Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 19 September 2019

Case Number: T 1946/14 - 3.3.02

Application Number: 07830188.4

Publication Number: 2083054

IPC: C09D11/00, B41J2/01, B41M5/00

Language of the proceedings: EN

Title of invention:
NONAQUEOUS INKJET INK AND INK SET

Patent Proprietor:
Toyo Ink Mfg. Co. Ltd.

Opponents:
Strawman Limited
Specht, Ewald

Headword:

Relevant legal provisions:
RPBA Art. 12(4)
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1946/14 - 3.3.02

D E C I S I O N
of Technical Board of Appeal 3.3.02
of 19 September 2019

Appellant: (Opponent 2)	Specht, Ewald Smetanastr. 7 85598 Baldham (DE)
Representative:	Müller-Boré & Partner Patentanwälte PartG mbB Friedenheimer Brücke 21 80639 München (DE)
Respondent: (Patent Proprietor)	Toyo Ink Mfg. Co. Ltd. 3-13, Kyobashi 2-chome Chuo-ku Tokyo 104-0031 (JP)
Representative:	SSM Sandmair Patentanwälte Rechtsanwalt Partnerschaft mbB Joseph-Wild-Straße 20 81829 München (DE)
Party as of right: (Opponent 1)	Strawman Limited Orchard Lea Horns Lane Combe, Witney Oxfordshire OX29 8NH (GB)
Representative:	Mewburn Ellis LLP City Tower 40 Basinghall Street London EC2V 5DE (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on**

11 July 2014 concerning maintenance of the European Patent No. 2083054 in amended form.

Composition of the Board:

Chairman	M. O. Müller
Members:	P. O'Sullivan
	P. de Heij

Summary of Facts and Submissions

I. The appeal of opponent 2 lies from the interlocutory decision of the opposition division according to which European patent No. 2 083 054 in amended form and the invention to which it relates were found to meet the requirements of the EPC.

II. The patent was opposed by opponents 1 and 2 under Article 100(a) and (b) EPC on the grounds that its subject-matter lacked novelty and inventive step and the invention defined in the claims was not sufficiently disclosed.

III. According to the contested decision, the subject-matter of the claims of the main request did not introduce new matter, was novel, and the invention defined therein was sufficiently disclosed. D2 was the closest prior art for the purpose of assessing inventive step. Claim 1 differed from the disclosure in D2 in the mixing ratio of the respective glycol ethers recited therein and in the total amount thereof by weight of the total amount of the inkjet ink. A technical effect linked to the distinguishing features was recognised, and the objective technical problem was the provision of non-aqueous inkjet inks having at least good ratings in the properties listed in table 1 of the patent in suit. The solution proposed in the claims involved an inventive step.

IV. During opposition proceedings, *inter alia* the following evidence was cited:

D1 : EP 1 801 171 A
D2 : JP 2006-009027
D2a : English language translation of D2

D4 : US 2004/266907 A

Experimental evidence filed in opposition proceedings is denoted by the board as follows:

E1 : "Comparative Experimental Report" filed with respondent's letter dated 19 February 2013
E2 : "Comparative Experimental Report II" filed with respondent's letter dated 1 April 2014

V. The decision of the opposition division was appealed by opponent 2 (hereinafter: appellant). With the statement of grounds of appeal the appellant filed further evidence including the following:

E3 : Appellant's "Supplementary Experimental Data" (numbering attributed by the board)

VI. With the reply to the statement of grounds the respondent (patent proprietor) submitted the following (numbering attributed by the board):

E4: New experimental data (on pages 7 and 8 of the reply to the grounds of appeal)
E5: "Letter of discontinuation" dated 13 January 2009, including shelf life data.

VII. With the letter of 26 September 2016 the appellant filed further evidence D8(1), D8(2), D9, D10, D11(1) and D11(2).

VIII. A communication of the board was sent in preparation for oral proceedings. Therein the board *inter alia* expressed the preliminary opinion that the invention defined in the claims was sufficiently disclosed, and in particular with regard to inventive step, identified

the issue of whether a technical effect had been demonstrated across the scope of the claims as being of importance during upcoming oral proceedings.

IX. With the letter of 19 August 2019, refiled on 11 September 2019 due to unreadable portions in the initial submission, the appellant, in an annexed "experimental summary", filed a series of tables (i) to (iv) summarising data already on file taken from the patent, E1, E2 and E3.

Final Requests

X. The **appellant** requests that the contested decision be set aside and that the patent be revoked in its entirety.

The **respondent** requests dismissal of the appeal. The respondent also requests that E3, D6, D7, D8(1), D8(2), D9, D10, D11(1) and D11(2) not be admitted into the appeal proceedings.

XI. Independent claim 1 of the main (and sole) request reads as follows:

"*1. A non-aqueous inkjet ink, comprising a pigment, a resin and a mixed solvent,*
wherein the mixed solvent comprises diethylene glycol dialkyl ether and tetraethylene glycol dialkyl ether, and the mixing ratio of the mixed solvent is that tetraethylene glycol diethyl ether is in a proportion of 5 to 50 parts by weight relative to 100 parts by weight of diethylene glycol dialkyl ether;
wherein the mixed solvent of diethylene glycol dialkyl ether and tetraethylene glycol dialkyl ether is present

in an amount of 60 to 95 % by weight of the total amount of inkjet ink; and
wherein the pigment is selected from the group consisting of dimethylquinacridone, dichloroquinacridone and unsubstituted quinacridone."

XII. Oral proceedings before the board were held on 19 September 2019 in the absence of the respondent and opponent 1, as announced by letters dated 8 August 2019 and 23 November 2018 respectively.

XIII. The appellant's arguments, insofar as relevant to the present decision, may be summarised as follows:

Admittance - E3

E3 was filed with the statement of grounds in response to the tests E2 filed by the respondent shortly before oral proceedings before the opposition division. The time interval between the filing of E2 (1 April 2014) and the date of the oral proceedings (3 June 2014) was insufficient to allow the preparation and filing of further experimental tests before oral proceedings in opposition, and it was thus to be admitted into appeal proceedings.

Inventive step - Article 56 EPC

D2 was a suitable closest prior art disclosure for the purpose of assessing inventive step. The subject-matter of claim 1 was distinguished from the disclosure in D2 in that the latter did not disclose (i) the feature of claim 1 according to which the mixing ratio of the mixed solvent of tetraethylene glycol dialkyl ether (TEG) is in a proportion of 5 to 50 parts by weight relative to 100 parts by weight of diethylene glycol

dialkyl ether (DEG), and (ii) the feature of claim 1 according to which the pigment is selected from the group consisting of dimethylquinacridone, dichloroquinacridone and unsubstituted quinacridone. The stipulation in claim 1 that the mixed solvent [of DEG and TEG] is present in an amount of 60 to 95% by weight of the total amount of the inkjet ink was non-limitative due to the open definition of the mixed solvent in view of the wording "the mixed solvent comprises ..." recited earlier in the claim, and as such did not represent a further distinguishing feature.

The distinguishing features were not linked to a technical effect achieved across the breadth of claim 1, as evidenced by the experimental results submitted in E3 in particular with regard to magenta inks (12), (13), (15), (17), and (18). The objective technical problem was the provision of an alternative non-aqueous inkjet ink to that disclosed in D2. With regard to feature (i), adjusting the mixing ratio in the mixed solvent would been within the routine ability of the skilled person. With regard to feature (ii), quinacridone-based pigments were listed in D2 (paragraph [0032]) as being suitable, while the patent itself referred to said pigments as being conventionally used for magenta pigments. Thus the skilled person wishing to solve said problem would arrive at the subject-matter of claim 1 without exercising inventive skill.

XIV. The respondent's arguments, insofar as relevant to the present decision, may be summarised as follows:

Admittance - E3

E3 was not to be admitted into the proceedings as it had not been submitted by the appellant in due time.

Inventive step - Article 56 EPC

Despite the evidence presented in E3, the alleged technical effects were in fact achieved when the total content of mixed solvent and the ratio TEG/DEG are at the lower limits of the claimed ranges, even in the absence of N-methyloxazolidinone (MOZ). Doubts were to be raised as to whether the appellant actually conducted the experiments set out in E3. Firstly, the "Very bad" safety result assigned by the appellant to the ink containing tetraethylene glycol dimethyl ether ("TEGDM") was due to changes in the current safety standard since the filing of the application. Secondly, there was an inconsistency in the appellant's "Experiment 12 comp" (E3, Table 1B) whereby the erroneous use of the "safe" TEGMB (in place of the corresponding TEGDM in experiment 12 of the respondent's data E2) as solvent provided a "Very bad" level of safety. Thirdly, as was evident from E5, commercial production of the resin "VYHD" allegedly employed in the appellant's experiments E3 (carried out in 2014) was discontinued in 2009, casting further doubt on whether the appellant actually conducted said experiments. Finally, the appellant's results for "Ink 4" (E3, pages 5-6) were scientifically incomprehensible and contradictory with the results obtained by the respondent in E4 (table) for a similar ink. None of the retrieved documents taught or suggested an inkjet ink

having the claimed features. Consequently, claim 1 involved an inventive step.

Reasons for the Decision

1. Admittance - evidence

1.1 E3

1.1.1 Supplementary experimental data E3 was filed by the appellant with the statement setting out the grounds of appeal, and was used to argue a lack of inventive step starting from D2 as closest prior art. This objection had already been submitted in opposition proceedings and consequently does not represent a new objection filed for the first time in appeal proceedings.

1.1.2 In its decision (paragraph 4.3), the opposition division relied on the results presented in table 1B of E2 to arrive at the conclusion that the distinguishing features of the claim with respect to D2 were responsible for obtaining the technical effect of improved ratings in a range of tests. Inventive step was thus acknowledged based on the claim providing a solution to the problem of providing inks having said improved ratings. E3 was filed by the appellant to demonstrate that in contrast to the conclusions of the opposition division, the objective problem as formulated in the decision was not solved across the claimed scope. Consequently, the board can follow the argument of the appellant that the filing of E3 represents a reaction to the tests E2 filed by the respondent in first instance proceedings approximately two month before oral proceedings before the opposition division. Furthermore, the board agrees that said time

interval was insufficient to reasonably expect the appellant to prepare counter-tests in advance of the oral proceedings.

1.1.3 It follows that the filing of E3 with the statement of grounds of appeal was justified in view of the circumstances in first instance proceedings. The board consequently decides to admit E3 into appeal proceedings in accordance with Article 12(4) RPBA.

1.2 D6, D7, D8(1), D8(2), D9, D10, D11(1) and D11(2)

1.2.1 The respondent requested that D6, D7, D8(1), D8(2), D9, D10, D11(1) and D11(2) not be admitted into the appeal proceedings. However, since these documents are not invoked in the reasons underlying this decision, there is no need for the board to decide on this matter.

2. Inventive step - Article 56 EPC

2.1 Closest prior art

The appellant submitted arguments starting from D2 (hereinafter the board will refer to the English language translation D2a) as closest prior art. The respondent does not dispute the choice of D2a as a suitable starting point for the skilled person, and the board sees no reason to differ.

2.2 Distinguishing features

2.2.1 D2a discloses a non-aqueous ("oil-based") ink composition comprising a pigment, a polymer resin and an organic solvent containing a polyalkylene glycol derivative in an amount of 20 to 90% by weight of the total amount of the ink composition (claim 1; paragraph

[0009]). The ink composition is intended for use in ink-jet printing systems (paragraph [0001]). DEG and TEG are mentioned among a list of (poly)alkylene glycol dialkyl ethers which may be used alone or as mixture of two or more components thereof (claim 3; paragraph [0023]). Quinacridone-based pigments are included among a list of examples of organic pigments which may be employed (paragraph [0032]).

2.2.2 Claim 1 at issue stipulates that the mixed solvent of diethylene glycol dialkyl ether and tetraethylene glycol dialkyl ether is present in an amount of 60 to 95% by weight of the total amount of the inkjet ink. However, the board agrees with the appellant that due to the open definition of said mixed solvent as merely **comprising** said respective ethers, the lower end of the range provided (60%) is non-limitative with respect to the total combined weight percentage of DEG and TEG present, since further solvents are not excluded. This feature consequently does not distinguish claim 1 from the disclosure in D2a.

2.2.3 The subject-matter of claim 1 at issue is consequently distinguished from the disclosure in D2a

(i) in the mixing ratio of TEG to DEG present in the mixed solvent as recited in claim 1 at issue, and
(ii) in the specific choice of pigment selected from the group consisting of dimethylquinacridone, dichloroquinacridone and unsubstituted quinacridone.

These conclusions have not been disputed by the respondent.

2.3 Problem solved

2.3.1 According to the description of the patent, the general object of the invention is the provision of an improved non-aqueous inkjet ink which smells less, has excellent safety and sanitariness, excellent resin dissolvability, excellent printing stability and excellent dryability, causes no corrosion of printers and has good adhesiveness to non-absorbent substrates (paragraph [0010]).

2.3.2 In order to formulate the objective technical problem effectively solved by the claimed subject-matter, it must be determined whether the distinguishing features of the claim provide the alleged technical effects or advantages. Alleged effects or advantages which are neither credible nor supported by sufficient evidence cannot be taken into consideration in determining the problem.

2.3.3 With regard to distinguishing feature (i), supra, the respondent submitted that the desired technical effects were achieved *inter alia* when the mixing ratio of TEG to DEG was within the range of 5 to 50 parts TEG relative to 100 parts by weight of DEG as recited in claim 1 at issue, and supported its position by referring to the data in the patent as well as the additional experiments comprised within supplementary experimental reports E1 and E2 filed during opposition proceedings.

2.3.4 On the other hand, the appellant submitted on the basis of experimental test report E3 that the tests in the patent, E1 and E2 did not sufficiently demonstrate that the alleged technical effects were achieved across the scope of claim 1 at issue. In particular, E3

demonstrated that when the total weight percentage of DEG and TEG of the total amount of the inkjet ink (hereinafter: DEG+TEG/total) was lower than 86.2%, it was not possible to achieve sufficient dryability and adhesiveness at the same time: at such lower levels, only the combined use of MOZ with the mixed solvent led to the achievement of the desired properties.

2.3.5 Experimental report E3 (tables 3 and 4) details the preparation of a large number of ink compositions falling within the scope of claim 1 at issue and their subsequent evaluation for the desirable properties attributed to the compositions of the patent (see E3, page 2 - 3, "Method for evaluating the inks"). In particular, compositions were prepared comprising a mixed solvent having a DEG+TEG/total ranging from 82.9% down to 51.4% (for ease of reference, the board refers to the data of E3 as summarized in table (iv) of the experimental report annexed to the appellant's letter of 11 September 2019). This data shows that in contrast to the evaluations of the ink compositions of e.g. example 2 of the patent, experiment 9 of E1 and experiment 16 of E2 (all of which comprise a DEG+TEG/total of above 86.2%), when the DEG+TEG/total is below said 86.2% threshold, the evaluated property ratings were consistently insufficient (mostly "VB" = very bad; table (iv), supra).

2.3.6 Additionally, although the experimental data provided in E1 and E2 filed by the respondent demonstrates that compositions having a lower DEG+TEG/total (lower than 86.2%) displayed the desired properties when MOZ was present (e.g. E1, experiments 8 and 10; E2, experiments 13, 14 and 15), the presence of MOZ in the composition is not a requirement of claim 1 at issue. A direct comparison of inks 12, 13, 15, 17 and 18 prepared by

the appellant in E3 with the above mentioned compositions of experiments 13, 8, 10, 14 and 15 respectively prepared by the respondent clearly demonstrates the effect of the presence of MOZ on the property rating of the resultant ink composition. Thus, to take one example, ink 13 comprising 81.49% DEG+TEG, 5.00% MOZ and having a proportion of TEG/DEG of 6.5 was evaluated as having "good" or "very good" properties, while the corresponding "Ink 12" of E3 comprising the same DEG+TEG and proportion of TEG/DEG, but with an alternative solvent to MOZ (in the case of ink 12, tetraethylene glycol monobutylether, E3, page 8, second last paragraph) was evaluated as "bad" or "very bad". Thus, below a DEG+TEG/total of 86.2%, the evaluated property ratings were insufficient in the absence of MOZ.

2.3.7 It follows from the foregoing analysis of the experiments in E3, with respect to distinguishing feature (i), supra, that claim 1 at issue encompasses within its scope a large number of embodiments which fail to display any identifiable technical effects. This conclusion applies *a fortiori* since, as mentioned above, the features of claim 1 at issue according to which the mixed solvent of DEG and TEG is present in an amount of 60 to 95% by weight of the total amount of inkjet ink is not limitative. Consequently, claim 1 at issue also encompasses compositions comprising an amount of DEG and TEG by weight falling under 60% by weight of the total, and thus below the lowest amount for which the appellant has demonstrated a lack of desirable properties (E3, ink 19, comprising 51.5% DEG and TEG by weight). It must be concluded that for those embodiments, the presence of a technical effect is even less credible.

2.3.8 Nor can the submissions of the respondent overturn this conclusion. In the first place, the question of whether the appellant actually conducted the experiments set out in E3 in view of the alleged non-availability of the resin "VYHD" amounts to mere allegation unsupported by substantiated evidence. That the commercial production of said resin may have ceased does not serve as sufficient evidence that the appellant, in one way or another, did not have access thereto. Similarly, the alleged table entry inconsistency (in the appellant's "Experiment 12 comp", supra; E3, Table 1B) could be explained by mere clerical error and cannot serve as evidence that the data underlying the experiment in question, or the experiment itself, was fabricated. Finally, while the board cannot explain the contradictory rating evaluation presented by the respondent in E5 for its preparation of "Ink 4" of E3, this single test is not sufficient to overcome the evidentiary weight of the body of test inks evaluated in E3, as well as the conclusions with respect to compositions having a DEG+TEG/total below 60%, as laid out above.

2.3.9 Furthermore, with respect to feature (ii) (the specific choice of pigment), although D2 does not disclose the specific quinacridone pigments recited in claim 1 at issue, it does discloses that quinacridone-based pigments may be employed with the compositions thereof (D2, paragraph [0032]). Furthermore, the patent itself refers to quinacridones as being conventionally used as raw materials for magenta pigments. Finally, at no point in the proceedings has the respondent argued that the presence of an inventive step could be linked to the use of said pigments. Consequently, it must be concluded that distinguishing feature (ii) also cannot

serve as a basis for acknowledging inventive step of the subject-matter of claim 1 at issue.

2.3.10 In conclusion, the alleged technical effects have been shown not to be present across the scope of claim 1, and consequently cannot be taken into consideration in determining the objective technical problem underlying the subject-matter of claim 1 at issue.

It follows from the above that the objective technical problem lies in the provision of further inkjet ink compositions to those provided in D2a.

2.4 Obviousness

2.4.1 The skilled person wishing to solve the above-mentioned problem, with a view to providing a mere further inkjet ink, would, in a routine manner, perform an arbitrary variation of the ratio of solvents disclosed in D2a (claim 3), and similarly, routinely choose from among the conventional and known quinacridone magenta pigments in order to arrive at the subject-matter of claim 1 at issue, without exercising inventive skill.

2.4.2 It follows that subject-matter of claim 1 of the main and sole request does not involve an inventive step.

3. The main and sole request is therefore not allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside

2. The patent is revoked

The Registrar: The Chairman:

N. Maslin M. O. Müller

Decision electronically authenticated