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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROY Y. TAYLOR
and PAUL W. MELNYCHUCK

Appeal No. 1996-3638
Application 08/169,681

ON BRIEF

Before JERRY SMITH, FLEMING, and BARRY, **Administrative Patent Judges**.

FLEMING, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 9, all of the claims pending in the present application.

The invention relates to a method and apparatus for storing, retrieving and displaying depth images stored in a multi-resolution format.

Independent claim 1 is reproduced as follows:

1. A depth image system, comprising:

decomposition means for decomposing a set of original images of a scene comprising a depth image, each original image being captured from a different perspective and each original image being decomposed into a group of multiresolution images forming groups of multiresolution images;

storage coupled to said decomposition means and storing the set of groups of the multiresolution images as linked images;

recomposition means for retrieving the multiresolution images of the linked images and reconstructing the original images of the scene at a particular resolution;

depth image production means for combining the reconstructed original images into a depth image; and

display means for displaying the depth image.

The Examiner relies on the following references:

Adelson	4,661,986	Apr. 28, 1987
Katsuta et al. (Katsuta)	4,829,453	May 9, 1989
Melnychuck et al. (Melnychuck)	4,969,204	Nov. 6, 1990

Claims 1 through 3, 6 and 7 stand rejected under 35 U.S.C. § 103 as being unpatentable over Melnychuck in view of Adelson.

Claims 4, 5, 8 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Melnychuck and Adelson and further in view of Katsuta.

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the briefs[1] and answer for the respective details thereof.

OPINION

We will not sustain the rejection of claims 1 through 9 under 35 U.S.C. § 103.

The Examiner has failed to set forth a ***prima facie*** case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the express teachings or suggestions found in the prior art, or by implications contained in such teachings or suggestions. ***In re Sernaker***, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." ***Para-Ordnance Mfg. v. SGS Importers Int'l, Inc***., 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), ***cert. denied***, 519 U.S. 822 (1996), ***citing W.L. Gore & Assocs., Inc. v. Garlock, Inc***., 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), ***cert. denied***, 469 U.S. 851 (1984).

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[1] Appellants filed an appeal brief on January 29, 1996. Appellants filed a reply brief on May 13, 1996. The Examiner mailed a communication on May 31, 1996 stating that the reply brief has been entered and considered but no further response by the Examiner is deemed necessary.

Turning first to the rejection of claims 1 through 3, 6 and 7 as being unpatentable under 35 U.S.C. § 103 based on Melnychuck in view of Adelson, Appellants argue on pages 10 through 12 of the appeal brief that neither Melnychuck nor Adelson teaches or suggests multiple perspective views or generating a depth image as required by the claims. In particular, Appellants disagree with the Examiner's interpretation that the difference in focus required in Adelson was equivalent to viewing the image from different distances, so that the change in focus is in fact a change in perspective. Appellants point out that the term "perspective" as defined by the common usage requires a technique or process of representing on a plane or curved surface the spatial relation of objects as they might appear to the eye. Appellants argue that to have different perspectives which will show different spatial relations of objects, one must change their viewing angle with respect to the object. Appellants argue that a change of focus is not a change in perspective because a change of focus does not require different spatial relations of objects. Appellants further argue that Adelson's teaching of a change of focus would not result in multiple perspective views nor in generating a depth image.

We note that Appellants' claim 1 recites a decomposition means for decomposing a set of original images of a scene comprising a depth image, each original image being captured from a different perspective. Appellants' claim 1 further recites a depth image production means for combining the reconstructed original images into a depth image and display means for displaying the depth image. Similarly, we note that Appellants' claim 6 recites a depth image capture system for capturing multiple

images as a set of images of a scene from different perspectives as a depth image.

Upon our review of Adelson, we find that Adelson teaches an image processing method for processing M separately focused two-dimensional images of a given three-dimensional scene to derive therefrom a single improved-focus two-dimensional image of the given three-dimensional scene. (See column 3, lines 10-20). Furthermore, we note Adelson teaches that the image processing method is particularly suitable for use in microscopy for deriving an improved-focus 2-dimensional image of a 3-dimensional microscope specimen. (See column 3, lines 38-40). We fail to find that Adelson teaches each original image being captured from a different perspective nor does Adelson teach a depth image production means for combining the reconstructed original images into a depth image.

On pages 8 and 9 of the brief, Appellants argue that the Examiner has not shown a ***prima facie*** case to combine Melnychuck with Adelson. In particular, Appellants argue that the whole point of storing multiple resolution image data of the same image as encompassed by Melnychuck is to provide ready access to the image at various resolutions. Appellants point to column 3, lines 17-20 of Melnychuck. Appellants argue that Adelson, on the other hand, aims to provide a single two-dimensional image with improved focus. Appellants argue that since Adelson is only concerned with the final signal two-dimensional image being obtained, there is simply no reason to generate multiple resolution images from each of the differently focused images of Adelson since Adelson does not intend to access each of those differently focused images at different resolutions for later viewing reproduction.

Appellants argue that Adelson actually teaches away from making the combination suggested by the Examiner.

The Federal Circuit states that "[t]he 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 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992) (***citing In re Gordon***, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984)).

Upon our review of Adelson, we find that Adelson is concerned with providing a single two-dimensional image, such as a specimen, under a microscope. Adelson is concerned with the improved focus of this two-dimensional image. Adelson accomplishes the improved focus by using a plurality of differently focused images of the specimen all taken from the same position. Adelson is only concerned with providing an improved image processing method for deriving a single improved focus two-dimensional image of a three-dimensional specimen from separately focused 2-dimensional images of this 3-dimensional specimen. See column 1, lines 6-15. Therefore, we find that the Examiner has failed to show any reason to use Adelson's focusing method with Melnychuck's hybrid residual pyramid hierarchy storage and display

method for high resolution digital images in a multiple use environment. Therefore, we will not sustain the Examiner's rejection of claims 1 through 3, 6 and 7 under 35 U.S.C.§ 103 as being unpatentable over Melnychuck in view of Adelson.

Claims 4, 5, 8 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Melnychuck and Adelson as applied to claims 1 through 3, 6 and 7 and further in view of Katsuta. On pages 12 and 13 of the brief, Appellants argue that claim 4 is similar to claim 1 in requiring in step (e) that the reconstructed images be combined into a depth image but differs in stating that the original images are taken from different viewpoints rather than perspectives. Appellants argue that taking the original images from different viewpoints is equivalent to taking the original image from a different perspective. Appellants point out that this is true because Appellants' claim 4 still requires that one is able to generate a depth image from the reconstructed images and depth images necessarily contain multiple perspective views. Appellants argue that all the arguments advanced for claims 1 through 3, 6 and 7 are applicable also to claim 4. Appellants also argue that claims 8 and 9 are analogous to claims 1 through 3, 6 and 7 in that claims 8 and 9 require a computer to decompose original images taken from multiple viewpoints and a second computer to produce depth images from the reconstructed original image. Appellants again argue that images from multiple viewpoints are necessary images from multiple perspectives. Thus, all the arguments advanced in connection with claims 1 through 3, 6 and 7 are applicable also to claims 8 and 9.

We note that Appellants' claim 4 recites capturing at least two original images of a scene as a set comprising a depth image, the original images captured from different viewpoints. Appellants' claim 4 also recites combining the reconstructed images into a depth image. Similarly, we note Appellants' claim 8 recites a depth image capture system capturing at least two original images of a scene from different viewpoints as a set of linked images and a first computer coupled to said depth image capture system and decomposing the original images into a set of multiresolution images and a second computer to produce the depth image. We find that in order to produce a depth image, the different viewpoints would have to be taken from different perspectives. Therefore, we will not sustain the Examiner's rejection of claims 4, 5, 8 and 9 under 35 U.S.C. § 103 as being unpatentable over Melnychuck and Adelson and further in view of Katsuta for the reasons set forth above.

In view of the foregoing, we have not sustained the rejection of claims 1 through 9 under 35 U.S.C. § 103. The Examiner's decision is reversed.

REVERSED

JERRY SMITH	)
Administrative Patent Judge	)
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	) BOARD OF PATENT
MICHAEL R. FLEMING	)
Administrative Patent Judge	) APPEALS AND
	)
	) INTERFERENCES
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