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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SANJEEV M. NAIK, WENDE ZHANG, and SHUQING ZENG¹

Appeal 2015-000948
Application 13/291,314
Technology Center 2400

Before ALLEN R. MacDONALD, AMBER L. HAGY, and
MICHAEL M. BARRY, *Administrative Patent Judges*.

BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1–22, which constitute all pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

¹ Appellants identify the real party in interest as GM Global Technology Operations, LLC. (App. Br. 2.)

Introduction

Appellants disclose “[a]n active vision system includes an image capture device for capturing images in a region exterior of a vehicle and a headlamp control unit for controlling a vehicle headlamp beam for illuminating an environment exterior of a vehicle.” (Spec., Abstract.)

Claim 1 is illustrative:

1. An active vision system for a vehicle comprising:

an image capture device for capturing images in a region exterior of a vehicle; and

a headlamp control unit for controlling a vehicle headlamp beam for illuminating an environment exterior of a vehicle, the headlamp control unit configured to selectively illuminate between making a path of travel of a road visible to a driver of the vehicle and making the region exterior of the vehicle visible for capturing images by the image capture device;

wherein the headlamp control unit utilizes a duty cycle for controlling a first cycle time that the headlamp beam illuminates the path of travel for making the road visible to the driver and for controlling a second cycle time that the headlamp beam makes the captured region visible for capturing images by the image capture device.

(App. Br. 22 (Claims App’x).)

Rejections

Claims 1–20 and 22 stand rejected under 35 U.S.C. § 103(a) as obvious over Higgins-Luthman (US 2009/0016073 A1; publ. Jan. 15, 2009) (“Higgins”) and Stam et al. (US 2008/0129206 A1; publ. June 5, 2008) (“Stam”). (Final Act. 3–8.)

Claim 21 stands rejected as obvious over Higgins, Stam, and Horii et al. (US 2005/0027419 A1; publ. Feb. 3, 2005) (“Horii”). (Final Act. 9.)

ISSUES

Appellants argue claims 1, 4, 6, 13, and 20 together as a group on the basis of claim 1 (App. Br. 7–8) and separately argue each of claims 2, 3, 5, 7–12, 14–19, 21, and 22 (App. Br. 9–21). The issues before us are whether the Examiner errs in rejecting each of the separately argued claims.

ANALYSIS

We have reviewed the Examiner’s rejections in light of Appellants’ arguments. With the exception of claim 18, we disagree with Appellants’ conclusions and adopt as our own: (1) the findings and reasons set forth in the Final Office Action from which this appeal is taken (Final Act. 3–15) and (2) the reasons set forth by the Examiner’s Answer in response to Appellants’ Appeal Brief (Ans. 9–17). With the exception of claim 18, we concur with the Examiner’s conclusions. We highlight the following for emphasis.

Claims 1, 4, 6, 13, and 20

In rejecting claim 1, the Examiner relies on Higgins for teaching the image capture device and the headlamp control unit, and on Stam for the “wherein the headlamp control unit utilizes a duty cycle . . .” requirements. (Final Act. 3–4; Ans. 2–3 (both citing Higgins Fig. 1, ¶ 22; Stam ¶¶ 8, 136).) Appellants argue the Examiner errs because “Stam fails to describe or suggest the limitations of duty cycling the headlamp beam between the road of travel and the region captured by the image capture device as recited.” (App. Br. 7.) Appellants further argue there would have been no motivation to combine Higgins and Stam “as the duty cycle in Stam is just to control the illumination intensity of the headlamps which are pointed in a fixed direction.” (*Id.* at 8.)

Appellants do not persuade us. Higgins, which relates “to vehicle lighting systems that may control the headlamps of the vehicle” (¶ 2), states:

The illumination source thus may automatically illuminate signs or other objects of interest at the side of the road, such as to provide automatic illumination for . . . enhanced viewing, or to provide enhanced illumination for an object recognition system of the vehicle

For applications with an object recognition system, the imaging device may automatically capture at least one image of the object when the object is illuminated by the illumination source Optionally, the control may direct or adjust and flash the illumination source in response to detection of the object . . . , whereby the imaging device may be synchronized with the flashing illumination source to capture one or more images of the object during the brief period of time that the sign or object area is illuminated. . . .

(Higgins ¶¶ 22–23.) Higgins thus teaches the claimed image capture device and headlamp control unit for selectively illuminating the path of vehicle travel and the other “region exterior . . . for capturing images.”

Stam, which also relates to headlamp control (Abstract, ¶¶ 2, 8), teaches techniques for adjusting headlamp illumination between high- and low-beams by varying duty cycles (¶¶ 135–36). We agree with the Examiner it would have been obvious for one of ordinary skill “to modify Higgin[s’] automatic headlight control system which illuminates the front and side of the road with the duty cycle of Stam to improve vision on the sides of a car by alternately illuminating the path of travel and the side of the road.” (Ans. 10.) We find Appellants’ argument the Examiner errs because Stam teaches only “duty cycling of headlamps either on or off” (App. Br. 8) unpersuasive because it does not address the combined teachings of Higgins and Stam. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (“The test for

obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. . . . Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art.”).

Appellants have not asserted that the proposed modification would have been beyond the capabilities of a person of ordinary skill in the art. Absent such an assertion, we “take account of the inferences and creative steps that a person of ordinary skill in the art would employ,” and find a person of ordinary skill in the art would overcome those difficulties within their level of skill. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *see also id.* at 421 (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”).

We accordingly sustain the rejection of claim 1, and along with it claims 4, 6, 13, and 20.

Claims 2, 3, 5, 7–12, 14–19, 21, and 22

Appellants argue the Examiner errs in rejecting claims 2 and 3 because Higgins does not teach or suggest the claimed synchronization between the image capture device and headlamp control unit. (App. Br. 9–10.) Appellants further argue Higgins is deficient because it “describes that directing the illumination is in response to detecting the object” whereas the claimed invention “captures the image in the region when illuminated based on synchronization.” (Reply Br. 3 (citing Higgins ¶ 23).) We find these arguments unpersuasive in view of the teachings and suggestions that flow from Higgins’ disclosure that “the imaging device may be synchronized with the flashing illumination source to capture one or more images of the object

during the brief period of time that the sign or object area is illuminated.” (Higgins ¶ 23.) We sustain the rejection of claims 2 and 3.

Claim 5 recites “an azimuth glance operating mode, wherein the headlamp control unit re-directs the headlamp beam horizontally between the primary region and the secondary region.” Appellants contend, without providing any citations to the Specification, that azimuth glance operating mode is defined to mean “illumination will only be autonomously directed in a side-to-side direction in which the image capture device is directed.” (App. Br. 11.) We disagree. Claim 5’s “wherein . . .” recitation delineates the azimuth glance operating mode requirements.

Appellants argue the Examiner errs in rejecting claim 5 because “[i]n Higgins, there is no azimuth operating mode; rather, Higgins redirects light based on the direction the driver is glancing.” (*Id.*) This does not persuade us of Examiner error; we agree with the Examiner’s finding that “wherein the headlamp control unit re-directs the headlamp beam horizontally between the primary region and the secondary region” as recited in claim 5 encompasses Higgins’ teaching of controlling headlamps to redirect illumination between the front and side of the vehicle. (*See* Ans. 13 (citing Higgins ¶¶ 13, 22).) We sustain the rejection of claim 5.

Appellants argue the Examiner errs in rejecting claims 7–11 because Higgins fails to disclose the claimed “secondary region” requirements² of “the sides of the road for identifying a geometry of the road” (claim 7), “a location where road signs are potentially located” (claim 8), “a location

² Claims 7–11 each recite a limitation that “[t]he active vision system of claim 5 wherein the primary region is the path of travel of the vehicle and the secondary region is” (App. Br. 23–24 (Claims App’x).)

where pedestrians are potentially located” (claim 9), “a location where animals are potentially located” (claim 10), and “a location where road side objects are potentially located” (claim 11). (App. Br. 12–14.) We find these arguments unpersuasive in view of Higgins’ teachings that its automatic lighting system can detect signs, animals, pedestrians, and other objects. (*See* Ans. 13–14 (citing Higgins ¶ 22).) We sustain the rejection of claims 7–11.

Claim 12 differs from claim 5 by reciting “an elevation glance . . . mode” instead of an “azimuth glance . . . mode.” Appellants make similar arguments for claim 12 as for claim 5, which we find unpersuasive in view of Higgins’ disclosure of adjusting the principal axis of illumination “optionally vertically.” (*See* Ans. 14 (citing Higgins ¶ 13).) We sustain the rejection of claim 12.

Appellants argue the Examiner errs in rejecting claims 14 and 15 because Higgins fails to disclose the claimed “secondary region” requirements³ of “a location where overhead signs are potentially located” (claim 14) and “a location where overhead objects are potentially located” (claim 15). (App. Br. 16.) We find these arguments unpersuasive for the same reasons discussed *supra* for claims 7–11 and 12; we sustain the rejection of claims 14 and 15.

Appellants argue the Examiner errs in rejecting claim 16, which recites a “scanning mode” that redirects headlamp illumination “between the road of travel and both sides,” because Higgins describes adjusting

³ Claims 14 and 15 recite a limitation that “[t]he active vision system of claim 12 wherein the primary region is a path of travel of the vehicle and the secondary region is” App. Br. 22–25 (Claims App.).

illumination based on “gaze direction” and does not teach or suggest any “scanning mode.” (App. Br. 16–17 (citing Higgins ¶ 17).) We are unpersuaded. “Gaze detection” in Higgins is a feature that supplements its “automatic lighting system” that otherwise “provides enhanced illumination . . . at a side of a road . . . to enhance the viewing by the driver *and/or imaging device* of signs and the like . . .” (Higgins ¶ 24 (emphasis added.) Appellants do not persuasively rebut the Examiner’s finding that Higgins teaches automatic illumination at the sides of a vehicle that is within the scope of the recited “scanning mode” requirements (*see* Ans. 13 (citing Higgins ¶¶ 13, 22); *see also* Higgins ¶¶ 23–26.) We sustain the rejection of claim 16.

Appellants argue the Examiner errs in rejecting claim 17 because “Higgins fails to describe an instrument control unit for allowing the driver to select [from] among *the plurality of system operating modes*” as recited. (App. Br. 17.) Appellants further contend, without citation, that the Specification defines the plurality of system operating modes to be those enumerated (azimuth glance mode, etc.). (*Id.*)

We disagree that the plurality of operating modes is limited based on the Specification. We also find Appellants do not persuasively explain why the Examiner’s finding that Higgins teaches this requirement by its disclosure of an instrument panel that enables an operator to selectively or partially enable the activation of the illumination system, with partial enablement “interpreted as selecting an operating mode,” is erroneous. (Ans. 16 (citing Higgins ¶ 19).) We sustain the rejection of claim 17.

Appellants argue the Examiner errs in rejecting claim 18⁴ by finding Higgins teaches or suggests that “the image capture device is steerable” as recited. (App. Br. 18.) The Examiner responds by finding that while “Higgins clearly discloses a forward facing camera” (that is, a camera that is fixed, not steerable) and that “[a] camera can also be steerable by means of the car steering wheel. Moreover, a camera mounted on a rear view mirror that is directed towards a driving instructor can still capture a secondary region exterior to the vehicle. Therefore, the limitations of claim 18 are met.” (Ans. 16–17.) We find Appellants’ argument persuasive. Neither Higgins nor Stam mentions a camera that is steerable or that otherwise moves, and the Examiner has not identified any disclosure or other reason for why such a teaching or suggestion arises from these references. We do not sustain the rejection of claim 18.

Appellants argue the Examiner errs in rejecting claim 19 by finding that Higgins (¶¶ 7, 20) teaches the recited requirements for a “body control module” that obtains geographical information for use with the headlamp control unit in re-directing the headlamps. (App. Br. 18–19.) We disagree. Higgins teaches that incorporating navigation systems “may also function to disable, enable, or partially enable or limit the operation of the adjustable illumination system.” (¶ 20.) We sustain the rejection of claim 19.

Claim 21 depends from claim 1 and recites “wherein the controller⁵ adjusts the duty cycle of the illumination of the vehicle headlamp as a

⁴ Claim 18 recites “[t]he active vision system of claim 3 wherein the image capture device is steerable to a respective position for capturing images in the secondary region.”

⁵ Claim 1 does not recite “a controller.” Without making a determination under 35 U.S.C. § 112 regarding indefiniteness, for analysis of this prior art

function of the speed of travel of the vehicle.” The Examiner finds this requirement obvious in view of Horii’s disclosure of “a vehicle speed sensor” as an input to its “light distribution control” for directing headlights, in combination with the variable duty cycle teachings of Stam. (Final Act. 20–21.) We agree. Appellants’ argument that Horii fails to teach the duty cycle-related requirement does not address the Examiner’s reliance on Stam for that aspect. *See Keller*, 642 F.2d at 425 (“[T]he test is what the combined teachings of those references would have suggested to those of ordinary skill in the art.”). We sustain the rejection of claim 21.

Appellants argue the Examiner errs in rejecting claim 22 because “Higgins fails to teach or suggest synchronization” as recited. App. Br. 19. We find this unpersuasive for the reasons discussed *supra* with regards to claims 1–3 and for the reasons as articulated by the Examiner’s Answer (pp. 10–11). We sustain the rejection of claim 22.

DECISION

For the above reasons, we affirm the Examiner’s rejections of claims 1–17 and 19–22, and reverse the rejection of claim 18. 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-IN-PART

rejection we construe the antecedent basis for “the controller” in claim 21 as the “headlamp control unit.” In the event of further prosecution, we suggest Appellants amend this claim to address this antecedent basis issue.