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(Apple) WONG, CABELLO, LUTSCH, RUTHERFORD & BRUCCULERI, LLP 20333 Tomball Parkway SUITE 600 HOUSTON, TX 77070			BULLOCK JR, LEWIS ALEXANDER	
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ALI SAZEGARI,  
RALPH BRUNNER, and JOHN HARPER

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Appeal 2010-000382  
Application 10/875,483  
Technology Center 2100

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Before ELENI MANTIS MERCADER, GREGORY J. GONSALVES, and  
ANDREW J. DILLON, *Administrative Patent Judges*.

MANTIS MERCADER, *Administrative Patent Judge*.

DECISION ON APPEAL

### STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1-6, 8-14, 16, and 17. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

### THE INVENTION

Appellants' claimed invention is directed to identifying a target function (105) in an image filter program (305) and substituting, by a just-in-time compiler application, a polynomial approximation (325) for the target function (105) in a compiled version (335) of the image filter program. *See* Br. 4; Spec. ¶¶ [0010-11], [0017], [0022]; Figs. 1 and 3.

Independent claim 1, reproduced below, is representative of the subject matter on appeal.

1. A method to approximate functions in an image processing application, comprising:  
identifying a target function in an image filter program; and  
substituting, by a just-in-time compiler application, a polynomial approximation for the target function in a compiled version of the image filter program.

### REFERENCES and REJECTIONS

1. The Examiner rejected claims 1, 3-6, 8-13, and 16-17 under 35 U.S.C. § 103(a) as allegedly being obvious over admitted prior art in view of a publication by Chunxi Wan and Alan M. Schneider, *Further Improvements in Digitizing Continuous-Time Filters*, IEEE Transactions on Signal Processing, 45, no. 3 (March 1997) ("Chunxi") and further in view of publication by George Almasi and David A. Padua, *MaJIC: A Matlab Just-In-Time Compiler*,

Lecture Notes in Computer Science, 2017, 68-81 (2000)  
("George").

2. The Examiner rejected claims 2 and 14 under 35 U.S.C. § 103(a) as allegedly being obvious over admitted prior art in view of Chunxi, in view of George and further in view of a publication by Andrew G. Deczky, *Equiripple and Minimax (Chebyshev) Approximations for Recursive Digital Filters*, IEEE Transactions on Acoustics, Speech, and Signal Processing, ASSP-22, no. 2, 98-111 (April 1974) ("Andrew").

#### ISSUE

The issue is whether the Examiner erred in finding that the combination of APA in view of Chunxi and further in view of George teaches the limitation of "substituting, by a just-in-time compiler application, a polynomial approximation for the target function in a compiled version of the image filter program" as recited in representative claim 1.

#### PRINCIPLES OF LAW

"[O]ne cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references." *In re Keller*, 642 F.2d 413, 426 (CCPA 1981).

Our reviewing court states that "the words of a claim 'are generally given their ordinary and customary meaning.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc)(internal citations omitted). The description in the Specification can limit the apparent breadth of a claim in two instances; (1) where the Specification reveals a special definition given

to a claim term by the patentee that differs from the meaning it would otherwise possess; and (2), where the Specification reveals an intentional disclaimer, or disavowal, of claim scope by the inventor. *Id.* at 1316.

## ANALYSIS

*Claims 1, 3-6, 8-13, and 16-17*

Appellants argue that the Admitted Prior Art (APA), paragraphs 2-4, does not describe *approximating* functions in an image processing application (Br. 9). Appellants also argue that Chunxi is silent about incorporating a determined approximation function into an image filter program (Br. 11). Appellants further assert that both George and Chunxi are completely silent as to any form of image processing (Br. 13).

We are not persuaded by Appellants' arguments. The Examiner relied on the APA for the teaching of transcendental functions, used in the image processing technology, which are computationally costly (i.e., target function) (Ans. 4-5). The Examiner (Ans. 5) then turned to Chunxi for the teaching of identifying a target function in the filter program (i.e., Abstract and Introduction, section I, page 533; Conclusions section in page 538-539).

The Examiner explained that in Chunxi a continuous function  $F(s)$  is identified for converting or transforming to the discrete function  $F(z)$ ; and substituting, by a compiler application (e.g., MATLAB program is considered a compiler application, page 536), a polynomial approximation for the target function (e.g., Abstract and Introduction sections, page 533, wherein the continuous function can be converted to a polynomial with certain degree of accuracy depending on the desired accuracy by approximating the continuous function in discrete time domain) (Ans. 5).

The Examiner then further relied on George for the teaching of a just-in-time compiler application (i.e., Abstract and Introduction sections in pages 68-69 wherein MaJIC is a just-in-time compiler for the MATLAB program to largely improve the speed of operation of running the program substantially instantaneously) (Ans. 5-6).

The Examiner concluded, and we agree, that it would have been obvious to a person having ordinary skill in the art at the time the invention is made to identify a target function in an image filter program and substitute, by a just-in-time compiler application, with a polynomial approximation for the target function as taught by Chunxi and George (see Ans. 5-6). The combination would enable to greatly improve the system performance (e.g., simplify the system as seen in the conclusions section in pages 538-539 of Chunxi by operating the direct discrete version of the function and result in large speedups operation as seen in the abstract section in page 68 of George because the program can be compiled and ran substantially instantaneous) (*see* Ans. 5-6).

Thus, the Examiner relied on the APA, paragraphs 2-4, for the description of the target function in an image processing environment and the description of substituting the target function with an approximating function using the MaJIC compiler to increase speed operation as taught by George and Chunxi. One cannot show non-obviousness by attacking references individually (i.e., George and Chunxi not teaching an image processing environment and APA not teaching approximating functions) where the rejections are based on combinations of references (i.e., George and Chunxi are relied on for the teaching of approximating functions and

APA is relied on for teaching an imaging environment). *See Keller*, 642 F.2d at 426.

Appellants further argue that the APA does not disclose any kind of a “compiled version of the image filter program” as recited in claim 1 (Br. 9-10). We agree with the Examiner (Ans. 10) that one skilled in the art would know that the program or application must be compiled by any compiler means prior to execute/run the program or application.

Appellants further dispute that Chunxi’s MATLAB is a “compiler application” and assert that it is merely a computation tool (Br. 11). Appellants assert that Chunxi’s MATLAB teaches away from just-in-time substitutions because MATLAB’s purpose is to avoid using traditionally compiled languages (Br. 12).

We do not agree with Appellants’ arguments. At the outset, we note that absent any special definition in the Specification, the ordinary and customary meaning of “a compiler” is defined as “a computer program that translates source code into object code” as described on *ComputerUser*, at <http://www.computeruser.com/dictionary/> (last visited Jan. 15, 2013). *See Phillips*, 415 F.3d at 1312.

The Examiner relied on George to fulfill the missing limitation of a just-in-time (JIT) compiler (Ans. 12). We agree with the Examiner that MATLAB is a program/application which has its own compiler for compiling the program into its own instruction and/or compiling the program into other language which can be understandable by other (e.g., C, Fortran, and/or machine language as standalone executable) (Ans. 12). Furthermore, even if MATLAB is a computation tool, George clearly cures that deficiency by disclosing a JIT (i.e., MaJIC) compiler for MATLAB to

speed up the operations on-fly (*see* Ans. 12 and George (Abstract and Introduction)).

Thus, the combination of APA in view of Chunxi and further in view of George teaches the limitation of “substituting, by a just-in-time compiler application, a polynomial approximation for the target function in a compiled version of the image filter program” as recited in representative claim 1.

Accordingly, we affirm the Examiner’s rejection of claim 1 and also the rejection of claims 3-6, 8-13, and 16-17 not separately argued (*see* Br. 14).

#### *Claims 2 and 14*

Appellants rely on the same arguments as those stated above and do not make any additional arguments of patentability with respect to claims 2 and 14 (Br. 14-15). Accordingly, we affirm the Examiner’s rejections of these claims.

### CONCLUSION

The Examiner did not err in finding that the combination of Chunxi in view of George teaches the limitation of “substituting, by a just-in-time compiler application, a polynomial approximation for the target function in a compiled version of the image filter program” as recited in representative claim 1.

### DECISION

The Examiner’s decision rejecting claims 1-6, 8-14, 16, and 17 is affirmed.

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Application 10/875,483

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) (2010).

AFFIRMED

gvw