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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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MG FREESITES LTD., MG FREESITES II LTD.,
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MG CONTENT RT LTD., MG PREMIUM LTD.,
MG CONTENT SC LTD., MG CYPRUS LTD.,
LICENSING IP INTERNATIONAL S.À.R.L.,
9219-1568 QUÉBEC INC. d/b/a ENTREPRISE MINDGEEK CANADA, and
COLBETTE II LTD.,

Petitioners

v.

UNIVERSITY OF SOUTHERN CALIFORNIA

PRESERVATION TECHNOLOGIES LLC

Patent No. 6,212,527

Issue Date: April 3, 2001

Title: Method and Apparatus for Cataloguing Multimedia Data

DECLARATION OF H V JAGADISH, PH.D.

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I, H V Jagadish, hereby declare the following:

1. I have been asked to provide my opinions concerning claims 1-18 of U.S. Patent No. 6,212,527 (“527 Patent”). I am being compensated for my time in preparing this declaration, but my compensation is not tied to the outcome of this matter and my compensation is not based on the substance of the opinions rendered here.

I. Introduction and Qualifications

2. All of my opinions stated in this declaration are based on my own personal knowledge and professional judgment. In forming my opinions, I have relied on my knowledge and experience in software development practices, and on the documents and information referenced in this report. I am competent to testify as to the matters set forth herein.

3. I am the Bernard A. Galler Collegiate Professor of Electrical Engineering and Computer Science at the University of Michigan. I am part of the database group and the software systems laboratory at the University. As a professor, I teach courses related to database management, the web, and data structures and algorithms.

4. My research focuses on how to build database systems and query models so that they are truly usable and how to design analytics processes so that they can deliver real insights to non-technical decision makers. My research is

focused on building computing and data systems that have the “right” end-to-end capability, in terms of meeting the users’ needs effectively, with minimum effort on their part.

5. Attached hereto as Exhibit 1012 is a true and correct copy of my Curriculum Vitae.

6. I obtained my Ph.D. from Stanford University in 1985, and worked many years for AT&T where I eventually headed the database department. I began my work at the University of Michigan in the fall of 1999, and also performed work at the University of Illinois.

7. I have published extensively, and am recognized as a leading researcher in the area of databases.

8. I am a Fellow of the ACM, a Fellow of AAAS, and named inventor on 37 United States patents.

9. I am being compensated at the rate of \$670 per hour for my work as an expert in this case. My compensation is not dependent on the content of my opinions or the outcome of this case.

10. The references I considered in preparing this declaration are listed below.

- U.S Patent No. 6,092,080.
- File history for U.S Patent No. 6,092,080.

- U.S. Patent No. 6,181,336 to Chiu.
- U.S. Patent No. 5,907,837 to Ferrel.
- U.S. Patent No. 6,199,060.
- File history for U.S. Patent No. 6,199,060.
- U.S. Patent No. 6,212,527.
- File History for U.S. Patent No. 6,212,527.
- Canadian Patent Application No. 2,128,667 to Jones-Lee.
- Objective video quality assessment system based on human perception to Webster et al.
- U.S. Patent No. 5,630,121 to Braden-Harder et al.
- European Patent Application Pub. No. 0 609 517 to Braden-Harder et al.
- U.S. Patent No. 5,668,897 to Stolfo.
- U.S. Patent No. 5,307,266 to Hayashi et al.
- U.S. Patent No. 6,574,638 to Gustman.
- File History for U.S. Patent No. 6,574,638.
- U.S. Patent No. 5,832,495 to Gustman.
- Any references cited herein.

II. Understanding of the Governing Law

A. Types of Claims – Independent and Dependent

11. I understand that there are two types of U.S. patent claims: 1) independent claims and 2) dependent claims. I understand that independent claims only include the aspects stated in the independent claim. I further understand that dependent claims include the aspects stated in that dependent claim, plus all the aspects stated in the other claim(s) from which that dependent claim depends.

B. Invalidity by Anticipation or Obviousness

12. I understand that a claim is invalid if it is anticipated or obvious. I understand that anticipation of a claim requires that every element of a claim is disclosed expressly or inherently in a single prior art reference, arranged as in the claim. With regard to inherency, I understand that anticipation by inherency requires that one of ordinary skill in the relevant art would have recognized that the missing descriptive matter is necessarily present in the subject matter described in the reference.

13. I further understand that obviousness of a claim requires that the claim be obvious from the perspective of a person of ordinary skill in the relevant art, at the time the invention was made. In analyzing obviousness, I understand that it is important to understand the scope of the claims, the level of skill in the relevant art, the scope and content of the prior art, the differences between the prior art and the

claims, and any secondary considerations.

14. I also understand that if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. For instance, I understand that the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement is obvious.

15. In addition, I understand that the United States Supreme Court has said that “[t]he use of one material instead of another in constructing a known machine is, in most cases, so obviously a matter of mere mechanical judgment, and not of invention, unless some new and useful result, an increase of efficiency, or a decided saving in the operation, is clearly attained.” *Hicks v. Kelsey*, 85 U.S. 670, 673 (1873). Moreover, to avoid obviousness, I understand that such a new and useful result, increase of efficiency, or decided saving in the operation must be unpredictable. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (U.S. 2007) (“when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.”).

16. There may also be a specific “teaching, suggestion or motivation” to combine any first prior art reference with a second prior art reference. Such a

“teaching, suggestion, or motivation” to combine the first prior art reference with the second prior art reference can be explicit or implicit.

17. I understand that there are several sources for a “teaching, suggestion or motivation” to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of the persons of ordinary skill in the art. In addition, market forces or other design incentives may be what produced a change, rather than true inventiveness. I also know that the application of common sense and ordinary skill to solve a problem is not patentable.

18. I understand that when considering invalidity, each claim must be considered individually.

C. Secondary or Objective Evidence of Nonobviousness

19. I understand that secondary considerations are relevant to the determination of whether a claim is obvious. Such secondary considerations can include evidence of commercial success caused by an invention, evidence of a long-felt need that was solved by an invention, evidence that others copied an invention, or evidence that an invention achieved a surprising result. I understand that such evidence must have a nexus, or causal relationship to the elements of a claim, in order to be relevant to the obviousness or non-obviousness of the claim. I have not been provided any such secondary considerations in relation to the claims of the '527 Patent.

D. Relevant Time Period for the Anticipation and Obviousness

Analyses

20. I also understand that the earliest U.S. application that eventually led to the '527 Patent was filed on July 8, 1996. Therefore, for the purposes of this declaration, I have analyzed anticipation and obviousness as of July 8, 1996.

E. Basis For My Opinion

21. In forming my opinion, I have relied on the '527 Patent claims and disclosure and the materials listed above, along with my belief as to the knowledge of the person of ordinary skill in the relevant art in the July 1996 timeframe.

F. Level of Ordinary Skill in the Art in the Relevant Timeframe

22. In '527 Patent, I believe that a relevant person of ordinary skill in the art (“POSITA”) would have had a B.S. degree in computer science or electrical engineering (or comparable degree) and two years of experience in databases or networking.

23. These descriptions are approximate, and a higher level of education or specific skill might make up for less experience, and vice-versa.

24. I believe I have a sufficient level of knowledge, experience and education to provide an expert opinion, including what one of ordinary skill in the art would have understood from the prior art in this field at that time.

III. State of the Art at the Claimed Priority Date

A. Indexing and Catalogs

25. Even before computers were in widespread use, humanity had felt a need to organize information and facilitate retrieval of items relevant to a query. Libraries developed catalog systems for this purpose.

26. With the rise of digital information, the field of information retrieval was born, with the central purpose of presenting a user with repository items most relevant to an expressed query. These repository items were initially restricted to text documents, and indeed, these remain of central importance even today.

27. In the 1960s and 70s, computers did not typically have the capacity to analyze and index every word in the full text of a document. As such, it was typical practice to associate a set of keywords or index terms with a document, and to index only these in a catalog. Over time, as computers became more powerful, it became possible to index every word in the full text of a document.

28. In addition to text, other types of objects were also stored in repositories, including videos, photographs, and audio recordings. The simplest way to access such objects was by name. However, it was recognized that many users would be interested in accessing such data by “content”. This was accomplished by reusing an old idea of having a catalog distinct from the stored object, as had been the case with text documents. Attributes or descriptions of the stored multimedia

object, whether derived by the computer in an automated fashion or specified explicitly by a human, could be stored and indexed in a catalog separate from the object itself. In fact, these attributes or descriptions would often be stored in a relational database while the objects themselves were stored in separate files. Exhibit 1013, Query by image and video content: the QBIC system by Flickner et al, IEEE Computer, Volume: 28 Issue: 9 pp. 23 – 32, Sep 1995, DOI: 10.1109/2.410146.

29. This technology was in widespread use in the 1980s. Archive servers, and index servers distinct from them, were introduced. Storage managers had already been in widespread use for many years by then.

30. By the early 1990s, computers had become powerful enough and digital storage capacities had increased enough that it became feasible to digitize and store videos: not just short clips but even entire movies. There was tremendous interest in so-called “video-on-demand”. There was a great deal of progress made on the storage and retrieval of videos.

31. There was also work reported on building these servers with tertiary storage. Exhibit 1014, Efficient organization and access of multi-dimensional datasets on tertiary storage systems by L.T.Chen et al. in Information Systems Volume 20, Issue 2, April 1995, Pages 155-183. And also in a distributed environment. Exhibit 1015, A Distributed Hierarchical Storage Manager for a

Video-on-Demand System by Craig Federighi and Lawrence A. Rowe, Technical Report No. UCB/CSD-94-795, February 1994, <http://www2.eecs.berkeley.edu/Pubs/TechRpts/1994/CSD-94-795.pdf>.

32. When a user specifies some search terms to retrieve a text document, it is often useful for the system to point the user to specific portions of the document that are relevant, particularly if the document is long. Technology for such identification of “segments” or “snippets” of a text document has long been known.

33. Similarly, given a long video, it is helpful for a user to be pointed to specific portions of it that are relevant to a particular search request. Fortunately, standard methods for video storage already segment videos into scenes. So it was straightforward to adopt ideas from text document indexing for this purpose. See, for example, Exhibit 1016, Content based video indexing and retrieval, by S.W. Smoliar and HongJiang Zhang, IEEE MultiMedia, Volume: 1 Issue: 2, Summer 1994, pp. 62-72, DOI: 10.1109/93.311653. For another example, a paper from 1993 describes a system that had been constructed and says: “Our prototype system, Media Streams, enables users to create multi-layered, iconic annotations of streams video data ... by means of a cascading hierarchical structure” Exhibit 1017, Media Streams: an iconic visual language for video annotation, by M. Davis, Proceedings 1993 IEEE Symposium on Visual Languages, 24-27 Aug. 1993 Print ISBN: 0-8186-3970-9 DOI: 10.1109/VL.1993.269596.

34. These technologies had in fact progressed enough by the mid 1990s that people were beginning to build other facilities on the infrastructure. For example, quality assessments could be used to annotate videos in Exhibit 1003, Objective video quality assessment system based on human perception by Arthur A. Webster et al, Proceedings Volume 1913, Human Vision, Visual Processing, and Digital Display IV; (1993) <https://doi.org/10.1117/12.152700>, 8 September 1993. Similarly, video segments could be selectively retrieved and combined into a storyboard as described in Exhibit 1018, IDIC: assembling video sequences from story plans and content annotations, by Sack and Davis, Proceedings of IEEE International Conference on Multimedia Computing and Systems, 14-19, May 1994. Print ISBN: 0-8186-5530-5 DOI: 10.1109/MMCS.1994.292430.

IV. Discussion of the '527 Patent

A. Overview

35. The '527 Patent was filed on November 2, 1998, claiming priority to continuation application (now U.S. Patent No. 5,832,495) filed on July 8, 1996. The '527 Patent issued on April 3, 2001.

36. The '527 Patent “relates to the cataloguing multimedia data and including storage and retrieval mechanisms.” Exhibit 1001, 1:9-11.

37. The '527 Patent states that, “[i]ncreasingly, computer systems are being used to present multimedia material. Such material is usually in the form of text,

graphics, video, animation, and sound.” *Id.*, 1:13-15. The ’527 Patent concedes that the prior art contained indexing and keywords (including synonyms).

A system that creates an index for frame sequences in a motion image is described in U.S. Pat. No. 5,428,774, Takahashi et al., issued on Jun. 27, 1995. . . . Data (i.e., frame sequences of a motion picture) is indexed based on a time sequence of frames of the data. A system that uses keywords to locate and retrieve higher level records is described in Kuga et al., U.S. Pat. No. 5,280,573, issued on Jan. 18, 1994. Each of a plurality of higher level records contain different types of information associated with a keyword. Such higher level records may contain usage, synonym, and meaning information associated with a keyword, for example. *Id.*, 3:15-31.

38. The ’527 Patent asserts, “A problem with prior art multimedia systems is an inability to search and retrieve multimedia data.” Exhibit 1001, 1:19-21. But this too was well known.

B. Claim Terms of the ’527 Patent

39. For purposes of the present IPR only, the claim terms of the ’527 Patent are presumed to take on their ordinary and customary meaning that the term would have to one of ordinary skill in the art.

V. The Prior Art References

40. I have reviewed the prior art references in the Petition, including:

- Canadian Patent Application No. CA2128667A1 to Jones-Lee (“Jones-Lee”) (Exhibit 1002);
- “Objective video quality assessment system based on human perception” to Arthur A. Webster et al. (“Webster”) (Exhibit 1003);
- European Patent Application Pub. No. 0 609 517 to Braden-Harder et al. (“Braden-Harder”) (Exhibit 1004);
- U.S. Patent No. 5,668,897 to Stolfo (“Stolfo”) (Exhibit 1005); and
- U.S. Patent No. 5,307,266 to Hayashi et al. (“Hayashi”) (Exhibit 1006).

41. I have been asked to assume that these references qualify as prior art.

42. Based on my review of the Jones-Lee, Webster, Braden-Harder, Stolfo, and Hayashi references, it is my opinion that the references disclose each of the limitations recited in claims 1-18 of the ’527 Patent. For example, I have reviewed the claim charts in the accompanying Petition and I agree the claim charts show where every element of claims 1-18 is disclosed by Jones-Lee, Webster, Braden-Harder, Stolfo, and Hayashi.

43. Both Jones-Lee and Webster are concerned evaluating multimedia, such as television shows. Both develop an indication of the quality of the multimedia content. Exhibit 1002, p.3:26-30, 7:4-10; Exhibit 1003, p. 15. Both

store data representing the quality assessment in a database. Exhibit 1002, Abstract, p. 4:34; Exhibit 1003, p. 1. In other words, they are both addressing the same quality assessment problem in similar contexts.

44. Jones-Lee discloses reviewing media information to apply a rating to the media information as, for example, positive, neutral, or negative. Exhibit 1002, Abstract.

45. Webster discloses “an objective video quality assessment system that emulates human perception.” Exhibit 1003, p. 1. The Webster system automatically evaluates multimedia and “returns results that agree closely with quality judgements made by a large panel of viewers.” Exhibit 1003, p. 1. Webster “provides broadcasters, video engineers and standards organizations with the capability for making meaningful video quality evaluations without convening viewer panels.” *Id.* Webster acknowledges that its “principles presented can be applied to other types of motion video and even still images”—multimedia. *Id.*, p. 1.

46. Jones-Lee and Webster teach two complementary ways to obtain quality ratings and then show how to associate these with the rated multimedia data and store them. A person of ordinary skill in the art at the time of the invention would be motivated to improve on the positive, negative, and neutral rating techniques of Jones-Lee to include the automated techniques of Webster. Such a

system would provide automated quality rating of multimedia, thereby improving the efficiency the rating system of Jones-Lee.

47. Braden-Harder discloses a “method of archiving and retrieving multimedia objects on a multipurpose computer by using structured indexes related to a lexical database.” Exhibit 1004, 2:50-53. Stolfo also teaches novel ways to compare and differentiate images in an image database Exhibit 1005, 7:10-21. Multimedia objects are generally understood to comprise images, audio, video, etc. As such an image database is a type of multimedia database. Both Braden-Harder and Stolfo are thus in the same field of endeavor.

48. Braden-Harder discloses that “the lexical database [used in Braden-Harder] is constructed in any of the ways well known in the art.” Exhibit 1004, 8:37-38.

49. Stolfo discloses “pre-processing the records in the database using a thesaurus database to indicate relatedness.” Exhibit 1005, 12:44-45. “The thesaurus database [disclosed in Stolfo] may include linked records indicating related names and nicknames in a plurality of languages.” *Id.*, 12:45-47.

50. The Stolfo thesaurus database, besides being a multimedia database contemplated by Braden-Harder, would be useful to a person of ordinary skill in the art to link videos based on considerations that include varying names or nicknames. Thus, a person of ordinary skill in the art would be motivated to combine the

thesaurus database of Stolfo with the lexical database of Braden-Harder.

51. Braden-Harder discloses a “method of archiving and retrieving multimedia objects on a multipurpose computer by using structured indexes related to a lexical database.” Exhibit 1004, 2:50-53. The method disclosed in Braden-Harder analyzes a descriptive phrase of text and then identifies keywords to output in a structured index. *See, e.g., Id.*, 10:36-11:18, 11:36-38, 11:45-48.

52. Hayashi, like Braden-Harder, also discloses a method and system for “collecting desired information from a large amount of information,” and linking this information to a retrieval system using a structured keyword index. Exhibit 1006, 1:7-9, 2:1-19. Hayashi is thus in the same field of endeavor as Braden-Harder.

53. Hayashi and Braden-Harder also disclose similar approaches to keywords. Hayashi, like Braden-Harder, analyzes natural language text and extracts keywords from it to construct a structured keyword index. *See Id.*, 7:8-54 and Fig. 5A. Given the similarity of approaches, a person of ordinary skill in the art would be motivated to combine the teachings of Hayashi with Braden-Harder.

54. Both Hayashi and Braden-Harder disclose using a lexical database or matching keywords with synonyms, and using these for to structure a keyword index. Exhibit 1004, 2:50-53; Exhibit 1006, 2:1-19, 5:63-7:4, 9:6-9 and Figure 2.

55. Stolfo discloses “pre-processing the records in the database using a thesaurus database to indicate relatedness.” Exhibit 1005, 12:44-45. “The

thesaurus database [disclosed in Stolfo] may include linked records indicating related names and nicknames in a plurality of languages.” *Id.*, 12:45-47.

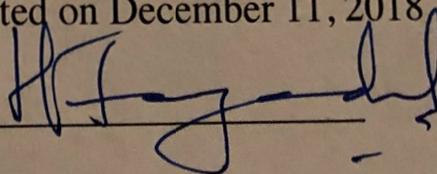
56. The Stolfo thesaurus database, relates and structures objects in a multimedia database such as contemplated by Braden-Harder and Hayashi. It would be useful to a person of ordinary skill in the art to link videos based on considerations that include varying names or nicknames. It thus would have been obvious for a person of ordinary skill in the art to combine Stolfo with the combination of Braden-Harder and Hayashi.

VI. Conclusion

57. I am therefore of the opinion that claims 1-18 of the '527 Patent are unpatentable for the reasons given above.

58. I hereby declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001).

Executed on December 11, 2018



Dr. H. V. Jagadish

Ann Arbor, MI