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Datasheet for the decision of 9 August 2013

Case Number: T 0183/12 - 3.3.09

Application Number: 02024292.1

Publication Number: 1308790

IPC: G03G 9/08, G03G 9/097, G03G 9/087

Language of the proceedings: EN

Title of invention:
Toner for developing electrostatic image, developer including the toner, container containing the toner, and developing method using the toner

Patent Proprietor:
Ricoh Company, Ltd.

Opponent:
Canon Kabushiki Kaisha

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes (unexpected improvement shown)"

Decisions cited:
T 0358/08, T 0197/86

Catchword:
-

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Case Number: T 0183/12 - 3.3.09

D E C I S I O N
of the Technical Board of Appeal 3.3.09
of 9 August 2013

Appellant: (Patent Proprietor)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 4 November 2011 revoking European patent No. 1308790 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman: W. Sieber
Members: J. Jardón Álvarez
F. Blumer

Summary of Facts and Submissions

I. This decision concerns the appeal filed by the patent proprietor against the decision of the opposition division to revoke European patent No. 1 308 790 granted to Ricoh Company, Ltd..

II. The patent was granted with 18 claims, independent claims 1 and 16 to 18 reading as follows:

"1. Toner particles comprising:

a binder resin;
a colorant; and
a particulate resin which is present at least on a portion of a surface of said toner particles, wherein said particulate resin has a glass transition temperature of from 50 to 90°C;

wherein the ratio (Dv/Dn) of a) the volume average particle diameter (Dv) of the toner particles to b) the number average particle diameter (Dn) thereof is from 1.00 to 1.40; and
wherein the covering ratio of 1) an area of the surface of said toner particles which are covered by said particulate resin to 2) the total area of said surface is from 1 to 90%."

"16. A two-component developer comprising:

a toner comprising toner particles according to any one of Claims 1 to 15; and a carrier."

"17. A developing method comprising:

developing an electrostatic latent image on an image bearing member with a developer including a toner to form a toner image thereon;
transferring said toner image onto a receiving material;
collecting a toner remaining on a surface of said image bearing member; and
returning the collected toner to the developer;
wherein said toner comprises toner particles according to any one of Claims 1 to 15."

"18. A toner container containing toner particles according to any one of Claims 1 to 15."

Claims 2 to 15 were dependent claims.

III. The opponent, Canon Kabushiki Kaisha, had requested revocation of the patent in its entirety on the grounds of Article 100(a) EPC, for lack of novelty and lack of inventive step, and Article 100(b) EPC. The documents cited during the opposition proceedings included:

D1: WO 01/60893 A1;

D1a: EP 1 283 236 A1 (English translation of D1);

D2: WO 87/01828 A1; and

D3: EP 1 026 554 A1.

IV. By its decision announced orally on 13 October 2011 and issued in writing on 4 November 2011, the opposition division revoked the patent.

The opposition division's decision was based on the sole request filed by the patent proprietor with letter dated 20 April 2009.

Claim 1 of this request read as follows:

"1. Toner particles comprising:

a binder resin which comprises a urea-modified polyester resin and an unmodified polyester resin;

a colorant;

a release agent; and

a particulate resin which is present at least on a portion of a surface of said toner particles, wherein said particulate resin has a glass transition temperature of from 50 to 90°C;

wherein the ratio (Dv/Dn) of a) the volume average particle diameter (Dv) of the toner particles to b) the number average particle diameter (Dn) thereof is from 1.00 to 1.40; and

wherein the covering ratio of 1) an area of the surface of said toner particles which are covered by said particulate resin to 2) the total area of said surface is from 5 to 80%."

Claims 2 to 12 were dependent claims and claims 13 to 15 corresponded to claims 16 to 18 of the granted claims (see point II above).

The opposition division held that the claims of this request fulfilled the requirements of Articles 84, 123(2) and (3), 83 and 54 EPC.

However, the opposition division revoked the patent because in its opinion the subject-matter of the claims lacked inventive step in view of D2 when combined with D1a and D3 or in view of D3 combined with D1a and D2. The opposition division held that the comparative examples of the patent did not convincingly demonstrate that a technical effect (improvement) of the claimed toners had its origin in the distinguishing features of the invention. In the absence of such an improvement, the provision of alternative toner particles was seen as lacking an inventive step in view of the combined teaching of the three documents mentioned above.

V. On 28 December 2011 the patent proprietor (in the following: the appellant) filed an appeal and on the same day paid the prescribed fee. The statement setting out the grounds of appeal was filed on 13 March 2012 together with the following further experimental evidence:

DEX: 'Comparative data' (6 pages).

The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the claims as submitted to the opposition division.

VI. With its reply dated 25 July 2012 the opponent (in the following: the respondent) argued that the appeal was inadmissible. If the board accepted that the appeal was

formally admissible, the respondent disputed the arguments submitted by the appellant, and requested that the appeal be dismissed. The respondent further requested that the experimental data submitted by the appellant be rejected as late-filed.

VII. On 23 April 2013 the board dispatched a summons to oral proceedings. In an attached communication the board expressed its preliminary opinion that the appeal was admissible. The board saw no reason not to admit DEX into the proceedings and indicated that the main issue to be discussed during the oral proceedings would be inventive step.

VIII. On 9 August 2013 oral proceedings were held before the board. As regards the admissibility of the appeal and the admittance of DEX, the respondent relied on its written arguments.

IX. The arguments presented by the appellant in its written submissions and at the oral proceedings, insofar as they are relevant for the present decision, may be summarised as follows:

- The closest prior art was represented by document D2. The patent in suit aimed to provide a toner having a combination of good properties, namely fine dot reproducibility, low temperature fixability and offset resistance, and which did not contaminate the image forming members used. Moreover it should produce sharp image for a long period of time and maintain good cleaning properties. This problem was solved by the claimed toner, which was distinguished from the toner disclosed in D2 at least by (i) the

particulate resin having a Tg from 50 to 90°C; (ii) the toner particles having a Dv/Dn ratio within the range of 1.00 to 1.40; and (iii) the binder resin of the toner particles comprising a mixture of urea-modified polyester and unmodified polyester.

- There was no hint to the claimed toner in the cited prior art. D1a did not deal with toner for electrophotography and it was silent about how to improve toner properties. Moreover the toner used in D3 did not have a core-shell structure and could not give any hint of how to modify the particulate resin of D2 in order to arrive at the claimed invention.

- Additionally, the experimental report DEX showed that only the claimed combination of features gave a toner having the required properties. Newly filed comparative examples A to F demonstrated that toners wherein one of the claimed features was outside the scope of the claims performed worse than the claimed toners. These examples confirmed the critical importance of the features of the claimed toners. Such a combination of features could not be deduced from the cited prior art.

X. The arguments of the respondent may be summarised as follows:

- The appeal was inadmissible. The requests filed with the appeal letter, namely to set aside the decision of the opposition division and to maintain the patent with claims to be submitted together with the statement of grounds for appeal, were contradictory

and unclear. The appeal did not fulfil the requirements of Rule 99(1)(c) EPC.

– The experimental data (DEX) submitted by the appellant together with the grounds of appeal should be rejected as late-filed.

– Concerning inventive step, the respondent agreed with the argumentation of the opposition division in the appealed decision. The claimed toner was an obvious alternative to the existing toners disclosed in documents D1a to D3. The claimed combination of features was a mere aggregation of technically independent features representing normal design options for the person skilled in the art. The newly filed data did not demonstrate any synergistic effect. The fact that the toner of comparative example A could not be fixed indicated that the examples were not valid. Document D1a could not be disregarded and the features of claim 1 overlapped with those of D1a.

XI. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 15 filed with letter dated 20 April 2009.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. *Admissibility of the appeal*

1.1 The appellant has requested in its notice of appeal that

"1) the decision be set aside;
2) the patent be maintained with the claims to be submitted together with the substantiation of appeal."

1.2 According to the respondent these requests are contradictory and unclear, and therefore infringe Rule 99(1)(c) EPC which prescribes that in the notice of appeal the subject of the appeal has to be defined. Hence, the appeal had to be considered inadmissible.

1.3 According to decision T 358/08 of 9 July 2009, Rule 99(1)(c) EPC is satisfied if the notice of appeal contains a request, which may be implicit, to set aside the decision in whole or (where appropriate) only as to part. Such a request has the effect of 'defining the subject of the appeal' within the meaning of Rule 99(1)(c) EPC. In the case of an appeal by an applicant or proprietor, it is not necessary that the notice of appeal should also contain a request for maintenance of the patent in any particular form. This is something which relates to "the extent to which [the decision] is to be amended", and which therefore may be submitted with the statement of grounds of appeal under Rule 99(2) EPC (see point 5 of the reasons).

1.4 In the present case, the notice of appeal contains the request "that 1) the decision be set aside". Even if it

was unclear in which form the appellant wanted the patent to be maintained, the requirements of Rule 99(1)(c) EPC are met. The board also sees no contradiction between requests 1) and 2) in the notice of appeal. If the board intended to maintain the patent in whatever form, it would 1) set aside the decision under appeal and 2) order that the patent be maintained.

1.5 The appeal is therefore admissible.

2. *Admissibility of DEX*

2.1 The respondent requested that the experimental report DEX, submitted by the appellant for the first time with the statement of the grounds of appeal, not be admitted into the proceedings as late-filed.

2.2 The experimental report was filed by the appellant as a reaction to the finding of the opposition division that the comparative examples in the patent in suit were not appropriate to demonstrate a technical effect of the claimed toners.

DEX contains experimental evidence dealing with this deficiency identified in the decision under appeal. Moreover it was filed with the statement of the grounds of appeal, *i.e.* at the earliest possible stage in appeal, in order to improve arguments already submitted by the appellant before the opposition division.

2.3 Under these circumstances, the board considers it appropriate to exercise its discretion to admit DEX into the appeal proceedings.

3. *Framework of the appeal*

The opposition division held in its decision that the claims now under consideration fulfilled the requirements of Articles 84, 123(2) and (3), 83 and 54 EPC. These findings have not been challenged by the respondent in the appeal proceedings. Consequently, the only remaining substantive issue in this appeal is inventive step.

4. *Inventive step*

4.1 The invention relates to electrophotographic toners. Claim 1 is now directed to toner particles comprising:

- (a) a binder resin which comprises
  - (a1) a urea-modified polyester resin and an unmodified polyester resin;
- (b) a colorant;
- (c) a release agent; and
- (d) a particulate resin present at least on a portion of the surface of said toner particles,
  - (d1) and having a glass transition temperature of from 50 to 90°C;

wherein

- (e) the ratio (Dv/Dn) of the volume average particle diameter (Dv) of the toner particles to the number average particle diameter (Dn) thereof is from 1.00 to 1.40; and
- (f) the covering ratio of the area of the surface of the toner particles covered by the particulate resin to the total area of said surface is from 5 to 80%.

4.2 Closest prior art

4.2.1 The board agrees with the opposition division and the appellant that document D2 is the closest prior art. Documents D1a and D3, also mentioned by the respondent as possible starting points for the assessment of inventive step, do not qualify as closest prior art for the following reasons:

- D1a is not specifically concerned with electrophotographic toners but relates generically to resin particles and resin dispersions having a uniform particle diameter. The description of D1a mentions "toners" in a list of other suitable uses for the resin particles described, including use as slush moulding resin, powder coatings, spacers for the manufacture of liquid crystal displays and other electronic parts, standard particles for electronic measuring instruments, hot melt adhesives and other moulding materials (see paragraphs [0001] and [0233]).

- D3 deals with toners, but with toners having a different structure. Whereas the claimed toner particles comprise primary particles which are covered with secondary particles of a specific particulate resin, the toners of D3 only comprise uncoated particles.

4.2.2 The closest prior art, D2, discloses in claim 1 toner particles for electrophotographic copying and electrostatic printing comprising an internally pigmented thermoplastic base particle having the

surface covered with a thermoplastic fine-grained polymerizate wherein 10 to 91% of its surface is covered by the fine-grained polymerizate. The toner particles also include a release agent (page 8, line 31). Thus, D2 discloses toners presenting features (a), (b), (c), (d) and (f) of the toner of claim 1.

4.3 Problem to be solved and its solution

4.3.1 According to the appellant, the technical problem to be solved by the patent in suit in view of the closest prior art D2 is the provision of a toner which has a good combination of fine dot reproducibility, low temperature fixability and offset resistance, which does not contaminate the image forming members and which can produce sharp images and maintain good properties for long periods of time (see paragraphs [0019] to [0021] of the patent specification).

4.3.2 As a solution to this problem the patent proposes the toner particles of claim 1 which differ from those of D2 by the following features:

- the binder resin comprises a mixture of urea-modified polyester and unmodified polyester (feature (a1));
- the particulate resin has a Tg of from 50 to 90°C (feature (d1)); and
- the toner particles have a Dv/Dn ratio in the range of 1.00 to 1.40 (feature (e)).

4.3.3 In order to show that this problem has been successfully solved by the claimed toners, the

appellant submitted with the statement of grounds of appeal comparative data (DEX) to demonstrate the criticality of the features distinguishing the invention over the closest prior art.

4.3.4 According to established jurisprudence, in the case where comparative tests are used to demonstrate an inventive step with an improved effect over a claimed area, the nature of the comparison with the closest state of the art must be such that the effect is convincingly shown to have its origin in the characterising feature(s) of the invention. For this purpose it may be necessary to modify the elements of comparison so that they differ only by such a characterising feature or features (see T 197/86, EPO OJ 1989, 371, points 6.1.2 and 6.1.3 of the reasons).

4.3.5 The comparative tests DEX filed by the appellant are pertinent, since they truly reflect the impact of the essential technical features distinguishing the claimed toners from the toners of D2, namely features (a1), (d1) and (e).

- Thus, comparative toner A, prepared using only a urethane-modified prepolymer 1 as a binder resin, was not suitable as a toner.

- Comparative toner B, prepared using only the unmodified low molecular weight polyester 1 as a binder resin, has drawbacks in that the toner causes filming problems while having poor offset resistance, and the image qualities such as image density and background fouling and the cleanability thereof deteriorate when a number of images are produced.

- Comparative toner C, having a Dv/Dn ratio of 1.45, which is greater than the upper limit of 1.40, has drawbacks in that the toner produces images with a low image density, background fouling and low resolution while causing the filming problem, and the toner has poor fixability and poor cleanability.

- Comparative toner D, prepared using a particulate resin having a Tg of 95°C, which is higher than the upper limit of 90°C, has drawbacks in that the toner has poor low temperature fixability, and the cleanability deteriorates when a number of images are produced.

- Comparative toner E, having a covering ratio of 3%, which is less than the lower limit of 5%, has drawbacks in that the toner causes the filming problem while having poor cleanability and poor offset resistance, and the toner produces images with a low image density, and background fouling when a number of images are produced.

- Lastly, comparative toner F, prepared using a particulate resin having a Tg of 45°C, which is lower than the lower limit of 50°C, has drawbacks in that the toner causes the filming problem while having poor cleanability and poor offset resistance, and the toner produces images with a low image density, and background fouling when a number of images are produced.

4.3.6 Thus, these comparative examples reveal the critical importance of the features distinguishing the claimed

toner particles from the toner of D2. Only when all the parameters specified in claim 1 are within the claimed values is the required combination of toner properties achieved.

4.3.7 The respondent contested the validity of these comparative examples because in its opinion it was not credible that the toner of comparative example A could not be fixed and because some partial results of the comparative examples were relatively close to the properties of the claimed toners.

4.3.8 The board finds this argument unconvincing. The patent in suit includes eleven working examples (examples 1 to 10 and 12) of toners according to the present claims and presenting the required combination of useful properties (see table 3, under "overall evaluation"). The new experimental data show indisputably that when one feature of the toner is outside the scope of the claims, this effect is not achieved (see DEX, table 6 under "overall evaluation"). In the absence of any experimental evidence to the contrary, it has to be assumed that this combination of properties is the result of the combination of features according to claim 1.

4.3.9 For these reasons, the board is satisfied that the technical problem underlying the patent in suit has been credibly solved by the proposed solution, *i.e.* the claimed toners.

4.4 Obviousness

4.4.1 It remains to be decided whether, in view of the available prior-art documents, it would have been obvious for the skilled person to solve the above defined technical problem by the means claimed.

4.4.2 Document D2 itself does not give any hint to the claimed solution. D2 is silent about the glass temperature of the polymers used for the fine-grained thermoplastic polymers used as particulate resins and about the ratio of the volume average particle diameter (Dv) to the number average particle diameter (Dn). Moreover, urea-modified polyester and unmodified polyester are not mentioned in D2 as possible polymers for the binder resin.

4.4.3 As discussed in point 4.2.1 above, the toner of D3 comprises only primary particles uncoated with a secondary (particulate) resin. These particles have a smooth surface and consequently D3 cannot give any incentive to modify the glass transition temperature of the particulate resin in order to solve the problem underlying the patent.

4.4.4 Lastly, D1a is not specifically concerned with electrophotographic toners but relates to resin particles and resin dispersions having a uniform particle diameter; it is silent about how the features of the particles would affect the electrophotographic properties of the toner. In this document the glass transition temperature of the particulate resin varies from 0°C to 300°C, more preferably from 50°C to 200°C (see [0065]) and gives no incentive to use the narrow

range of glass transition temperature claimed. Moreover, the particles of example 8 on which the respondent mainly relied, because it uses a resin with a Tg of 64°C, are actually made with a urethane-modified polyester and therefore according to an embodiment not suitable as an electrophotographic toner (cf. comparative toner A of DEX).

4.4.5 In view of the above, the board concludes that neither D3 nor D1a provides any incentive to modify the toner of D2 to arrive at the claimed toner.

4.4.6 The opposition division denied an inventive step essentially because, in view of the examples in the patent in suit, there was no technical effect caused by the distinguishing features of the claimed toners.

As explained above, this argument no longer applies in view of the experimental evidence filed during the appeal proceedings. The evidence filed during the appeal proceedings shows the criticality of the features distinguishing the claimed toner particles over the closest prior art.

4.5 Therefore the subject-matter of claim 1 and, for the same reason, that of claims 2 to 15 which are directly or indirectly dependent on claim 1, involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of claims 1 to 15 filed with letter dated 20 April 2009, after any necessary consequential amendment of the description.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber