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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ROBERT W. ZEHNER, HOLLY G. GATES,  
KARL RAYMOND AMUNDSON, JOANNA F. AU, ARA N. KNAIAN,  
ALEXANDROS COSMOS ARANGO, and JONATHAN L. ZALESKY

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Appeal 2019-003880  
Application 14/991,397  
Technology Center 2600

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Before JOHN A. EVANS, JUSTIN BUSCH, and  
JOHN P. PINKERTON, *Administrative Patent Judges*.

EVANS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner’s decision to reject Claims 1–8, which are all of the claims pending in the present application. Appeal Br. 1; *see also* Claims App. 15–17. We have jurisdiction under 35 U.S.C. § 6.

We REVERSE.<sup>2</sup>

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<sup>1</sup> We use the word “Appellant” to refer to “Applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as E Ink Corporation, a wholly owned subsidiary of E Ink Holdings Ltd. Appeal Br. 3.

<sup>2</sup> Rather than reiterate the arguments of Appellant and the findings and conclusions of the Examiner, we refer to the Appeal Brief (“Appeal Br.”) and Claims Appendix (Claims App.), filed April 28, 2018 and revised June 5, 2018; the Examiner’s Answer (“Ans.”), mailed July 24, 2018; the Final

STATEMENT OF THE CASE

CLAIMED SUBJECT MATTER

The claims relate to “driving bistable electro-optic displays.” Spec.

¶ 5.

CLAIMS

Claims 1, 7, and 8 are independent. Claim 1 is illustrative and reproduced below with some formatting added:

1. A method of driving a bistable electrophoretic display having at least one pixel with two extreme optical states, the electrophoretic display containing electrophoretically-mobile particles suspended in a liquid suspension medium, the method comprising:

(a) driving the pixel from an initial gray level to one extreme optical state different from the initial gray level; and

(b) immediately driving the pixel from the one extreme optical state to the opposed extreme optical state and immediately thereafter driving the pixel to a final gray level different from the one extreme optical state.

REFERENCES AND REJECTION

Claims 1–8 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over Sheridan et al. (US 6,137,467; issued Oct. 24, 2000) (“Sheridon”) and Kondoh (US 5,838,293; issued Nov. 17, 1998). Final 4–8.

ANALYSIS

CLAIMS 1–8:

OBVIOUSNESS BASED ON SHERIDON AND KONDOH

The Examiner rejects claims 1–8 under 35 U.S.C. 103(a) for obviousness over Sheridan and Kondoh. Final 4–8. Appellant argues that

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Office Action (“Final”), mailed June 29, 2017; and the Specification (“Spec.”), filed January 8, 2016, for their respective details.

the Examiner's rejection is erroneous because there is no adequate reason to combine the asserted teachings of Sheridan and Kondoh. Appeal Br. 11–13. For the reasons that follow, we are persuaded of Examiner error.

In rejecting Claim 1, the Examiner cites Sheridan's method for recording an image on an electronic paper sheet for teaching a method of driving pixels of a bistable electrophoretic display between gray levels and two extreme optical states. Final 4–5 (citing Sheridan 3:6–20, 3:32–44, Fig. 8). Sheridan describes an optically sensitive sheet of electric paper made up of a number of bichromal balls, each having a fluid-filled cavity and a sphere therein. Sheridan, Title, 3:6–8, 3:11–12, 6:19–21. Each sphere has two hemispheres, one whose surface is made of a white insulative material, and the other whose surface is made of a photosensitive material with a contrasting color. *Id.* at 3:13–17. Because the hemispheres are made from different materials, they behave differently when in the presence of an electric field. *Id.* at 3:21–23. For example, when in contact with a dielectric plasticizing liquid, each hemisphere of a given bichromal ball will develop a different surface charge density. *Id.* at 3:26–27. According to an embodiment of Sheridan, a light source may be generated and focused on the electric paper sheet by a lens. *Id.* at 3:8–9. The photosensitive hemisphere of a given bichromal ball may respond electrically to actinic light exposure such that a corresponding change in surface charge density will superimpose on the dark surface charge condition. *Id.* at 3:32–36. A stored image may be produced by applying a uniform electrical field at the surfaces of the sheet to orient all the balls in one direction and, thereafter, applying actinic radiation such that the field is reversed to orient only the exposed or only the unexposed balls in the other direction. *Id.* at 3:37–42.

The Examiner explains that although Sheridan’s “display can be reset over and over to achieve” a pixel “being driv[en] into extreme optical state to opposed extreme optical state and thereafter driv[en] . . . to the final gray level, and then reset[] to an opposed extreme optical state and so forth,” Sheridan “does not expressly teach resetting to two opposite extremes and driving to a gray level.” Final 5. The Examiner finds, however, that “Kondoh teaches a bi-stable display device wherein the display is reset to one extreme and then immediately reset to the opposite extreme and then immediately drives to a final gray level.” *Id.* (citing Kondoh, Fig. 2). Kondoh describes a driving method for an antiferroelectric liquid-crystal display (LCD) device. Kondoh 1:6–9. According to one embodiment, the driving method may undergo a reset period, during which a bipolar reset pulse of a sufficiently high voltage may be applied continuously to bring the antiferroelectric liquid-crystal into first and second ferroelectric states, as well as into an antiferroelectric state, thereby resolving an after-image phenomenon. *Id.* at 13:9–13, 13:23–31, Fig. 2. The Examiner asserts that “it would have been obvious . . . to incorporate the idea of resetting a bistable display twice to two different extremes before finally driving the gray level as taught by Kondoh into the method of driving a bistable electro-optic display as taught by Sheridan . . . to reduce after-image.” Final 5.

Appellant argues there is no rationale to combine the asserted teachings of Sheridan and Kondoh. Appeal Br. 11–13. In support of its argument, Appellant makes the following assertions. First, “it would not occur to anyone skilled in the technology of electro-optic media that the teaching of Kondoh has any application outside AFE-LC displays.” *Id.* at 12. Second, “there is no reason why a skilled person would apply the

teaching of Kondoh to Sheridan's [sic] rotating bichromal ball type of medium which has nothing corresponding to the random, first and second ferroelectric and antiferroelectric states of the Kondoh medium." *Id.* Third, "there is no reason for anyone skilled in this field of technology to believe that improvements in image quality in antiferroelectric liquid crystal displays will translate to the rotating bichromal ball medium of Sheridan." *Id.* at 13. And fourth, "it would make no sense to first drive all the balls to one extreme optical state (say black) and then to the opposed extreme optical state (say white) before imagewise driving of some balls to their final optical state," which "would have no apparent advantage over the single extreme optical state method actually used in Sheridan, and would result in increase in switching time and power consumption." *Id.*

In response to Appellant's arguments, the Examiner maintains that it would have been obvious to combine the asserted teachings of Sheridan and Kondoh and provides the following explanation:

[B]oth Sheridan and Kondoh employ bi-stable material. It is already well known in the field of bi-stable optical displays to utilize different driving schemes to achieve improvement in image quality. Bi-stable display devices, regardless of the material, are susceptible to after-image problems depending the way the displays are driven. The prior art is replete with varying types of reset schemes to reduce such after-image problems across various bi-stable display utilizing different materials. Where there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasps.

Ans. 2 (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417–18 (2007)).

The Examiner explains further that it would make sense to drive the balls in Sheridan as proposed because "[a]fter-image or image sticking effects occur

when not all of the pixels in a display device are rotated as driven,” and the “[m]ultiple resetting of electrophoretic bichromal balls assures that all of the bichromal balls are aligned in one direction,” which “would reduce the likelihood of some of the bichromal balls causing artifacts or after-image due to insufficient rotations caused when the pixels are driven.” Ans. 3.

“A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art.” *KSR*, 550 U.S. at 401. Although it may “be necessary for a court to look to interrelated teachings of multiple patents,” in order to “facilitate review, this analysis should be made explicit.” *Id.* at 418. Accordingly, “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

We are persuaded of Examiner error because the Examiner has not provided an adequate rationale to combine the asserted teachings of Sheridan and Kondoh. In particular, the Examiner has not articulated adequate reasoning, with sufficient rational underpinning, to support the proposed combination of Sheridan and Kondoh. As an initial matter, the Examiner asserts it would have been obvious to apply the reset schemes of Kondoh to the display of Sheridan “to reduce after-image effects.” Ans. 2; Final 2. But the Examiner fails to present any persuasive evidence that Sheridan’s bichromal ball teachings would have been compatible—or otherwise combinable—with Kondoh’s antiferroelectric LCD teachings, with a reasonable expectation of success. Similarly, we find no persuasive evidence that the improvements in image quality achieved by Kondoh’s

antiferroelectric liquid crystal display would translate to the rotating bichromal ball medium of Sheridan.

Moreover, the Examiner's explanations do not provide a sufficient rational underpinning of the proposed reason to combine Sheridan and Kondoh. Rather, the Examiner merely strings together a number of speculative and conclusory assertions and asserts them as facts without any supporting evidence. For example, the Examiner fails to cite any prior art references to show that "it was already well known in the field of bi-stable optical displays to utilize different driving schemes to achieve improvement in image quality," or that "[t]he prior art is replete with varying types of reset schemes to reduce such after-image problems across various bi-stable display utilizing different materials." Without such supporting evidence, the Examiner's position that there was a design need or market pressure for a skilled artisan to make the proposed combination rings hollow.

For similar reasons, we are not convinced by the Examiner's unsupported assertion that it would make sense to drive the bichromal balls in Sheridan according to the antiferroelectric, LCD-based driving technique of Kondoh in order to reduce artifacts or afterimage effects. And the Examiner does not even address Appellant's argument that the proposed combination undesirably "would result in [an] increase in switching time and power consumption."

Therefore, constrained by the record, we decline to sustain the Examiner's § 103(a) rejection of Claim 1 over the combination of Sheridan and Kondoh. We also decline to sustain the Examiner's § 103(a) rejection of claims 2–8, for which the Examiner relies on the same defective reasoning. *See* Final 6–8; Ans. 3–4.

CONCLUSION

We reverse the Examiner's rejection of Claims 1–8 under pre-AIA 35 U.S.C. § 103(a).

DECISION SUMMARY

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1–8	103(a)	Sheridon, Kondoh		1–8
<b>Overall Outcome</b>				1–8

REVERSED