Paper No. 52

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHRISTOPHE CHEVANCE
and DOMINIQUE THOREAU

Appeal No. 2000-2247
Application 08/137,189[1]

HEARD: April 23, 2002

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

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the

BACKGROUND

The invention relates to coding blocks of moving images, such as in visual telephony. The prior art discloses three coding modes: intra-image coding, inter-image coding, and movement-compensated inter-image coding. Intra-image coding is costly in terms of the number of bits transmitted, but must be used, for example, upon transmission of the first image in a sequence or upon abrupt changing of scenes. Intra-image coding risks an overflow of the buffer memory. The invention provides a fourth mode of inter coding which substitutes for the intra-image coding mode. The coding mode codes the difference between a current macroblock (at position bc in figure 3) and the most similar of four adjacent macroblocks of the reconstructed current image (positions br in figure 3). This makes it possible to limit the use of strictly intra-image coding.

Claim 1 is reproduced below.

> 1. A method of coding of blocks of television images including intra-image coding and differential coding wherein said differential coding consists in coding a minimum pixel-by-pixel difference between a current block of a current image to be transmitted and one among four reconstructed blocks of the same current image in a closest vicinity of the current block, said one closest block being

The Examiner relies on the following reference:

Krause et al. (Krause) 5,093,720 March 3, 1992

Claims 1 and 3-7 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Krause.

We refer to the Office action (Paper No. 32) of February 24, 1998, the final rejection (Paper No. 35[2]), and the examiner's answer (Paper No. 46) (pages referred to as "EA__") for a statement of the Examiner's rejection, and to the brief (Paper No. 45) (pages referred to as "Br__") and reply brief (Paper No. 47) (pages referred to as "RBr__") for a statement of Appellants' arguments thereagainst.

OPINION

Both independent claims recite the coding of a minimum pixel-by-pixel difference between a current block of a current image to be transmitted and one block among four reconstructed blocks of the same current image in the closest vicinity of the current block. Thus, the coding is between a current block and a reconstructed block of the same current image. This limitation is dispositive of the anticipation rejection.

Krause discloses motion compensated coding of interlaced

odd field and an even field (figures 1 and 2). Krause discloses (col. 2, lines 24-37):

> Successive interlaced video frames are subdivided into blocks of odd field pixel data and even field pixel data. The odd field blocks and even field blocks of a first video frame are stored in memory after further processing including compression and decompression. Each block of pixel data from a subsequent second video frame is compared before compression to similarly situated blocks in both the odd and even fields of the first video frame. A preferred first frame counterpart (e.g., the best match) for each second frame block is determined. A prediction error signal is generated for each second frame block indicative of the difference between the block and the odd or even first frame block it matches best.

This is illustrated in figure 3 where each block (a block is 8 pixels wide and 8 pixels high for a total of 64 pixels per block) in a current frame is compared to similarly situated blocks in the odd field and even field. Thus, block 1 of odd field 100 (current frame before compression) is compared to block 1 of prior frame odd field 102 as well as to block 2 of even field 104 of the prior frame (col. 4, lines 60-63). This embodiment does not compare a block to a block in a closest vicinity of the block, as claimed, but compares a block to a block in the same location in a prior odd or even field.

Krause further discloses (col. 2, lines 44-49):

The range is 16 positions in the horizontal and vertical directions (-8 to +7 pixels from the center of the block, col. 5, lines 10-13, which includes 0 pixel displacement) for a total of 16^2 tests to find the best match in the prior frame odd field and 16^2 tests to find the best match in the prior frame even field (col. 5, lines 13-16). Because a block is 8x8 pixels, this range compares a current block to blocks in the vicinity of the current block in prior frame fields (as compared to the embodiment of figure 3 which compares a block to a block at the same location in the prior frame fields). However, this embodiment also does not compare a current block of the current frame to reconstructed neighboring blocks of the current frame, as claimed.

The Examiner relies on "the motion compensation circuit of figure 8 as incorporated into the encoder of figure 4" (EA5). The Examiner's reasoning is somewhat lengthy and convoluted, but basically the Examiner finds that the frame memories contain reconstructed current frames and interprets elements 134 and 136 in figure 8 to be memories that hold reconstructed current and preceding frames (EA5-7).

Appellants argue, inter alia: (1) there is no suggestion to

While it is true that Krause reconstructs and stores the current image (col. 6, lines 12-19), the data is stored "for use as the prior frame data when the next frame is being processed" (col. 6, lines 17-19). The odd field store 22a and even field store 22b hold odd and even fields of a prior frame. The motion estimators 26, 28 identify the best match between each current frame block to a previous frame in stores 22a, 22b and a comparator 36 determines which of the "best matches" is closest to the current frame being processed (col. 5, lines 55-65). When the reconstructed current image is used as prior frame data it is no longer a reconstructed current image. We have thoroughly considered the Examiner's rationale, but find nothing in Krause which teaches or suggests anything other than comparing a block of a current field to a block of a prior field.

Krause states (col. 7, lines 51-55):

> FIGS. 7 and 8 depict another embodiment of the present invention wherein pixel data from a current field is compared to similarly situated pixel data is a plurality of prior fields. A comparison with any number of prior fields can be accomplished. [Emphasis added.]

See also col. 8, lines 53-61. Clearly, figure 8 is not intended to be combined with figure 4, but is an alternative embodiment.

current field. Further, the figure 8 embodiment compares similarly situated pixel data in prior fields, i.e., between blocks of a current field to blocks at the same location in a prior field, and not to blocks in a closest vicinity of the current block. Even if one were to modify figure 8 to compare a current block to blocks within a range as taught in connection with figure 4, this would still not meet the limitation of comparing a current block of a current image to reconstructed blocks of the same current image, as claimed.

Because Krause does not disclose coding of a difference between a current block of a current image to be transmitted and a reconstructed block of the same current image, the Examiner erred in the finding of anticipation. The rejection of claims 1 and 3-7 is reversed.

REVERSED

ERROL A. KRASS)
Administrative Patent Judge)
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Administrative Patent Judge)

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