 1 of auxiliary request I the charge generating agent is further specified based on the disclosure on page 8, lines 14 to 18 of the application documents, corresponding to page 4, lines 12 to 16 of the patent specification and on Preparation Examples 5 and 6 referring to oxytitanium phthalocyanine having strong diffraction peaks at the Bragg angles ($2\theta \pm 0.2^\circ$) of 9.2° , 13.1° , 20.7° , 26.2° and 27.1° . Since doubts have been expressed by the respondent as to whether the description of the patent sufficiently discloses how to obtain oxytitanium phthalocyanine having the required X-ray diffraction pattern as used in the Preparation Examples of the contested patent or whether it was a commercial product at the date of the patent, the patent proprietor makes reference to the document EP-A-0 180 930, published in 1986, which shows in

Figure 1 an X-ray diffraction spectrum of this material with the Bragg angles of the material used in the Preparation Examples. Since the X-ray diffraction spectrum of this material differs from the spectrum of the oxytitanium phthalocyanine shown in Figure 1 of document E5, this material has a different crystal structure and the material used in Claim 1 of this request is not anticipated by the teaching of Document E5. In the further auxiliary requests the material to be used is further restricted, wherein in Claim 1 of auxiliary requests VII, VIII and IX the charge generating agent may not be an oxytitanium phthalocyanine pigment, i.e. the reference to this material as disclosed in Preparation Example 6 has been deleted from the list of charge generating agents.

IX. The arguments of the respondent may be summarised as follows.

The opposition division was correct in finding that Claim 1 of the opposed patent lacked novelty over document E5. This document is directed to an electrophotographic photosensitive member for use in electrophotographic apparatus which includes an electrophotographic support, a charge generation layer and a charge transport layer and in which the charge generation layer comprises oxytitanium phthalocyanine. At page 5, lines 36 to 38 it is stated that the photosensitive member can be charged by corona discharge or by direct (contact) charging. Furthermore in this document contact charging is defined in Claims 11, 16, 21 and 26. In accordance with established Case Law, see Decision T 0332/87, the disclosure of a document has to be considered as a

whole and not only on the basis of the examples thereof and, when examining novelty, different passages of one document may be combined provided that there are no reasons preventing such a combination.

Although document E5 does not expressly disclose the geometry of the particles, it gives detailed instructions in Synthesis Example 2 and in Example 1 (this combination of examples corresponding to Example 5) to prepare a coating liquid for the photosensitive member. The phthalocyanine pigment and a coating solution containing it were prepared in accordance with these Examples by Mr Sumino and the results in form of electron micrographs were presented in the opposition proceedings with the first statement of Mr Sumino from which it can be seen that the pigment particles have major axes of not more than 1000 nm, minor axes of not less than 10 nm and a ratio of major to minor axis of not more than three. With respect to the declaration of Mr Ohkura, his observation concerning the X-ray diffraction pattern of the pigment he obtained is not relevant to the issue of anticipation of the opposed patent by E5 in the light of Mr Sumino's experiment because the claims of the patent are not restricted to any diffraction pattern. Furthermore according to Mr Ohkura's declaration the pigment was milled with glass beads for 20 minutes in the crystallisation step whereas in E5 the pigment is milled for 20 hours. With respect to the milling temperature, document E5 states that in the Synthesis Example 2 the milling was performed at room temperature (22°C) (see page 6, line 13), and it should be noted that the major part of the milling (20 hours) is conducted during this synthesis step. Furthermore, the

inventor of E5 had confirmed that the milling operation in Example 1 of E5 was also conducted at room temperature, which is the only sensible interpretation of E5 in the absence therein of any reference to heating or cooling during milling. Finally reference is made to the second declaration by Mr Sumino. According to this declaration, three coating solutions were prepared which had been dispersed at different temperatures, namely 12°C, 24°C, and 30°C.

Photomicrographs taken from the particles illustrate that there is hardly any difference in the shape of the particles obtained at dispersion temperatures between 12°C and 30°C. All the particles have sizes and geometries well within the ranges specified in Claim 1 of the patent in suit. Document E10 is not relevant since the variation in particle diameter reported in this document is due to changes in the degree of cohesion between primary particles that make up the secondary particles, and does not reflect any difference in the size of the primary particles themselves.

With respect to auxiliary requests I to VI there arises an objection under Article 100(b) EPC and Article 83 EPC since in Claim 1 of these requests the charge generating agent is characterised by the peaks in the X-ray spectrum, using the description of preparation Example 5 on page 5, lines 36 to 37 of the patent specification as the basis for the amendment. A specific form of oxytitanium phthalocyanine is presented as the starting material and there is no disclosure how this particular form is made. Furthermore, oxytitanium phthalocyanine having the required X-ray pattern was not as far as the respondent

is aware a commercial product at the date of the patent, or even now. Document EP-A-0 180 930 referred to by the appellant does not provide the necessary information since the X-ray spectrum in Figure 1 of that document shows peaks that are stronger than the lines of the spectrum in the auxiliary requests whence it must be concluded that these spectra do not show the same material at all. Therefore the skilled person would not have sufficient information from the patent specification to form a photoconductor as defined in the claims of auxiliary requests I to VI.

Reasons for the Decision

1. The appeal is admissible.
2. *Main Request*
 - 2.1 Document E5 discloses, see for instance Claim 17, the use of a photoconductor for electrophotography in an electrophotographic apparatus, wherein the photoconductor comprises a conductive substrate, a charge generating layer and a charge transporting layer formed on the charge generating layer. The charge generating layer comprises pigment particles of oxytitanium phthalocyanine (which is an organic pigment) and a binder (see Example 5, where the photosensitive member has been prepared as in Example 1). These facts are undisputed amongst the parties.
 - 2.2 According to the appellant, document E5 does not disclose that the specific pigments of the examples are used in an apparatus employing direct charging. The

respondent has pointed to the passage on page 5, lines 36 to 38, and to Claims 11, 16, 21 and 26 which specify that the charging means is a "direct charging means" (this being synonymous to "contact charging"), whence this feature was also anticipated by document E5.

The board observes that in all independent claims of document E5 (Claims 1, 7, 12, 17 and 22) the charge generating layer comprises oxytitanium phthalocyanine and that the dependent Claims 11, 16, 21 and 26 referred to by the respondent are directly appended to independent Claims 7, 12, 17 and 22. Therefore in the opinion of the board document E5 also anticipates the use of this pigment in the charge generating layer of a photoconductor in an apparatus employing contact charging.

- 2.3 The second issue of dispute amongst the parties relates to the geometry of the pigment particles, which is defined in the Claim 1 in terms of the largest and smallest values of the major and minor axes of the particles, respectively, and of their ratio. Such parameters are clearly unusual in the context of the characterization of organic pigments in the charge generating agents of photoconductors for electrophotography, and in none of the prior art documents on the file are there such parameters used for describing the disclosed particles. In the decision under appeal the opposition division had accepted the experimental data provided by the opponent and the first declaration by Mr Sumino, according to which oxytitanium phthalocyanine pigment particles prepared as in the Examples of document E5 had the geometry defined in Claim 1 of the patent in suit. With the

letter containing the grounds of appeal the appellant included a declaration by Mr Ohkura who, in repeating the Synthesis Example 2 of document E5, found that the X-ray spectrum of the resulting particles was different from the spectrum shown in Figure 1 of this document. Furthermore the appellant observed that the temperature of the second milling step was not disclosed in E5 which was an important parameter because it greatly influenced the size of particles, as is clear from documents E9 and E10. The appellant concluded that the results of document E5 were not unambiguously reproducible and uncertain, whence the patentee should be given the benefit of the doubt, in accordance with Decision T 1003/96. Against the data of Mr Ohkura the respondent objected that the experimental conditions of this synthesis experiment were different from those disclosed in E5 and that even a possible difference in X-ray spectra data did not necessarily reveal a difference in the particle geometry, which was the only relevant parameter in Claim 1. Furthermore the respondent filed a second declaration by Mr Sumino to illustrate that a variation of the temperature between 12°C and 30°C for the second milling step did not substantially influence particle size.

- 2.4 The question is whether in repeating the synthesis of the oxytitanium phthalocyanine in Synthesis Example 2 of document E5 and that of the photosensitive member in Example 5 of this document the particles thereby obtained automatically fall within the parameter range defined in Claim 1, and therefore whether this subject-matter is inherently disclosed in the prior art document. In a case in which claimed subject-matter was defined in terms of unusual parameters the present

board in a different composition has explained in Decision T 0186/99 that, although in *inter-partes* proceedings the burden of proof rests primarily upon the opponent, it is incumbent upon the patent proprietor to contribute in establishing to which extent such parameters actually distinguish the claimed subject-matter from the prior art (see point 3 of the Reasons).

- 2.5 In the present case the patent proprietor filed as a reaction to the data provided by Mr Sumino and accepted by the opposition division a declaration with data obtained by Mr Ohkura. To the subsequent observations made by the respondent that the experimental conditions followed by Mr Ohkura were different from those in E5 (milling time 20 minutes versus 20 hours) and that a difference in X-ray spectrum did not allow a conclusion with respect to the relevant parameter of particle size, the appellant did not provide any counterargument in the written procedure. At the oral proceedings the appellant then surmised that the figure relating to a milling time of only 20 minutes in the declaration of Mr Ohkura merely resulted from a clerical error. No satisfactory response was provided either to the board's question as to why Mr Ohkura had not carried out a measurement of particle size or shape as actually referred to in claim 1, which is presumably a much simpler measurement than the determination of a Bragg X-ray spectrum. On the other hand, as was noted in point 2.3 of the Communication by the board (see Section V *supra*) the appellant had not questioned the values provided by Mr Sumino as such but rather raised doubts about the temperature at which he performed the second milling step. In reply to this, the respondent

filed a second declaration by Mr Sumino providing supplemental experimental data to show that the temperature of the second milling step could be varied and particle sizes and shapes still be obtained within the claimed range.

2.6 The position of the appellant that the teaching of document E5 would not unambiguously lead to the claimed subject-matter essentially relies on the experimental data by Mr Ohkura. However, the appellant did not convincingly rebut the observation by the respondent (also referred to by the board in point 1.2.3 of its communication) that the milling times were substantially different. Also no data directed to the relevant parameters as actually claimed (i.e. the geometry of the particles) were provided by Mr Ohkura.

2.7 Therefore the situation is not comparable with that in Decision T 1003/96 in which a question of interpretation of a prior art document could not be resolved, whence the patentee was given the benefit of the doubt. In the present case the data both in the first and the second declaration by Mr Sumino as provided by the respondent in the board's view establish a strong presumption that the claimed geometry of the pigment particles is inherently disclosed in document E5. In the face of such strong presumption, the appellant - who incidentally had freely chosen to define the invention by way of unusual parameters - could not simply claim the benefit of the doubt: the burden of proving that the product obtained from the teaching of document E5 did not exhibit the claimed parameters had actually switched to his side and it was his duty to provide convincing evidence in

support of his allegation, which he did not for the reasons set out in points 2.4 and 2.5 above.

2.8 Therefore the board sees no reason to question the conclusion of the opposition division that the subject-matter of Claim 1 of the appellant's main request in the board's view is not novel (Article 52(1) and 54 EPC).

3. *Admissibility of the auxiliary requests*

3.1 The auxiliary requests I to IX were filed on 19 November 2004, i.e. just one month before the oral proceedings. According to the letter of the respondent of 1 December 2004 he received these requests only on 30 November 2004. In the oral proceedings the appellant defended the late filing of these requests as a reaction by the patent proprietor to the new objections by the opponent.

3.2 The board however observes that the new experimental data by Mr Sumino filed by the respondent with the letter of 15 November 2004 are no more than a further substantiation of the arguments already out forward in point 10 of its letter of 10 October 2003, which thus had been on file for more than one year.

3.3 In addition the respondent in respect of auxiliary requests I to VI expressed serious doubts as to the availability of the oxytitanium phthalocyanine material having the required X-ray spectrum. At the oral proceedings the appellant made reference to the prior art document EP-A-0 180 930 which should illustrate that the material with the claimed X-ray spectrum had

been available. However, consideration of the spectrum in Figure 1 as discussed on page 18, lines 10 to 13 of that document shows that the material disclosed there produces further diffraction peaks at angles 10.6° , 15.1° , 15.7° , 16.1° and 23.3° and that some of the lines (e.g. at 15.1°) are even stronger than the lines defined in Claim 1 of these requests. Therefore it appears that at least the document referred to by the appellant cannot convincingly establish that the claimed material had been available at the priority date of the patent in suit.

3.4 With respect to auxiliary requests VII to IX the board observes that in independent Claim 1 of each of them charge generating agent material is defined which has been taken from the description and which has presumably not been searched. It cannot however be excluded that a search might have revealed such material which - like the oxytitanium phthalocyanine material of document E5 - inherently exhibits the claimed parameters.

3.5 Thus the appellant's auxiliary requests are clearly not *prima facie* allowable, but they raise new issues which have not been considered so far in the opposition or appeal procedure. Admitting these requests into the procedure would have obliged the board to remit the case to the opposition division so as to avoid the loss of an instance by the losing party.

Accordingly, the board has decided not to admit the appellant's late filed auxiliary requests into the procedure.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

P. Martorana

A. Klein