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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BARRETT E. COLE, CHRISTOPHER SCOTT LARSEN,
and KWONG WING AU

Appeal 2019-006714
Application 15/225,165
Technology Center 2800

Before TERRY J. OWENS, JAMES C. HOUSEL, and
CHRISTOPHER C. KENNEDY, *Administrative Patent Judges*.

OWENS, *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, 2, 4, 6–11, and 13–20. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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 Honeywell International Inc. (Appeal Br. 3).

CLAIMED SUBJECT MATTER

The claims are directed to a configurable fail-safe flame detector.

Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A system comprising:

a lens through which one or more of mid-wave infrared radiation (MWIR), long-wave infrared radiation (LWIR), and visible/near infrared radiation (VIS/NIR) pass;

a beam splitter to split the MWIR, the LWIR, and the VIS/NIR into one or more of an MWIR component, an LWIR component, and a VIS/NIR component;

an MWIR detector for receiving the MWIR component;

one or more of an LWIR detector for receiving the LWIR component and a visible/near infrared (VIS/NIR) detector for receiving the VIS/NIR component, wherein the LWIR detector and the VIS/NIR detector are standalone units separate from the VIS/NIR detector: and

a computer processor coupled to the MWIR detector, the LWIR detector, and the VIS/NIR detector;

wherein the MWIR detector is operable to detect the MWIR component; wherein the LWIR detector is operable to detect the LWIR component; wherein the VIS/NIR detector is operable to detect the VIS/NIR component:

wherein the computer processor is operable to analyze the MWIR component and to determine a presence of a flame; wherein the computer processor is operable to analyze one or more of the LWIR component and the VIS/NIR component and to determine whether the system is functioning properly; wherein the MWIR detector comprises a standalone MWIR camera, the LWIR detector comprises a standalone LWIR camera, and the VIS/NIR detector comprises a standalone VIS/NIR camera; and

wherein one or more of the MWIR detector, the LWIR detector, and the VIS/NIR detector are standard off the shelf products.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Levinos	US 4,189,652	Feb. 19, 1980
Castleman	US 6,518,574 B1	Feb. 11, 2003
Kravitz	US 2011/0200319 A1	Aug. 18, 2011

REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1, 2, 4, 6–10, and 13–20 over Castleman in view of Kravitz; and claim 11 over Castleman in view of Kravitz and Levinos.

OPINION

We need address only independent claim 1.²

Castleman discloses a flame detector (32) comprising a sensor array (38) having a sensor (40) for sensing radiant energy within the visible band (VB) spectrum, a sensor (42) for sensing radiant energy within the near band infrared (NBIR) spectrum, and a sensor (44) for sensing radiant energy within the wide band and middle band infrared (WBIR and MIR) spectra (col. 7, ll. 50–54; col. 15, ll. 2–6; Fig. 11). A controller (739) analyzes sensor digital data to determine whether there is any sign of sparks, flames or fire and to prevent false alarms (col. 15, ll. 20–34; col. 35, ll. 7–12; Fig. 35).

Kravitz discloses an “optical image system for fusing images of various wavelengths while eliminating parallax effects and chromatic

² Claim 13, which is the only other independent claim, is similar to claim 1.

abberation [sic]" (§ 2). The system includes beam splitters (106, 106a, 106b) which split beams into long wavelength infrared (LWIR), visible, short wavelength infrared (SWIR), and medium wavelength infrared (MWIR) beams (§§ 16, 19, 27, 28; Fig. 4). The LWIR, visible, SWIR, and MWIR beams are focused, respectively, by an LWIR sensor/camera (102), a visible sensor/camera (104), an SWIR sensor/camera (302), and an MWIR sensor/camera (402), to form images (§§ 16, 19, 28). The images are combined by a vision processor (110) into a single fused image which is free of parallax and chromatic aberration (§ 31).

Setting forth a prima facie case of obviousness requires establishing that the applied prior art would have provided one of ordinary skill in the art with an apparent reason to modify the prior art to arrive at the claimed invention. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

The Examiner finds:

The detectors of Castleman share a window, but are spaced from each other, to at least some extent, in the direction perpendicular to the optical axis. (See Castleman, Fig. 6)[.] This leads to the situation of each sensor being directed at the scene from a slightly different position, introducing parallax error into the detector (unrecognized by Castleman). Using a beam splitter to allow each of the detectors to view the scene from the same optical axis (See Kravitz, in particular Fig. 4) removes this error (Kravitz, [0019])[.] Thus Kravitz explicitly solves a problem that Castleman suffers from [(Ans. 4–5)].

The Examiner concludes: "It would have been obvious to use the arrangement of Kravitz in the detector of Castleman in order to enable parallax-free image fusion. (Kravitz, [0019])" (Final Rej. 3).

Kravitz's system forms optical images which benefit from being free of parallax and chromatic aberration (§§ 20, 31). Castleman's flame detector

does not form optical images but, rather, merely senses radiant energy (col. 7, ll. 50–54). The Examiner does not provide evidence that one of ordinary skill in the art would have considered parallax to be a problem in Castleman’s flame detector.

Thus, the Examiner has not established that Kravis would have provided one of ordinary skill in the art with an apparent reason to modify Castleman’s flame detector to arrive at the Appellant’s claimed system. Accordingly, we reverse the rejections.

CONCLUSION

The Examiner’s rejections are reversed.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 2, 4, 6–10, 13–20	103	Castleman, Kravitz		1, 2, 4, 6–10, 13–20
11	103	Castleman, Kravitz, Levinos		11
Overall Outcome				1, 2, 4, 6–11, 13–20

REVERSED