UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* PER FROJDH,
RICKARD SJOBERG and TORBJORN EINARSSON

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Appeal 2007-2751
Application 10/306,349
Technology Center 2600

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Decided: December 5, 2007

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Before KENNETH W. HAIRSTON, ANITA PELLMAN GROSS, and MARC S. HOFF, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

## STATEMENT OF THE CASE

Appellants seek our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1-14. We have jurisdiction under 35 U.S.C. § 6(b).

## SUMMARY OF DECISION

We AFFIRM.

## INVENTION

Appellants' claimed invention is to a new mode for global motion compensation, referred to as Implicit Global Motion Compensation (IGMC), wherein the motion vector used for motion compensating a macroblock is predicted from neighboring blocks (Spec. 16:19-17:5). In other words, this mode is used to copy pixels from a previous frame of a collocated block, dislocated by a motion vector that is predicted from neighboring image blocks of the current frame (Spec. 8:7-18).

Claims 1 and 7, reproduced below, are representative of the subject matter on appeal.

> 1. In a method of video data compression for use with video frames comprising a plurality of image blocks, wherein each image block shall be decoded according to one of a plurality of coding modes, a method of decoding a particular image block in a current frame according to an implicit global motion compensation (IGMC) mode comprising the steps of:
>
> copying from a previous frame a collocated block dislocated by a motion vector; and

predicting said motion vector from neighboring image blocks of said current frame.

7. A video decoder for decoding an image block in a current frame according to one of a plurality of coding modes, said video decoder comprising:

means for copying from a previous frame a collocated bock [sic] dislocated by a motion vector according to an implicit global motion compensation (IGMC) mode; and

means for predicting said motion vector from neighboring image blocks of said current frame according to said IGMC mode.

## THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

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|---|---|---|
| Sun | US 2003/0043912 A1 | Mar. 6, 2003 (filed Aug. 23, 2001) |

The following rejection is before us for review.

Claims 1-14 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Sun.

## ANTICIPATION UNDER § 102(e)

Claim 1 and its dependent claims 2-6 and 11-14 were argued as a group with claim 1 as representative (Br. 4-5).[1] Further, as Appellants have presented no further arguments as to independent claim 7 and its dependent claims 8-10, but

[1] Appellants inadvertently identified claims 11-14 as dependent on claim 7 (Br. 4).

instead rely on the arguments provided for claim 1 (Br. 4-5), claims 7-10 will likewise stand or fall with claim 1.

There are two issues before us regarding whether the Examiner erred in rejecting claim 1 under 35 U.S.C. § 102(e) as anticipated by Sun.

The first issue turns on whether the Examiner erred in construing imaging subblocks as disclosed by Sun as neighboring image blocks under the broadest reasonable construction in light of the Specification.

The second issue addresses the Appellants' assertion of the four corners of an image not being correctly construed as neighboring image blocks (Br. 4). At the outset, we note that the Examiner clarified that it is the subblocks that were construed as neighboring and not the four corners of the current image frame as asserted by Appellants (Ans. 6-7). However, we still address the Appellants' argument. This issue turns on whether at least some of the corners of the current image frame as disclosed by Sun can be reasonably construed as neighboring image blocks with respect to an image subblock based on the definition of the term "neighboring" as provided in the Specification and based on the open transitional phrase "comprising" used in the claim.

## FINDINGS OF FACT

The relevant facts include the following:

1. Sun discloses that global motion vectors account for changes in camera angle, camera zooming, etc. that have occurred between a current image frame and a previous image frame (¶[0002]).

2. Sun identifies a portion of an image as a macroblock (MB) (¶[0002]). Each MB contains subblocks of arrays of pixels (¶[0035]).
3. Sun teaches that the MBs and the subblocks can be of any size (¶[0035]).
4. Sun discloses a global motion vector coding scheme for coding or decoding an image wherein global motion parameters are associated with a current image frame and local motion vectors are derived from the global motion parameters for individual MBs in the current image frame. The local motion vectors are then used to identify reference blocks in a current reference frame. The reference blocks are then used to either encode or decode the MBs in the current image frame (¶[0006]).
5. Referring to FIG. 6, Sun teaches that the motion vectors $v^{00}$, $v^{H0}$, $v^{0V}$, $v^{HV}$ are used for bilinear motion vector interpolation and represent the motion vectors of four 4x4 pixel subblocks at the four corners of the frame (¶ [0025]).
6. Referring to FIG. 7, Sun discloses that the motion vectors for each MB in a Global Motion Vector Coding (GMVC) mode image frame are derived using Equation (1) (hereinafter EQ. (1)). For example, four global motion vectors 70 are associated with the four corners of a current image frame 72 wherein the MB 74 is being decoded. The decoder identifies the x pixel position 76 and the y pixel position 78 for the upper left hand corner of MB 74. The x and y pixel positions are then used along with the global motion vectors 70 as described in EQ. (1) to generate a local motion vector 80 (¶ [0033]).

7. Referring to FIG. 7, Sun discloses that the local motion vector 80 points to a reference MB 82 in a reference frame 84. Depending on whether GMVC code for MB 74 indicates GMVC copy or GMVC not copy, the reference MB 82 is either copied or corrected for residuals to derive image values for MB 74 (¶ [0034]).
8. Sun in FIG. 8 shows how GMVC can encode 4x4 subblocks 86 in the same MB 74 (¶ [0035]).
9. Sun discloses that local motion vectors 88 are derived for each individual subblock 86 in MB 74 using EQ. (1). For example, a local motion vector for subblock 86A is derived by first identifying the x and y location 90 in the upper left hand corner. The global motion vectors 70 are then interpolated to the x and y location 90 using EQ. (1) to derive local motion vector 88A (¶ [0035]).
10. Sun teaches that the local motion vector 88A points to subblock 92 in reference frame 84. The reference subblock 92 is then used to construct the image in subblock 86A (¶ [0036]). In other words, the collocated block (subblock) 92 is copied from frame 84.
11. Sun teaches that the other subblocks 86 in MB 74 are decoded in a similar manner. For example, the upper left corner of subblock 86B is at location 94 in image frame 72. If the subblocks are 4x4 pixel sizes, then subblock 86B is at location (x +4, y) in relation to subblock 86A at location (x, y). The global motion vectors 70 are interpolated to pixel location (x +4, y) using EQ. (1) to derive the local motion vector 88B. The local motion

vector 88B is then used to identify reference subblock 96 in reference frame 84. The image information in subblock 96 is then used to reconstruct the image for subblock 86B in the current image frame 72. A similar process is conducted for the other subblocks 86 in MB 74 (¶ [0036]).

12. The Specification defines "neighboring blocks" as blocks which are adjacent to or proximate to the particular image block (Spec. 17:3-5).

## PRINCIPLES OF LAW

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. Inc., v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987).

Analysis of whether a claim is patentable over the prior art under 35 U.S.C. § 102 begins with a determination of the scope of the claim. We determine the scope of the claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of the Specification as it would be interpreted by one of ordinary skill in the art. *In re American Academy of Science Tech Center.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

"The claims, of course, do not stand alone. Rather, they are part of a 'fully integrated written instrument' . . . consisting principally of a specification that concludes with the claims. For that reason, claims 'must be read in view of the specification, of which they are a part.' . . . . [T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single

best guide to the meaning of a disputed term.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005).

The transitional term "comprising" is inclusive or open-ended and does not exclude additional, unrecited elements. *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997).

If the written description sets forth no specific parameters as to "distance" and only provides general teachings as to the physical separation, then claims must be construed to encompass all locations as supported by the Specification. *Brookhill-Wilk 1, LLC. v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1304 (Fed. Cir. 2003).

## ANALYSIS

### A. Did the Examiner err in construing the imaging subblocks as disclosed by Sun as neighboring image blocks under the broadest reasonable construction in light of the Specification?

Appellants argue that Sun fails to disclose the step of predicting a motion vector from neighboring image blocks of a current image frame because in Sun the local motion vector of an image block or subblock is derived by interpolating the four global motion vectors associated with the four corners of the image which do not constitute neighboring blocks (Br. 4). The Examiner interpreted Sun's subblocks 86 of MB 74 as the neighboring image blocks (Ans. 7). The issue then turns on whether the Examiner erred in interpreting subblocks 86 as disclosed by Sun as neighboring image blocks.

As indicated *supra*, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co. of California*, 814 F.2d at 631 (Fed. Cir. 1987). Analysis of whether a claim is patentable over the prior art under 35 U.S.C. § 102 begins with a determination of the scope of the claim. We determine the scope of the claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of the Specification as it would be interpreted by one of ordinary skill in the art. *In re American Academy of Science Tech Center*, 367 F.3d at 1364.

Sun discloses that local motion vectors 88A-88C are derived for each individual subblock 86 of the MB 74, which is located within the current frame 72 (Findings of Fact 2, 3 and 9 and Ans. 7). The local motion vector 88A for the neighboring image block 86A is derived by first identifying the x and y location 90 in the upper left hand corner of the MB 74 (Finding of Fact 9 and Ans. 7). The global motion vectors (Finding of Fact 1) are then interpolated to the x and y location 90 using EQ. (1) to derive the local motion vector 88A (Finding of Fact 9 and Ans. 7). The Examiner identified as the neighboring image blocks the subblocks 86A, 86B and 86C (Ans. 7). The Specification defines "neighboring blocks" as blocks, which are adjacent to or proximate to the particular image block (Finding of Fact 12). Thus, blocks 86A, 86B and 86C as shown in Figure 8 of Sun correspond to neighboring image blocks as these blocks are adjacent to one another consistent with the definition provided in the Specification (Finding of Fact 12).

The prediction of the motion vector 88A for image block 86A is based on its interpolation from the four corners of the current image using EQ. (1) to its x and y location 90 (Finding of Fact 9) which is then used to identify and copy the collocated block 92 from the reference frame 84 to the current frame 72 (Findings of Fact 4 and 10). Thus, the location of x and y required for the interpolation/prediction of the motion vector is relative to the neighboring image blocks in the MB 74. It further follows that the prediction of the motion vector is based on the neighboring image blocks (i.e., their respective relative locations).

This is more evident with the prediction of the motion vector 88B for image block 86B at location x+4 and y, wherein the subblocks are 4x4 pixel sizes, in relation to its neighboring image block 86A at location x and y (Finding of Fact 11), wherein the global motion vectors 70 are interpolated to the pixel location (x+4, y) using EQ. (1) to derive the local motion vector 88B which is then used to identify and copy the respective collocated block 96 from the reference frame 84 to the current frame 72 (Finding of Fact 11).

Therefore, we are not persuaded by Appellants' argument that Sun does not disclose predicting a motion vector from neighboring image blocks as motion vector 88B of image block 86B is interpolated/predicted for location (x+4, y) as it relates to the neighboring image block 86A at location (x, y) wherein both image blocks 86A and 86B lay adjacent in MB 74 which is consistent with the definition of neighboring provided by the Specification (Findings of Fact 11 and 12). We agree with the Examiner that claim 1 is anticipated by Sun under the broadest

reasonable construction in light of the Specification as it would be interpreted by one of ordinary skill in the art.

### B. Can at least some of the corners of a current image frame as disclosed by Sun be reasonably construed as neighboring image blocks with respect to an image subblock?

Appellants argue that Sun fails to disclose the step of predicting a motion vector from neighboring image blocks of a current frame because the local motion vector of an image block or subblock is derived by interpolating the four global motion vectors associated with the four corners of the image which do not constitute neighboring image blocks (Br. 4). The Specification defines neighboring blocks as adjacent to or proximate to the particular image block (Finding of Fact 12). The issue turns on whether the disputed term "neighboring" encompasses corners of an image being interpreted as neighboring image blocks as they relate to subblock 86A.

As stated previously, "[t]he claims, of course, do not stand alone. Rather, they are part of a 'fully integrated written instrument' . . . consisting principally of a specification that concludes with the claims. For that reason, claims 'must be read in view of the specification, of which they are a part.' . . . . [T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips v. AWH Corp.*, 415 F.3d at 1315 (Fed. Cir. 2005). Furthermore, the transitional term "comprising" is inclusive or open-ended and does not exclude additional, unrecited elements. *Genentech, Inc. v. Chiron Corp.*, 112 F.3d at 501.

The Specification defines neighboring blocks as adjacent to or proximate to the particular image block (Finding of Fact 12). Sun teaches four corner image blocks (Finding of Fact 5) and interpolation of motion vectors from the four corner image blocks of the current frame image (Findings of Fact 5-11). Therefore, the Specification's definition does not exclude construing subblock 86A as an image block proximate and therefore neighboring the two corner image blocks associated with the global motion vectors $v^{00}$ and $v^{0V}$ (Sun, Fig. 8).

In addition, since the claim uses the transitional, open-ended term "comprising," the two corners associated with the global motion vectors $v^{H0}$ and $v^{HV}$, which are not neighboring the image block 86A (Sun, Fig. 8) as they are the furthest away and which are still used for the interpolation/prediction of the motion vector 88A, are not excluded as unrecited elements.

Thus, the claim limitation of predicting the motion vector from neighboring image blocks of the current frame is met by the two neighboring corner image blocks $v^{00}$ and $v^{0V}$ and two unrecited non-neighboring corner image blocks $v^{H0}$ and $v^{HV}$ of the current frame 72 used to interpolate/predict the motion vector 88A of image block 86A.

Accordingly, we are not persuaded by Appellants' assertion that all four corners of the image are not neighboring image blocks as they relate to subblock 86A.

Furthermore, if the written description sets forth no specific parameters as to the "distance" and only provides general teachings as to the physical separation, then claims must be construed to encompass all locations as supported by the

Specification. *Brookhill-Wilk 1, LLC. v. Intuitive Surgical, Inc.*, 334 F.3d at 1304 (Fed. Cir. 2003).

The Specification is silent as to specific distance parameters which would not be encompassed by the disputed term "neighboring". Therefore, at least the term "neighboring" encompasses the two neighboring image blocks associated with the global motion vectors $v^{00}$ and $v^{0V}$ in Sun.

We find Appellants' argument unpersuasive, as the definition provided by the Specification does not exclude at least two of the image block corners being construed as neighboring image blocks as they relate to image block 86A. We therefore find that claim 1 is anticipated by Sun.

## CONCLUSIONS OF LAW

We conclude that the Appellants have not shown that the Examiner erred in rejecting claims 1-14.

## DECISION

The decision of the Examiner to reject claims 1-14 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

KIS

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