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**Datasheet for the decision
of 30 October 2012**

Case Number: T 2037/09 - 3.3.09
Application Number: 99306861.8
Publication Number: 982636
IPC: G03G 9/08, G03G 9/097,
G03G 15/08, G03G 15/16
Language of the proceedings: EN

Title of invention:

Toner for use in electrophotography, image formation method
using the toner, method of producing the toner, and apparatus
for producing the toner

Patent Proprietor:

Ricoh Company, Ltd.

Opponent:

Canon Kabushiki Kaisha

Headword:

-

Relevant legal provisions:

EPC Art. 100(b), 100(c)

Relevant legal provisions (EPC 1973):

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Keyword:

"Sufficiency of disclosure (no, none of the requests)"

Decisions cited:

T 0593/09

Catchword:

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Case Number: T 2037/09 - 3.3.09

DECISION
of the Technical Board of Appeal 3.3.09
of 30 October 2012

Appellant: Canon Kabushiki Kaisha
(Opponent) 30-2, Shimomaruko 3-chome
Ohta-ku
Tokyo 146-8501 (JP)

Representative: TBK
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D-80336 München (DE)

Respondent: Ricoh Company, Ltd.
(Patent Proprietor) 3-6, Nakamagome 1-chome
Ohta-ku
Tokyo 143-8555 (JP)

Representative: Lamb, Martin John Carstairs
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 3 August 2009
rejecting the opposition filed against European
patent No. 982636 pursuant to Article 101(2)
EPC.

Composition of the Board:

Chairman: W. Sieber
Members: N. Perakis
F. Blumer

Summary of Facts and Submissions

I. Mention of the grant of European patent No. 0 982 636 in the name of Ricoh Company, Ltd. was published on 14 December 2005 (Bulletin 2005/50). The patent was granted with 21 claims, independent claim 1 reading as follows:

"1. A toner comprising toner particles and a fluidity-imparting agent, said toner particles having an average circularity of 0.93 to 0.97, with a residue of said toner being in an amount of 10 mg or less when 100 g of said toner is sieved with a sieve, the openings of which have a dimension of 25.8 micrometres and the diameter of the wires of which is 25.0 micrometres (500-mesh sieve), wherein said toner exhibits a charge rise-up ratio Z of 70% or more, which is calculated from formula (1):

$$Z(\%) = (Q20/Q600) \times 100$$

wherein Q600 is a quantity of charge of said toner when said toner and a carrier are mixed and stirred for 10 minutes, with a concentration ratio of said toner in the mixture of said toner and said carrier being set at 5 wt% or less at normal temperature and normal humidity, and Q20 is a quantity of charge of said toner when said toner is mixed with said carrier for 20 seconds under the same conditions as for said Q600, said toner being for use in an electrophotographic, image formation method using an intermediate image transfer method which comprises (1) a first image transfer step of transferring a toner image formed on a toner image bearing member from said toner image bearing member to

an endless-shaped intermediate image transfer member so as to form a toner image thereon, and (2) a second image transfer step of transferring said toner image from said intermediate image transfer member to an image transfer material."

II. An opposition was filed by Canon Kabushiki Kaisha requesting revocation of the patent in its entirety on the grounds that the claimed subject-matter was neither novel nor inventive (Article 100(a) EPC), that the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC) and that the subject-matter of the claims as granted extended beyond the content of the application as filed (Article 100(c) EPC).

III. The opponent filed *inter alia* the following document:

D2: <http://www.lenntech.com/deutsch/Drahtgewebe.htm>,
5 September 2006.

The patent proprietor filed *inter alia* the following document:

D12: ASTM Standard E 11-95.

IV. By its decision announced orally on 2 July 2009 and issued in writing on 3 August 2009, the opposition division rejected the opposition because it considered that none of the grounds for opposition raised by the opponent prejudiced the maintenance of the patent as granted.

V. On 9 October 2009 the opponent (appellant) filed a notice of appeal against the decision of the opposition division and paid the appeal fee on the same day. The statement setting out the grounds of appeal was filed on 11 December 2009. The appellant reiterated the objections raised before the opposition division and requested that the decision of the opposition division be set aside and that the patent be revoked in its entirety. In support of its argument regarding insufficient disclosure it submitted new documents, including D15, which illustrated the ultrasonic vibration sieve referred to in paragraph [0041] of the opposed patent:

D15: Ultrasonic Vibration Sieve: "TMR-50-IS Type" made by Tokuju Kosakusho Co., Ltd.

VI. By letter dated 19 April 2010, the patent proprietor (respondent) filed observations on the appeal, including an auxiliary request.

VII. By letter dated 13 December 2010, the appellant submitted further arguments and an additional document illustrating a 500-mesh sieve before and after having sieved a toner using ultrasonic vibration:

D16: photographs A to J.

VIII. By letter dated 23 September 2012, the respondent filed further arguments and claims for a new first auxiliary request and new second and third auxiliary requests.

- Claim 1 of auxiliary request 1 was derived from granted claim 1 except that the sieve was defined as

follows:

"the openings of which have a dimension of **25** micrometres and the diameter of the wires of which is **25** micrometres (500-mesh sieve)".

- Claim 1 of auxiliary request 2 was derived from granted claim 1 and further defined the fluidity-imparting agent:

"and wherein the fluidity-imparting agent comprises hydrophobic silica particles in an amount of 0.3 to 1.5 wt.% and hydrophobic titania particles in an amount of 0.3 to 1.5 wt.%".

- Claim 1 of auxiliary request 3 was derived from granted claim 1 and contained the amendments to claim 1 of auxiliary requests 1 and 2.

IX. On 2 October 2012 the board issued a communication informing the parties of its preliminary, non-binding opinion.

X. Oral proceedings were held before the board on 30 October 2012.

XI. The relevant arguments put forward by the appellant in its written submissions and during the oral proceedings may be summarised as follows:

Article 100(c) EPC

- The subject-matter of claim 1 extended beyond the content of the application as filed since the definition of the sieve in the granted claim, namely as having openings of 25.8 micrometres and a

diameter of the wires of 25.0 micrometres, was not disclosed in the application as originally filed. The definition disclosed in the application as filed was that the sieve was provided with a 500-mesh screen (the opening diameter: 25 µm, the thickness of wires: 25 µm and the material: SUS316). Even if a person skilled in the art recognised an inconsistency between the above definitions, it was neither clear nor obvious which one was correct. In particular, no reference to the ASTM standard (D12) was made in the patent in suit so that a person skilled in the art would not find the least indication therein for an unambiguous correction of the inconsistency.

- Furthermore, the skilled person was not supposed to look to the history of the file in order to identify a possible source of error (in the present case the definition of the 500-mesh sieve in terms of SI units).

Article 100(b) EPC

- The claimed invention was not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art since the patent failed to teach a reliable measurement of the residue of the toner when sieved with a sieve having openings of 25.8 micrometres and diameter of the wires of 25.0 micrometres (500-mesh sieve). It was totally silent on the conditions of sieving in terms of vibration time despite the fact that it was expected that the amount of the residue changed with vibration time (see D15).

- If the argument of the respondent was accepted that sieving should be performed until a constant weight of the residue was reached, paragraph [0036] in the patent itself made it clear that sieving destroyed agglomerated toner particles, which were actually the particles which are determined by the "residue parameter" in claim 1 (see paragraph [0041]). Therefore the patent did not sufficiently describe how to measure a crucial parameter of the invention, namely the residue of the toner, thus making it impossible to rework the patent.

 - Furthermore, the patent completely failed to describe a method of accurately measuring the weight of the residue of the toner on the 500-mesh sieve down to milligrams (see D15 and D16) when the device "Vibro Separator with Ultrasonics TMR-50-IS Type[®]" was used.

 - Additionally, there was not sufficient information in the patent regarding the measuring of the charge rise-up ratio and the average circularity of the toner particles as a whole.
- XII. The relevant arguments put forward by the respondent in its written submissions and during the oral proceedings may be summarised as follows:

Article 100(c) EPC

- The subject-matter of claim 1 did not extend beyond the content of the application as filed. Granted claim 1 still defined the sieve as a 500-mesh sieve.

Thus the skilled person, based on his general technical knowledge illustrated by D12, would recognise that the other definition of the sieve in said claim, i.e. a sieve having openings of 25.8 micrometres and a diameter of the wires of 25.0 micrometres, was wrong and that the correct values were those calculated using D2 and disclosed in the description as filed (paragraph [0041]).

Article 100(b) EPC

- The claimed invention was disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.
- It was self-evident and natural for the skilled person to sieve the toner using a 500-mesh sieve until no more material came through the sieve. Therefore it was not necessary to indicate the vibration time for the sieving.
- The moderate sieving with a 500-mesh sieve according to paragraph [0041] of the patent was not the same as the aggressive sieving regime disclosed in paragraphs [0032] to [0036], which resulted in the destruction of the aggregates (caused to collapse in the course of the sieving step but re-agglomerated afterwards). The first corresponded to the screening of the toner during manufacture, whereas the second corresponded to a test of the finished product (which was to screen out this kind of agglomerate and retain it as a residue which could then be measured and used to test the agglomeration-forming properties of the toner).

- It was self-evident and very easy to measure the weight of the toner residue, which could be done in several ways.
- The charge rise-up ratio might be very broadly defined. Nevertheless the skilled person could define this parameter required in claim 1.
- The skilled person was instructed in paragraph [0040] of the patent that the circularity of toner particles was measured using a commercially available flow particle image analyser. This applied of course to the toner of claim 1 and not only to the residue of the toner.

XIII. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

XIV. The appellant (patent proprietor) requested that the appeal be dismissed, or, on an auxiliary basis, that the patent be maintained on the basis of any of the first, second or third auxiliary requests, all as filed by letter dated 28 September 2012.

Reasons for the Decision

1. The appeal is admissible.
2. Article 100(c) EPC

2.1 Granted claim 1 requires that the residue content of the toner is "in an amount of 10 mg or less when 100 g of said toner is sieved with a sieve, the openings of which have a dimension of 25.8 micrometres and the diameter of the wires of which is 25.0 micrometres (500-mesh sieve)".

The board concurs with the appellant that there is no explicit disclosure in the application as filed of a sieve having openings of 25.8 micrometres and a wire thickness of 25.0 micrometres. The last paragraph on page 18 of the description as filed discloses that "[T]he residue of the toner which remains on the meshes of the sieve is collected, using an ultrasonic vibration sieve (Trademark "VIBRO SEPARATOR WITH ULTRASONICS TMR-50-IS Type" made by Tokuju Kosakusho Co., Ltd.), provided with a 500-mesh screen (the opening diameter: 25 μm , the thickness of wire: 25 μm , and the material: SUS316), with vibrations with a frequency of 36 kHz".

The board concurs further with the appellant that the definition in granted claim 1 is not equivalent to the definition given in the above-mentioned paragraph in the application as filed.

2.2 It is recalled that claim 1 as filed merely specified that the sieve is a 500-mesh sieve. The designation of "500-mesh" was amended to a SI designation, the original "500-mesh" being put in brackets in granted claim 1. Why the originally disclosed value of 25 μm for both the opening diameter and the wire thickness was not taken over but some recalculations to one decimal place were done remains unknown.

2.3 However, contrary to the assertions of the appellant, the person skilled in this art would be aware that the sieve size is normally given in "mesh". The skilled person would also know that values for the nominal sieve opening and the nominal wire diameter in a 500-mesh sieve are identical. This is apparent from table 1, penultimate line of D12, the ASTM standard specification for wire cloth and sieves for testing purposes, where 25 μm are given for both parameters. This value exactly corresponds to the value indicated on page 18 of the application as filed. If one were to indicate this value to one decimal place, the precise value would presumably be 25.4 μm , resulting from the conversion of 0.0010 inch into an SI unit.

2.4 On the basis of his common general knowledge the skilled person would therefore immediately recognise that the definition of the sieve in mesh, which was part of the claims from the beginning, is the correct one and that the indication of 25.8 μm for the openings and 25.0 μm for the wire thickness is erroneous. This is different from the situation referred to by the appellant, in which the skilled person is confronted with two inconsistent definitions in a claim and is not provided with any clue to guide him to select the correct one.

2.5 In summary, when reading claim 1 as granted the skilled person would realise that the sieve definition given in micrometers is erroneous and that the "original" definition 500 mesh was meant. Therefore the board agrees with the respondent that the amendments to the

definition of the sieve filed during prosecution of the patent application do not add subject-matter.

3. Article 100(b) EPC

3.1 Three objections were raised in relation to the issue of insufficient disclosure, namely that

(a) the patent failed to teach a reliable measurement of the residue of the toner when sieved with a 500-mesh sieve;

(b) the patent did not provide the skilled person with sufficient information for measuring the charge rise-up ratio;

(c) the patent did not sufficiently disclose a method for determining the average circularity of the toner particles as a whole.

3.2 With regard to the first objection, claim 1 requires that the residue of the toner be 10 mg or less when 100 g of the toner is sieved with a 500-mesh sieve.

The appellant argued that the skilled person could not reliably measure this parameter, which is a prerequisite for achieving the aim of the invention, namely providing a toner which is capable of producing high-quality toner images, without being affected by any toner dust, and free of local non-image transferred spots (paragraph [0012] of the patent specification). It argued that the patent in suit did not disclose all the necessary sieving conditions, in particular the vibration time. As could be seen from D15 (table and

graph), the amount of residue was dependent on the vibration time. It furthermore argued that the patent in suit did not disclose by what method a toner residue of 10mg or less could reliably be weighed when the heavy equipment specified in the patent in suit was used. In this context reference was made to the photographs in D15 and D16.

3.3 The respondent did not contest that the vibration time determined the amount of the residue in the sieving operation, but argued that it was natural for the skilled person to continue sieving until no more material came through the sieve.

3.4 However, in view of the information given in the patent itself, the board cannot accept this explanation.

3.4.1 Thus, it is stated in paragraph [0036] that in the preparation of the toner particles a step of removing aggregated toner particles and/or coarse particles from the toner is carried out using a sieve. Furthermore it is stated in that paragraph that "[T]he inventors of the present invention investigated the mechanism of this step in detail and discovered that in this step, coarse particles with a diameter larger than each opening of the meshes of the sieve can be in fact removed, and the aggregated toner particles are **caused to collapse in the course of this step and pass through the meshes of the sieve**, but again aggregate to form aggregated toner particles after they have passed through the sieve. The result is that such aggregated toner particles cannot be removed from the toner even when the toner is caused to pass through the sieve" (emphasis added).

Hence this passage makes it clear that sieving destroys aggregated toner particles so that they pass through the sieve.

3.4.2 On the other hand, when it comes to the relevant parameter, namely the toner residue remaining on a 500-mesh sieve, paragraph [0041] of the patent in suit states: "The residue of the toner which remains on the meshes of the sieve is collected [...] . The residue contains the above-mentioned aggregated toner particles and coarse particles".

3.4.3 It is clear from the above that one has to measure the amount of aggregated particles which are actually destroyed during the measuring method. Therefore it is self-evident that the longer the toner particles remain on the moving sieve the more aggregated toner particles are destroyed by the energy impact acting on them.

3.4.4 The respondent argued that a specific non-aggressive (i.e. non-invasive) sieving had to be used when determining the parameter required in claim 1 whereas a more aggressive sieving was employed in the preparation step mentioned in paragraph [0036] of the patent. However, neither paragraph [0036] nor paragraph [0041] discloses sieving conditions, including vibration time, which would characterise one of the sieving steps as aggressive and the other as non-aggressive. Therefore the argument of the respondent is an unfounded allegation.

3.5 Consequently, at the filing date of the opposed patent, the skilled person would not have known what sieving

conditions had to be applied when determining the toner residue.

In view of the fact that the toner residue strongly depends on the vibration time (as demonstrated by D15) and in the absence of any knowledge of what sieving conditions (including vibration time) to apply, the skilled person would thus not be able to establish whether a given toner has a residue content as required according to claim 1 in order to obtain the desired high quality toner images. Hence, because of the undefined "residue parameter" the skilled person, when trying to carry out the invention underlying the opposed patent, would be left having to find out what are in fact the true criteria for the sieving operation and, in the end, what is the relevant parameter for achieving the high quality images. In view of the numerous possible sieving conditions, this would amount to an undue burden to solve the problem addressed in the opposed patent. The teaching of the patent in effect is at most a suggestion to perform a research programme in order to identify suitable toner materials (in this context see T 593/09 of 20 December 2011, point 3 of the Reasons, not published in the OJ EPO).

- 3.6 In summary, the requirement that the invention has to be disclosed "in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art" is not met (Article 100(b) EPC). Consequently, the main request is not allowable.

- 3.7 Under these circumstances there is no need to elaborate on the other objections raised within the context of Article 100(b) EPC, namely accurate weighing of the toner residue, charge rise-up ratio and circularity.
4. The first, second and third auxiliary requests of the respondent also contain in their respective claim 1 the feature of the toner residue as defined in claim 1 of the main request. Thus, for the same reason as given for the main request, the auxiliary requests are not allowable either.

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:

M. Cañueto Carbajo

W. Sieber