

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 39

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KAZUO TSUBUKO, SHINICHI KURAMOTO, TOSHIKI NANYA,
KAZUHIKO UMEMURA and KAYOKO NAGAI

Appeal No. 94-2441
Application 07/821,314¹

ON BRIEF

Before JOHN D. SMITH, GARRIS and PAK, Administrative Patent Judges.

JOHN D. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1

¹ Application for patent filed January 13, 1992. According to appellants, this application is a continuation of Application 07/276,169 filed November 23, 1988, now abandoned.

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through 14, 16 through 18, 20 and 21². In the Answer, the examiner allowed claims 17 and 19³ and indicated that claims 3, 7 and 12 would be allowable if rewritten in independent form. Accordingly, remaining for our consideration is the appeal from the rejection of claims 1, 2, 4 through 6, 8 through 11, 13, 14, 16, 18, 20 and 21.

Claim 1 is representative and is reproduced below:

1. A liquid developer for use in electrophotography comprising:

a toner comprising as the main toner components a colorant and a polyolefin resin having an acid value of from 5 to 50 and a melt viscosity at 200EC of from 100 to 15,000 cps; and

an aliphatic hydrocarbon carrier liquid in which said toner is dispersed.

The sole reference now relied upon by the examiner is:

El-Sayed et al. (El-Sayed) 4,798,778 Jan. 17, 1989

The appealed claims stand rejected for obviousness (35 U.S.C. § 103) in view of El-Sayed.

We affirm.

² The rejection of appealed claim 21 was inadvertently omitted from the examiner's statement of rejection in the final rejection.

³ Claim 19 was allowed by the examiner in the final rejection.

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The subject matter on appeal is directed to a liquid developer for use in electrophotography comprising a toner which is dispersed into an aliphatic hydrocarbon carrier liquid. The toner is comprised of a colorant and a polyolefin resin. Importantly, the polyolefin resin is defined as having an acid value of from 5 to 50 and a melt viscosity at 200EC of from 100 to 15,000 cps. When the polyolefin resin component of the toner has an acid value of less than 5, allegedly the toner does not exhibit sufficient adhesiveness. When the toner component has an acid value of greater than 50, it is said that the toner particles tend to coagulate and thereby affect the storage stability (the "preservability") of the composition. With respect to the melt viscosity parameter of the claimed polyolefin resin, appellants indicate (Specification, pages 5 and 6) that when a polyolefin having a melt viscosity of below 100 cps is used, the toner layer permeates through a transfer sheet to the reverse side upon application of heat, thus resulting in images which are fixed to both sides of the transfer sheet. Further, it is stated that when a polyolefin having a melt viscosity of more than 15,000 cps is employed, the toner cannot be easily melted upon application of heat. Therefore, it is difficult to fix the toner image to a transfer sheet at a low temperature. See the

Specification, page 6.

As evidence of obviousness of the claimed subject matter, the examiner relies on El-Sayed. This reference discloses a positive-working liquid developer for use in electrophotography comprising a toner dispersed in an aliphatic hydrocarbon carrier liquid. El-Sayed's toner is comprised of a colorant (column 5, line 62 to column 6, line 18) and a polyolefin resin (column 4, line 48 to column 5, line 50). Especially preferred polyolefin resins are copolymers of ethylene with acrylic acid/ester or methacrylic acid/ester. At column 5, line 21, El-Sayed indicates that the acid number of the copolymers range from 1 to 120, preferably 54 to 90 wherein the acid number is defined as the milligrams of potassium hydroxide required to neutralize one gram of polymer. At column 5, line 24, El-Sayed teaches that these copolymers have a melt index⁴ of 10 to 500 as defined by the ASTM D1238 procedure A.

⁴ Melt index is a measure of the viscosity of a thermoplastic polymer at a specified temperature and pressure and is a function of the molecular weight of the polymer. Specifically, melt index is defined as the number of grams of such a polymer that can be forced through a standard orifice under a standard applied force in ten minutes at 190°C. See the Condensed Chemical Dictionary, page 649, copyright 1981 and Kirk-Othmer Encyclopedia of Chemical Technology, Third Edit., Vol. 16, pages 425 and 426, copyright 1981, copies attached. As evident from Table 1 in Kirk-Othmer, melt index and molecular weight are inversely related.

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Based on these disclosures in the prior art, the examiner found that the acid value range of the claimed polyolefin resin toner component (i.e., from 5 to 50) "overlaps" with the acid value range of the polyolefin copolymer of El-Sayed (i.e., from 1 to 120). With respect to the claimed viscosity range for appellants' toner resin, the examiner also urged that the melt index range of 10 through 500 for El-Sayed's toner resin component overlaps with the melt viscosity range of 100-15,000 cps for appellants' toner resin component. In this regard, appellants have not directly rebutted the examiner's finding. In essence, it is appellants' position that the specific examples disclosed in the El-Sayed reference utilize a toner resin component having an acid number and melt viscosity outside the respective claimed ranges of their invention. However, the allegation by appellants' attorney, with respect to the specific examples in the El-Sayed reference, that "the melt index of 100 at 190EC converts to a melt viscosity greater than 40,000 cps at 200EC" (Reply Brief, page 3) which is much higher than the claimed viscosity (Brief, page 6), further supports the examiner's finding of overlapping ranges based on the broad range disclosed at column 4, lines 24-26, inasmuch as a toner resin having a melt index of 500 at 190EC is five times less viscous

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than a resin having a melt index of 100 at 190°C. See footnote 4. We therefore conclude that the examiner has correctly determined that the claimed ranges of acid value and melt viscosity fall within or substantially overlap the respective ranges described for El-Sayed's toner resin component. We therefore agree with the examiner that a strong prima facie case of obviousness has been established for the claimed subject matter. See In re Malagari, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974) and In re Orfeo, 440 F.2d 439, 440, 169 USPQ 487, 488 (CCPA 1971). Indeed, appellants state at page 2 of their Reply Brief filed March 3, 1994 that

...at best the El-Sayed et al reference presents a rebuttable showing of prima facie obviousness of the presently claimed invention.

When an applicant seeks to overcome a prima facie case of obviousness by showing improved performance in a range that is within or overlaps with the range disclosed in the prior art, the applicant must "show that the [claimed] range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Here, appellants submit that the evidence of record allegedly showing the criticality of the claim parameters is more than sufficient

to rebut any showing of prima facie obviousness established by El-Sayed. More particularly, appellants refer to the Tsubuko declaration executed on October 28, 1992, the Tsubuko declaration executed on December 28, 1989 and the comparative examples set forth on pages 18 and 19 of the specification. Essentially, it is appellants' contention that comparative examples have been presented which fall within the scope of the disclosure of El-Sayed but outside of the scope of the present claims, and that these comparative examples demonstrate liquid toner compositions having very poor preservability and/or inferior toner image fixing ratios when compared to toner compositions covered by the claims on appeal.

We have carefully considered all of the comparisons of record. However, we agree with the examiner that the comparative data reported in the specification and the declarations is insufficient to show unexpected results because the toner resins of the comparative examples do not correspond to the closest prior art toners⁵, as described in working examples 1 and 4 of El-Sayed. See the Answer at pages 3 and 4. As the examiner has

⁵ From our perspective, the closest prior art copolymer disclosed by El-Sayed is the particularly preferred copolymer having an acid number of 60 and a melt index of 500. See the reference at column 5, lines 26-28.

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noted, the comparative examples use copolymers which are either different chemically from those of the closest prior art or when using copolymers of the prior art, the materials and amounts of monomers are substantially different. Thus, the data of record relied on by appellants is not based upon a comparison of their claimed invention with the closest prior art. In re Johnson, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984). Although the comparative examples relied on "fall within the scope of the disclosure" of El-Sayed, appellants have not shown that these examples are so close to the working examples in the relied upon patent, that identical results would have been expected had the El-Sayed working examples been duplicated.

To the extent that appellants have separately argued the subject matter defined by claims 16, 20 and 21 (Reply Brief, page 4), we find that the subject matter of these claims would have been obvious in view of the disclosures in El-Sayed at column 5, lines 5-9.

Based on the above, we agree with the examiner's ultimate conclusion that the claimed subject matter would have been obvious within the meaning 35 U.S.C. § 103 to a person of ordinary skill in the art. We, therefore, affirm the rejection

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of the appealed claims under this section of the statute.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

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| JOHN D. SMITH |) | |
| Administrative Patent Judge) |) | |
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| BRADLEY R. GARRIS |) | BOARD OF PATENT |
| Administrative Patent Judge) |) | APPEALS AND |
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