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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KENSUKE MATSUMURA, MASAYIKI WATANABE, and YUSAKU MIYAZAKI

Appeal 2019-004113
Application 15/322,059
Technology Center 1700

Before JAMES C. HOUSEL, BRIAN D. RANGE, and
JANE E. INGLESE, *Administrative Patent Judges.*

HOUSEL, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1, 3, and 5 under 35 U.S.C. § 102(a)(1) as anticipated by Soska (US 6,369,353 B1, iss. Apr. 9, 2002) and claim 4 under 35 U.S.C. § 103 as unpatentable over Soska in view of Tokura (US

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[1] We use the word Appellant to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as The Yokohama Rubber Co., LTD. Appeal Brief ("Appeal Br.") filed November 16, 2018, at 3.

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2010/0038560 A1, pub. Feb. 18, 2010).[2] We have jurisdiction under
35 U.S.C. § 6(b).

We REVERSE.

CLAIMED SUBJECT MATTER

The claims are directed to a mold cleaning system. Spec. 1:4, Title.
The mold cleaning system comprises a laser oscillator and head configured
to irradiate a molding surface of a mold to be cleaned with a laser beam, an
arm configured to move the laser head freely in three dimensions ("3D"), a
control device configured to control motion of the arm, and a camera
configured to acquire 3D image data of the molding surface. *Id.* at 2:24–29.
By controlling the arm motion based on the 3D image data acquired by the
camera, the laser head is moved along the molding surface while irradiating
with the laser beam to clean the surface. *Id.* at 2:29–32. Appellant discloses
that acquiring 3D image data of the molding surface of a mold to be cleaned
avoids the need to invoke mold shape data from a database and verify
correspondence between the mold to be cleaned and the database shape data
every time cleaning is performed. *Id.* at 2:33–3:1. Further, Appellant
discloses that movement of the laser head based on 3D image data acquired
from the actual mold to be cleaned prevents scratching while permitting
efficient cleaning of the molding surface, even for molds having complicated
molding surfaces or with molding surfaces that may change over time. *Id.* at
3:1–10. In addition, Appellant discloses that the mold cleaning system may
also be configured to determine a cleaning state of a cleaned molding

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[2] The anticipation rejection of claims 2 and 6, and the obviousness rejection
of claims 7 and 8 have been withdrawn by the Examiner and are not before
us on appeal. Examiner's Answer ("Ans.") dated February 28, 2019, at 7.

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surface and, for positions on the molding surface failing to satisfy a preset clean standard, perform additional cleaning with the laser beam. *Id.* at 3:11–19.

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the claimed subject matter:

1. A mold cleaning system comprising:

a laser oscillator;

a laser head configured to irradiate a molding surface of a mold with a laser beam supplied from the laser oscillator;

an arm configured to move the laser head freely in three dimensions;

a control device configured to control motion of the arm; and

a camera configured to acquire three-dimensional image data of a molding surface of a mold to be cleaned;

wherein by controlling the motion of the arm on a basis of the image data acquired by the camera when the mold is cleaned, the laser head is moved along the molding surface while irradiating with the laser beam to clean the molding surface.

OPINION

Rejection 1: Anticipation by Soska

The Examiner rejects claims 1, 3, and 5 under 35 U.S.C. § 102(a)(1) as anticipated by Soska. The dispositive issue before us is whether Appellant has identified reversible error in the Examiner's finding that Soska's video camera is "configured to acquire three-dimensional image data of a molding surface of a mold to be cleaned" and thereby meets the camera recitation of

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claim 1. We answer this question in the affirmative and, therefore, will not sustain the Examiner's rejections based on Soska.

Anticipation is established when a single prior art reference discloses all features of the claimed invention. *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990). Inherent disclosure requires that the prior art reference "necessarily include[s] the unstated limitation." *Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 1000 (Fed. Cir.2006); *see also Cont'l Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "'[P]robabilities or possibilities'" are not enough to find that the prior art inherently discloses something not explicitly present. *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981).

The Examiner finds that Soska teaches a robotic laser mold cleaning system equivalent to the system of claim 1 comprising, among other things, a video camera configured to acquire 3D image data of the molding surface of a tire mold to be cleaned. Ans. 3–4. The Examiner further finds that Soska teaches that by controlling the laser arm motion on the basis of this acquired image data, the laser head is moved along the molding surface while irradiating with the laser to clean the molding surface. *Id.* at 4, 7. In addition, the Examiner finds that Soska's camera is "inherently capable of acquiring image data, and if the subject matter in the visual field of the camera is a three-dimensional object, that image data would necessarily be three-dimensional data." *Id.* at 8. The Examiner explains that objects at differing distances from the camera's lens would appear in different degrees of focus within the image data acquired by the camera. *Id.*

Appellant argues that Soska fails to teach or suggest a camera acquiring any image data of the mold, whether 3D or otherwise. Appeal

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Br. 10. Further, Appellant contends that Soska's camera is not capable of acquiring 3D image data. *Id.* at 11. Appellant urges that Soska's teaching of using a camera to recognize and adjust the location of the end effector is not based on image data of a molding surface. *Id.* at 10. In this regard, Appellant asserts that Soska fails to disclose how the end effector is recognized and how this recognition relates in any way to a molding surface. *Id.* at 10–11. Appellant additionally argues that Soska fails to teach that the movement of the arm carrying the laser head is controlled based on 3D image data of a molding surface of a mold to be cleaned. *Id.* at 11.

A central issue before us is the meaning of the phrase "configured to" as used throughout claim 1, and in particular, the meaning of the limitation "a camera *configured to* acquire three-dimensional image data of a molding surface of a mold to be cleaned." As we note above, the Examiner interprets this limitation to mean a camera capable of acquiring three-dimensional image data of a molding surface of a mold to be cleaned. Ans. 7–8. On the other hand, Appellant's position is that this limitation requires a camera that is specifically designed and positioned to capture three-dimensional image data of a molding surface of a mold to be cleaned. Appeal Br. 13.

We begin, appropriately, with the claim's words. *See Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001) ("Only when a claim is properly understood can a determination be made . . . whether the prior art anticipates and/or renders obvious the claimed invention."). The PTO's traditional pre-issuance approach has been to give claims "their broadest reasonable construction '*in light of the specification as it would be interpreted by one of ordinary skill in the art.*'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (emphasis added). Under

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a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the Specification.

Having considered the respective interpretations of the Examiner and Appellant, we find the broadest reasonable interpretation is that the camera is positioned and includes hardware and software necessary to acquire 3D image data of the molding surface of a mold to be cleaned sufficient to enable the control device to control motion of the arm on the basis of the image data when the mold is cleaned, thereby moving the laser head along the molding surface while irradiating with the laser beam to clean the molding surface. Although the Examiner applies a broad meaning to the phrase "configured to" to mean "capable of" (Ans. 8), we find the ordinary and customary meaning of this phrase, especially in light of Appellant's Specification, supports a narrower meaning for this phrase to require that the camera is designed such that it is able to perform the particular use, purpose or situation recited in claim 1. *See Aspec Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (The phrase "adapted to" construed narrowly to mean "configured to", as opposed to "capable of" or "having the capacity of".); *Boston Scientific Corp. v. Cordis Corp.*, 2006 WL 3782840 (N.D. CA. 2006) ("A widely accepted dictionary definition of the word 'configure' means '[t]o design, arrange, set up, or shape with a view to specific applications or uses.' American Heritage Dictionary 386 (4th ed. 2000).")

This interpretation is bolstered by Appellant's Specification, which discloses "three-dimensional image data of a molding surface of the mold to be cleaned is acquired by a camera. As such, the shape of the molding surface of the mold can be accurately grasped at the time of cleaning." Spec.

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2:33–36; *see also id.* at 7:29–32. Appellant further discloses "a camera *configured to* acquire three-dimensional image data of a molding surface of a mold to be cleaned." *Id.* at 2:28–29 (emphasis added). In addition, Appellant discloses that "[t]he camera 3 and the temperature sensor 8 are attached to a tip of the arm 6, and the image data acquired by the camera 3 and the temperature data detected by the temperature sensor 8 are input into the control device 7." *Id.* at 4:37–5:2. In operation, Appellant discloses that "the arm 6 is moved to dispose the camera 3 at an appropriate position and three-dimensional image data of the molding surface 12 of the mold 11 is acquired." *Id.* at 7:1–3. Although the Examiner finds that Appellant relies on unclaimed features including a camera system having plural lenses arranged in a configuration with overlapping visual fields to utilize a parallax effect to acquire 3D image data (Ans. 8), Appellant contends, and we agree, that these features were not part of Appellant's argument. Reply Br. 4.

Applying this interpretation to the claims, we find Soska is not configured to acquire three-dimensional image data of a molding surface of a mold to be cleaned; wherein by controlling the motion of the arm on a basis of the image data acquired by the camera when the mold is cleaned, the laser head is moved along the molding surface while irradiating with the laser beam to clean the molding surface. The Examiner fails to adequately explain how image data of a 3D object acquired by any camera, or Soska's disclosed video camera in particular, inherently is 3D image data of that object. Even assuming the Examiner is correct that objects appearing at different distances would appear in different degrees of focus, the Examiner fails to adequately explain how such focus differences equate to 3D image data. Indeed, the Examiner's position essentially is that 2D images captured

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by a camera are actually 3D image data, a position which is not supported on this record.

The Examiner also took the position that the limitations at issue are functional and do not serve to distinguish the claimed mold cleaning system over Soska. Ans. 8. As noted by the Examiner, apparatus claims must be distinguished from the prior art in terms of structure rather than intended use or intended function. *In re Danly*, 263 F.2d 844, 847 (CCPA 1959). However, there is nothing intrinsically wrong in using functional language, defining something by what it does rather than by what it is, in drafting patent claims. *In re Swinehart*, 439 F.2d 210, 212 (CCPA 1971).

Here, the claimed structure is defined by how it functions, not by how it is possible to function. *Danly*, 263 F.2d at 847. In order to establish that a prior art structure teaches a claim's functional recitation, it is necessary to establish that the prior art is necessarily capable of functioning as claimed. *In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995) ("The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness."); *In re King*, 801 F.2d 1324 (Fed. Cir. 1986) ("Under the principles of inherency, if a structure in the prior art necessarily is capable of functioning as claimed, the claim is anticipated."). The Examiner's observation that the functional language is mere intended use, without more, does not establish that the prior art is capable of performing the required function. Here, the Examiner has not established that Soska is necessarily capable of functioning as claimed. To the contrary, we note Soska teaches that the robotic arm "is moved through at least one *predetermined* set of movements with respect to the tire mold." Soska 6:27–31 (emphasis added). Soska further teaches that the controller, which directs

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the movement of the robotic arm, is fully programmable to move the robotic arm through a plurality of different *predetermined* sets of movements to allow the cleaning system to be used with various molds of different sizes and shapes. *Id.* at 6:36–41. These disclosures suggest that movement of the robotic arm is controlled based on information retrieved from a database rather than 3D image data of the mold to be cleaned acquired by the camera. Therefore, we are persuaded that Soska does not anticipate the claimed invention.

Accordingly, we cannot sustain the Examiner's anticipation rejection of claim 1, and dependent claims 3 and 5, based on Soska.

Rejection 2: Obviousness over Soska and Tokura

The Examiner rejects claim 4 under 35 U.S.C. § 103 as unpatentable over Soska in view of Tokura. However, the Examiner does not rely on Tokura to remedy the deficiencies in Soska as applied to claim 1, as discussed above. Accordingly, for the same reasons as set forth above, we likewise do not sustain the Examiner's obviousness rejection of claim 4.

CONCLUSION

For the reasons given above and in the Appeal and Reply Briefs, the Examiner's decision to reject claims 1, 3, and 5 under 35 U.S.C. § 102(a)(1) as anticipated by Soska and claim 4 under 35 U.S.C. § 103 as unpatentable over Soska in view of Tokura is *reversed.*

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DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3, 5	102(a)(1)	Soska		1, 3, 5
4	103	Soska, Tokura		4
Overall Outcome				1, 3–5

REVERSED