

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent of: Ingemar J. Cox

U.S. Patent No.: 8,205,237

Issue Date: Jun. 19, 2012

Appl. No.: 11/977,202

Filing Date: Oct. 23, 2007

Title: IDENTIFYING WORKS, USING A SUB-LINEAR TIME SEARCH,  
SUCH AS AN APPROXIMATE NEAREST NEIGHBOR SEARCH, FOR  
INITIATING A WORK-BASED ACTION, SUCH AS AN ACTION ON THE  
INTERNET

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**PETITIONER'S EXHIBIT 1004**

**DECLARATION OF DR. PIERRE MOULIN IN SUPPORT OF  
PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,205,237  
UNDER 35 U.S.C. §§ 311-319**

I, Dr. Pierre Moulin, D. Sc., declare as follows:

## **I. INTRODUCTION**

1. My name is Pierre Moulin, D. Sc. I am a Professor of Electrical and Computer Engineering ("ECE") and Statistics at the University of Illinois. My business address is University of Illinois, Beckman Institute, 405 N. Matthews Ave., Urbana, IL 61801. I have been retained by counsel for Google Inc. ("Petitioner"), as a technical expert witness with respect to the *inter partes* review petition filed by Petitioner concerning U.S. Patent No. 8,205,237 (the "'237 patent").

2. For purposes of this Declaration, I have been asked to provide an expert technical analysis and opinion, including whether a single prior art reference or combination of references discloses the elements of the claims of the '237 patent. In addition, I have been asked to provide opinions on the knowledge of skill in the art, the scope and content of the prior art, the motivations to combine certain prior art references, and other matters as set forth in this Declaration.

3. My investigation into the matters addressed herein is ongoing and I reserve the right to supplement this Declaration as my investigation continues.

## **II. EDUCATIONAL AND PROFESSIONAL BACKGROUND**

4. My qualifications, including my publications, are generally summarized in my Curriculum Vitae, attached hereto as Exhibit 1005.

### **III. MATERIALS REVIEWED**

5. I have considered a number of references in connection with the preparation of this Declaration, including the '237 patent and file history. In addition, I have reviewed all references cited in this Declaration and the references identified in the Exhibit List included in Petitioner's petition. Further, I have conducted an independent review of available prior art. Finally, I have relied on my own expertise when formulating the opinions contained in this Declaration.

### **IV. PERSON OF ORDINARY SKILL IN THE ART**

6. I understand that the present owner of the '237 patent, Network-1 Technologies, Inc., has represented that the inventor conceived of the purported inventions embodied in the '237 patent no earlier than July 1, 2000 (the "critical date"). Ex. 1019 at 30.

7. In my opinion, the relevant field of art for the '237 patent is that of automatic content recognition algorithms. It is my opinion that a person of ordinary skill in the art as of the critical date of July 1, 2000 would have been highly skilled, and typically would have possessed at least an M.S. in computer science, electrical engineering, or mathematics; knowledge of video and audio processing techniques; and 1-2 years of experience in audio, video, or image processing. I personally possessed this level of experience in 2000, and I worked closely with numerous other individuals who also possessed this level of experience.

## V. BACKGROUND IN THE FIELD OF AUTOMATED CONTENT RECOGNITION

8. I provide the following background that relates to any opinions on the claims of the '237 patent.

9. In the 1990s, the emergence of affordable computing power sufficient to process electronic media spurred researchers and entrepreneurs to automate various tasks within the field of content publication and consumption. Ex. 1001 at 1:41-44. Three exemplary problems were (1) television viewers often disliked watching commercials; (2) television advertisers had no means to verify that commercials they paid to air were in fact aired, and aired in the correct time slot; and (3) radio listeners often failed to purchase music albums because they did not know the titles of songs that they enjoyed. Before 2000, numerous individuals concurrently developed the same two solutions to all three problems: (1) embedding hidden "watermarks" in electronic works, which could later be interpreted to identify the work; and (2) using computer-automated systems to recognize audio, video, and/or image content by analyzing the intrinsic features of a video work. The second technology is at issue in the present petition.

10. Content recognition schemes universally relied on two widely known technologies: feature extraction and neighbor searching in a database.

11. Feature extraction refers to quantifying a media work in a form that—unlike a raw video feed—is easily parsed by a computer. Typically, extracted

features were compact, meaning they occupied less memory on a computer than the corresponding video file did. Furthermore, extracted features were typically structured in a format that facilitated efficient search. In the context of a content identification system, each set of extracted features corresponding to a given media work was stored as an entry in a database. Within such a database, entries were typically organized to facilitate efficient search. Such organization was known as "preprocessing."

12. Neighbor searching refers to algorithms for comparing a first set of extracted features with one or more additional sets of extracted features to locate a close, but not necessarily exact, match. Because neighbor searching is computationally intensive for large feature sets, content recognition schemes typically employed search algorithms that increased efficiency by intelligently searching only a subset of potential matches (i.e., "non-exhaustive" algorithms).

## **VI. OVERVIEW OF THE '237 PATENT**

13. It is my understanding that Petitioner is requesting *inter partes* review on the '237 patent, entitled "Identifying Works, Using A Sub-Linear Time Search, Such As An Approximate Nearest Neighbor Search, For Initiating A Work-Based Action, Such As An Action On The Internet" The '237 patent lists Ingemar J. Cox as inventor. It issued on Jun. 19, 2012, with 40 claims, of which claims 1, 5, 9, 13, 25, and 33 are independent. The patent application that led to the '237 patent

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