IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

FASTVDO LLC, Plaintiff,	:	
v.	:	Civil Action No. 11-797-RGA
DXG TECHNOLOGY USA, INC., *et al.*, Defendants.	:	

ORDER

The Court having considered the Parties' Joint Claim Construction Brief (D.I. 209), appendix (D.I. 210), and chart (D.I. 200), and oral argument (D.I. 215), **IT IS HEREBY ORDERED** that, as used in U.S. Patent No. RE 40,081, the terms below are construed as follows:

1. The Court notes the parties' agreed-upon construction of the term "biorthogonal transform": "Transform that uses as a decomposition basis a complete set of basis vectors, such that every vector in the original basis has a 'dual' vector in a dual basis to which it is orthogonal."

2. The Court notes the parties' agreement that steps (a) through (f) of Claim 26 should be performed in the order in which they are listed, but that within step (a), sub-steps (ii) through (iv) need not be performed in the order in which they are listed. (D.I. 209 at 83-84).

3. The Court further notes the parties' agreement at oral argument that the preambles of the asserted claims limit the claims' scope. (D.I. 215 at 37-38).

4. As noted at oral argument, the Court provides some constructions definitively, subject to the Court's standard right to modify claim constructions; provides other constructions more

tentatively; and holds some terms in abeyance. (D.I. 215 at 154-56). For the terms in the latter two categories, the Court welcomes additional submissions from the parties' experts as expert discovery progresses.

5. The following terms are construed definitively:

a. *"recursively"*

The term "recursively" is construed to mean "according to a repeated procedure such that the results of a following step includes input from a previous step." Plaintiff offered this construction at oral argument. (D.I. 215 at 44). This construction addresses the undisputed fact that a first step has no previous step from which to derive input. It also omits Defendants' proposed limitations that the following step be "defined" "according to a particular rule." The following step is not wholly defined by the previous step, but rather, includes input from other sources, *e.g.*, the original image intensities. There is no support for Defendants' proposed limitation "according to a particular rule" in Defendants' cited extrinsic evidence or the intrinsic evidence. (D.I. 209 at 26). Further, that phrase does not clarify the meaning of the claim term; to the contrary, it introduces vagueness as to what the rule may be. The words "according to" are added only to correct the grammar when the construction is inserted into the claim.

b. *"initial stage"*

The term "initial stage" is construed to mean "transform which effects the conversion of the input data to the spatial frequency domain, e.g., discrete cosine transform." The first dispute centers on whether the conversion must be "full," and whether the input is converted "to the spatial frequency domain." There is no intrinsic or extrinsic evidence supporting the limitation that the conversion be "full." *See* (D.I. 209 at 30) (offering, without citation, that "this is what a

DCT transform does"); (D.I. 215 at 63-64) (same). If, as Defendants argue, conversion is what a DCT does, then adding "full" as a modifier is confusing surplusage.

The second dispute addresses whether the conversion is limited to a conversion of the input data to the spatial frequency domain. (D.I. 215 at 128-29). Plaintiff argues that because the specification discloses the initial stage may be the DCT or many other coding transforms, it must include preprocessing. (D.I. 209 at 31-32). Defendants rightly point out that this last leap to preprocessing is not supported by the specification. *Id.* at 32.

c. *"MxM block coder" and "transform coder"*

The terms "MxM block coder" and "transform coder" are construed to require that "the MxM block coder includes the initial stage and the transform coder." The parties agree that the MxM block coder is, at minimum, the initial stage. Claim 12 reads in relevant part:

> a. processing the intensities in ***an MxM block coder*** . . .;
> b. processing the result of the preceding step through ***a transform coder*** . . . ;
> c. transmitting or storing the output coefficients of ***said MxM block coder*** . . . ;
> . . .
> e. processing the output coefficients in the decoder . . . using the inverse of ***the coder of steps a. and b.***

Col.12 ll.5-25 (emphasis added). In other words, the MxM block coder processes the intensities; the transform coder adds transform coding; the resulting output coefficients are claimed as being derived from the MxM block coder; and both coders are referred to as one, as "the coder" in step (e).

Defendants argue that because the transform coder in step (b) processes the result of the MxM block coder in step (a), the two must be separate and distinct. (D.I. 209 at 34). This argument fails in the face of the remainder of the claim, in which the output of the transform

coder is claimed as originating with the MxM block coder, and in which the coders performing steps a. and b. are collectively referred to as "the coder." Listing different steps of a method claim does not mean that the components performing those steps must be different; this is particularly true in the face of the claim language here. The specification also describes the transform as being "in" the block coder, contrary to Defendants' interpretation of Figure 5. *Compare* Fig. 5 *with* col.4 ll.27-30.

d. *"invertible linear transform" / "invertible forward linear transform"*

The terms "invertible linear transform" and "invertible forward linear transform" are construed to mean "a lapped transform, that is, one where pixels from adjacent blocks are utilized in the calculation of transform coefficients for the working block, which implements the transform coder." It appears the parties agree the claimed invertible linear transform encompasses the full scope of the invented transform, but disagree on that scope. The dispute concerns whether the claimed transform must be lapped, or whether it may be a unitary, orthogonal, or biorthogonal transform with lapped transforms as a subset of those groups.

The specification shows the transform must be lapped. Plaintiff points to col.2 ll.55-60 to argue that one embodiment is "a new transform which is simple and fast enough to replace the bare DCT," while another embodiment "provide[s] an image transform which has overlapping basis functions," and therefore not all claimed transforms must be lapped. In fact, these are two objects of the same invention. *See* col.2 ll.55-60. The patent repeatedly provides that the object of the invention is a lapped transform, referred to as LiftLT, that efficiently accomplishes compression without blocking artifacts. '081 Patent, [57] (providing in the Abstract, "The invention introduces a class of multi-band linear phase lapped biorthogonal transforms."); col.2

l.55 - col.3 l.5 (Background of the Invention); col.3 ll.7-10 (providing in the Summary of the Invention,"In the current invention, we use a family of lapped biorthogonal transforms."); col.3 ll.15-18 (providing in the Summary of the Invention,"The LiftLT is a lapped biorthogonal transform."); col.3 ll.36-39 (providing in the Summary of the Invention, "Most generally, the current invention is an apparatus . . . comprising a chain of lattices of lapped transforms."); col.4 ll.48-52 ("In the current invention, which we call the Fast LiftLT, we apply lapped transforms."). Thus, the written description repeatedly and consistently defines the invention as comprising a lapped transform, and does so in sections of the specification that are more likely to provide statements that describe the invention as a whole. *Eon-Net LP v. Flagstar Bancorp*, 653 F.3d 1314, 1321 (Fed. Cir. 2011); *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 864 (Fed. Cir. 2004). These statements about the invention are not limited to specific embodiments or examples, but rather, describe and define the invention overall. *Eon-Net LP*, 653 F.3d at 1322.

The prosecution history also shows the invertible linear transform must be lapped. Plaintiff points to its own statements during reissue prosecution that the claimed transforms are "(potentially) overlapped." (D.I. 210, Ex. 19 at JA-000709). Plaintiff cannot rely on those statements during reissue prosecution to enlarge the claims beyond what the specification discloses. *See Lydall Thermal/Acoustical, Inc. v. Federal-Mogul Corp.*, 344 F. App'x 607, 614 (Fed. Cir. 2009). In the prosecution history that led to the original issue, plaintiff stated, "[t]he instant invention revolves around the use of lapped transforms." (D.I. 210, Ex. 12 at JA-000248).

The extrinsic evidence also shows lapping is essential. The specification and prosecution history cite the Malvar reference in defining a lapped transform. Col.2 ll.34-35; (D.I. 210, Ex. 12

at JA-000248). Plaintiff argues Malvar discloses that all block transforms can be viewed as lapped transforms "with $P^T = [0\ A^T\ 0]$" – in other words, that a block transform with an overlapping factor equal to zero is still technically a lapped transform. *See* (D.I. 210, Ex. 10 at JA-000156). In response, Defendants show that Malvar defines all lapped transforms as actually overlapping. *Id.* at JA-000155 ("[T]he basis functions from one block and one of its neighboring blocks would overlap, and this is the reason for the name *lapped.*"). Defendants' proposed construction tracks the specification's definition of a lapped transform based on Malvar. *See* col.2 ll.34-38. Further, the patent discloses the "simplest" embodiment has an overlapping factor equal to two – not zero. Col.5 ll.53-56.

In sum, the specification and prosecution history clearly and repeatedly provide the invention comprises a lapped transform, the reference the specification relies upon to define a lapped transform requires actual overlap, the resulting definition requires actual overlap, and the simplest disclosed embodiment actually overlaps to a factor of two. The claimed invertible linear transform must be a lapped transform.

e. *"Representable as a cascade, using the steps"*

Defendants requests construction of the entire following phrase:

> said transform being representable as a cascade, using the steps, in [a preselected] arbitrary order, of:
> i) [(ii)] at least one ±1 butterfly step,
> ii) [(iii)] at least one lifting step with rational complex coefficients, and
> iii) [(iv)] at least one scaling factor.

Plaintiff asserts only the terms "butterfly step," "±1 butterfly step," and "lifting step" require construction. The dispute centers on whether the steps need to be actually used, or whether, as in Plaintiff's proposed construction, the claim covers any operation that may be mathematically

represented on a signal flow diagram as a sequence of these steps without actually using the steps.

The Court construes the phrase "said transform being representable as a cascade, using the steps" to mean "said transform being representable as a cascade, and actually using the steps." The terms "butterfly step," "±1 butterfly step," and "lifting step" are construed below. The remainder of the phrase does not require construction.

The claim language itself provides the transform is both "representable as a cascade" and "us[es] the steps." A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so. *Merck & Co., Inc. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005). Further, the specification repeatedly describes actually using these steps. *See* col.2 ll.64-67; col.3 ll.7-10; col.3 ll.15-18; col.4 ll.48-52. Plaintiff's attempt to read actual use out of the claim is unsupported by any intrinsic or extrinsic evidence. *E.g.*, (D.I. 209 at 59).

Defendants' proposed construction includes the additional limitation that the steps be "implemented with separate and distinct hardware or software circuits." However, Defendants provided no intrinsic or extrinsic support for this limitation. *See* (D.I. 209 at 56-58). It is therefore not adopted.

f. *"processing the output coefficients in the decoder into a reconstructed image"*

The term "processing the output coefficients in the decoder into a reconstructed image" is given its plain and ordinary meaning. There is no support for Defendants' proposed limitation that the "reconstructed image" be "the original digital image." To the contrary, the specification discloses the claimed process results in imperfect reconstruction. Fig. 9; col.8 ll.14-20, 66-67;

col.9 ll.1-4. The reissue prosecution history Defendants rely upon to argue for "perfect reconstruction" describes integer-to-integer mapping, not a perfect reconstruction of the original image upon completion of the entire process. (D.I. 210, Ex. 19, JA-000711-12). No further construction is necessary or helpful to the jury.

g. *"dyadic"*

The term "dyadic" is construed to mean "a number whose denominator is a power of 2, *i.e*, $a/2^b$, where b is a natural number (e.g. 1, 2, 3, etc.)." The dispute is whether element "b" may be zero (0). The specification describes "dyadic rational values, that is, rational fractions having (preferably small) powers of two denominators." Col.6 ll.39-48. While it may be that 0 is a natural number, the denominator should be a power of 2, and if "b" is 0, the denominator is 1, such that under that construction any number is dyadic. This is improper and contrary to the patent's definition.

h. *"orthogonal transform"*

The term "orthogonal transform" is construed to mean "matrix that uses as a decomposition basis a complete set of unit length basis vectors that are orthogonal to all other basis vectors." The parties agree their proposals are mathematically equivalent. (D.I. 209 at 80). Plaintiff's proffered construction tracks the language used in the specification and is therefore adopted. *See* col.4 ll.28-36.

6. The following terms are construed tentatively:

a. *"butterfly step" / "±1 butterfly step"*

The terms "butterfly step" and "±1 butterfly step" are construed to mean "a computation that combines results of smaller discrete transforms with coefficients 1 and -1." As explained in

section 5(e), *supra*, the claims require actual use of the steps, not mere representation as Plaintiff's construction would have it.

b. *"lifting step"*

The term "lifting step" is construed to mean "a transform signal processing operation which effects a linear transformation in accordance with a transform matrix $\begin{bmatrix} 1 & a \\ b & 1 \end{bmatrix}$, where one of a, b is 0." As explained in section 5(e), *supra*, the claims require actual use of the steps, not mere representation as Plaintiff's construction would have it.

7. Construction of the terms "rational complex coefficients" and "unitary transform" is held in abeyance.

Entered this 26th day of March, 2013.

Richard G. Andrews
United States District Judge