

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board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. 40

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YOSHIHIRO GOTO
and KAZUHIRO SATO

Appeal No. 2000-1935
Application 08/460,937

ON BRIEF

Before THOMAS, KRASS, and DIXON, Administrative Patent Judges.
THOMAS, Administrative Patent Judge.

DECISION ON APPEAL

Appellants have appealed to the Board from the examiner's final rejection of claims 1-6 and 13-21.

Representative claim 1 is reproduced below:

1. A method of constructing a three-dimensional image by using a central projection method, comprising the steps of:

(a) setting coordinates of a point of view on a memory space so that a projection subject image is located between the view point and a projection plane;

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(b) setting a predetermined region such that the predetermined region extends into the projection subject image and contains the view point;

(c) judging whether coordinates of a pixel of the projection subject image are in the predetermined region or not; and

(d) applying coordinate transformation according to the central projection method and shading to the coordinates of the pixel only when the coordinates of the pixel are outside the predetermined region, while the coordinate transformation according to the central projection method and the shading are not applied to the coordinates of the pixel when the coordinates of the pixel are inside the predetermined region.

The following references are relied on by the examiner:

Kaufman et al. (Kaufman) 5,101,475 Mar. 31, 1992

Kimura (Japanese) 64-37678 Feb. 8, 1989

Foley et al. (Foley), Computer Graphics: Principles and Practice, Second Edition, pages 237-242 (1993)

Claims 1-6 and 13-21 stand rejected under 35 U.S.C. 103. As evidence of obviousness, the examiner relies upon Kaufman in view of Foley and Kimura.

Rather than repeat the positions of the appellants and the examiner, reference is made to the brief and answer for the respective details thereof.

OPINION

We reverse.

According to the examiner's statement of the rejection at the second and third pages of the answer, the examiner only relies upon Kaufman as a basis for the claimed central projection method, asserted to be shown in Figure 6A of this reference. The examiner recognizes that this reference does not explicitly disclose the projection subject image being located between the view point and the plane of projection. The examiner, in our judgment as well as according to the arguments presented at pages 9-15 of the principal brief on appeal, argues that Foley teaches this disputed feature.

The focus of this dispute is upon the recited feature, set forth in representative independent claim 1 and set forth in the same measure in independent claims 6, 13 and 14 as well, that the projection image is located between the view point and the projection plane. Figure 6A of Kaufman shows the projection screen located between the view point and the object of interest. This is also shown in Figure 6E. This approach would appear to us to be consistently used throughout the teachings and showings

in Kaufman because of the ability of this reference to view 3-D voxel images along arbitrary viewing directions as depicted in Figure 7.

Notwithstanding these deficiencies of Kaufman, the admitted prior art discussed with respect to Figure 1 does indicate according to the specification as filed that it was a known feature of the central projection method that the images themselves would be located between the view point and the projection plane. On the other hand, the examiner's perspective is wrongly-based according to the urging that Figure 6.21 at page 241 of Foley justifies this interpretation. Like appellants, we do not agree with the examiner's interpretation that the projection subject image in this figure is located between the view point and the projection plane as claimed. However, Foley does essentially teach this feature according to the statement at the bottom of page 237 where he indicates that the "view plane [projection plane] may be anywhere with respect to the world objects to be projected: it may be in front of, cut through, or be behind the objects."

The examiner's succeeding views with respect to Foley are misplaced. At the outset, we note at page 239 that Foley states that the "view volume bounds that portion of the world that is to be clipped out and projected onto the view plane." The ensuing discussion shows in Figures 6.19 through 6.21 area projection approaches utilizing a more limited view volume defined by a front clipping plane and a back clipping plane on either side of the viewing plane itself. These figures do not indicate to us and, as noted earlier, we are in agreement with appellants' views as to this issue, that the projection subject image is located between the view point and a projection plane. The view plane or projection plane is in the middle of a region bounded by the front and back clipping planes, which is a viewing volume essentially smaller than that which may be defined from the entire volume of three-dimensional images to begin with. This limited viewing volume we assume the examiner intends to consider to be analogous to the claimed predetermined region. With this view we fully agree.

On the other hand, because we do not agree with the examiner's views with respect to this relationship of the projection subject image located between the view point and the projection plane, notwithstanding the teaching noted earlier at the bottom of page 237 of Foley that the view plane may be located anywhere with respect to the object, it appears to us and appellants that the view point itself is always outside of any truncated or limited viewing volume according to the figures and showings of Foley relied upon by the examiner. Foley is therefore incapable of meeting the limitation of representative claim 1 (as well as independent claims 6, 13 and 14 as well) on appeal that the predetermined region itself "contains the view point." The view point in the noted figures in the portion of Foley relied upon by the examiner appears to us and appellants to be always located away from or in a region not a part of the truncated viewing volume itself. Figures 6A, 6E and 7 of Kaufman indicate the same.

As to the examiner's view that Kimura teaches this, we are also in agreement with appellants' views that Kimura does not. Both perspectives shown and the initial teachings and showings associated with Figure 5 indicate that the point of view is located away from the projection plane B according to the Figure

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5b and Figure 5c perspectives, which are used as a starting point for the analysis in Kimura. There, the view point is outside of the projection plane B which itself is located between the view point and the object to be viewed. This is essentially true as well for the contribution depicted in Kimura's Figure 2. We recognize Kimura essentially does teach the concept of a predetermined region by its use of the terminology relating to the drill regions shown in Figure 3, such as the plane drill region in sub-figure a as well as spherical drill region shown in sub-figure b, the earlier one of which is depicted in Figure 5c.

We therefore find ourselves in general agreement with appellants' arguments presented at pages 16-20 of the brief. Essentially, neither Foley nor Kimura teach or suggest the requirement of each independent claims 1, 6, 13, and 14 on appeal that the predetermined region be located such that it extends into the projection subject image AND contains the view point itself. In fact, it appears to us that the view point is always outside of any projection subject image according to the teachings of all three references relied upon and is not contained within or on any defined predetermined region within the teachings and showings of Foley and Kimura.

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In view of the foregoing, we have reversed the rejection of independent claims 1, 6, 13 and 14 on appeal. As such, we also necessarily reverse the rejection of their respective dependent claims. Therefore, the decision of the examiner is reversed.

REVERSED

James D. Thomas)	
Administrative Patent Judge)	
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Errol A. Krass)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
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