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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YANG YANG, FRANK BURROUGHS, and KRISTEN CURLEE

Appeal 2018-006383
Application 13/804,156
Technology Center 3600

Before JILL D. HILL, LEE L. STEPINA, and ARTHUR M. PESLAK,
Administrative Patent Judges.

PESLAK, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 3–7, and 21–23, which constitute all the claims pending in this application.² *See* Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

¹ 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 Dow AgroSciences LLC. Appeal Br. 3.

² Claims 8–10 are withdrawn from consideration and claims 11 and 13–17 are allowed. Final Act. 1.

THE CLAIMED SUBJECT MATTER

Appellant's invention relates to providing artificial light to plant growing areas. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. An apparatus for controlling the light intensity received at a plant canopy comprising:
 - a frame;
 - an artificial light source supported by the frame and positioned at a distance generally above a plant canopy;
 - a light intensity sensor positioned to measure a light intensity, the light intensity sensor positioned at one of the plant canopy and a distance above the plant canopy;
 - a first height adjustment unit configured to adjust the distance between the artificial light source and plant canopy; and
 - a distance sensor supported by the frame and moveable with the artificial light source, the distance sensor measuring a distance between the distance sensor and the plant canopy, wherein the first height adjustment unit adjusts the distance between the artificial light source and the plant canopy in response to at least one of the light intensity measured by the light intensity sensor and the distance measured by the distance sensor.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Kloos	US 5,038,261	Aug. 6, 1991
Van Den Dool	US 2006/0032115 A1	Feb. 16, 2006
Dubé	US 2010/0115830 A1	May 13, 2010
Hirawai ³	JPH04356139A	Dec. 9, 1992
Baccigalupi	Baccigalupi et al., <i>Field Programmable Analog Arrays for Conditioning Ultrasonic Sensors</i> , IEEE Sensors Journal, Vol. 7, No. 8	Aug. 2007

REJECTIONS

- 1) Claims 1, 3, 4, and 21–23 are rejected under 35 U.S.C. § 103(a) as unpatentable over Hirawai⁴, Kloos, and Dubé.
- 2) Claims 5 and 6 are rejected under 35 U.S.C. § 103(a) as unpatentable over Hirawai, Kloos, Dubé, and Van Den Dool.
- 3) Claim 7 is rejected under 35 U.S.C. § 103(a) as unpatentable over Hirawai, Kloos, Dubé, and Baccigalupi.

³ Although the inventor of JPH04356139A is Hirawai Hideyoshi, because both the Examiner and Appellant use the name “Hirawai,” we keep this nomenclature to refer to JPH04356139A for consistency.

⁴ We refer to the English-language machine translation provided by the Examiner.

OPINION

Rejection 1

Claims 1 and 22

The Examiner finds that Hirawai discloses all the limitations of claim 1 except that “Hirawai is silent about a light intensity sensor positioned to measure a light intensity . . . and a distance sensor the distance sensor measuring a distance between the distance sensor and the plant canopy.” Final Act. 2–3. The Examiner finds that Kloos discloses a distance sensor and that Dubé discloses a light intensity sensor. *Id.* at 3–4. The Examiner concludes that it would have been obvious to replace Hirawai’s detection sensor with Kloos’s distance sensor “in order to adjust the distance between the plant canopy and the light based on plant height before the plants block the light source,” and that it would have been obvious to further modify Hirawai with Dubé’s light intensity sensor “in order to control the light intensity hitting the plants and adjust the height based on various sensor readings.” *Id.*

Appellant argues that Kloos is non-analogous art because (1) it is in a different field of endeavor and because (2) it is not reasonably pertinent to the particular problem with which the inventor is involved. Appeal Br. 11–12 (citing *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004); *In re Wood and Eversole*, 599 F.2d 1032, 1036 (CCPA 1979)). Regarding the second prong of the analogous art test, Appellant argues that the problem to be solved by the claimed invention is “controlling of intensity of artificial light at a plant canopy to improve quantity and quality of yields,” whereas Kloos focuses on a different problem, namely, “readjust[ing] the beam direction setting so that the originally set illumination zone (operating incision) will again be exactly

illuminated without new displacement of the lamp fixture.” *Id.* at 12–13 (citing Spec. ¶ 3 and Kloos, 2:10–15). According to Appellant, “one of ordinary skill in the art would not look to Kloos because the object of the present invention is control the light intensity at a plant canopy and not to ensure a specific area is covered by the light irrespective of intensity.” *Id.* at 13.

The Examiner responds that Kloos is addressing the same problem as Appellant, “measuring the distance between an artificial light source and a pertinent field.” Ans. 3 (citing Kloos, 3:25–30). Specifically, Kloos uses “a distance sensor to determine any needed height adjustment of the light to the pertinent field.” *Id.* According to the Examiner, “[t]he limitations of a plant canopy and adjusting the distance from the plant itself have already been taught by Hirawai, Kloos is merely teaching a light source with a different type of sensor is known and can be implemented thereon.” *Id.* at 3–4.

Appellant replies that “the Examiner’s suggested problem is too generic and abstract a way of framing the art fields in question.” Reply Br. 3. Appellant argues that “while Kloos is directed to keeping a specific area illuminated and adjusting the lamp fixture to keep the exact area illuminated at different positions, the present application is directed to providing a specific, consistent intensity of light at the plant canopy independent of the given area covered by the light.” *Id.* For the following reasons, we are not persuaded that Kloos is not analogous art.

The analogous art test requires that a reference either be in the field of the applicant's endeavor or reasonably pertinent to the problem with which the inventor was concerned in order to rely on that reference as a basis for the rejection. *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992).

References are selected as being reasonably pertinent to the problem based on the judgment of a person having ordinary skill in the art. *Id.* (“[I]t is necessary to consider ‘the reality of the circumstances,’ --in other words, common sense--in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.” (quoting *In re Wood*, 599 F.2d 1032, 1036 (CCPA 1979))).

Furthermore, the scope of analogous art is to be construed broadly. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (“The Supreme Court’s decision in *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007), directs us to construe the scope of analogous art broadly, stating that ‘familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle.’ *Id.* at 402 (emphasis added).”).

Appellant’s argument in the Reply Brief that the Examiner’s framing of the art fields in question is too generic and abstract may be relevant to the first prong of the analogous art test, i.e., whether Kloos is in Appellant’s field of endeavor. However, we focus here on the second prong, i.e., whether Kloos is reasonably pertinent to the problem with which the inventor was concerned.

Appellant identifies a problem with prior art plant growing systems of undesirable variations in lighting as plants grow because those systems use a lamp “that is maintained at a fixed distance from the plant growing area.” Spec. ¶ 3. Appellant’s claimed invention utilizes a distance sensor to measure the distance between the distance sensor and the plant canopy and then adjusting the distance between the light source and the plant canopy. Appellant does not dispute the Examiner’s finding that Kloos teaches “an

ultrasound sensor 15 for determining the distance between illumination zone 8 (operating plane) and reference point 7 of the lamp housing 9.” Kloos, 4:44–47. Because both Appellant and Kloos use a sensor to determine the distance between a light source and what the light is illuminating (*see* Spec. ¶ 25; Kloos 4:44–47), we agree with the Examiner that Kloos is reasonably pertinent to the problem addressed by the claimed invention. Appellant’s assertion of differences between applications for surgical lamps and grow lamps may be relevant to the first prong of the analogous art test, but does not apprise us of Examiner error in finding that Kloos is reasonably pertinent to the problem solved by Appellant’s claimed invention of adjusting the distance between a light source and a plant canopy.

Appellant also argues that the combination of references fails to disclose a first height adjustment unit adjusting the distance in response to the distance measured by the distance sensor. Appeal Br. 15. According to Appellant, Kloos rotates the lamp head in response to a distance measurement indicating that the desired illuminated zone is not properly illuminated, but does not adjust the distance between the artificial light source and the field in response to the distance measurement. *Id.* The Examiner responds that Kloos changes distance in addition to rotating the lamp in order to have proper illumination. Ans. 4–5.

Appellant’s arguments are not persuasive because the arguments are an attack on Kloos individually whereas the rejection is based on the combined teachings of Hirawai and Kloos. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (explaining that one cannot show nonobviousness by attacking references individually when the rejection is based on a combination of references). Here, the Examiner finds that Kloos teaches a

distance sensor, and proposes to modify Hirawai's system to make Hirawai's detection sensor a distance sensor and reasons that the combination of Hirawai and Kloos would have been obvious "in order to adjust the distance between the plant canopy and the light based on plant height before the plants block the light source." Final Act. 3. Specifically, the Examiner understands Hirawai's system to wait until the light is blocked by the plants before changing the distance, whereas Kloos determines a distance and would allow the system of Hirawai to adjust the distance before the plant blocks the light.

We agree with the Examiner that Kloos changes distance in addition to rotating the lamp in order to have proper illumination. Kloos discloses that "[a]fter movement of the lamp . . . the lamp housing is displaced until the lighting axis intersects with the originally set illumination zone." Kloos, 2:27–37. Specifically, with respect to Figure 4 of Kloos, when the distance between illumination zone 8 (operating plane) and reference point 7 is changed, i.e., "for displacement of lamp housing 9 by a distance N from position 7 to position 7' . . . angles are then adjusted by the positioning motors by rotations at joints 3 and 4. The resetting of the intensely illuminated zone by overlapping of the light beams is accomplished." *Id.* at 5:30–50 (emphasis omitted); *see also* Ans. 5.

Appellant also argues that there is no reason to replace the detection sensor of Hirawai with the distance sensor of Kloos, because the plants of Hirawai do not block the light source itself in Hirawai, but the light source of the sensor so that the sensor may trip and signal that the light needs to be moved up. Appeal Br. 16. We note that Appellant does not direct our attention to any portion of Hirawai in support of this argument. *See id.*

Appellant asserts that the Examiner's proposed replacement is not a simple substitution of the sensor of Hirawai with a distance sensor, because this would render the system of Hirawai inoperable for its intended purpose. *Id.* Specifically, Appellant asserts that even if the resultant system were "capable of measuring a distance, there is no guidance with what to do with the measured distance since neither Hirawai nor Kloos disclose adjusting the height of the lamp relative to the plant canopy in response to the measured distance." *Id.*

Appellant's arguments are not persuasive. Hirawai discloses that the position of lamp 1 is changed in the vertical direction based on the output of detecting means 3 so that the "distance between the plant 2 and the lamp 1 can be properly maintained at all times." Hirawai Abstract, *see also id.* ¶ 8. Using a distance sensor, if the distance is not appropriate, the height would be adjusted so as to maintain a proper distance. Any adjustment would be based on the measured distance. Previously, Hirawai would adjust the distance based on the amount of light hitting the sensor (whether the light hitting sensor 3 was blocked or not). By substituting the distance sensor of Kloos for the detection sensor of Hirawai, Hirawai would continue to operate in its intended manner of adjusting the height to maintain proper distance between the plant and the lamp.

We have considered all of Appellant's arguments and determine that they fail to apprise us of error in the Examiner's findings and reasoning. We, thus, sustain the rejection of claim 1 under 35 U.S.C. § 103(a). Claim 22 depends from claim 1. Appeal Br. 27 (Claims App.). Appellant does not argue separately for the patentability of claim 22. *See Appeal Br. passim.*

We, thus, sustain the rejection of claim 22 for the same reasons as stated above for claim 1.

Claims 3, 4, 21, and 23

For claim 3, the Examiner finds that it would have been obvious to include a second height adjustment mechanism in order to further adjust the height as the “mere duplication of the essential working parts of a device.” Final Act. 4–5; *see also* Ans. 5.

Appellant argues that the addition of the second height adjustment unit is not a mere duplication of parts because the second height adjustment unit is configured to adjust a different distance than that of the first height adjustment unit. Appeal Br. 17–18; *see also* Reply Br. 4.

Appellant’s argument is persuasive because the Examiner does not explain adequately how duplication of height adjustment units will result in a second height adjustment unit configured to adjust the relative position of the light intensity sensor to the artificial light source as required by claim 3. As Appellant correctly notes, the first height adjustment unit of claim 1 is configured to adjust the distance between the artificial light source and plant canopy. Having a second unit performing this function would not adjust the relative position of the light intensity sensor to the artificial light source. Thus, we agree with Appellant that the Examiner’s conclusion that the second height adjustment unit is a mere duplication of parts is not supported because “the addition of the second height adjustment unit adds the ability to adjust two other components of the system relative to each other independent or dependent of the adjust[ment]s made by the first height adjustment unit.” Appeal Br. 18.

For these reasons, we do not sustain the rejection of claim 3 and claims 4, 21, and 23 depending therefrom.

Rejections 2 and 3

Claims 5–7 depend from claim 1. Appeal Br. 24 (Claims App.). Appellant does not argue separately for the patentability of claims 5–7. *See* Appeal Br. *passim*. We, thus, sustain the rejection of claims 5–7 for the same reasons as stated above for claim 1.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3, 4, 21–23	103(a)	Hirawai, Kloos, Dubé	1, 22	3, 4, 21, 23
5, 6	103(a)	Hirawai, Kloos, Dubé, Van Den Dool	5, 6	
7	103(a)	Hirawai, Kloos, Dubé, Baccigalupi	7	
Overall Outcome:			1, 5–7, 22	3, 4, 21, 23

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED IN PART