

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAKUYA KADOTA,
Appellant

Appeal 2008-3821
Application 11/296,337¹
Technology Center 1700

Decided: August 18, 2008

Before ADRIENE LEPIANE HANLON, CAROL A. SPIEGEL, and
MARK NAGUMO, *Administrative Patent Judges*.

NAGUMO, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ Application 11/296,337 filed 8 December 2005, titled *Toner and Image forming Apparatus Using the Same*, referred to as the “337 Specification” and cited as “Spec.”. The real party in interest is listed as Seiko Epson Corporation. (Appeal Brief filed 15 June 2007 (“Br.”), at 2.)

A. Introduction

Takuya Kadota (“Kadota”) timely appeals from the final rejection of claims 1 and 13 under 35 U.S.C. § 102(b) in view of Okada.² (Br. 4.) Claims 2-12 have been withdrawn from consideration (*id.*) and are not before us. We AFFIRM but enter a NEW GROUND OF REJECTION.

B. Findings of Fact (FF)

Findings of fact throughout this Decision are supported by a preponderance of the evidence of record. Characterizations (“CC”) of arguments by the Examiner and by Kadota are numbered sequentially with findings of fact but are referred to distinctly.

1. Claim 1 of the 337 Specification reads:

A toner comprising, at least,
a plurality of mother particles,
a plurality of silicas, and

a plurality of titanium oxide particles, wherein

the liberated mother particle ratio of liberated mother particles
without titanium oxide particle adhering thereto is set to be
30% or less and

the liberated titanium oxide particle ratio of liberated titanium
oxide particles adhering to none of the mother particles is set to
be 5 % or less.

(Claims App., Br. 14; paragraphing and emphasis added.)

² Hideki Okada *et al.*, *Toner and Development Unit and Image Forming Apparatus Using the Same*, U.S. Patent 6,146,802 (14 November 2000).

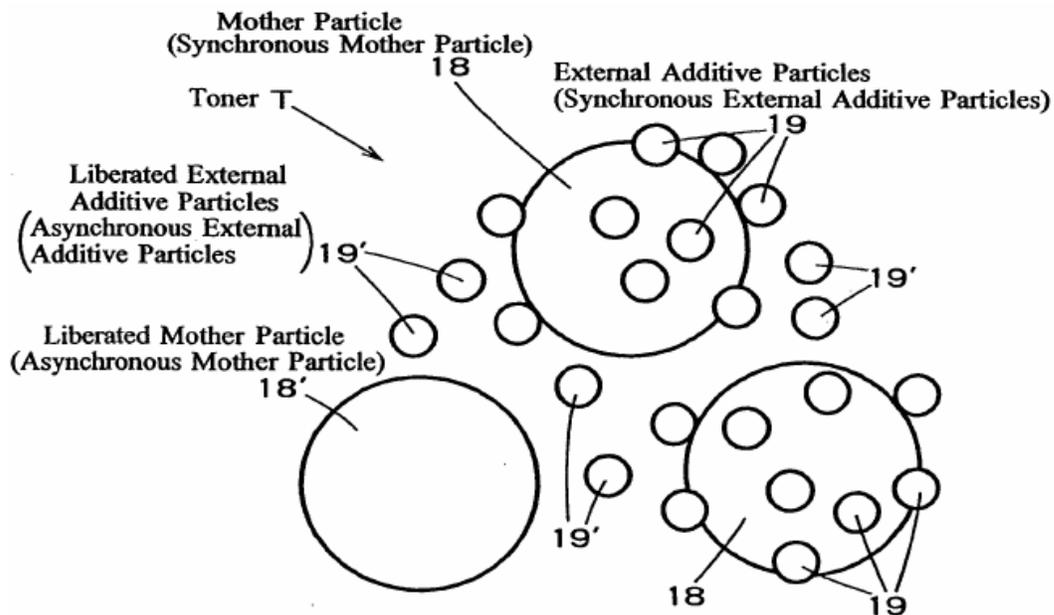
2. Claim 13 depends from claim 1 and requires that the titanium oxide particles be surface treated with a silane coupling agent.

3. In most conventional color toners, according to the 337 Specification, and:

[a]s shown in Fig. 2(b), actually there are mother particles **18** and external additive particles **19** which adhere to each other . . . liberated mother particles **18'** to which no external additive particle **19** adheres, and liberated external additive particles **19'** adhering no mother particles **18** and they exist in the mixed state.

(Spec. 5:13-23.)

4. Figure 2(b) of the 337 Specification is reproduced below:



{Kadota Figure 2(b) is said to show a sketch of a toner.}³

³ The text in curly braces following the Figures is provided to ensure compliance with section 508 of the U.S. Rehabilitation Act for publication of this Decision on the USPTO website pursuant to the Freedom of Information Act. It is not part of the Decision.

5. According to the 337 Specification, silica (SiO_2) is added conventionally as an external additive **19** to prevent the occurrence of filming caused by liberated mother particles fusing to toner contact members. (Spec. 4:24-26; 5:24-6:3.)
6. The 337 Specification instructs further that titanium oxide (TiO_2) is added conventionally as an external additive **19** as a charge control agent to stabilize the charge of the toner **T**. (Spec. 5:1-4.)
7. An excess of liberated mother particles **18'** is said to lead to excessive charge. (Spec. 7:15-17.)
8. Binding too much TiO_2 to mother particles, however, is said to lead to insufficient charge, leading to image defects and toner scattering. (Spec. 7:19-23.)
9. Moreover, liberated TiO_2 particles are said to adhere to toner contact members, thereby facilitating filming. (Spec. 7:24-27.)
10. According to the 337 Specification, in one embodiment, [t]he liberated mother particle ratio of liberated mother particles **18'** without titanium oxide particle **19** adhering thereto is set to be 30 % or less. The liberated mother particle ratio is a percentage of the amount of the liberated mother particles **18'** relative to the entire amount of the toner. In addition, the liberated titanium oxide particle ratio of liberated titanium oxide particles **19** adhering to none of the mother particles **18** is set to be 5 % or less. The liberated titanium oxide particle ratio is a percentage of the amount of the liberated titanium oxide particles **19** relative to the entire amount of the toner.
(Spec. 40:7-15.)

11. The 337 Specification indicates that external additives may be treated with a silanizing agent such as HDMS (hexadimethyldisilazane) to make them hydrophobic to improve their environmental stability, fluidity and charging properties. (E.g., Spec 16:21-25; 35:14-18; 40:15-19.)

12. The Examiner finds that

Okada teaches a toner comprising a mother particle and an external additive where the amount of liberated external additive and liberated mother particles is in the same ranges as claimed (claims 2 and 9). Okada specifically teaches titanium oxide as an external additive (col. 23 line 18). Okada also teaches that two or more additives may be used and that additional silica particles may be surface treated with a silane coupling agent (Col. 20 lines 17-45 and col. 23 lines 10-25).

(Ans. 3).

13. The Examiner thus concludes that Okada describes subject matter within the scope of claims 1 and 13. (Ans. 3.)

14. The toner of appealed claim 1 comprises mother particles, silicas, and titanium dioxide particles and requires "the liberated mother particle ratio of liberated mother particles without titanium oxide particles adhering thereto" to be 30% or less (Claims App., Br. 14).

15. Kadota argues that Okada claim 9 does not suggest how many mother particles are attached only to silica particles, only to titanium oxide particles, or to neither silica nor titanium oxide particles and, therefore, cannot teach the recited liberated mother particle ratio of

liberated mother particles “without titanium oxide particles adhering thereto.” (Br. 11.)

16. Kadota does not dispute the Examiner’s findings regarding Okada claim 2.

17. Okada claim 9 depends from independent Okada claim 7.

18. Okada claim 7 reads in relevant part:

A toner comprising:

a plurality of mother particles; and

a plurality of external additive particles to be attached to said mother particles, and

including toner particles comprising said mother particle having attached thereto said external additive particles and toner particles comprising said mother particle not having attached thereto said external additive particles, wherein an inclination . . . is not smaller than 0.4.

(Okada 52:7-20.)

19. Okada claim 9 reads:

The toner according to claim 7, wherein a percentage of the number of said toner particles each comprising said mother particle having attached thereto said external additive particles and the number of the entire toner particles is not lower than 60%.

(Okada 52:33-37.)

20. According to Okada, “[t]he sum of the count of synchronous mother particles (synchronous toner particles) and the count of asynchronous mother particles is defined as the entire toner particles.”

(Okada 34:24-27 and 40:20-23.)

21. Okada defines “synchronous” mother particles as those that are attached to external additive particles, and “asynchronous” mother particles as mother particles that are not attached to external additive particles. (Okada 18:8-14 & 27-34.)

22. The terms “synchronous” and “asynchronous” arise from the method of analysis, which measures time-resolved emission spectra of the toner to determine whether and to what extent mother particles are attached to external additive particles. (Okada 17:44-19:17.)

23. According to Okada, external additives “include a variety of materials having surfaces subjected to a process of obtaining hydrophobic characteristics[s].” (Okada 20:17-19.)

24. Okada indicates that silane coupling agents are useful hydrophobic surface treatment agents, and that they prevent deterioration in electrification characteristics and fluidity by preventing the adsorption of water. (Okada 20:22-32.)

25. Okada teaches that when θ [theta], the ratio of the equivalent particle size of the external additive to the equivalent particle size of the mother particles, is not larger than 0.6, the external additive is not so easily liberated, and less filming occurs. (Okada 22:7-26; cf. Spec. paragraph bridging 30-31 (describing θ .)

26. Okada teaches further that “[t]he present invention is not limited to the silica fine particles which are employed as the external additives. . . . In the present invention, two or more kinds of external additives may be used. In such cases, it is sufficient if at least one of them satisfies the above-described relationship” (Okada 23:11-26.)

27. More particularly, Okada describes an embodiment in which:

θ is not larger than 0.6 and the number of the asynchronous external additives **13** shown in Fig. 6 is not higher than 5% with respect to the overall number of toner particles. Since the proportion of the asynchronous external additives **13** is determined as described above, re-coagulation of the external additives **13** can be prevented. Therefore, filming can be prevented.

(Okada 23:32-38.)

28. Okada teaches that “[w]hen titanium oxide is employed to serve as the external additives [sic], the emission spectrum of Ti must be detected and processed.” Okada 23:18-20.)

29. Thus, the synchronous/asynchronous [attached/free] measurement is specific to the type of external additive.

30. Okada does not expressly describe toners having both silica (SiO_2) and titanium oxide (TiO_2) external additives.

31. All of the examples provided by Okada appear to have only SiO_2 particles as the external additive.

32. In Example 1, Okada presents five tests in which the ratio of asynchronous toner ranges from 36.1 to 6.8 percent by number.

(Okada 36:40-53.)

33. Summarizing the results, Okada states:

When the proportion of asynchronous toner was 20% by number or lower, satisfactory results were obtained such that fixation of toner was completely prevented and no unevenness in the density of images occurred. When the proportion of the asynchronous toner was 30% by number or lower, relatively satisfactory results were

obtained. It is preferable that the proportion is 20% by number or lower.

(Okada 37:10-16.)

34. According to Okada, the method is disclosed in "New Method of Analyzing Additive, Analysis of Toner by Particle Analyzer", Suzuki and Takahara, collection of "Japan Hardcopy '97", (95-th) annual meeting of Electrophotography Association, Jul. 9 to 11, 1997. (Okada 17:52-58.)

35. Kadota reports using the same method of analysis disclosed in the same article cited by Okada. (Spec. 27-31.)

36. Kadota argues the term "number of the entire toner particles", as recited in Okada claim 9, means the total number of all particles (mother particles attached to external additive particles + mother particles not attached to external additive particles + unattached external additive particles) and presents calculations of percents based on a "hypothetical toner." (Br. 8-11.)

37. Kadota does not present any evidence from the Okada specification in support of its interpretation of the term "number of entire toner particles."

38. Nonetheless, Kadota concludes that appealed claim 1 is not anticipated and would not have been obvious over Okada. (Br. 11.)

39. Kadota also argues that the Examiner's rejection is legally flawed because disclosure of a broader, encompassing range is not necessarily a disclosure of a narrower claimed range, citing *Atofina v. Great Lakes Chemical Corp.*, 441 F.3d 991, 1000 (Fed. Cir. 2006).

40. The assignee of Okada is listed as Seiko Epson Corporation.

41. Kadota does not challenge the status of Okada as prior art against the appealed claims.

C. Discussion

On appeal, the procedural burden is on the Appellant to come forward with facts or arguments demonstrating reversible error in the Examiner's rejection. *See Gechter v. Davidson*, 116 F.3d 1454, 1460 (Fed. Cir. 1997) ("[W]e expect that the Board's anticipation analysis be conducted on a limitation by limitation basis, with specific fact findings for each contested limitation and satisfactory explanations for such findings.") (emphasis added).

Section 102(b) reads in relevant part, "A person shall be entitled to a patent unless— . . . (b) the invention was patented or described in a printed publication . . . more than one year prior to the date of the application for patent in the United States."

35 U.S.C. § 102(b) (2002). "Anticipation requires a showing that each limitation of a claim is found in a single reference, either expressly or inherently." *Atofina*, 441 F.3d at 999 (citation omitted.)

In other words, description in the prior art of a single embodiment within the scope of a claim suffices to anticipate. However, as the Federal Circuit explained in *Atofina*, "the disclosure of a range is no more a disclosure of the end points of the range than it is of each of the intermediate points." *Id.* at 1000.

Although cases can be found supporting the proposition that description of a small genus can be a description of the individual species that make up that genus (e.g., *In re Schaumann*, 572 F.2d 312, 316-17 (CCPA 1978)), even when the genus has several hundred species (e.g., *In re Petering*, 301 F.2d 676, 681 (CCPA 1962)⁴, the facts of those cases provided something more than the mere disclosure of the genus. In the context of the written description requirement, this “something more” has been described as a “blazemark.” *In re Ruschig*, 379 F.2d 990, 995 (CCPA 1967) (“We are looking for blaze marks which single out particular trees. We see none.”) The same considerations, highlighted by the presence of the word “described” in section 102(b) apply in the context of anticipation.

Here, the Examiner relies on claims 2 and 9 of Okada to reject claims 1 and 13 of the 337 application. The Examiner, however, has not referred to the Okada specification to explain what the Okada claims might mean when read in light of that specification. Nor has the Examiner directed our attention to any teachings in the specification indicating a preference for toners wherein the liberated mother particles (which we understand the Examiner and Kadota

⁴ In *Petering*, the court explained: “We think the Karrer patent, as a printed publication, describes to one skilled in this art not only the broad class but also this much more limited class within that broad class, and we think it is immaterial that Karrer did not expressly spell out the limited class as we have done here. It is our opinion that one skilled in this art would, on reading the Karrer patent, at once envisage each member of this limited class, even though this skilled person might not at once define in his mind the formal boundaries of the class as we have done here.”

agree are those that do not have adhered titanium oxide) are 30% or less, as recited by appealed claim 1. Indeed, all of the examples in Okada have only silica as the external additive particle.

On the record established by the Examiner, as pointed out by Kadota, the Examiner failed to establish a prima facie case of anticipation. We therefore REVERSE the rejection under § 102(b).

We have considered Kadota's other arguments, which make up the bulk of its brief, but find them to be without merit. First, Kadota has not supported its interpretation of the term "entire toner particles" as being each and every particle present in the toner by reference to evidence of record. Moreover, this interpretation is not immediately plausible because toners, as the name suggests, are usually colored so an image can be formed on a substrate. Thus, calling a minute colorless silica particle a "toner particle" is incongruous. Although the "plain language" of the claim could be read as urged by Kadota, the plain language does not demand to be read in that way. Our own review of the Okada disclosure indicates that the only definition of the term "entire toner particle," which is presented twice in the Okada specification, refers only to "synchronous" and "asynchronous" mother particles, which are synonymous with mother particles with attached external particles and with mother particles without any attached external particles, respectively. (FF 20-22.) Thus, the preponderance of the evidence supports the interpretation of the term "entire toner particles" as being the sum of the attached and unattached mother particles. Accordingly, we accord no weight to any of Kadota's arguments based on its "all particles" reading.

Similarly, Kadota's argument that Okada fails to teach ratios of liberated mother particles "without titanium oxide particles adhering thereto" because Okada does not suggest how many mother particles are attached to what kind of external additive particles fails because it is unsupported by any credible evidence or explanation. The record indicates that a very large number of external additive particles are added to a very large number of mother particles and mixed vigorously using a high-speed fluidization mixing machine. (Okada 20:48; identical language at Spec. 34:13-14.) Under such conditions, it would have been expected that two species of external additive, both preferably made hydrophobic by silanization, would have been distributed randomly on the mother particles, weighted by any preferential attachment of one additive relative to the other. We also note that Kadota does not appear to provide any breakdown of the ratios of liberated mother particles in the toners it describes in Tables 2 and 7 ($\text{TiO}_2/\text{SiO}_2$) and in Table 3 ($\text{Al}_2\text{O}_3/\text{SiO}_2$) of its own specification. Thus, we find this argument unpersuasive of reversible error.

Finally, Kadota "submits that claim 1 is not anticipated (and would not have been obvious over) Okada." (Br. 11; FF 38.) While we agree that a prima facie case of anticipation has not been established, the issue of obviousness has not been put before us by the Examiner. We note, however, that obviousness frequently arises in cases where the prior art discloses an overlapping or encompassing range. *See, e.g., In re Harris*, 409 F.3d 1339, 1341 (Fed. Cir. 2005) ("a prima facie case of obviousness arises when the ranges of a

claimed composition overlap the ranges disclosed in the prior art.”) (citations omitted); *In re Peterson*, 315 F.3d 1325, 1329–30 (Fed. Cir. 2003) (“Selecting a narrow range from within a somewhat broader range disclosed in a prior art reference is no less obvious than identifying a range that simply overlaps a disclosed range.”)

A review of Okada, which, being commonly assigned with Kadota’s 337 application to Seiko Epson Corp., we assume is familiar to Kadota, provides ample reason to conclude that Okada renders the subject matter on appeal at least obvious. First, Okada teaches that two or more external additives may be used, mentioning titanium oxide specifically. (Okada 23:18-20; FF 26.) Second, Okada teaches that when the ratio of asynchronous toner is less than 30% by number, images are satisfactory, and when that ratio is 20% by number or less, “fixation of toner was completely prevented and no unevenness in the density of images occurred.” (Okada 37:10-12; FF 32.) Okada also teaches that re-coagulation of external additives and filming can be prevented when the number of asynchronous particles (i.e., external particles not attached to mother particles) is not higher than 5% with respect to the overall number of toner particles. (Okada 23:18-20; FF 27.) Finally, Okada teaches that external additives are advantageously surface treated with silane coupling agents. (Okada 20:17-32; FF 23-24.) Thus, the various limitations of claims 1 and 13 are within the general scope of the teachings of Okada.

Okada does not expressly teach the combination of silica and titanium oxide required by the claims. The predecessor to our reviewing court explained that “rejections under 35 U.S.C. § 102 are

proper only when the claimed subject matter is identically disclosed or described in the prior art.” *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972). A proper anticipatory reference, the court continued, “must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.” *Id.* We lack the Examiner’s familiarity with the art, and the record has not been developed by a sufficiently detailed exchange of views between the Examiner and Kadota to enable us to determine whether the disclosures in Okada are sufficient to direct those skilled in the art to the claimed subject matter without any need for picking, choosing, and combining the various disclosures in Okada. But the record does persuade us that the presently claimed subject matter is “a combination of familiar elements according to known methods [that] is likely to be obvious when it does no more than yield predictable results.” *Leapfrog Enter., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (quoting *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739 (2007)).

We have not overlooked the presence of some results reported in the Examples and Tables of the 337 Specification. However, it is far from clear whether those results are commensurate in scope with the exclusionary coverage sought; nor is it clear that they compare adequately to Okada.

Because the issue of obviousness in view of Okada has not been raised by the Examiner, we enter this rejection as a NEW GROUND.

Moreover, we leave it to the Examiner and Kadota to consider, in the first instance, whether the record contains sufficient objective indicia of nonobviousness to rebut a prima facie case of obviousness of claims 1 and 13.

D. Summary

In view of the record and the foregoing considerations, it is:

ORDERED that the rejection of claims 1 and 13 under 35 U.S.C. § 102(b) in view of Okada is REVERSED;

FURTHER ORDERED that claims 1 and 13 are rejected under 35 U.S.C. § 103(a) in view of Okada;

APPELLANTS' OPTIONS FOR
RESPONDING TO THE NEW GROUND OF REJECTION

Regarding the new ground of rejection pursuant to 37 C.F.R. § 41.50(b), that paragraph explains that "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review." Appellants, within two months from the date of this decision, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution.* Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the Examiner, in which event the proceeding will be remanded to the Examiner. . . .

(2) *Request rehearing.* Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

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37 C.F.R. § 41.50(b) (2007).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

AFFIRMED: 37 C.F.R. § 41.50(b)

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