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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte VIJAY KAMARSHI,
ROBERT WARREN SJOBERG, MENASHE HASKIN, and
AMIT TIKARE

Appeal 2018-007843
Application 13/888,047¹
Technology Center 2600

Before DEBRA K. STEPHENS, DANIEL J. GALLIGAN, and
DAVID J. CUTITTA II, *Administrative Patent Judges*.

STEPHENS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1, 4–6, 10–12, 14, 16, 17, 19–23, 25–27, and 30, which are all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b). Claims 2, 3, 7–9, 13, 15, 18, 24, 28, 29, 31, and 32 have been cancelled.

We REVERSE.

¹ According to Appellants, the real party in interest is Amazon Technologies, Inc. (App. Br. 3).

CLAIMED SUBJECT MATTER

According to Appellants, the claims are directed to a computer vision system including multiple time of flight (ToF) cameras used to capture particular portions of a scene (Abstract). Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A system comprising:
 - one or more processors;
 - a light source to illuminate a scene, the light source including a first emitter and a second emitter;
 - a first time of flight (ToF) camera including a first lens and a first image sensor, the first lens providing a first field of view;
 - a second ToF camera including a second lens and a second image sensor, the second lens providing a second field of view that is narrower than the first field of view; and
 - one or more computer-readable media storing instructions which, when executed by the one or more processors, cause the one or more processors to be configured to:
 - receive first data from the first image sensor, the first data based at least in part on first light reflected off an object within the first field of view;
 - determine, based at least in part on the first data, a location of the object; and
 - orient, based at least in part on the location of the object, the second ToF camera to include the object within the second field of view, the orienting including adjusting a zoom parameter of the second ToF camera.

REFERENCES

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Hildreth

US 2009/0079813 A1

Mar. 26, 2009

Oh	US 2013/0201167 A1	Aug. 8, 2013
Zhang	US 2014/0071245 A1	Mar. 13, 2014
Forutanpour	US 2014/0168262 A1	June 19, 2014
Lee	US 2014/0240464 A1	Aug. 28, 2014
Kalevo	US 2014/0320668 A1	Oct. 30, 2014
Fuchikami	US 2015/0292884 A1	Oct. 15, 2015

REJECTIONS

Claims 1, 4, and 27 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, and Fuchikami (Final Act. 8–15).

Claims 5, 6, 10–12, 16, 23, and 26 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, and Zhang (*id.* at 15–23).

Claims 14 and 25 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Zhang, and Oh (*id.* at 23–24).

Claims 17, 19, 21, and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Fuchikami, and Zhang (*id.* at 24–30).

Claim 20 stands rejected under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Zhang, Fuchikami, and Oh (*id.* at 30–31).

Claim 30 stands rejected under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Zhang, and Forutanpour (*id.* at 31–32).

Our review in this appeal is limited only to the above rejections and the issues raised by Appellants. Arguments not made are waived (*see* MPEP § 1205.02; 37 C.F.R. §§ 41.37(c)(1)(iv)).

ISSUE

35 U.S.C. § 103

Appellants contend their invention as recited in claims 1, 4, and 27, is patentable over Lee, Kalevo, Hildreth, and Fuchikami (App. Br. 13–18), and

their invention as recited in claims 5, 6, 10–12, 16, 23, and 26, is patentable over Lee, Kalevo, Hildreth, and Zhang (*id.* at 18–23), and their invention as recited in claims 17, 19, 21, and 22 is patentable over Lee, Kalevo, Hildreth, Fuchikami, and Zhang (*id.* at 24–26). The issue presented by the arguments is whether the Examiner has shown the combination of Lee and Kalevo teaches or suggests “receiv[ing] first data from the first image sensor” of a first ToF camera, “determin[ing], based at least in part on the first data, a location of the object; and orient[ing], based at least in part on the location of the object, the second ToF camera to include the object within the second field of view,” as recited in claim 1 and similarly recited in claims 5, 17, and 23?

ANALYSIS

Appellants contend the Examiner erred in finding the combination of Lee and Kalevo teaches “receiv[ing] first data from the first image sensor” of a first ToF camera, “determin[ing], based at least in part on the first data, a location of the object; and orient[ing], based at least in part on the location of the object, the second ToF camera to include the object within the second field of view,” as recited in claim 1 and similarly recited in claims 5, 17, and 23 (App. Br. 13–26; Reply Br. 3–9). Specifically, Appellants argue that neither Lee nor Kalevo teach focusing, i.e., “orient[ing],” a second camera based on data from a first camera (Reply Br. 4; App. Br. 16–17). Further, Appellants argue the Examiner’s combination “‘equip[s]’ cameras with auto-focusing” but that “does not permit the . . . [Examiner] to jump to a conclusion that the cited documents teach or suggest, that a ‘second ToF camera ... is orient[ed] ... to include the object within the second field of

view’ *based on* ‘first data from [a] first image sensor [of a first ToF camera]’” (Reply Br. 5).

We are persuaded the Examiner erred. As an initial matter, the claims similarly recite “orient[ing], based at least in part on the location of the object, the second ToF camera”; the location of that object is “determine[d] based at least in part on the first data” that is “receive[d] . . . from the first image sensor” of “a first time of flight (ToF) camera.” As such, the claims require that the second camera is “orient[ed]” based on data from a first camera. We agree with the Examiner that Lee, disclosing an “electronic device 100” having a “wide-angle imaging camera 114 and [a] narrow-angle imaging camera 116,” used to “calculate the depths of the objects” i.e., “the distances of the objects from the electronic device 100” (Lee ¶¶ 25, 37, Fig. 4), teaches “receiving first data from the first image sensor” of a first ToF camera and “determining, based at least in part on the first data, a location of the object” (Final Act. 9–10; Ans. 7). We also agree with the Examiner that Kalevo, disclosing a camera with “auto-focus [that] is configured to track [an] object of interest and maintain focusing on it even when the object travels” (Kalevo ¶ 3; Kalevo ¶¶ 2, 105), teaches “orient[ing], based at least in part on the location of the object” a “camera to include the object within [the camera’s] field of view” (Final Act. 10; Ans. 5). However, we cannot readily ascertain, and the Examiner has not shown where, either reference alone teaches a second camera “orient[ed] . . . *based at least in part on*” data from a first camera (claim 1 (emphasis added)).

Furthermore, the Examiner has not adequately explained how the combination of Lee and Kalevo teaches a second camera that is “orient[ed] . . . *based at least in part on*” data from a first camera (claim 1

(emphasis added)). The Examiner describes that the combination of Lee and Kalevo results in “a device that detects depths of objects using multiple cameras to capture modulated light and subsequently autofocuses the cameras with regard to the detected object when a distance of the object changes,” i.e., “each of the cameras 114 and 116 of Lee would be equipped with the auto-focus feature of Kalevo such that when an object captured by Lee moves, cameras 114 and 116 of Lee would auto-focus on the moving object” ((Ans. 3) (emphasis omitted); *see id.* 5–8; *see also* Final Act. 11). However, even if the Examiner’s combination does teach auto-focusing a first camera or a second camera based on depth, distance, or movement data, that stated combination does not teach that the depth, distance, or movement data, which the second camera bases its autofocus on, is, specifically, the depth or movement data *of the first camera*. And, although the Examiner asserts in one sentence that “the combination of Lee and Kalevo teaches: detecting a location of an object with first ToF camera 114 and subsequently autofocuses both first ToF camera 114 and second ToF camera 116 based on the location detected by first ToF camera as the object moves” (Ans. 8), that assertion, by itself, does not fairly support the Examiner’s obviousness conclusion. In particular, the Examiner has not explained adequately why it would have been obvious to an ordinarily skilled artisan to use data from one camera to autofocus, i.e., orient, another camera.

Accordingly, we are constrained by the record to reverse the Examiner’s obviousness rejection of independent claims 1, 5, 17, and 23. Because we agree with at least one of the arguments advanced by Appellants, we need not reach the merits of Appellants’ other arguments (*see App. Br.* 17–18). Dependent claims 4, 6, 10–12, 14, 16, 19–22, 25–27,

and 30 stand with their respective independent claims. Therefore, we cannot sustain the rejections of claims 1, 4–6, 10–12, 14, 16, 17, 19–23, 25–27, and 30 under 35 U.S.C. § 103.

DECISION

The Examiner's rejection of claims 1, 4, and 27 under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, and Fuchikami is reversed.

The Examiner's rejection of claims 5, 6, 10–12, 16, 23, and 26 under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, and Zhang is reversed.

The Examiner's rejection of claims 14 and 25 under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Zhang, and Oh is reversed.

The Examiner's rejection of claims 17, 19, 21, and 22 under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Fuchikami, and Zhang is reversed.

The Examiner's rejection of claim 20 under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Zhang, Fuchikami, and Oh is reversed.

The Examiner's rejection of claim 30 under 35 U.S.C. § 103 as being unpatentable over Lee, Kalevo, Hildreth, Zhang, and Forutanpour is reversed.

REVERSED