

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN F. REINTJES, MICHAEL D. DUNCAN,
RITA MAHON, LAWRENCE L. TANKERSLEY,
PAUL L. HOWARD, MARTIN CHAMBERLAIN
and THOMAS MCKENNA

Appeal No. 97-0673
Application 08/143,370¹

ON BRIEF

Before FLEMING, LEE and CARMICHAEL, Administrative Patent
Judges.

LEE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from
the final rejection of claims 2, 3, 5-11, 14-38 and 40-41. No
claim has been allowed.

References relied on by the Examiner

¹ Application for patent filed October 29, 1993.

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Stockham et al. (Stockham)	3,641,320	Feb. 8, 1972
Kolomiets (Russia)	SU 1643995	Apr. 23, 1991
Longobardi et al. (Longobardi) (Europe)	0507746	Oct. 7, 1992
Kamiwano (Japan)	5-45274	Feb. 23, 1993

The Rejections on Appeal

Claims 2, 3, 5-10, 17-25 and 33-41 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Kamiwano, Longobardi and Stockham.

Claims 11, 14-16 and 26-32 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Kamiwano, Longobardi, Stockham and Kolomiets.

The rejection of claim 39 has not been appealed (Br. at 1).

The appellants have grouped the following dependent claims together with their respective parent claims for purposes of this appeal (Br. at 1): claims 5-10, 14-20, 22-23, 25-26, 28-30, 32, 34-36, 38 and 41. These claims depend ultimately from independent claims 2, 3, 11 and 40.

The Invention

The invention is directed to a fluid monitoring apparatus and method for detecting the presence of and determining the characteristics of particulate matter suspended in fluid. The invention makes identification of the size and shape of a particle in fluid by forming an optical image of the fluid and then analyzing the image.

Claims 2, 3, 11 and 40 are the only independent claims the rejections of which are on appeal. Representative claims 2 and 40 are reproduced below:

2. An apparatus for the real time monitoring of suspended particulates in a fluid, said apparatus comprising:

a laser light source;

means for collimating an optical beam from said light source;

a fluid chamber for passing a fluid to be examined, said fluid chamber being suitable for illumination by said collimated beam;

means for forming an optical image of the fluid within said fluid chamber; and

means for classifying shapes of particulates in said optical image;

wherein said means for classifying shapes comprises:

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a two dimensional transducer array means for detecting said optical image and

means for comparing, responsive to said means for detecting, shapes of the particulates in the fluid with at least one reference shape.

40. A particulate monitoring system, comprising:

a laser adapted to illuminate a fluid;

optical means for forming an image of said fluid responsive to said laser;

a two-dimensional opto-electric array disposed effective to detect said image; and

means, responsive to said array, for identifying in said image particualtes [sic, particulates] from within said fluid.

Opinion

Our opinion is based solely on the arguments raised by the appellants in their briefs. We do not address and offer no opinion on arguments which could have been raised but were not set forth in the briefs.

The appellants point out (Br. at 7) that each of the independent claims 2, 3, 11 and 40 recites a two dimensional imager and argue that because Kamiwano does not disclose the use of a two dimensional imager, contrary to the examiner's position, the examiner has not established prima facie

obviousness. We agree with the examiner that Kamiwano does disclose use of a two dimensional imager as is required by the claims.

The appellants focus on those embodiments of Kamiwano which use pairs or sets of linear phototransistor arrays and fail to appreciate another portion of Kamiwano's disclosure which discusses and points out the benefits of using a planarly arranged matrix of phototransistors as the sensor. In Kamiwano, before the disclosure starts to discuss an improved invention making use of sets of linear arrays, there is a brief discussion of what had previously been thought of by the inventors there in the general subject matter area of optical real-time measuring of flowing particles.

Specifically, from the bottom of page 5 to the top of page 6 in Kamiwano, it is stated:

For a particle measuring method using such a light transmission method [general optical arrangement as shown in Figure 1], the inventor has already proposed a method for calculating the speed of the particle and particle size based on the principle shown in Figure 2 in which a number of phototransistors are arranged in planar form at the sensor (5). The method itself can carry out particle measurement in real time and it can be used with the measuring device of the invention.

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The foregoing discussion leads up to the subsequent text in the disclosure which describes the later embodiments using at least two sets of phototransistors. Note, for instance, the immediate following paragraph on page 6:

However, in the subsequent investigation, the inventor used a highly accurate and excellent measuring method and a device which could realize the method. That is, in the device of the present invention, characterized by such properties, at least two sets of photosensors (A) and (B), such as the phototransistors shown in Figure 3(a), are arranged in series and are perpendicular to the direction of the flight of the particles. (Emphasis added.)

Thus, the appellants are focusing only on what is referred to as the subsequent investigation and have ignored or overlooked the discussion in Kamiwano concerning that which preceded the subsequent investigation. The examiner correctly pointed out that Kamiwano's Figure 2 illustrates a planar matrix arrangement of phototransistors in a single sensor 5. It represents what existed prior to Kamiwano's subsequent development of the use of a set or a pair of sensors.

Furthermore, Kamiwano on page 6 indicates that the arrangement of Figure 2 can be used with the measuring device of the invention. Thus, it would have been obvious to one with ordinary skill in the art that each of the sensors (A)

and (B) in the embodiment shown in Figure 3(A) of Kamiwano can take the form of the planar phototransistor matrix shown in Figure 2. Note also the grid-like pattern shown at the top of each sensor (A) and (B) in Figure 3(a), which also reasonably suggests that there are multiple rows of the linearly arranged array. Additionally, see also the image illustrated in Kamiwano's Figure 3(b), it shows multiple pixels for each row occupied by the particle image detected by each sensor, which would have suggested to one with ordinary skill in the art plural rows of phototransistors together forming a planar two dimensional image sensor.

The appellants offer no response to explain away or otherwise rebut the examiner's reasonable position with regard to Kamiwano's Figure 2 and discussion in connection therewith. The appellants are also incorrect that in Kamiwano an image is reconstructed rather than detected. The "reconstitute" language at the top of page 13 of Kamiwano is merely referring to reproducing an image from stored image data to provide it to a display device. It does not mean that in Kamiwano the particle image is not initially detected by a two dimensional imager. For all of the foregoing reasons, the argument that

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Kamiwano does not disclose or suggest a two dimensional imager is rejected.

Each of independent claims 2, 3, 11 and 40 requires that the light illuminating the chamber be from a coherent light source. Kamiwano does not disclose the use of an extended light source which is non-coherent. However, we agree that it would have been obvious to one with ordinary skill in the art that a coherent light source, as well as an extended light source, may be used, especially in light of Longobardi which discloses an optical imaging system for particle measurement using a coherent light source. The appellants point to nothing in Kamiwano which would have indicated to one with ordinary skill in the art that the invention of Kamiwano requires or would work only if an extended or non-coherent light source is used.

We agree with the examiner that one with ordinary skill in the art possesses sufficient basic skills and common sense to recognize that the light for use in Kamiwano can come from a variety of sources, including a coherent light source. One with ordinary skill in the art is presumed to possess a

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certain level of basic skills and common sense. See, e.g., In re Sovish,

769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985); In re Bozek, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

Where a light is needed, generally it would be recognized that any light source can be used, especially one which by its own nature would have a better signal to noise ratio for optical imaging and is already used in a similar optical imaging device as in Longobardi. The examiner is correct that both Kamiwano and Longobardi are from the same field of optical measurement (answer p. 8, lines 7-11).

There is nothing unique about using an extended or non-coherent light source in Kamiwano. The teachings of a reference is not limited to its disclosed or preferred embodiments, In re Burckel, 592 F.2d 1175, 1179, 201 USPQ 67, 70 (CCPA 1979); In re Bode, 550 F.2d 656, 661, 193 USPQ 12, 17 (CCPA 1977), and must be considered for everything it teaches by way of technology. EWP Corp. v. Reliance Universal Inc., 755 F.2d 898, 907, 225 USPQ 20, 25 (Fed. Cir.), cert. denied, 474 U.S. 843 (1985).

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For the foregoing reasons, the rejection of independent claim 40 and dependent claim 41 will be sustained.

Independent claims 2 and 3 further recite the comparing of the detected shape of the particulates with stored reference shapes. Kamiwano does disclose the detection of particle shape (page 8, lines 9-17). However, the examiner correctly recognizes that Kamiwano does not disclose comparing or matching the detected shape with a stored reference shape (answer at page 3, lines 19-20). Nonetheless, the examiner relies (answer at 4, lines 2-3) on Longobardi and states that Longobardi discloses comparing the detected image data with stored reference data to determine particle size. The examiner has not provided any specific citation to the portions of Longobardi. The closest disclosure we can find is this (column 3, lines 49-55):

. . . , and the corresponding image is acquired by the system 7 and transmitted to the computer 9 for the calculation of the particle sizes. This calculation is performed with image analysis software which is known per se (for example, a software package known commercially under the name GIPS, produced by Gate Data of Denmark, may be used).

That disclosure does not reveal that a comparison is performed between detected data and stored data, much less between the

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detected size and a stored reference size of particles. In any event, the subject at hand concerns not a comparison of sizes but a comparison of the detected image shape with stored reference shapes. The appellants are correct that Longobardi does not even mention image shape detection. It cannot be said that Longobardi reasonably would have suggested to one with ordinary skill in the art comparing the detected image shape of Kamiwano with a stored reference shape.

It may be true that known means exists which can be employed to compare a detected image shape with a stored reference shape, as is suggested by the examiner (answer at page 3, lines 21-23). But that does not alone provide the motivation to make the comparison. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). Here, the examiner relied on Longobardi for that motivation, but as discussed above, Longobardi is insufficient in that regard.

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For the foregoing reasons, we do not sustain the rejection of claims 2 and 3, and the claims which depend directly or indirectly from claims 2 and 3, i.e., claims 5-10, 20-25, 17-19 and 33-38. Stockham was relied on by the examiner to show collimating the optical beam and Kolomiets was relied on by the examiner to show a mirror positioned on the side of the fluid chamber opposite the light source. Neither Stockham nor Kolomiets makes up for the above-noted deficiencies of Kamiwano and Longobardi.

Claim 11 requires a "means for optical phase conjugation of said collimated beam on the side of said fluid chamber opposite to that which said light enters said chamber." The examiner has interpreted that as requiring some component which "precisely changes the direction of propagation of the incident beam in such a way that the return beam retraces the same path as the incident beam" (answer at page 9, lines 4-12), an interpretation not disputed by the appellants. The examiner then regards lens 5 and mirror 6 in Kolomiets as an optical phase conjugator because, according to the examiner, they appear to reflect light such that it retraces the exact path of the incident beam (answer at page 9, lines 10-12).

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The appellants argue that the position of the examiner is mere "wishful reading" and that there is nothing in Kolomiets to support the examiner's position.

The examiner's view with respect to Kolomiets' lens 5 and mirror 6 is misplaced. They evidently do not provide a return beam which precisely retraces the path of the incident beam. In Kolomiets, it is stated on page 2, lines 18-22, that the reflected beam is shifted in the direction of the particle's movement by a certain magnitude. On page 4, lines 1-2, Kolomiets further states that the incident beam a and the return beam b are spread by a magnitude equal to $2F$. We agree with the appellants that the examiner has not a sufficient basis to shift the burden of proof to the appellants with regard to whether the lens 5 and mirror 6 together constitute an optical phase conjugator.

Accordingly, the rejection of claim 11, and claims which depend either directly or indirectly from claim 11, i.e., claims 14-16 and 26-32, will not be sustained.

Conclusion

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The rejection of claims 2, 3, 5-10, 17-25 and 33-38 under 35 U.S.C. § 103 as being unpatentable over Kamiwano, Longobardi and Stockham is reversed.

The rejection of claims 11, 14-16 and 26-32 under 35 U.S.C. § 103 as being unpatentable over Kamiwano, Longobardi, Stockham, and Kolomiets is reversed.

The rejection of claim 40 and 41 under 35 U.S.C. § 103 as being unpatentable over Kamiwano, Longobardi and Stockham is affirmed.

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

MICHAEL R. FLEMING)

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Administrative Patent Judge)	
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