

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROY VAN DIJK and JEFFREY A. SHIMIZU

Appeal No. 2003-1550
Application No. 09/365,209

ON BRIEF

Before KRASS, FLEMING and RUGGIERO, Administrative Patent Judges.
KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1-15.

The invention is directed to compensating for motion of image planes in color sequential displays. In certain types of color image displays, color image planes are displayed sequentially, wherein light of various colors sequentially illuminates a common spatial light modulator so that the modulator modulates the intensity of each respective color

Appeal No. 2003-1550
Application No. 09/365,209

component of a pixel sequentially and independently, which is perceived as a color motion image. When a user's eyes are focused on a moving object, the eyes track the motion. The tracking motion of the eyes causes a color breakup artifact that an observer notices.

The instant invention addresses the perceived artifacts in a color sequential display producing an image of a moving object, by separately motion compensating the objects represented within the respective color planes based on the time of display.

Representative independent claim 1 is reproduced as follows:

1. A method for motion compensation of displays, comprising:

(a) processing received image data comprising frames (2), each frame defining a plurality of subframes (4, R, G, B), each subframe representing a different component of the image frame (R, G, B) for display at different respective times (T_R , T_G , T_B) within a frame period;

(b) estimating a motion of an image portion represented in said frames of image data input (3); and

(c) motion compensating the image portion based on the estimated motion, with respect to a respective time instance of display of at least one of said subframes thereof (5), thereby reducing display artifacts.

The examiner relies on the following reference:

Gillard et al. (Gillard) 4,862,267 Aug. 29, 1989

Claims 1-15 stand rejected under 35 U.S.C. § 102(b) as anticipated by Gillard.

Appeal No. 2003-1550
Application No. 09/365,209

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

At the outset, we note that, in accordance with appellants' grouping at page 8 of the principal brief, all claims will stand or fall together. Accordingly, we will focus on independent claim 1.

A rejection for anticipation under 35 U.S.C. § 102 requires that the four corners of a single prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation. See Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1946-47 (Fed. Cir. 1999); In re Paulsen, 30 F.3d 1475, 1478-79, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994).

It is the examiner's view that Gillard discloses, in Figures 1-3 and 11-13, a motion compensated interpolation of digital television images which is the same as motion compensation of displays, as set forth in the instant claims. The examiner contends that the reference processes received image data comprising frames 31, each frame defining a plurality of

Appeal No. 2003-1550
Application No. 09/365,209

subframes 11, each subframe 11 representing a different component of the image frame for display at different respective times within a frame period; that it estimates a motion of an image portion represented in the frames of image data input (35-47); that it motion compensates the image portion based on the estimated motion, with respect to a respective time instance of display of at least one of the subframes, thereby reducing display artifacts (1-34), and wherein each respective subframe corresponds to a different color plane (UV), of a respective frame, for display in a color-sequential manner at different times within the frame period. The subframe of the motion compensated image portion is translated into a corrected subframe having modified pixel values by bilinear interpolation, defining a portion boundary at a closest color pixel plane (Figure 11).

For their part, appellants argue that while Gillard teaches motion compensated interpolation of digital television images by a combination of motion compensation and interpolation of successive image frames (with the motion compensation being carried out in order to eliminate image artifacts such as multiple imaging, judder and blurring, and carried out on successive frames of video information), appellants are concerned with color artifacts caused by the depiction of motion in a color

Appeal No. 2003-1550
Application No. 09/365,209

frame-sequential system, i.e., a full color display represented by the sequential display of color component sub-fields.

Moreover, appellants argue, the instant claimed invention applies motion compensation to the component color subframes, not to conventional video frames containing all luminance and chrominance information for a color image frame. Gillard, *alleged* appellants, does not teach or suggest motion compensation based on component subframes.

With regard to appellants' first arguments relative to "color artifacts," the examiner has indicated, appellants have admitted, and we agree, that instant claim 1 is not limited to different color subframes exhibited in a color-sequential manner (though other claims, e.g., claim 2, appear to be so limited).

However, we do agree with appellants that claim 1 is limited to the application of motion compensation to subframes representing different components of an image frame for display at different respective times within a frame period. Gillard does not appear to teach such a limitation.

The examiner's response is that appellants already admit "on page 8 of the Brief that Gillard . . . teaches motion compensation" (answer, page 3). In addressing the "components subframes" (as argued by appellants at page 9 of the principal

Appeal No. 2003-1550
Application No. 09/365,209

brief) feature, the examiner points to Figure 2 of Gillard for an illustration that the color frames U and V (i.e., color components in a TV signal) are divided (11C) into subframes, i.e., fields within a frame, prior to motion compensation processing. We are not convinced, by the examiner's explanation, that Gillard teaches the invention described by instant claim 1.

Looking at Figure 2 of Gillard, and the attendant description thereof, at column 3, lines 10-11, and at column 8, line 66 through column 12, line 34, it appears that Figure 2 describes a television standards converter for converting a 625 line 50 fps standard (input into demultiplexer 31) to a 525 line 60 fps standard (output at multiplexer 34). This is performed by separating the input video signal into Y (luminance), SYNC (synch signals) and UV (chrominance) components (see output of demultiplexer 31). The Y and UV components are later recombined to provide a new video signal and this new video signal displays all image components simultaneously in each field or frame. The Y and UV components might be considered to be different components of an image frame, and this is admitted by appellants at page 3 of the reply brief, but these components are still not displayed at different times within a frame period, as required by claim 1.

Appeal No. 2003-1550
Application No. 09/365,209

The best that the examiner can muster to respond to the "different times" argument is to allege that Gillard "never discloses displaying the components YUV simultaneously" (answer, page 4) and that the multiplexer of Figure 2 "shows that the image components are transmitted through a single video output channel. It is noted that Gillard . . . does not illustrate 3 parallel output channels for Y, U, and V to be simultaneously outputted because these image components are outputted at different respective times within a frame period . . ." (answer, pages 4-5).

We are in agreement with appellants that there "is no support whatsoever in the disclosure of Gillard . . . for the Examiner's contention that the Y, U and V components are separately outputted during different times within a frame period" (reply brief, page 5).

While Gillard may not specifically state that components Y, U and V are displayed "simultaneously," it is clear that the Y and UV components in Gillard are multiplexed in multiplexer 34 to form a new TV video signal which is a conventional television signal in which each frame carries all of the luminance (Y) and chrominance (UV) information of the display image. Further, merely because a reference does not specifically state certain

Appeal No. 2003-1550
Application No. 09/365,209

components of a signal to be displayed "simultaneously," does not unequivocally lead to the conclusion that the components are displayed at different respective times. Thus, we find nothing in Gillard, and the examiner has not convinced us of any teaching in Gillard, that indicates the receipt of image data comprising frames, with each frame having a plurality of subframes, "each subframe representing a different component of the image frame for display at different respective times . . . within a frame period," as required by claim 1.

The problem with the examiner's attempt to force the disclosure of Gillard to "fit" the instant claimed invention appears to lie in appellants' R, G and B subframes (though these are not specifically claimed in claim 1, the claim does recite time periods T_R , T_G , T_B), which are quite different from YUV components. It is the R, G and B subframes, not YUV components, which receive motion compensation in the instant invention. The artisan would have understood, as appellants point out, at page 4 of the reply brief, that "YUV components in the conventional sense are not for display at different respective times within a frame period."

Appeal No. 2003-1550
Application No. 09/365,209

Since each and every claim limitation is not taught by the applied reference, we will not sustain the examiner's rejection of claims 1-15 under 35 U.S.C. § 102(b).

The examiner's decision is reversed.

REVERSED

ERROL A. KRASS)	
Administrative Patent Judge)	
)	
)	
)	
)	
MICHAEL R. FLEMING)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
)	
JOSEPH F. RUGGIERO)	
Administrative Patent Judge)	

EAK:clm

Appeal No. 2003-1550
Application No. 09/365,209

Philips Intellectual Property
& Standards
P.O. Box 3001
Briarcliff Manor, NY 10510