The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEVEN M. HANCOCK,
MARK A. PIETRAS,
and LESLIE R. WILSON

Appeal No. 1998-0879
Application 08/251,730[1]

ON BRIEF

Before THOMAS, KRASS, and BARRETT, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

[1] Application for patent filed May 31, 1994, entitled "Hybrid Video Compression/Decompression System."

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-33.

We reverse.

BACKGROUND

The disclosed invention is directed to a method and system for compressing and decompressing luminance and chrominance information within a video data stream. The selected compression techniques are encoded utilizing selected escape codes and header codes. An escape code is inserted into the video stream to indicate a common compression characteristic; in the disclosed embodiment one mode would indicate real-time compression and a second mode would indicate off-line compression (figure 2A). Header codes are inserted at the beginning of each data block. A header code when taken together with a preceding escape code indicates which of the multiple compression techniques was utilized to compress the associated data. Compression efficiency is achieved in two ways. First, because of the escape code, the amount of encoded data in the compressed video data stream is reduced. Second, a header code can utilize a smaller number of bits to represent diverse

compression techniques because the same bit combination can be interpreted in different ways depending on the value of a preceding escape code.

Claim 1 is reproduced below.

1. An image processing system for compressing a digital data stream comprising a sequential series of data blocks, each of said data blocks having a beginning and representing a portion of a digitized video image which is displayed as a succession of multi-block frames, the image processing system comprising:

a frame buffer store responsive to the digital data stream for storing a plurality of sequential data blocks representing an entire frame of the digitized video image;

apparatus responsive to digital data in each of the sequential data blocks for compressing the digital data in each data block using one of a plurality of compression techniques;

a comparator mechanism responsive to the stored data blocks and to the digital data stream for inserting into the digital data stream an escape code which indicates a common compression characteristic shared by a plurality of digital data blocks following the escape code; and

apparatus responsive to the one of the plurality of compression techniques and to the escape code for inserting a header code at a beginning of each data block, which header code when taken together with a preceding escape code indicates the one of the plurality of compression techniques used.

The Examiner relies on the following references:

Kantner, Jr. et al. (Kantner) 5,463,701 October 31, 1995
(filed January 18, 1994)
Bhargava et al. (Bhargava) 5,471,248 November 28, 1995
(filed November 13, 1992)

Claims 1-29 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Kantner.

Claims 30-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kantner and Bhargava.

We refer to the second Official Action (Paper No. 9), the Final Rejection (Paper No. 14), and the Examiner's Answer (Paper No. 20) (pages referred to as "EA__") for a statement of the Examiner's position and to the Appeal Brief (Paper No. 19) (pages referred to as "Br__") for a statement of Appellants' arguments thereagainst.

OPINION

"Anticipation is established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed invention." RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984).

Kantner discloses a method and system for compressing digitized color video data. During compression, each image is decomposed into a plurality of non-overlapping, contiguous rectangular regions termed elementary units, typically a four by four matrix of pixels (col. 4,

lines 35-41). Each elementary unit corresponds to one of four types: unchanged, homogeneous, pattern, or predetermined pattern (col. 4, lines 43-45). In the protocol of the compressed video data stream 38, elementary units are organized as quadruples, and a byte header having four two-bit dyads defines the corresponding type of each of the four elementary units (col. 4, lines 50-61). A predetermined pattern elementary unit type is encoded as an index block 54 into a table of predetermined bit map patterns 56 (col. 5, lines 14-28). Kantner discloses "escape codes" as follows (col. 5, lines 36-43):

> If the table of patterns 56 is limited in number, certain entries in the table may be designated as escape codes. <u>Subsequent to a byte header 68</u>, occurrence of an <u>escape code 70</u> in the location of an index block <u>is indicated</u>. Such escape codes can indicate a number of things including, run lengths of elementary units which are unchanged or homogeneous. Subsequent to the escape code a supplemental run length block 72 may be provided. [Emphasis added.]

Thus, Kantner discloses an escape code 70 following a header 68 in a compressed video data stream 38.

Appellants agree that the dyad values within a byte header (e.g., dyads 44, 46, 48, and 50 having dyad values 00, 01, 10, 11 in byte header 42 shown in figure 3 of

Kantner) indicate the compression technique utilized to compress the video data in a corresponding elementary unit (Br7).

Appellants argue (Br6): "*Kantner* fails to identically disclose the escape code, which as recited in exemplary Claim 1, 'indicates a common compression characteristic shared by a plurality of digital data blocks following the escape code' and which indicates a particular compression technique when taken together with a subsequent header code." "Thus, Kantner teaches neither the ordering (i.e., escape code preceding header code) nor the function of the escape code recited in the present claims." (Br7.)

The Examiner states that "Applicant's first assertion is that Kantner fails to disclose the use of byte headers in conjunction with the escape codes" (EA5). The Examiner finds that when the dyad in the header indicates a predetermined pattern elementary unit, the stream 38 contains an index block 54 and that, in some circumstances, an escape code can replace the index block. The escape code can indicate run lengths of elementary units which are unchanged or homogeneous (two types of compression). Thus,

the Examiner finds that the header and the escape code are used together to indicate the compression technique (EA6).

While we agree with the Examiner's findings, the analysis does not address Appellants' argument. Appellants do not argue that the header and escape codes are not taken together to indicate a compression technique. Instead, Appellants' first argument is that the escape codes in Kantner do not perform the claimed function of "an escape code which indicates a common compression characteristic shared by a plurality of digital data blocks following the escape code." As to this limitation, considered in isolation, Kantner's disclosure that the "escape codes can indicate . . . run lengths of elementary units which are unchanged or homogeneous" (col. 5, lines 40-42) teaches that the escape code indicates a common compression characteristic (unchanged or homogeneous) shared by a plurality of data blocks (the number of blocks or elementary units is indicated by the run length) following the escape code. The limitation does not require that <u>all</u> data blocks following the escape code share the common compression characteristic. Therefore, Kantner literally meets this

limitation although Appellants' escape code is disclosed to work differently.

The Examiner correctly states that Appellants' second argument is that "[Kantner] fails to disclose using byte headers *subsequent* to the escape codes in the compressed bit-stream for delineating the desired compression technique" (EA6). The Examiner provides a long and complex discussion of how Kantner can be interpreted to meet the limitation, which we do not find persuasive.

First, the Examiner erroneously finds byte header 68 to be a "trailing byte header" (EA7), which is a function of the previous quadruple of elementary units. It is stated (EA7): "While Kantner discloses accessing the leading byte header [42] for determining the coding technique placement for the first quadruple which follows, <u>the reference appears to be silent on the function of the trailing byte header for anything</u>, *as would be required by the claims in question*" (underlining added). Nevertheless, the Examiner finds that one of ordinary skill in the art would have recognized that the encoding process inserts a trailing byte header which is a function of the previous quadruple of elementary units.

This finding is erroneous. A "header" refers to identification or control information placed at the beginning of a file or message, as contrasted with a "trailer" which refers to information placed at the end. It is clear that header 68 is associated with subsequent blocks, two of which are the escape code block 70 and block 72, and not with the previous blocks. Although figure 3 shows a gap between header 68 and block 70, this only means that one to three elementary units may be encoded before the escape code, <u>not</u> that header 68 is functionally associated with the previous blocks. That is, header 68 has the same structure as header 42 and refers to subsequent elementary units in the stream 38.

Second, the Examiner errs in finding that where the escape code indicates elementary units crossing quadruple boundaries, "the generated trailing byte header of the first quadruple would indicate the actual positional implementation of the escape code compression technique for the specific elementary units in the subsequent quadruple" (EA10), i.e., the trailing header follows the escape code. As discussed in the preceding paragraph, there is no

"trailing header." The headers, including header 68, refer to the compression of elementary units which follow the header; they do not refer back to the blocks of the preceding quadruple of elementary units. Therefore, the header always precedes the escape code, contrary to the limitation of the claims. Kantner expressly states (col. 5, lines 38-39): "Subsequent to a byte header 68, occurrence of an escape code 70 in the location of an index block is indicated." Thus, the header precedes the escape code. Kantner provides very little information about the actual working of the escape code and headers when the escape code specifies a run length for a compression technique (unchanged or homogeneous, col. 5, lines 39-43). It is not clear whether there is still a header for every quadruple of elementary units when the run length extends past the boundary of the quadruple of elementary units and, if so, what the header specifies. It is improper to resort to speculation or unfounded assumptions to supply deficiencies in the factual basis for a rejection. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967). There

is nothing in Kantner which indicates that the subsequent headers use the information specified in the escape code.

Third, we observe that the "run length" escape code in Kantner is very similar to the run length escape code described in Appellants' specification (p. 21, lines 10-16) with respect to figure 5. However, this disclosed escape code is not the "stream interpretation" escape code which is claimed.

For the reasons stated above, we find that the Examiner has failed to establish a prima facie case of anticipation as to independent claims 1, 9, 17, 21, and 29. The anticipation rejection of claims 1-29 is therefore reversed. Independent claims 30 and 32 contain similar limitations to those discussed in the anticipation rejection. Bhargava, applied in the obviousness rejection of claims 30-33, does not cure the deficiencies of Kantner. Accordingly, the obviousness rejection of claims 30-33 is reversed. In summary, the rejections of claims 1-33 are reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)	
ERROL A. KRASS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LEE E. BARRETT Administrative Patent Judge	)	

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