The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RISTO OLAVI ORAVA, JOUNI LLARI PYYHTIA,
TOM GUNNAR SCHULMAN, MILTIADIS EVANGELOS SARAKINOS
and KONSTANTINOS EVANGELOS SPARTIOTIS

Appeal No. 2003-0312
Application No. 08/871,199

ON BRIEF

Before DIXON, LEVY, and BLANKENSHIP, Administrative Patent Judges.
LEVY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 61-72, which are all of the claims pending in this application.

BACKGROUND

Appellants' invention relates to an imaging device. Specifically, the method includes comparing a detected pixel value related to a minimum detected charge value expected for

directly incident radiation, and discarding detected pixel values less than the threshold value, to eliminate scattered radiation before processing (specification, pages 12 and 14). In addition, the method includes accumulating charge resulting from radiation hits at or above the threshold (specification, page 37). An understanding of the invention can be derived from a reading of exemplary claim 61, which is reproduced as follows:

61. A semiconductor radiation imaging device for imaging high-energy radiation, comprising an array of pixel cells including an array of pixel detectors which directly generate charge in response to incident radiation and a corresponding array of individually addressable pixel circuits, wherein each pixel circuit is associated with a respective pixel detector for accumulating charge directly resulting from radiation incident on said pixel detector and comprises threshold circuitry and charge accumulation circuitry, said threshold circuitry being configured to discard radiation hits on said pixel detector below a predetermined threshold and said charge accumulation circuitry being configured to accumulate charge directly resulting from a plurality of successive radiation hits on said respective pixel detector at or above said predetermined threshold.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Tower	4,811,371	Mar. 7, 1989
Hack et al. (Hack)	5,153,420	Oct. 6, 1992
Kramer et al. (Kramer)	5,379,336	Jan. 3, 1995
Fouilloy et al. (Fouilloy)	5,387,933	Feb. 7, 1995
Sugawa	5,401,952	Mar. 28, 1995

Claim 61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fouilloy in view of Hack.

Claims 62, 63, 69, 70 and 72 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fouilloy in view of Hack, and further in view of Sugawa.

Claims 64-68 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fouilloy in view of Hack, Sugawa, and further in view of Tower.

Claim 71 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Fouilloy in view of Hack, and further in view of Kramer.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejections, we make reference to the examiner's answer (Paper No. 25, mailed August 13, 2002) for the examiner's complete reasoning in support of the rejections, and to appellants' brief (Paper No. 24, filed June 25, 2002) for appellants' arguments thereagainst. Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered. See 37 CFR 1.192(a).

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejections advanced by the examiner, and the evidence of obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, appellants' arguments set forth in the brief along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

Upon consideration of the record before us, we reverse, essentially for the reasons set forth by appellants. We observe at the outset that appellants assert (brief, page 4) that "[a]ll of the claims stand or fall with claim 61." Consistent with this statement, appellants arguments are directed to the rejection of claim 61. In addition, we observe that appellants do not argue any of the secondary references applied by the examiner. Accordingly, we consider claim 61 to be representative of the group. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual

determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole. See id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

Turning to claim 61, the examiner's position (answer, page 4) is that Fouilloy does not specifically state that the image sensor may be used to image high-energy radiation. To overcome this deficiency in Fouilloy, the examiner turns to Hack for a teaching of image sensors may be made sensitive to high-energy wavelengths. Appellants do not contest the teachings of Hack, but rather assert (brief, page 6) that the position taken by the examiner has no merit because in Fouilloy, the circuitry will accumulate charges below and above V0 when the accumulated charges remain below V1 and will discard charges below and above V0 when the accumulated charge rises above V1. Appellants assert (brief, page 4) that claim 61 recites

> a semiconductor radiation imaging device for imaging high-energy radiation, which includes threshold circuitry and charge accumulation circuitry, the threshold circuitry being configured to discard radiation hits below a predetermined energy threshold, and the charge accumulation circuitry being configured to accumulate charge resulting from radiation hits above the predetermined energy threshold. Thus, only radiation hits that exceed the threshold are accumulated. Radiation hits below the threshold are discarded,

and that Fouilloy teaches the opposite, i.e., that during normal operation, charges below V1 are accumulated, and that when charges above V1 are detected, all charges are discarded.

From our review of Fouilloy, we find that Fouilloy is directed to the field of optronic countermeasures, and specifically relates to the protection of detector-fitted cameras against dazzling, jamming or even destruction (col. 1, lines 6-10). Fouilloy discloses that it is a known countermeasure of detecting a camera through the reflection of a low powered laser, and then aiming a high-powered pulsed laser to illuminate all or part of the optical detector to dazzle or even damage the camera. The lasers operate at a wavelength that is transparent to the optical system of the camera. The dazzling is due to the saturation of all or part of the sensor which make up the detector, and results in images that are partially or totally saturated. If the frequency of the pulses is faster than the frequency of the images, then the saturation systematically affects all of the images (col. 1, lines 10-25). A known way to protect a camera from these countermeasures is to discriminate between the narrow spectrum of this radiation and the wide spectrum of natural sources, and to stop the frame scanning of the camera during the duration of the disturbing laser (col. 1, lines 27-32). In the summary of the invention, Fouilloy discloses providing intermediate integration circuits, and wherein the camera comprises measuring means to measure the

charge of the intermediate integration circuits, and control means to modify the contents of the intermediate integration circuits when at least one of the charges exceeds a given value (col. 1, line 60 through col. 2, line 2). Figure 1 discloses a detector constituted by an array of sensors A1, Ai...An. Each of the sensors is connected by a sequence of circuits, to multiplexer K, provided with an output S. The output of sensor Ai is connected to the input of coupling circuit Bi, which is controlled by clock H. The output of circuit Bi is connected to the input of an intermediate integration circuit Di, which is associated with a potential barrier Ei. A port of intermediate integration circuit is connected to an input of transfer circuit Gi, which is controlled by clock H. The output of transfer circuit Gi is connected to the input to main integration circuit Ji., the output of which is connected to multiplexer K. A port of the potential barrier Ei is connected to a measuring circuit M and to a switch N. Inverter Q, controls the potential barriers such as Ei, and the input of switch N (col. 2, lines 15-59). In the example described, potential barrier Ei has an FET transistor, the drain of which is connected to measuring circuit M and switch N. The gate receives the signal Cc, as shown in figure 2. Fouilloy further discloses that the height of the

barrier can have two values, V0 and V1. When the height has the value V1, charges that exceed V1 are collected by the drain. when the height has the value V0, all of the charges contained in circuit Di flow into the drain. In normal operation, the potential of circuit Di is below V1, such that Ei plays the role of a changeover switch. When the potential of circuit Di is greater than V1, i.e., a high amplitude signal is received, the charges overflow into the drain. When the potential of circuit Di exceeds V1, the height of the barrier is lowered to V0 by the inverter Q. The result is that, outside normal operation, barrier Ei is opened, switch N is closed, emptying Di.

We find from the disclosure of Fouilloy that under normal operation, the barrier Ei is set to V1, and that all charges in Di below the potential of V1 are accumulated. We further find that if the potential of circuit exceeds V1, that excess charges are collected by the drain. Thus, we find that in Fouilloy, during normal operation charges below the threshold V1 are stored and charges in excess of V1 go to drain, which is opposite to the operation of the circuit defined in appellants' claim 61. We additionally find that outside of normal operation, i.e., when the sensors are being dazzled, that the height of the barrier is lowered to V0, and all charges in Di go to drain. In an attempt

to read Fouilloy on the claimed threshold operations defined in claim 61, the examiner attempts to apply Fouilloy by taking the position (answer, page 4) that "[w]hen the height has value V0 (predetermined threshold), all the charges contained in the circuit Di flow into the drain, it clearly includes the charges below V0 (discard radiation hits on the pixel detector below a predetermined threshold, column 3, lines 4-45)." We agree with the examiner that during dazzling of the detector, the height of the barrier is set at V0, and that charges below V0 are discarded, as all charges on Di, both above and below V0 are discarded. However, we do not agree with the examiner (answer, pages 4 and 5) that "Fouilloy et al. also discloses when the height has value V1, only the charges such that the potential of the circuit Di exceeds V1 are collected by the drain (column 3, lines 10-15). It clearly [sic] that charges below V1 are accumulated in integration circuit. Fouilloy et al. discloses that V0 is smaller than V1 (column 3, lines 37-39). Therefore, charges above V0 are accumulated in integration circuit (accumulate charges above the predetermined threshold)." We find that during normal operation of the device, the threshold is V1, and charges below the threshold V1 are accumulated, not discarded, as required by claim 61. We additionally find that

during normal operation, there is no threshold V0. Although the reference accumulates all charges below V1, including charges between zero and V0 and between V0 and less that V1, there is no threshold V0 during the normal operation. This is where the examiner's analysis fails. Because there is no threshold V0 during normal operation, there is no accumulation of charge above a set threshold during normal operation. Thus, we find that the examiner's analysis does not meet the claimed threshold operation set forth in claim 61. Accordingly, we agree with appellants (brief, pages 6 and 7) that:

> During normal operation, when the camera of Fouilloy is not being dazzled or jammed, the camera will not discard charges below V). Instead, it will accumulate all charges below V0 and above V0 up to V1. Thus, Fouilloy, during normal operation, will not discard radiation hits below a predetermined energy threshold as required by claim 61 of the application, and in fact will accumulate charges below the Examiner’s asserted threshold V0. Second, when the camera of Fouilloy is dazzled or jammed, it will dump all charges, including those both above and below V0. Thus when the camera is dazzled or jammed, it will not accumulate charges above the Examiner’s asserted predetermined energy threshold of Vo as required by claim 61 of the application, and in fact will discard charges above the Examiner’s asserted threshold V0. In summary, Fouilloy’s potential barrier Ei having a value of V0 does not act as a predetermined energy threshold below which charges are dropped and above which charges

> are accumulated, as asserted by the Examiner. As explained above, during normal operation, Fouilloy will accumulate charges below the value V0, and during dazzling or jamming. Fouilloy will discard charges below V0. For at least these reasons, Fouilloy does not disclose or suggest discarding radiation hits below a predetermined energy threshold and accumulating charges resulting from hits above the predetermined energy threshold, as required by claim 61 of the application.

Turning to Hack, although appellants do not argue the teachings of Hack, we find that Hack does not make up for the basic deficiencies of Fouilloy. From all of the above, we find that the examiner has failed to establish a prima facie case of obviousness of claim 61. Accordingly, the rejection of claim 61 under 35 U.S.C. § 103(a) is reversed.

In addition, we reverse the rejection of claims 62-72 as the references to Sugawa, Tower and Kramer do not make up for the deficiencies of the basic combination of Fouilloy and Hack. The rejection of claims 62-72 under 35 U.S.C. § 103(a) is therefore reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 61-72 under 35 U.S.C. § 103(a) is reversed.

REVERSED

JOSEPH L. DIXON Administrative Patent Judge	)	
STUART S. LEVY Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
HOWARD B. BLANKENSHIP Administrative Patent Judge	)	

SSL/kis

KENYON & KENYON
ONE BROADWAY
NEW YORK, NY 10004