Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JI-HO KIM and YUNG-JUN PARK

Appeal No. 2002-1961
Application No. 09/133,430

HEARD: MAY 20, 2003

Before GROSS, BLANKENSHIP, and LEVY, Administrative Patent Judges.
LEVY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-7, which are all of the claims pending in this application.

BACKGROUND

Appellants' invention relates to a method and apparatus for image signal compression coding. An understanding of the invention can be derived from a reading of exemplary claim 1, which is reproduced as follows:

1. An image signal compression coding method comprising the steps of:

(a) compression-coding one field of an input progressive image signal composed of frames, using only data from said one field; and

(b) compression-coding another field of the input progressive image signal using differential data between said one field and said another field, wherein said one field and said another field are of the same frame.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Murashita et al. (Murashita)	5,485,213	Jan. 16, 1996
Owada et al. (Owada)	5,825,931 (effectively filed:	Oct. 20, 1998 July 7, 1993)

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Murashita in view of Owada.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejection, we make reference to the examiner's answer (Paper No. 18, mailed January 16, 2002) for the examiner's complete reasoning in support of the rejection, and to appellants' brief (Paper No. 17, filed November 6, 2001) and reply brief (Paper No. 19, filed March 18, 2002) for appellants' arguments thereagainst. Only those arguments actually made by appellants have been considered in this decision. Arguments which appellants could have made but

chose not to make in the brief have not been considered. See 37 CFR 1.192(a).

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejection advanced by the examiner, and the evidence of obviousness relied upon by the examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejection and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the invention of claims 1-7. Accordingly, we reverse.

We begin with claim 1. The examiner's position (answer, page 4) is that Murashita is silent about compression coding another field of the input image signal wherein the one field and the another field are of the same frame. To overcome this deficiency of Murashita, the examiner (answer, pages 4 and 5)

turns to Owada for a teaching of compression coding another field of the input progressive signal using differential data between the one field and the another field, where the one field and the another field are of the same frame. According to the examiner (answer, page 5):

> Therefore, it is considered obvious that one skilled in the art at the time of the invention would recognize the advantage of using differential data between the one field and the another field, wherein the field and the another field are of the same frame, and would be motivated to look to Owada et al. to provide the claimed compression of the other field from the same frame for the same purpose of maintaining a uniform transmitting rate, thereby preventing a degradation of the quality of the image.

The examiner additionally asserts (answer, page 8) that claim 1 is met by selecting intra-frame coding of a difference signal.

Appellants assert (brief, page 3) that "neither of the references teaches or suggests compression coding one field of a frame and then compression coding the other field of the same frame using differential data between the one field and the another field, as required by independent claims 1, 3 and 4."

Appellants further argue (brief, pages 5 and 6) that Owada teaches using either **intra-frame** encoding or **inter-frame** encoding, and that in intra-frame encoding, a frame is divided into blocks and the blocks are transformed into co-efficients

representing the frequency domain. In this type of encoding, differential data is not generally used, and although intra-frame encoding uses data from only one frame, this does not suggest compression coding one field of a frame and then compression coding the other field of the same frame using differential data between the one field and the other field, as required by claim 1. In addition, appellants note (brief, pages 8 and 9) that in Owada, a "picture" can refer to either a frame or a field. Appellants assert (brief, page 9) that in Owada, if pictures were represented by fields, a partial area of a field would be encoded by using only pixels in the present field and motion compensating operations would be performed in the remaining portion of the same field, where discrimination circuit 106 would select between intra-field coding and inter-field coding in local areas of the remaining portion, i.e., the refresh area of each field would be intra-field encoded and local areas of the other part of the field would be either intra-field encoded or inter-field encoded based upon decisions of the discriminating circuit 106.

We note at the outset that the examiner bears the initial burden of establishing a prima facie case of obviousness in a rejection under 35 U.S.C. § 103(a). In reaching our decision in

this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. Upon evaluation of all the evidence before us, it is our conclusion that the evidence adduced by the examiner is insufficient to establish a prima facie case of obviousness with respect to the claims under appeal. Accordingly, we will not sustain the examiner's rejection of claims 1-7 under 35 U.S.C. § 103(a). Our reasoning for this determination follows.

A prima facie case of obviousness is established by presenting evidence that would have led one of ordinary skill in the art to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) and In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). Murashita discloses (col. 3, lines 42-58) that:

> The compressing field designating section uses either one of the following three designating methods.
> I. Either one of the odd field and the even field is fixedly designated.
> II. The designation of the odd field or the even field is alternately switched every other frame.
> III. In the case where a code amount of one frame is equal to or less than a predetermined threshold value (when an image change is small), the image of

> the field different from the field which was compressed in the previous frame is designated as a target to be compressed.

We find from the disclosure of Murashita that although Murashita teaches compression coding one field of an input progressive signal composed of frames, using only data from the field; Murashita only uses either the odd field, the even field, alternates between the fields, or uses one field or the other as a target to be compressed depending on whether the code amount of the previous field exceeds a threshold value. In any event, Murashita does not use both fields of the same frame for compression coding of another field of the input image signal wherein the one field and the another field are of the same frame, as required by independent claim 1. Owada relates to an image encoding device which uses a correlation between adjacent pictures (frames or fields) of a video signal (col. 1, lines 9-12). As shown in figure 1, 103 shows a block dividing circuit for changing the order of pixels included in the video signal and for dividing the pixels into a plurality of blocks, each of which is comprised of pixels. 104 shows a subtracting circuit which calculates a difference between a video signal of a present frame and a predictive video signal. 105 shows a switching circuit which outputs a signal from the block dividing circuit 103 and

the signal from the subtracting circuit (col. 2, line 62 through col. 3, line 13). 106 shows a discrimination circuit which compares an efficiency of encoding the video signal of the present frame with an efficiency of encoding the predictive video signal to select one of them as the signal to be encoded. 107 shows a control circuit for a refresh operation (col. 3, lines 4-8). 108 shows an OR circuit to which a discrimination result from discrimination circuit 106 and a refresh signal from control circuit 107 are supplied. 109 shows an orthogonal transformation circuit for orthogonally transforming a signal selected by switching circuit 105. 118 shows a switching circuit which selects either terminal a or b in response to an output of OR circuit 108, and connects to switching circuit 105 (col. 3, lines 14-18 and 32-34).

In operation, the signal produced by block dividing circuit 103 is supplied to the subtracting circuit 104, terminal (a) of switching circuit 105, and discrimination circuit 106. The predictive signal from motion compensating circuit 121 is also supplied to subtracting circuit 104. The subtracting circuit 104 calculates difference values from the predictive signal output from the motion compensating circuit and the signal of the present frame processed through block dividing circuit 103, and

supplies the difference values to terminal (b) of switching circuit 105 and the discrimination circuit 106 as a difference signal. The discrimination circuit 106 compares efficiencies for encoding the signals of the present frame and the predictive signal, and outputs a discriminating result which indicates which signal is better for encoding. In short, the discrimination circuit 106 selects the encoding system between the intra-frame encoding and the inter-frame encoding systems. The discrimination result controls the switching circuit 105 and switching circuit 118 through OR circuit 108 such that (col. 4, lines 11-21):

> terminal (a) connects to a common terminal when the efficiency for encoding the signal of the present frame is better than for encoding the predictive signal, and the terminal (b) connects to the common terminal when the efficiency for encoding the predictive signal is better than that for encoding the signal of the present frame. On the other hand, a control signal for forcibly setting the intra-frame encoding system to periodically execute the refresh operation is produced by the control circuit 107 and is supplied to another input of the OR circuit 108.

When switching circuits 105 and 118 are at terminal (a) intra-frame encoding is being executed, and the output of adding circuit 117 is similar to the output of block dividing circuit 103 (col. 5, lines 16-26). When switching circuit 118 is connected to terminal (b) switching circuit 105 is outputting a

difference signal output from subtracting circuit 104 and a signal similar to the difference signal is supplied to adding circuit 117. The difference signal is produced by subtracting the predictive video signal produced by 121 from the signal output from block dividing circuit 103 (col. 5, lines 25-34).

As shown in figure 2, a high level for the control signal causes a refresh operation. When the control signal is at a low level, the device executes a normal operation (col. 6, lines 1-9). The refresh period returns to an initial position every frame (col. 6, lines 31 and 32). Control circuit 107 outputs the refresh control signal (col. 6, line 33). As shown in the second frame of figure 4, the refresh area (where intra-frame encoding is performed) is shifted by the distance S. The refresh area is shifted every "n" frame (col. 7, lines 3-15).

We find from the disclosure of Owada that the subtracting circuit 104 calculates difference values between the predictive signal output from the motion compensating circuit and the signal of the present frame processed through the block dividing circuit. We additionally find that when switching circuits 118 and 105 are connected to terminal (a), intra-frame encoding is being executed, i.e., the signal of the present frame is encoded and decoded without the above-mentioned subtraction. Thus, we

we find that when intra-field encoding is being executed, the present signal is used. We further find that when operating Owada in a fashion such that a picture represents a field, that it is not clear from the disclosure of Owada whether the difference signal, produced by subtracting the predictive video signal produced by 121 from the signal output from block dividing circuit 103, involves differential data from two fields of the same frame. However, from the admission of appellants (reply brief, page 4) that "[a]ppellant recognizes that intra-frame coding can involve differential data derived from two fields of the same frame," we find that Owada inherently teaches "compression-coding another field of the input progressive image signal using differential data between said one field and said another field, wherein said one field and said another field are of the same frame" as recited in claim 1.

Nevertheless, from the disclosure of Murashita that only one of the fields is used, and the disclosure of Owada that the discrimination circuit 106 compares the efficiencies for encoding the signal of the present frame and the predictive frame and outputs a result which indicates which signal is better for encoding, we find no teaching or suggestion, and no convincing line of reasoning has been advanced by the examiner, that would

have led an artisan to combine the teachings of Murashita and Owada, in order to arrive at the claimed invention. We are not persuaded by the examiner's assertion (answer, page 5) that an artisan "would recognize the advantage of using differential data between the one field and the another field, wherein the field and the another field are of the same frame, and would be motivated to look to Owada" other than from appellants' disclosure.

In our view, the only suggestion for modifying Murashita in the manner proposed by the examiner stems from hindsight knowledge derived from the appellants' own disclosure. The use of such hindsight knowledge to support an obviousness rejection under 35 U.S.C. § 103 is, of course, impermissible. See, for example, W. L. Gore and Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). From all of the above, we find that the examiner has failed to establish a prima facie case of obviousness of claim 1. It follows that we cannot sustain the examiner's rejection of claim 1. Accordingly, the rejection of claim 1, and claim 2, dependent therefrom, under 35 U.S.C. § 103(a) is reversed.

Independent claim 3 similarly recites "(a) supplying delayed field data obtained by delaying one field of an input progressive image signal composed of frames; (b) detecting differential data between the delayed field data and data of another field." Independent claim 4 similarly recites "a pre-processor for outputting unaltered data of one field of an input progressive image signal composed of frames, and outputting as data for another field of the input progressive image signal differential data between said one field and said another field, wherein said one field and said another field are of the same frame." Accordingly, the rejection of independent claims 3 and 4, and claims 5-7, dependent from claim 4, under 35 U.S.C. § 103(a) is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1-7 under 35 U.S.C. § 103(a) is reversed.

REVERSED

ANITA PELLMAN GROSS Administrative Patent Judge	)
STUART S. LEVY Administrative Patent Judge	) BOARD OF PATENT APPEALS AND INTERFERENCES
HOWARD B. BLANKENSHIP Administrative Patent Judge	)

SSL/kis

SUGHRUE, MION, ZINN, MACPEAK & SEAS PLLC
2100 PENNSYLVANIA AVENUE N.W.
WASHINGTON, DC 20037-3202