

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(2) is not binding precedent of the Board.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. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRUCE B. MCARTHUR and
ADLAI H. SMITH

Appeal No. 1997-3969
Application 08/175,052

ON BRIEF

Before KRASS, JERRY SMITH, and RUGGIERO, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

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This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-29, which constitute all the claims in the application. An amendment after final rejection was filed on December 29, 1995 and was entered by the examiner.

The disclosed invention pertains to the area of computer generated holograms which produce working images for machining or other processing of materials. More particularly, the invention is concerned with the generation of a plate having a plurality of contiguous polygonal subapertures formed thereon. The subapertures produce working images independently of each other.

Representative claim 1 is reproduced as follows:

1. A method for the generation of a plate having a plurality of side-by-side subapertures, each subaperture for generating at least one working image, with all working images of all subapertures producing a working image array including a plurality of side-by-side working images on a workpiece, the method comprising the steps of:

providing subapertures which produce each working image of the working image array independent of all other subapertures present;

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providing a plate and defining a working area on the plate having an area at least equal to a sum of required areas for all of the subapertures for receiving computer generated holograms consisting of the plurality of side-by-side subapertures;

dividing the working area into contiguous polygonal subapertures, each subaperture having the required area for producing a working image, the contiguous polygonal subapertures having boundaries which are either common boundaries with adjacent polygons or boundaries of the working area on the plate, whereby all subapertures in the working area are continuously tiled and adjacent to other subapertures forming an uninterrupted continuum over the working area of the plate; and,

producing a computer generated hologram by placing optical features on each subaperture to produce the working image from each subaperture.

The examiner relies on the following references:

Hirsch et al. (Hirsch)	3,619,022	Nov. 09, 1971
Akkapeddi et al. (Akkapeddi)	4,897,325	Jan. 30, 1990
Haines	5,194,971	Mar. 16, 1993

The following rejections are before us on this appeal:

1. Claim 1 stands rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Akkapeddi in view of Haines.

2. Claims 2-7 and 18-25 stand rejected under 35 U.S.C.

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§ 103 as being unpatentable over the teachings of Akkapeddi in view of Haines.

3. Claims 8-11 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Haines in view of Hirsch.

4. Claims 12-17 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Akkapeddi in view of Haines and Hirsch.

5. Claims 26-29 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Haines in view of Hirsch.

Rather than repeat the arguments of appellants or the examiner, we make reference to the brief and the answer for the respective details thereof.

OPINION

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, the appellants'

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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.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1-7 and 18-25. We reach the opposite conclusion with respect to claims 8-17 and 26-29. Accordingly, we affirm-in-part.

Appellants have indicated that for purposes of this appeal the claims will all stand or fall together in groups as rejected by the examiner [brief, page 5]. Consistent with this indication appellants have made no separate arguments with respect to different claims within each rejection of the examiner. Therefore, appellants' grouping will be accepted as a representation that all the claims within each rejection will stand or fall together. Note In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). Accordingly, we will only consider the rejections against a single claim

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from each separate rejection as representative of all the claims on appeal.

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.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the

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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 and the relative persuasiveness of the arguments. 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). 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)].

We consider first the rejection of claim 1 as unpatentable over the teachings of Akkapeddi and Haines. The examiner finds that Akkapeddi teaches the claimed invention except for the plate having a working image array in which a plurality of subapertures are formed as contiguous polygonal subapertures. The examiner cites Haines as teaching such a

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plate for computer generated holograms. The examiner explains that it would have been obvious to the artisan to use the subaperture arrangement of Haines on the master grating or plate of Akkapeddi [answer, pages 3-4].

Appellants argue that Haines does not show or suggest discrete subapertures forming their own discrete working image segments because all adjacent segments of Haines would contribute redundantly to form a surface [brief, pages 8-9]. We find that appellants' argument is not commensurate in scope with the claimed invention, and we agree with the examiner that the invention as recited in claim 1 would have been obvious within the meaning of 35 U.S.C. § 103 in view of Akkapeddi and Haines.

In our view, appellants are improperly focusing on the manner in which the subapertures of Haines are created rather than on how the subapertures of Haines are used to create holographic working images on a workpiece. Once the plate 50 in Haines has been created, each subaperture 52 or 54 produces a working image in response to a coherent light beam. Once the plate 50 has been created, the working image generated by each subaperture 52 or 54 is independent of the working image

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created by the other subapertures. Although the working images may interact at the surface of the workpiece, the working images per se as they leave the subapertures 52 and 54 are only a function of what image is contained in each of the subapertures. Since the working image leaving any subaperture 52 or 54 in Haines is a function only of what is contained within each subaperture 52 or 54 of the plate 50, the working images are independent as recited in claim 1.

Appellants also argue that the applied prior art does not teach the step of dividing the working area into contiguous polygonal subapertures. We agree with the examiner, however, that the plate 50 in Haines is clearly a working area which has been divided into a plurality of contiguous polygonal subapertures shown as 52 or 54 in Haines. Since these are the only arguments presented by appellants in their brief, we sustain the rejection of claim 1 as set forth by the examiner.

With respect to the rejection of claims 2-7 and 18-25 based on Akkapeddi and Haines, the examiner has explained how

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the invention of these claims is rendered obvious by the teachings of Akkapeddi and Haines [answer, pages 3-4]. Appellants essentially rely on the same arguments considered above and assert that neither reference teaches the specific geometry of the tiles or adjacent tiles [brief, page 10]. Representative claim 2 recites a rectangular working area for the plate, and Haines clearly teaches a rectangular working area for plate 50 [see Figure 3B]. Therefore, we sustain the examiner's rejection of claims 2-7 and 18-25.

With respect to the rejection of claims 8-11 based on Haines and Hirsch, the examiner has explained how the invention of these claims is rendered obvious by the teachings of Haines and Hirsch [answer, pages 4-5]. Although appellants' arguments with respect to this rejection primarily rely on factors that we have considered above, we will not sustain this rejection because the examiner has failed to make a prima facie case of obviousness. The examiner asserts that Haines teaches all the features of claim 8 except for the step of back propagating, and the examiner cites Hirsch to meet this feature. We find the examiner's rejection insufficient to establish the obviousness of claim 8. The last five steps

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of the claim require a phase mapping of subaperture segments to centroids before the back propagation takes place. The examiner has never addressed how these steps are taught by Haines in order to support this rejection. The mere statement that these steps are taught by Haines without explanation is insufficient to establish a prima facie case of obviousness. Therefore, we do not sustain the rejection of claims 8-11.

With respect to the rejection of claims 12-17 and 26-29, these claims all have limitations similar to those of claim 8 that we just considered. The examiner's rejection of these claims also fails to establish a prima facie case of obviousness for the reasons discussed above. Therefore, we do not sustain the rejection of claims 12-17 and 26-29.

In summary, we have sustained the examiner's rejection of claims 1-7 and 18-25, but we have not sustained the rejection of claims 8-17 and 26-29. Therefore, the decision of the examiner rejecting claims 1-29 is affirmed-in-part.

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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)
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) BOARD OF PATENT
Jerry Smith)
Administrative Patent Judge) APPEALS AND
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) INTERFERENCES
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