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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEALS BOARD

Ex parte TIEN TEH CHEN, TONY PIDDING, and
RAJASEKAR VAIDYANATHAN

Appeal 2011-012466
Application 11/799,207
Technology Center 1700

Before ANDREW H. METZ, BEVERLY A. FRANKLIN, and
GEORGE C. BEST, *Administrative Patent Judges*.

METZ, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1, 2, and 5 through 18. Claims 19 and 21 through 34 are claims directed to a previously non-elected invention pursuant to a requirement for restriction in which election of the subject matter of claims 1, 2, and 5 through 18 was made without traverse. Accordingly, claims 19 and 21 through 34 stand withdrawn from consideration and form no issue in this appeal. 37 C.F.R. § 1.142(b). We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM.

THE INVENTION

Appellants disclose an ink-jet media sheet, that is, a substrate having a surface on which is printed by an ink-jet with ink-jet ink images such as photographic images or printing. Ink-jet ink is a liquid containing a colorant such as a dye or pigment. Sp., pages 5 and 14. The ink-jet media sheet comprises a substrate and at least two coatings. Sp., page 2. The substrate may be paper, coated paper, or fabric. Sp., p.7, lines 20 through 26. One coating, a porous ink-absorbing layer, is deposited on the substrate. A second coating, a porous ink-receiving layer, is deposited on the ink-absorbing layer. Sp., page 6. Both the ink-absorbing layer and the ink-receiving layer may comprise metal oxide particulates, semi-metal oxide particulates or combinations thereof. Both layers may utilize the same type of particulates and preferably the particulates in both layers are silica. Sp., pages 7 and 8. The particulates in the first layer have a specific surface area of less than or equal to $300 \text{ m}^2/\text{g}$ and the particulates in the second layer have a specific surface area of at least $200 \text{ m}^2/\text{g}$. Sp., page 9. While the particulates in both layers may have the same specific surface area, preferably the particulates in the second layer have a specific surface area greater than the specific surface area of the particulates in the first layer. *Id.* The performance of the ink-jet media sheet may depend on the thickness of the respective layers. *Id.* The particulates may be combined with other additives such as binders and mordants. Sp., pages 8 and 13. The ink-absorbing layer may further comprise a trivalent or tetravalent metal salt such as aluminum chlorohydrate. Sp., pages 3, 4, 5, and 6. Additionally, the desired

characteristics for the ink-jet media sheet may be imparted by adding other reagents—such as organosilanes, including amine-functionalized silanes—to the layers. Sp., pages 2, 3, and 10.

Claim 1 is believed to be adequately representative of the appealed subject matter and is reproduced below for a more facile understanding of the claimed invention.

1. An ink-jet media sheet, comprising:

a substrate;

a porous ink-absorbing layer deposited on the media substrate, said porous ink-absorbing layer comprising metal oxide particulates or semi-metal oxide particulates, an organosilane reagent, and a trivalent or tetravalent metal salt, the metal oxide particulates or semi-metal oxide particulates having a specific surface area less than or equal to $300 \text{ m}^2/\text{g}$;

a porous ink-receiving layer deposited on the porous ink-absorbing layer, said porous ink-receiving layer comprising metal oxide particulates or semi-metal oxide particulates, an organosilane reagent, the metal oxide particulates or semi-metal oxide particulates having a specific surface area of at least $200 \text{ m}^2/\text{g}$;

wherein the specific surface area of the metal oxide particulates or semi-metal oxide particulates of the porous ink-absorbing layer is less than or equal to that of the porous ink-receiving layer.

The references of record which are being relied on by the Examiner as evidence of obviousness are:

Chu et al. (Chu)	US 2004/0114012 A1	Jun. 17, 2004
Kaneko et al. (Kaneko)	US 2004/0258858 A1	Dec. 23, 2004

THE REJECTIONS

Claims 1, 2, and 5 through 18 stand rejected as being unpatentable under 35 U.S.C. § 103(a) as the claimed subject matter would have been obvious from the combined disclosure of Watanabe, Chu, and Kaneko.

OPINION

Appellants have chosen to limit the arguments in their Brief only to the Examiner's rejection of the claim 1. Appellants have not directed our attention to any specific limitation in any of the claims dependent on claim 1 that render those dependent claims patentable beyond the argued patentability of claim 1. Accordingly, we have limited our consideration to the patentability of claim 1 and the patentability of claims 2 and 5 through 18 stands or falls with the patentability of claim 1.

Appellants assign as error the Examiner's determination that Watanabe's first-ink receiving layer and second ink-receiving layer correspond to Appellants' ink-absorbing layer and ink-receiving layer, respectively. According to Appellants, claim 1 requires that the porous ink-absorbing layer "is deposited on the media substrate" and that the porous ink-receiving layer "is deposited on the porous ink-absorbing layer. Appellants urge that because Watanabe's ink-receiving layers are deposited on a substrate which is coated with a pigment layer and subsequently coated with the ink-receiving layers, it is the pigment layer of Watanabe, and not the first ink-receiving layer, that corresponds to the claimed ink-absorbing layer. Appellants urge that because Watanabe does not disclose or suggest that the pigment layer deposited on the paper substrate comprises particulates as claimed by Appellants in their ink-

absorbing layer no *prima facie* case of obviousness is made out by the proposed combination of references. We find these arguments to be unpersuasive.

In the first instance, we find no basis in Appellants' disclosure for Appellants' argument that the ink-absorbing layer of claim 1 is deposited directly on the "substrate" of claim 1. Rather, on page 2 of their Specification, Appellants disclose that the term "media substrate" or "substrate" includes any substrate that can be coated with coating compositions and can include papers, coated papers, fabric, or the like. Sp., page 2, lines 18 through 21. Again, at page 7 of their Specification, Appellants disclose that the substrate which supports both the ink-absorbing and ink-receiving layers can be paper, plastic, coated paper, fabric, or "other known substrate used in the ink-jet printing arts." Sp., page 7, lines 20 through 26 (emphasis added). Thus, not only does Appellants' disclosure not support the argument advanced by Appellants in their brief but, to the contrary, it supports the Examiner's position that Watanabe is evidence that paper coated with a pigment corresponds to the claimed "media substrate"¹ in claim 1.

In raising their arguments over the Examiner's rejection of the claims over Watanabe, Chu, and Kaneko we find that Appellants have not challenged or otherwise meaningfully argued that the Examiner's finding that Watanabe's first and second ink-receiving layers "meet" the claimed ink-absorbing layer and ink-receiving layer is erroneous. Ans., page 5. Accordingly, after analyzing what claim 1 requires, and after carefully reviewing the disclosure of Watanabe, we find that Watanabe discloses the composition of the ink-absorbing and ink-

¹ We observe that while the term "media substrate" in claim 1 lacks *ipsimus verbis* antecedent in claim 1, based on the definition of "substrate" as interchangeable with "media substrate" found on page 2 of the specification, we find no violation of 35 U.S.C. § 112, paragraph 2.

receiving layers of claim 1 and that the surface area of the inorganic particulates in Watanabe's first ink-receiving layer is less than the surface area of the inorganic particulates in the second ink-receiving layer.

Watanabe discloses in paragraph [0065] on pages 5 and 6 that the specific surface area for the inorganic particulates in each of the ink-receiving layers as measured by the BET method is preferably not less than $30 \text{ m}^2/\text{g}$ and not more than $300 \text{ m}^2/\text{g}$. In paragraph [0074] on page 7, Watanabe discloses that when a plurality of ink-receiving layers is utilized the specific surface area of the inorganic particulates in the first ink-receiving layer is less than that of the inorganic particulates in the second and subsequent layers. We find this disclosure to be a description of the limitation in claim 1 that "the specific surface area of the metal oxide particulates or semi-metal oxide particulates of the porous ink-absorbing layer is less than or equal to that of the porous ink-receiving layer." Thus, according to Watanabe's disclosure, the surface area of the particulates in the first ink-receiving layer is "less than or equal to $300 \text{ m}^2/\text{g}$." The surface area of the inorganic particulates in the second or subsequent ink-receiving layers may also be up to but not more than $300 \text{ m}^2/\text{g}$ and is greater than the surface area of the particulates in the first layer.

We find that this disclosure in Watanabe, coupled with Watanabe's disclosure from pages 5 and 6 referenced above, suggests that the inorganic particulates in the second ink-receiving layer include inorganic particulates having a specific surface area of from 30 to up to $300 \text{ m}^2/\text{g}$ including particulates having a specific surface area of from $200 \text{ m}^2/\text{g}$ up to but not more than $300 \text{ m}^2/\text{g}$. Because Appellants' claim 1 embraces, for example, media sheets where the inorganic particulates in each layer has a surface area of $300 \text{ m}^2/\text{g}$ and because Watanabe teaches or suggests such layers, we find

Watanabe discloses the ink-jet media sheet configuration as set forth in claim 1 except for the organosilane reagent.

The Examiner has relied on Chu for the purpose of showing that treating inorganic particles such as silica with an amine-functionalized silane coupling agent for the purpose of improving several properties of the images printed on ink jet media containing said treated inorganic particles was known in the art at the time Appellants made their invention. Except for acknowledging Chu's disclosure at page 10 of their brief and denying that the combination of Watanabe, Chu, and Kaneko would have rendered the claimed subject matter obvious (page 14 of the Brief), Appellants do not challenge or otherwise comment on the Examiner's determination with respect to Chu in any fashion. Accordingly, we find the Examiner has made out a prima facie case of obviousness with respect to the subject matter of claim 1 as the claimed subject matter would have been obvious from the disclosure of Watanabe considered with Chu.

Because we have found that the subject matter of claim 1 would have been obvious in the sense of the statute from the disclosure of Watanabe considered with Chu we find Kaneko to be unnecessary to that determination.² Nevertheless, we shall address Kaneko here for purposes of completeness. The Examiner has relied on Kaneko for their disclosure of an inorganic particulate used in an ink-receptive layer of an ink-jet recording sheet and having a specific surface area of from 200 m²/g to 400 m²/g. The Examiner reasons that it would have been obvious at the time Appellants made their invention to have utilized the specific inorganic particulate of Kaneko as the inorganic particulate in

² The Examiner's reliance on a reference unnecessary for reaching a conclusion of obviousness is considered to be harmless error.

Watanabe. Appellants argue that the combination of Watanabe with Kaneko is improper because “the proposed combination would destroy the functionality of the primary reference, Watanabe.” Br. Page 15. Additionally, Appellants argue that the proposed combination is improper because “Kaneko teaches away from the Watanabe.” *Id.* We do not find any of Appellants’ arguments to be persuasive.

In the first instance, the rejection before us is based on the combination of Watanabe, Chu, and Kaneko. As we have stated above, Appellants have made virtually no meaningful argument with respect to what the disclosure of Watanabe and Kaneko considered together with Chu teaches or suggests. Rather, Appellants have chosen to argue the patentability of claim 1 over what Watanabe and Kaneko teach or suggest separately instead of considering what the combined disclosures of Watanabe, Chu, and Kaneko teaches or suggests. Appellants’ various arguments concerning only two of the three references from the combination of references relied on by the Examiner evidences a misunderstanding of the inquiry under 35 U.S.C. § 103(a). The question to be answered is not whether the references could be physically combined but rather the question is whether the subject claimed by Appellants would have been rendered obvious to the hypothetical person of ordinary skill in the art at the time Appellants made their invention considering the teachings of the prior art as a whole. In this case we are satisfied that the prior art on which the Examiner has relied, including Kaneko, establishes at the time Appellants made their invention that ink-jet media sheets as claimed in claim 1 would have been obvious for reasons expressed above.

We reject Appellants’ argument that the combination of Watanabe and Kaneko (a combination not before us and not proposed by the Examiner) would

destroy the functionality of Watanabe or that Kaneko “teaches away from Watanabe” because it is founded on theory for which there is no supporting evidence in the record. While both the Examiner and Appellants consider Table 2 of Kaneko to be evidence that using Kaneko’s 200 to 400 m²/g particulates would introduce cracking on the surface of the recording medium, we find no such evidence in Table 2. In the first instance, Kaneko discloses ink-jet recording media prepared according to their disclosure have improved cracking resistance. [0001]. The ink-jet recording medium has excellent surface smoothness, its flexibility results in cracking resistance and it exhibits excellent ink absorbability. [0026]. In Table 2 of Kaneko, ink-jet recording medium are evaluated for a variety of properties, including “cracking resistance.” Of the thirteen samples tested, only two of the inventive samples gave a value of “C” which was still judged “to be commercial viable.” [0179]. The only commercially unacceptable sample was Sample No. 13, and it was a comparative sample. Accordingly, we find no evidence in Table 2, let alone anywhere within the four corners of Kaneko, which suggests that using the 200 to 400m²/g particulate in the ink-receptive layer causes such extensive cracking in the surface as to “destroy” the invention disclosed by Kaneko or results in a loss of ink absorbability. Thus we reject Appellants’ arguments concerning destroying the functionality of Watanabe and that Kaneko teaches away from Watanabe.

Finally, Appellants argue that they have demonstrated they provide “unexpected results over the present combination.” Brief, page 18. However, the “present combination” referenced and which is argued over pages 13 through 18 of Appellants’ Brief is not the combination of references proffered by the Examiner because it excludes any discussion of Chu on which the

Examiner relies. Moreover, Appellants have failed to direct us to where the “evidence” to which they allude may be found. The only data in Appellants’ Specification may be found at page 19 and at best it merely shows that “two layered porous ink-jet media prepared in accordance with embodiments of the present invention has better color gamut and black density **than single layered porous ink-jet media with same fumed silica and same treatment as the ink absorbing layer.**” Because the actual nature of the media being compared in Table 2 is not adequately set forth and because the comparison is not with the closest prior art but is with a single layered ink-jet media the basis for Appellants’ conclusion that the results are “unexpected” cannot be ascertained. Accordingly, we reject Appellants’ argument that they have provided evidence of “unexpected results.

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 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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