UNITED STATES PATENT AND TRADEMARK OFFICE

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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 WENMING ZHENG, HAITIAN ZHU,
ZONGCAI RUAN, and YANKUN ZHANG

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Appeal 2018-009044
Application 14/770,087
Technology Center 2600

_____

Before JUSTIN BUSCH, JOHN P. PINKERTON, and
NORMAN H. BEAMER, *Administrative Patent Judges*.

PINKERTON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] appeals under 35 U.S.C. § 134(a) from the Examiner's

Final Rejection of claims 1–6, 8–13, and 15. We have jurisdiction under 35

U.S.C. § 6(b).

We REVERSE.

STATEMENT OF THE CASE

Introduction

Appellant generally describes the disclosed and claimed invention as relating to road region detection. Spec. ¶ 1.[2]

Claims 1, 8, and 15 are independent. Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

> 1. A method for detecting road regions, comprising:
>
> obtaining a first image captured by a camera at a first time point and a second image captured by the camera at a second time point;
>
> converting the first image and the second image into a first top view and a second top view, respectively;
>
> obtaining a movement vector matrix which substantially represents movement of a road region relative to the camera between the first time point and the second time point; and
>
> determining whether a candidate point belongs to the road region by determining whether a position change of the candidate point between the first top view and the second top view conforms to the movement vector matrix.

Appeal Br. 15 (Claims App.).

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[2] Our Decision refers to the Final Office Action mailed Nov. 3, 2017 ("Final Act."); the Advisory Action mailed Jan. 25, 2018 ("Advisory Act."); the Appeal Brief filed Apr. 5, 2018 ("Appeal Br."); the Reply Brief filed Sept. 17, 2018 ("Reply Br."); the Examiner's Answer mailed July 16, 2018 ("Ans."); and the original Specification filed Aug. 24, 2015 ("Spec.").

Rejection on Appeal[3]

Claims 1–6, 8–13, and 15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Yang (US 2010/0246901 A1; published Sept. 30, 2010).[4]

ANALYSIS

The dispositive issue raised by the arguments in Appellant's briefs is whether Yang discloses the limitation "determining whether a candidate point belongs to the road region by determining whether a position change of the candidate point between the first top view and the second top view conforms to the movement vector matrix," as recited in claim 1, and as similarly recited in claim 8 and claim 15[5] (hereinafter, "the disputed limitation").[6]

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[3] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. § 100 *et seq.* effective on March 16, 2013. Because this application is a U.S. national stage application filed under 35 U.S.C. § 371 of international application PCT/CN2013/072054 filed on Mar. 1, 2013 (*see* Abstract), the Examiner examined the claims under the pre-AIA version of 35 U.S.C. § 102. Final Act. 3.

[4] The Examiner objected to claims 7 and 14 as being dependent upon a rejected base claim, but stated they would be allowable if written in independent form including the limitations of the base claim and any intervening claims. Final Act. 8.

[5] In claim 15, the disputed limitation is recited as the function in the means-plus-function limitation "means for determining whether a candidate point belongs to the road region by determining whether a position change of the candidate point between the first top view and the second top view conforms to the movement vector matrix." Appeal Br. 20 (Claims App.).

[6] Appellant argues claims 1–6, 8–13, and 15 together, focusing on claim 1. Appeal Br. 10–13. Thus, we select claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by Yang. Final Act. 4 (citing Yang, Fig. 5, ¶¶ 72, 73, 76–79). In the Answer, the Examiner finds that Yang discloses determining the movement vector between the bird's eye view images TI1 and TI2, which "represents the movement vector (or change) from the set of points at t1 to the set [of] points at t2." Ans. 2–3 (citing Yang, Figs. 6–9, ¶¶ 77–79). The Examiner also finds, based on paragraph 45 of the Specification, that "determining whether a candidate point belongs to the *road region*," as claimed, "is the same as determining whether a candidate point belongs to the *road surface* as disclosed by Yang." *Id.* at 3 (citing Yang, Figs. 6–9, ¶¶ 74, 78–79) (emphasis added). The Examiner also cites paragraph 82 of Yang, which states:

> As mentioned above, if given two target feature points are located on the ground surface, the movement vectors of the two feature points on the bird's eye view coordinate plane are uniform. However, if the feature points are located on a three-dimensional object, such uniformity between the movement vectors is, in principle, broken.

Ans. 3. The Examiner then finds that "the uniformity is interpreted as conformance to the movement vector matrix." *Id.* And, therefore, the Examiner finds that Yang discloses

> [w]hen the uniformity is broken and thus the feature points are not moving in uniform with others (or, in claim language, the feature points do not conform to the movement matrix), the feature points (i.e., 'the candidate point') are not on the road surface (i.e., not in the road region).

Id.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631

(Fed. Cir. 1987); *see also In re Buszard*, 504 F.3d 1364, 1366 (Fed. Cir.
2007). "[A]nticipation by inherent disclosure is appropriate only when the
reference discloses prior art that must *necessarily* include the unstated
limitation . . . ." *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d
1364, 1373 (Fed. Cir. 2002). "Inherency, however, may not be established
by probabilities or possibilities. The mere fact that a certain thing *may* result
from a given set of circumstances is not sufficient." *Cont'l Can Co. USA,
Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991) (quoting *In re
Oelrich*, 666 F.2d 578, 581 (CCPA 1981)).

Appellant makes several arguments that the Examiner erred in finding
Yang discloses the disputed limitation of claim 1. *See* Appeal Br. 10–13;
Reply Br. 3–5. For the reasons discussed below, we are persuaded by
Appellant's arguments that the Examiner has erred.

First, Appellant argues, and we agree, that Yang discloses a technique
for detecting a three-dimensional object that appears to be rising up from the
road surface in an image and estimating an area where the three-dimensional
object appears. Appeal Br. 10 (citing Yang, Abstract; *see also* Yang, Fig. 5;
¶¶ 1, 5, 71). Appellant also argues, and we agree, that Yang's technique of
determining whether a target feature point on the bird's eye view image is
the ground feature point "is concerned only with whether a feature point is
on the ground or above ground (i.e., a feature point on a three-dimensional
obstacle)," instead of "whether a point is within a region of an image that
corresponds to a road." *Id.* at 11; Reply Br. 3 (citing Yang ¶¶ 74–79, 82–
100). Appellant further argues that "in the instant [a]pplication, a point may
be on the ground but not in a road region," and that "the [a]pplication does
not disclose that a road region may correspond to any type of ground

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surface, whether or not that ground surface is within a road region," as the Examiner appears to suggest. Appeal Br. 11; Reply Br. 5. In view of the Specification, we agree with Appellant. *See* Spec. Fig. 1, ¶¶ 3, 33, 45. Thus, Appellant argues, and we agree, that "determining whether a feature point is a ground feature point (e.g., whether the feature point is on a road surface), as disclosed in Yang, is not equivalent to determining whether a point belongs to a road region, as recited in claim 1." Reply Br. 5.

Second, Appellant argues that the technique of Yang does not disclose determining whether a position change of a point between images captured at different times conforms to a movement vector matrix, as recited in claim 1. Appeal Br. 12. In particular, Appellant argues that the Examiner maps the recited road region to the road surface within the image in Yang, maps the recited candidate point to the feature point in Yang, maps the recited position change of the candidate point to the movement vectors of the feature points in Yang, and further maps the recited movement vector matrix to the movement vectors of the feature points in Yang. *Id.* at 12 (citing Advisory Act. 2; Final Act. 4). Thus, Appellant argues, and we agree, that the Examiner improperly maps two different elements recited in claim 1 (i.e., the candidate point position change and the movement vector matrix) to the same teaching in Yang, the movement vector of the feature points, which is the same as the position change of the feature point. *Id.* at 12–13; Reply Br. 4.

Third, in regard to the Examiner's finding in the Answer (citing paragraph 82 of Yang) that the existence of uniformity between the movement vectors of two given feature points in Yang could be mapped to determining whether there is conformity between the position change of a

candidate point and the movement vector matrix, as recited in claim 1,

Appellant argues as follows:

> Notably, the uniformity feature in Yang is concerned only with whether the movement vectors of the two given feature points are uniform in direction and magnitude. Neither one of the movement vectors is designated as the authoritative vector to which other movement vectors are compared in order to determine conformity. Indeed, Yang is silent regarding determining which of two given feature points is on the ground and which is not on the ground based on whether movement vectors of the given two feature points are uniform. By contrast, the pending claims explicitly require that the position change of a candidate point is checked for conformity to the movement vector matrix, and a determination is made regarding whether the candidate point is in the road region based on this conformity check. Yang contains no such teachings.

Reply Br. 4–5. In view of the disclosures of paragraphs 80 and 82 of Yang, we agree with Appellant that neither one of the movement vectors is designated as the authoritative vector to which other movement vectors are compared to determine conformity and that Yang is silent regarding determining which of two given feature points is on the ground and which is not on the ground based on whether movement vectors of the given two feature points are uniform. Thus, we are persuaded by Appellant's argument that the uniformity feature in Yang does not disclose the disputed limitation of claim 1.

For these reasons, we do not sustain the Examiner's rejection of claim 1 under 35 U.S.C. § 102(b). For the same reasons, we do not sustain the

Examiner's rejection of independent claims 8 and 15[7], and dependent claims 2–6 and 9–13, under § 102(b).

DECISION

We reverse the Examiner's rejection of claims 1–6, 8–13, and 15 under 35 U.S.C. § 102(b).

SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–6, 8–13, 15	102	Yang		1–6, 8–13, 15

REVERSED

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[7] As noted *supra*, claim 15 recites the disputed limitation as the function in the "means for determining" limitation, which is a means-plus-function limitation under 35 U.S.C. § 112, paragraph 6. Because Yang does not disclose the function of "determining whether a candidate point belongs to the road region by determining whether a position change of the candidate point between the first top view and the second top view conforms to the movement vector matrix," Yang does not disclose or anticipate the disputed limitation of claim 15 for this reason as well.