Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WAYNE ISAMI IMAINO, ANTHONY JULIANA, MILTON RUSSELL LATTA, CHARLES H. LEE, WAI CHEUNG LEUNG, HAL J.ROSEN, STEVEN MEEKS, and RICHARD SONNENFELD

Appeal No. 2000-1414
Application No. 08/840,351

ON BRIEF

Before KRASS, JERRY SMITH, and DIXON, **Administrative Patent Judges**.

DIXON, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1-4, 6, 8[1]-14, and 16-26. The examiner has indicated that claims 5, 7, 15, and 26 would be allowable over the prior art of record if the claims were rewritten in independent form.

We AFFIRM-IN-PART.

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[1] We note that claim 8 depends from claim 7 which has been indicated by the examiner as allowable over the prior art of record on page 2 of the answer.

BACKGROUND

Appellants' invention relates to a system and method for detecting defects in a planar surface. An understanding of the invention can be derived from a reading of exemplary claim 1, which is reproduced below.

> 1. An apparatus for detecting defects in planar surfaces of a [sic, an] object comprising:
>
> means for directing a first laser beam (the A-beam) along a first path;
>
> a first telecentric lens assembly including one or more lenses;
>
> first rotating mirror means for scanning the A-beam through the first telecentric lens assembly and across at least a portion of a first planar surface, the A-beam striking the first planar surface of the object at [sic, at an] angle which deviates from perpendicular in one plane by an angle which causes a portion of the A-beam to form a reflected beam (A/R-beam) passing back through the telecentric lens assembly and being reflected off of the rotating mirror means along a second path; and
>
> a first light detector arranged in the second path producing an A-analog signal proportional to the intensity of the A/R-beam.

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

Cuthbert et al. (Cuthbert)	3,790,287	Feb. 05, 1974
Kato et al. (Kato)	4,464,050	Aug. 07, 1984
Hellstrom	5,073,712	Dec. 17, 1991
Taylor	5,581,353	Dec. 03, 1996

Claims 1, 3 and 4 stand rejected under 35 U.S.C. § 103 as being unpatentable over Cuthbert in view of Kato. Claims 2, 9-13, and 16-25 stand rejected under

35 U.S.C. § 103 as being unpatentable over Cuthbert in view of Kato further in view of Taylor. Claims 6, 14, and 25 stand rejected under 35 U.S.C. § 103 as being unpatentable over Cuthbert in view of Kato further in view of Taylor and Hellstrom.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejections, we make reference to the final rejection (Paper No. 12, mailed March 11, 1999) and the examiner's answer (Paper No. 16, mailed Mar. 1, 2000) for the examiner's reasoning in support of the rejections, and to appellants' brief (Paper No. 15, filed Sep. 16, 1999) for the appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we make the determinations which follow.

At the outset, we note that the examiner has set forth a ***prima facie*** case of obviousness with respect to independent claim 1. The examiner maintains that the teachings of Cuthbert teach the use of a first laser beam along a first path. This beam is scanned across at least a portion of the planar surface and passes back through the optical system, reflected off the rotating mirror and passes to a detector. The examiner maintains that Cuthbert does not specifically recite a telecentric lens, but

that it would have been obvious to one of ordinary skill in the art to use a telecentric lens. (See final rejection at page 2.) While appellants note that Cuthbert does not specifically mention a telecentric lens, appellants do not provide any specific argument to rebut the examiner's position . Therefore, we accept the examiner's position.

The examiner maintains that "Cuthbert clearly discloses the instant claimed arrangement in which the secularly [sic, specularly] reflected beam is detected." The examiner maintains that Kato teaches a similar system as Cuthbert, but uses either of the scattered or reflected beams or a combination of both to detect defects in an object. The examiner further maintains that it would have been obvious to one of ordinary skill in the art to employ the teaching of Kato with respect to the use of the reflected beam in the system of Cuthbert. (See final rejection at page 3.) We agree with the examiner.

We note that appellants present arguments are directed to more specific claim 9 rather than to the broader claim 1. Therefore, we will address appellants' arguments as they apply to independent claim 1. Appellants argue that Cuthbert teaches away from the use of the reflected beam and the use of the light scattered from the defect to identify the defect. (See brief at pages 6-8.) We disagree with appellants. Here, we note that the system and defects taught by Cuthbert at that time would have been of an order greater than that at the time to appellants' invention. As technology and knowledge in the relevant art advances as taught by Kato, the recognition that the

reflected beam may be used in tracking and in the detection of defects on the surface of an object.

Appellants argue that reflected light is not interchangeable with scattered light. (See brief at pages 7-8.) We agree with appellants, but note that the examiner has used the teachings of Kato to teach the additional use of more recent teaching of the use of the reflected beam in addition to the use of scattered light from the defect. Appellants argue that "stains" on the surface do not scatter light and the system of Cuthbert would not detect them. We find no support in the language of claim 1 to support this argument. Therefore, this argument is not persuasive.

Appellants argue that the system of Kato differs in a great many respects from that taught by Cuthbert. We agree with appellants, but note that Kato teaches that various uses of the reflected beam and the scattered beam may be implemented in order to detect defects in a planar surface. Furthermore, in our view, it would have been obvious to one of ordinary skill in the art that various factors would have been involved in determining what portion of the beam or scattered light would have been desirable to use. Such factors would have been the surface to be evaluated along with the type and relative size of the defects. Here in independent claim 1, any defect in a planar surface of any object may be detected. In light of the general breadth of the claim, we do not find the teachings of Cuthbert to teach away from the use of the reflected beam for all defect detection.

Appellants argue that the examiner relied upon hindsight using appellants' specification. (See brief at page 9.) Again, we disagree with appellants as discussed above. Appellants have made no other specific arguments in the brief with regard to claim 1 except at page 13 of the brief, but these arguments merely distinguish independent claim 1 from independent claim 9.

With respect to claim 3, appellants argue that Cuthbert teaches away from the use of an aperture mask to block at least some of the scattered light since Cuthbert teaches the reflected beam should be blocked. This argument is not persuasive since Kato is relied upon to teach the use of the reflected beam.

With respect to claim 4, appellants argue that Cuthbert and Kato do not teach or suggest the use of a rate of change of pixel data to detect defects. (See brief at page 13.) Appellants then argue that the examiner has asserted that it would have been obvious to use any known signal processing arrangement. (See brief at page 13.) We disagree with appellants' interpretation of the rejection. From our understanding of the examiner's statement of the rejection at page 3 of the answer, the examiner relies upon the premise that skilled artisans would have been motivated to implement known processing circuitry to perform desired functions and that Cuthbert teaches the use of a high pass filter and high pass amplifier and level detector. The examiner indicates that Figure 3 of Cuthbert teaches these well known circuits in use in Cuthbert and that the high pass filter is a differentiator by a different name. Additionally, the examiner

maintains that the level detector is a threshold detector referenced by a different name. (See answer at page 9.) We agree with the examiner that the use of differentiators and rate of change was well known in such circuits. Appellants argue that the examiner asserts that any known circuit would have been obvious to use in the combination and that some teaching in a reference would be necessary. (See brief at page 13.) We disagree with the appellants' statement. The examiner relies upon the teachings of Cuthbert and maintains that Cuthbert teaches and/or fairly suggests the use of rate of change, but does not use the same terminology. (See answer at page 9.) Appellants have not responded to the examiner's clarification. Therefore, appellants' argument is not persuasive.

With respect to claim 5, the examiner indicated that this claim would be allowable if rewritten in independent form. (See answer at page 2.)

With respect to independent claim 9, independent claim 16, and dependent claim 2, the examiner relies upon the teachings of Taylor to teach and suggest the inspection of both planar surfaces. (See final rejection at page 4.) Appellants argue that the system of Taylor is completely different from the systems of Cuthbert and Kato. (See brief at page 9.) We agree with appellants that the examiner has not provided a proper analysis of how the teachings of these varied references would have been combined and has not established a ***prima facie*** case of obviousness. Additionally,

appellants argue that independent claim 9 recites a "means supporting the object . . ." Here, we find that the examiner has neither addressed this limitation in the final rejection nor in the examiner's answer. Since the examiner has not established a ***prima facie*** case of obviousness, we cannot sustain the rejection of independent claim 9, independent claim 16 and dependent claim 2 and claims 10-14 and 17-20 which are dependent therefrom.

With respect to independent claim 21, the examiner maintains that the combination of Cuthbert, Kato and Talyor are relied upon in the rejection, yet independent claim 21 is more similar to independent claim 1 than to independent claims 9 and 16. Furthermore, we find no specific arguments directed to independent claim 21, therefore we will group independent claim 21 with independent claim 1 since we find that the teachings of Taylor are not needed to reach the limitations of independent claim 21. Therefore, we will sustain the rejection of independent claim 21 and dependent claims 22-24 since no arguments thereto have been presented.

With respect to dependent claims 6 and 25, appellants argue that the samples of Hellstrom does not reflect the scanning beam as recited in the claims. (See brief at page 12.) Appellants argue that Hellstrom teaches at col. 6 that the samples are selected to define the appropriate characteristics for the calibration of the optical scanning system. The examiner maintains that with a wafer, a mirror-like surface would have been an appropriate surface. (See answer at page 10.) Appellants argue that

columns 7-8 teach away from using a mirror. While Hellstrom does disclose that specular reflection is not desirable, it is our view that this is due to the orientation of the optics rather than a specific prohibition of reflected light. Additionally, we find the inclusion of Taylor in the combination as unnecessary, as discussed above. Therefore, this argument is not persuasive, and we will sustain the rejection of dependent claims 6 and 25.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1, 3, 4, 6, and 21-25 under 35 U.S.C. § 103 is affirmed, and the decision of the examiner to reject claims 2, 9-14, and 16-20 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

ERROL A. KRASS Administrative Patent Judge	)
JERRY SMITH Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
JOSEPH L. DIXON Administrative Patent Judge	)

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