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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte VILLE KÖNÖNEN, JUSSI LIIKKA, and JANI MÄNTY JÄRVI

Appeal 2018-000247
Application 13/320,265
Technology Center 2100

Before JOHNNY A. KUMAR, CHARLES J. BOUDREAU, and
JASON M. REPKO, *Administrative Patent Judges*.

REPKO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants¹ appeal under 35 U.S.C. § 134(a) from the Examiner’s rejection of claims 21–23 and 25–40. App. Br. 5.² Claims 1–20 and 24 are canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ According to Appellants, the real party in interest is Teknologian Tutkimuskeskus VTT of Finland. App. Br. 3.

² Throughout this opinion, we refer to the Final Rejection (“Final Act.”) mailed Sept. 8, 2018; the Appeal Brief (“App. Br.”) filed March 20, 2017; the Examiner’s Answer (“Ans.”) mailed August 9, 2017; and the Reply Brief (“Reply Br.”) filed October 9, 2017.

THE INVENTION

Appellants' invention relates to context recognition in mobile devices. Spec. 1:6–7. A typical context-recognition system uses a classification algorithm that maps sensor observations to a context. *Id.* at 1:35–36. A context could be an environmental state, the device's state, or a user's physiological state. *Id.* at 1:18–19. The Specification explains that classifiers used in this way have several limitations, including variable accuracy and high computational requirements for training and recognition, among other issues. *Id.* at 1:35–2:5.

To improve classification for context recognition, the invention uses feedback from the user. *Id.* at 3:30–36. Feedback can include some indication of the classification's quality and correctness. *Id.* at 4:6–7. For instance, the user can provide feedback using keys shown on a mobile device's touchscreen. *Id.* at 4:9–11. The invention adapts the classifier to take into account the user's feedback. *Id.* at 4:14–15.

Claims 21, 38, and 39 are independent. Claim 21 is reproduced below with our emphasis:

21. A mobile device comprising:
 - a feature determination logic for determining a plurality of representative feature values on the basis of sensing data indicative of the context of the mobile device associated with the user thereof, and a context recognition logic including an adaptive linear classifier, configured to map, during a classification action, the plurality of feature values to a context class, wherein *the classifier is further configured to adapt the classification logic thereof on the basis of the feature values and feedback information by the user of the mobile device,*
 - wherein in the case of positive or negative feedback regarding the performed classification, the classifier is configured to adapt the classification logic thereof such that a

prototype feature value vector of the recognized class is brought closer to or farther away from the feature vector, the feature vector determined by the plurality of feature values, respectively.

THE EVIDENCE

The Examiner relies on the following as evidence:

Golding et al.	US 6,323,807 B1	Nov. 27, 2001
Chaddha	US 6,404,923 B1	June 11, 2002
Botchen et al.	US 2009/0278937 A1	Nov. 12, 2009
Huang et al.	US 2010/0087987 A1	Apr. 8, 2010

Dwi H. Widyantoro et al., *An Adaptive Algorithm for Learning Changes in User Interests*, CIKM '99, 405–412 (1999) (“Widyantoro”).

Kristof Van Laerhoven, *Combining the Self-Organizing Map and K-Means Clustering for On-Line Classification of Sensor Data*, ICANN 2001, 464–469 (2001) (“Van Laerhoven”).

Jon Froehlich et al., *MyExperience: A System for In situ Tracing and Capturing of User Feedback on Mobile Phones*, Mobisys '07 (2007) (“Froehlich”).

Erich Bruns et al., *Mobile Phone-Enabled Museum Guidance with Adaptive Classification*, Projects in VR, 98–102 (2008) (“Bruns”).

THE REJECTIONS

Claims 21–23, 31, and 38–40 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Van Laerhoven and Widyantoro. Final Act. 3–7.

Claims 25 and 30 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Van Laerhoven, Widyantoro, and Chaddha. Final Act. 7–9.

Claim 26 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Van Laerhoven, Widyantoro, and Botchen. Final Act. 9–10.

Claims 27–29 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Van Laerhoven, Widyantoro, and Bruns. Final Act. 11–13.

Claims 32 and 33 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Van Laerhoven, Widyantoro, and Golding. Final Act. 13–15.

Claims 34–36 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Van Laerhoven, Widyantoro, and Froehlich. Final Act. 16–18.

Claim 37 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Van Laerhoven, Widyantoro, and Huang. Final Act. 18–20.

THE OBVIOUSNESS REJECTION OVER VAN LAERHOVEN AND WIDYANTORO

The Examiner finds that Van Laerhoven teaches every limitation recited in representative³ claim 21 except for using the recited user feedback. Final Act. 4–5. In concluding that the subject matter of claim 21 would have been obvious, the Examiner finds Widyantoro teaches this feature. *Id.* at 5. Specifically, the Examiner finds that Widyantoro uses the feedback about a user’s interests to adapt logic for updating feature-vector descriptors. *Id.* at 4–5 (citing Widyantoro 405, 407–408).

Appellants argue that Widyantoro’s classification logic does not adapt as required by claim 21. App. Br. 24–25. Instead, according to Appellants,

³ Appellants argue claims 21–23, 31, and 38–40 as a group. *See* App. Br. 20–25. In particular, Appellants argue claims 22, 23, 31, and 38–40 would not have been obvious over Van Laerhoven and Widyantoro for the same or similar reasons as those presented for claim 21. *Id.* at 25. Accordingly, we select independent claim 21 as representative of claims 22, 23, 31, and 38–40. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Widyantoro uses the same logic for each article-sorting cycle. *Id.* We disagree.

Claim 21 recites, in relevant part, “the classifier is further configured to *adapt* the classification logic thereof on the basis of the feature values and feedback information by the user of the mobile device” (emphasis added). The Examiner interprets the term “adapt” as adjusting the logic to new conditions. Ans. 25. Appellants do not rebut the Examiner’s interpretation. *See* Reply Br. 1–4.

We find the Examiner’s interpretation reasonable in view of the Specification, which discloses adjusting logic to new conditions. *See, e.g.*, Spec. 19:6–17. For example, the Specification discusses adjusting an adaptive linear classifier to the condition of the user providing feedback about the correct context class. *Id.*

We agree with the Examiner that, like Appellants’ logic, Widyantoro’s logic is also adjusted to new user feedback. Ans. 25. In particular, Widyantoro relates to automated information filtering. Widyantoro 405, Abstract. Potential applications include personalizing a news agent to gather online articles and filter them according to a user’s interests. *Id.*, § 1. Widyantoro’s adaptive algorithm learns changes to a user’s interests. *Id.*, Abstract. Like the recited method, Widyantoro’s learning process also relies on the user’s feedback. *Id.* at 407, § 3.3.1. This feedback represents whether the user likes or dislikes a document’s content. *Id.* With this feedback, Widyantoro’s learning process updates the descriptor feature vectors. *Id.* This updating uses equation 9 in section 3.3.2:

$$d_{(new)}^c = d_{(old)}^c * (1 - \alpha) + f_{v_d} * \alpha$$

We agree with the Examiner that Widyantoro adapts this logic in the case of the user’s positive or negative feedback, as claim 21 recites. *See* Final Act. 4 (citing Widyantoro 408, equation 9); Ans. 25. Specifically, in equation 9 above, d^c is d_p^c for positive feedback, d_n^c for negative feedback, and d_{it}^c for both positive and negative feedback. Widyantoro 408, § 3.3.3.2. So contrary to Appellants’ argument (*see* App. Br. 24–25), Widyantoro uses different logic—i.e., an equation with a different coefficient—after receiving different feedback. Ans. 25.

The Examiner concludes that it would have been obvious to incorporate Widyantoro’s adapting in Van Laerhoven to arrive at the recited classifier. Final Act. 4–5. For the reasons discussed below, Appellants have not persuaded us that the Examiner erred in this regard.

Appellants argue that the Examiner’s proposed combination lacks any rational underpinning, and thus, is pure hindsight. App. Br. 21–22; Reply Br. 1–3. In Appellants’ view, impermissible hindsight is “the only way” to modify Van Laerhoven with Widyantoro. App. Br. 21. Appellants argue the Examiner’s proposed combination would render Van Laerhoven unsuitable for its intended purpose. *Id.* at 24; Reply Br. 2–3. According to Appellants, introducing Widyantoro’s feedback into the Self Organizing Map (“SOM”) and Kohonen Self Organizing Map (“KSOM”) neural networks disclosed by Van Laerhoven would “break the Van Laerhoven system, such that it no longer conforms to the SOM or KSOM neural networks.” App. Br. 24; *see also* Reply Br. 4. Appellants argue that the SOM algorithm’s stabilization would be lost because external feedback would lead to violations of Van Laerhoven’s inbound winner-takes-all principle. Reply Br. 2. Appellants argue that, because the winner-takes-all

principle would be violated, Van Laerhoven would have to be completely redesigned. *Id.*

Appellants, however, have not shown that redesigning Van Laerhoven in this way would have been uniquely challenging or otherwise beyond the level of ordinarily skilled artisans. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Even if Van Laerhoven would need to be changed or redesigned, 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). Here, Appellants have at most shown that Van Laerhoven would operate in a different way in the Examiner’s proposed combination.

Appellants provide no persuasive evidence to substantiate the claim that the modification would render Van Laerhoven unsuitable for its intended purpose. Instead, Appellants only offer conclusory assertions that have little probative value. *See In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997), *cited in* Ans. 23.

Specifically, Appellants assert the proposed combination “would break the SOM and KSOM neural networks.” App. Br. 24. The Examiner, however, finds that the Van Laerhoven-Widyantoro combination would classify in a different way than Van Laerhoven alone—i.e., the combination would use the user’s feedback. *See* Ans. 24–25. In its asserted rebuttal of this finding, Appellants have not provided persuasive evidence that Van Laerhoven would be unsuitable for classification. Rather, Appellants have only shown that Van Laerhoven would no longer use a particular feature for classification—i.e., the winner-takes-all aspect. *See* App. Br. 25;

Reply Br. 2. In this regard, Appellants take an overly narrow view of Van Laerhoven's intended purpose. Here, Van Laerhoven's intended purpose is classifying sensor data. *See* Van Laerhoven, Abstract. And considering the weight of the evidence before us, we are unconvinced that the Examiner's modification to Van Laerhoven would render it unsuitable for classifying sensor data.

Appellants also argue that Van Laerhoven and Widyantoro are non-analogous art. App. Br. 22–23. In Appellants' view, Van Laerhoven teaches a neural network and Widyantoro has “nothing to do with neural networks.” *Id.* at 22; Reply Br. 2. Appellants argue that “a skilled worker would not be motivated to combine Van Laerhoven with Widyantoro, because the technologies are so different.” App. Br. 23.

Prior art is analogous if it is (1) from the same field of endeavor as that of *Appellants' invention* regardless of the problem addressed or (2) reasonably pertinent to the particular problem with which *the inventor* is involved. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004) (emphasis added). That is, the analogous-art test does not ask whether the prior art references are analogous to each other, as Appellants' argument suggests. *See* App. Br. 22–23; Reply Br. 2. Rather, the proper inquiry is whether the references are analogous to Appellants' invention or the problem with which the inventor is concerned. *See Bigio*, 381 F.3d at 1325. For at least the reason that Appellants' arguments do not squarely address the relevant considerations, these analogous-art arguments are unpersuasive. Furthermore, Widyantoro's user-feedback processing is at least reasonably pertinent to the inventor's problem because Widyantoro teaches a way to use feedback to reduce undesired outcomes. *See* Widyantoro 405, 407–408.

To the extent Appellants argue that the differences between Van Laerhoven and Widyantoro weigh against the Examiner's proposed combination, we find that reasoning unpersuasive for the reasons discussed above. We also note that the Examiner finds that Van Laerhoven and Widyantoro teach adaptive algorithms. Ans. 25. The proposed combination merely substitutes one basis for adapting with another. *See* Final Act. 4–5; Ans. 25.

Accordingly, we sustain the rejection of claim 21, which is representative of claims 22, 23, 31, and 38–40. *See supra* note 3.

THE REMAINING OBVIOUSNESS REJECTIONS

Claims 25–30 and 32–37 depend from claims 21, 38, and 39. In arguing for the patentability of claims 25–30 and 32–37, Appellants refer to the arguments presented for the independent claims. *See* App. Br. 26–31; Reply Br. 4. Thus, for the reasons discussed in connection with claims 21, 38, and 39, we also sustain the rejections of claims 25–30 and 32–37.

DECISION

We affirm the Examiner's decision to reject claims 21–23 and 25–40.

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). *See* 37 C.F.R. § 41.50(f).

AFFIRMED