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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* BRIAN DALE LAUGHLIN, RICHARD EUGENE MURRISH,  
and JAN H. VANDENBRANDE

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Appeal 2017-004302  
Application 14/556,865  
Technology Center 2600

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Before JOHN A. JEFFERY, KRISTEN L. DROESCH, and  
JAMES W. DEJMEK, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner’s decision to reject claims 1–17. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Appellants’ invention combines physical and digital data to create an “augmented reality” related to multi-layer composite structures. In one aspect, the augmented reality environment can depict repairs made to the structure at different times. *See generally* Spec. ¶¶ 2, 99–103; Figs. 3, 9. Claim 1, reproduced below with our emphasis, is illustrative:

1. A method for generating an augmented reality presentation of a composite component, the method comprising:
  - recording an image of a first layer of a composite component, the composite component comprising a plurality of layers, wherein the first layer is one of the plurality of layers;
  - capturing physical data for the composite component from a surface layer of the composite component using a number of portable devices;
  - transmitting the physical data captured by the number of portable devices to a processor unit remote from the number of portable devices for alignment;
  - retrieving information related to the composite component including the first layer of the composite component, wherein the information comprises *past repairs* performed on the first layer of the composite component;
  - generating in the processor unit a multi-dimensional representation of a combined augmented reality of the composite component including a display of the first layer of the composite component; and
  - displaying in the number of portable devices the multi-dimensional representation comprising physical data for an image of the surface of the composite component and digital data for an overlay of the first layer of the composite component beyond the surface of the composite component.

#### THE REJECTIONS

The Examiner rejected claims 1–13 under 35 U.S.C. § 103(a) as unpatentable over Fábio R. de Miranda et al., *AR X-Ray: Portable Projector-based Augmented Exploration of Buildings*, PROC. OF THE X SYMP. ON VIRTUAL & AUGMENTED REALITY 185–95 (2008) (“de Miranda”), Mani Golparvar-Fard et al., *D<sup>4</sup>AR – A 4-Dimensional Augmented Reality Model for Automating Construction Progress Monitoring Data Collection, Processing and Communication*, 14 J. INFO. TECH. IN CONSTRUCTION 129–

53 (2009) (“D<sup>4</sup>AR”), and Davies (US 2008/0030575 A1; Feb. 7, 2008).  
Final Act. 6–28.<sup>1</sup>

The Examiner rejected claims 14–17 under 35 U.S.C. § 103(a) as unpatentable over de Miranda, D<sup>4</sup>AR, Davies, and Leung (US 2011/0216089 A1; Sept. 8, 2011). Final Act. 29–31.

#### THE REJECTION OVER DE MIRANDA, D<sup>4</sup>AR, AND DAVIES

In rejecting claim 1, the Examiner finds that de Miranda generates an augmented reality presentation of a composite component (e.g., a wall), and D<sup>4</sup>AR and Davies both disclose, among other things, displaying information related to past repairs as claimed. Final Act. 6–11. Based on the collective teachings of de Miranda, D<sup>4</sup>AR, and Davies, the Examiner concludes that claim 1 would have been obvious. *Id.*

Appellants argue that neither D<sup>4</sup>AR nor Davies teaches or suggests retrieving or displaying information regarding past repairs as claimed. According to Appellants, D<sup>4</sup>AR’s deviation from a plan in constructing a building is not a repair because the disclosed technology merely highlighted a missing part that was filled in later and, therefore, was built according to plan. App. Br. 11–12; Reply Br. 3–6. Nor is D<sup>4</sup>AR said to display the correction or the return to the plan after the correction. App. Br. 12. Appellants add that Davies, likewise, does not display past repairs because,

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<sup>1</sup> Throughout this Opinion, we refer to (1) the Final Office Action mailed June 30, 2016 (“Final Act.”); (2) the Appeal Brief filed October 11, 2016 (“App. Br.”); (3) the Examiner’s Answer mailed November 16, 2016 (“Ans.”); and (4) the Reply Brief filed January 17, 2017 (“Reply Br.”).

among other things, parts are displayed as they currently exist. App. Br. 12–13; Reply Br. 6–8.

#### ISSUE

Under § 103(a), has the Examiner erred in rejecting claim 1 by finding that de Miranda, D<sup>4</sup>AR, and Davies collectively would have taught or suggested retrieving information comprising past repairs performed on the first layer of a composite component?

#### ANALYSIS

We begin by noting that the Examiner cites D<sup>4</sup>AR or, *alternatively*, Davies for teaching or suggesting retrieving or displaying information regarding performing past repairs. *See* Final Act. 7–9. *Compare* Ans. 2–6 (articulating findings based on D<sup>4</sup>AR regarding the recited past repair information) *with* Ans. 6–8 (same for Davies). We emphasize the Examiner’s *alternative* reliance on these two references, for the teachings of one reference are technically cumulative to the other at least with respect to the disputed past repair information limitation. Because we find no error in the Examiner’s reliance on D<sup>4</sup>AR in this regard, we, therefore, confine our discussion to that reference unless otherwise indicated.

Turning to claim 1, the term “repair” is not defined in the Specification, unlike at least one other term whose definition leaves no doubt as to its meaning. *See, e.g.*, Spec. ¶ 43 (defining “at least one of”). Nor does claim 1 specify the nature or extent of the “past repairs” apart from their performance on the first layer of the composite component. We, therefore, construe the term the term “repair” with its plain meaning which is

defined, quite broadly, as “fix.” WEBSTER’S NEW WORLD DICTIONARY OF AMERICAN ENGLISH 1137 (3d College ed. 1993).

Given this interpretation, we see no error in the Examiner’s reliance on the example on D<sup>4</sup>AR’s pages 146 and 147 where a concrete subcontractor misinterpreted structural drawings resulting in a *mistake* that needed to be fixed or repaired. Final Act. 7; Ans. 3–4. Nor do we see error in the Examiner’s finding that once the faulty structure resulting from this construction blunder is repaired, D<sup>4</sup>AR at least suggests adding this repaired condition to construction progress images to monitor progress of the project after the repairs, or that doing so would have been at least an obvious variation. *See* Ans. 4 (citing page 145 of D<sup>4</sup>AR).

We reach this conclusion even assuming, without deciding, that correcting the subcontractor’s error on page 146 results solely in filling in a missing part that otherwise does not deviate from the construction plan as Appellants seem to suggest. *See* App. Br. 12; Reply Br. 4. Even if this were the case, correcting the subcontractor’s obvious mistake involves past repairs, namely fixing or repairing the subcontractor’s *erroneous and incomplete* structure to obtain a more complete and structurally-sound foundation consistent with the construction plan. *See* D<sup>4</sup>AR at 146–47. To the extent that Appellants contend otherwise, we disagree.

We also find unavailing Appellants’ contention that Davies’ video of repairs being performed would allegedly have no place in D<sup>4</sup>AR’s system that augments static images. Reply Br. 8. First, this argument was not raised in Appellants’ opening brief and is, therefore, waived as untimely. *Compare* App. Br. 6–13 *with* Reply Br. 2–8. *See* 37 C.F.R. § 41.41(b)(2).

Second, even if this argument was timely raised (which it was not), Appellants' contention regarding the alleged incompatibility between systems based on video and still images is not only unsubstantiated by any persuasive evidence on this record, Appellants' argument is not germane to the limited purpose for which Davies was cited which, notably, includes limitations *other than* the past repairs information limitation. *See* Final Act. 8, 10 (emphasizing via bolding the features for which Davies was cited). Although the Examiner cites Davies for teaching displaying past repairs in the rejection (Final Act. 8), the Examiner clarifies in the Answer that this reliance on Davies is an *alternative* to the teachings of D<sup>4</sup>AR in that regard. *See* Ans. 6. Therefore, Appellants' arguments regarding Davies' alleged shortcomings regarding the past repairs information limitation do not persuasively rebut the Examiner's alternative reliance on D<sup>4</sup>AR as noted previously.

Third, it is well settled that "a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements." *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) (citations omitted). Nor is the test for obviousness whether a secondary reference's features can be bodily incorporated into the structure of the primary reference. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *Id.* Here, the Examiner's proposed combination predictably uses prior art elements according to their established functions to yield a predictable result. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007). On this record, we see no error in

the Examiner's reliance on the cited references' collective teachings in concluding that claim 1 would have been obvious.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 1, and claims 2–6 and 13 not argued separately with particularity.

#### *Claims 7–12*

For similar reasons, we also sustain the Examiner's rejection of independent claim 7 reciting, in pertinent part, that first and second images include past repairs to plural layers. Final Act. 14–19. Appellants' arguments are similar to those for claim 1 (*see* App. Br. 13–14) and are, therefore, unavailing for the reasons previously discussed.

Therefore, we are not persuaded that the Examiner erred in rejecting claim 7, and claims 8–12 not argued separately with particularity.

#### THE OTHER OBVIOUSNESS REJECTION

We also sustain the Examiner's obviousness rejection of claims 14–17. Final Act. 29–31. Despite nominally arguing claim 14 separately, Appellants reiterate similar arguments made in connection with claim 13, and allege that Leung fails to cure those purported deficiencies. App. Br. 15–16. We are not persuaded by these arguments for the reasons previously discussed.

#### CONCLUSION

The Examiner did not err in rejecting claims 1–17 under § 103(a).



Appeal 2017-004302  
Application 14/556,865

DECISION

We affirm the Examiner's decision to reject claims 1–17.

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