

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE PETITIONER
Cisco Systems, Inc.,

v.

THE PATENT OWNER
UMBRA Technologies Ltd.

U.S. Patent No. 11,146,632
Issue Date: October 12, 2021

Inter Partes Review No.: IPR2024-00344

DECLARATION OF DR. MICAH BECK IN SUPPORT OF
PATENT OWNER'S RESPONSE TO PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,146,632

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Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-14

I, Dr. Micah Beck, declare as follows:

I. INTRODUCTION

1. I am over the age of eighteen (18) and otherwise competent to make this declaration.

2. I have been retained by UMBRA Technologies Ltd. (Patent Owner) as an independent expert consultant in this proceeding before the United States Patent and Trademark Office. Although I am being compensated at my rate of \$350 per hour for the time I spend on this matter, no part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding. To the best of my knowledge, I have no financial interest in the Client.

3. The Petition for inter partes review (Paper No. 1) involves U.S. Patent No. 11,146,632 (“the ’632 Patent”) (Ex. 1001), entitled “DATA BEACON PULSER(S) POWERED BY INFORMATION SLINGSHOT” and lists Joseph E. Rubenstein, as the inventor.

4. For the purposes of this *inter partes* review, I have conducted my analysis based on the effective filing date of the Claims of the ’632 Patent challenged by the Petitioner in this *inter partes* review being at least as early as April 26, 2016, the filing date of U.S. Provisional Patent Application Nos. 62/327,846, 62/327,907, and 62/327,911 (collectively, “the ’632 Patent Provisionals”).

5. I understand that according to USPTO records, the '632 Patent is currently assigned to UMBRA Technologies Ltd. ("UMBRA" or "Patent Owner").

6. The '632 Patent is directed to a network system for providing data beacons including nodes, with each node having a read/write queue and a parallel file system. I am familiar with the technology described in the '632 Patent as of the effective priority date of April 26, 2016.

7. In preparing this Declaration, I have reviewed the '632 Patent (EX-1001), the file history of the '632 Patent (EX-1002), and each of the documents cited herein, and I have considered these documents in light of the general knowledge in the art as of April 26, 2016. In formulating my opinions, I have relied upon my experience in the relevant art. I have also considered the viewpoint of a person of ordinary skill in the art ("POSITA") in the relevant field, as of April 26, 2016, which I describe further below (§III).

8. The opinions and comments formulated during this assessment are based on observations and information available at the time of the investigation. The findings presented herein are made to a reasonable degree of scientific certainty. I have made every effort to accurately and completely investigate all areas of concern identified during our investigation.

9. I have been asked to provide my technical expertise, analysis, insights and opinions regarding the '632 Patent and relevant references that form the basis of the arguments set forth in the accompanying Petition for inter partes review of

the '632 Patent. As described in detail below, I offer the following opinions in this Declaration:

- A POSITA would have found Claims 1-7 of the '632 Patent are not disclosed by or unpatentable over *Agarwala* (EX-1005).
- At least one claim of the '632 Patent is supported by the '632 Patent Provisionals, thus establishing April 26, 2016 as the effective filing date of the '632 Patent.

II. MY BACKGROUND AND QUALIFICATIONS

10. I am currently an Associate Professor of Electrical Engineering and Computer Science at the University of Tennessee in Knoxville, Tennessee. I have over 30 years of experience in a wide variety of technologies and industries relating to data communications. These include storage systems, distributed systems, including packet-switched network communications, and high-performance computing.

11. My academic credentials include a Bachelor's degree with honors in Mathematics and Computer Science from the University of Wisconsin, Madison, Wisconsin, in June 1979. I then received a Master of Science in Computer Science from Stanford University, Palo Alto, California, in May 1980. Then I received a Ph.D. in Computer Science from Cornell University, Ithaca, New York in May 1992.

12. I have worked for over 30 years in the fields of Computer Science and Electrical Engineering. My primary focus and research interest has been on computer networks, storage systems, and computer architecture. I have authored and coauthored scores of technical papers and at least two book chapters related to several of these interests.

13. My employment history following my graduation from the University of Wisconsin at Madison began at the Bell Laboratories in Murray Hill, New Jersey in 1979. At Bell, I engaged in research on distributed operating systems.

14. In 1992, I joined the faculty of the department of Electrical Engineering and Computer Science at the University of Tennessee as an Associate Professor.

15. At the University of Tennessee, I have taught several courses related to computer networking and communications, as well as computer architecture.

16. I have been a past member of a number of professional societies, including the Association for Computing Machinery and the Institute of Electrical and Electronic Engineers (IEEE) Computer Society. I have published in the conferences, journals and magazines of both professional societies.

17. In 2016-17, I was awarded a Fulbright Teaching and Research Scholarship, awarded by US State Department, hosted by Strathmore University, Nairobi, Kenya.

18. My curriculum vitae, which includes a more detailed summary of my background and experience, is attached as Appendix A.

III. RELEVANT LEGAL STANDARDS

19. I am not a lawyer and do not provide any legal opinions in this Declaration. Although I am not a lawyer, I have been informed and understand that certain legal standards are to be applied by technical experts in forming opinions regarding the meaning and validity of patent claims. I have been asked to provide my opinions regarding whether the claims of the '632 Patent are anticipated or would have been obvious to a person having ordinary skill in the art at the time of the alleged invention, in light of the alleged prior art.

20. I have been informed and understand that a patent claim is not anticipated under 35 U.S.C. § 102 unless a single document describes every element of the claimed invention, either expressly or inherently, such that a POSITA (described below) could practice the invention without undue experimentation.

21. I have been informed and understand that a patent claim is not patentable under 35 U.S.C. § 103 if the differences between the patent claim and the prior art are such that the claimed subject matter as a whole would have been obvious at the time the claimed invention was made to a person having ordinary skill in the relevant art. Obviousness, as I have been informed and understand, is based on the scope and content of the prior art, the differences between the prior

art and the claim, the level of ordinary skill in the art, and, to the extent that they exist, certain objective indicia of non-obviousness.

22. I understand that objective indicia can be important evidence regarding whether a patent is obvious or nonobvious, if it has an appropriate nexus to the claimed invention, i.e., is a result of the merits of a claimed invention (rather than the result of design needs or market-pressure advertising or similar activities). Such indicia include: commercial success of products covered by the patent claims; a long-felt need for the invention; failed attempts by others to make the invention; copying of the invention by others in the field; unexpected results achieved by the invention as compared to the closest prior art; praise of the invention by the infringer or others in the field; the taking of licenses under the patent by others; expressions of surprise by experts and those skilled in the art at the making of the invention; and the patentee proceeded contrary to the accepted wisdom of the prior art.

23. I have been informed that whether there are any relevant differences between the prior art and the claimed invention is to be analyzed from the view of a person of ordinary skill in the relevant art at the time of the invention. As such, my opinions below as to a person of ordinary skill in the art are as of the time of the invention, even if not expressly stated as such; for example, even if stated in the present tense.

24. In analyzing the relevance of the differences between the claimed invention and the prior art, I have been informed that I must consider the impact, if any, of such differences on the obviousness or non-obviousness of the invention as a whole, not merely some portion of it. The person of ordinary skill faced with a problem is able to apply his or her experience and ability to solve the problem and also look to any available prior art to help solve the problem.

25. I have been informed that a precise teaching in the prior art directed to the subject matter of the claimed invention is not needed. I have been informed that one may take into account the inferences and creative steps that a person of ordinary skill in the art would have employed in reviewing the prior art at the time of the invention. For example, if the claimed invention combined elements known in the prior art and the combination yielded results that were predictable to a person of ordinary skill in the art at the time of the invention, then this evidence would make it more likely that the claim was obvious. On the other hand, if the combination of known elements yielded unexpected or unpredictable results, or if the prior art teaches away from combining the known elements, then this evidence would make it more likely that the claim that successfully combined those elements was not obvious.

26. I have been informed and understand that there are recognized, exemplary, rationales for combining or modifying references to show obviousness of claimed subject matter. Some of the rationales include the following: combining

prior art elements according to known methods to yield predictable results; simple substitution of one known element for another to yield predictable results; use of a known technique to improve a similar device (method or product) in the same way; applying a known technique to a known device (method or product) ready for improvement to yield predictable results; choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art teachings to arrive at the claimed invention.

27. I am familiar with the knowledge and capabilities of one of ordinary skill in the art. Unless otherwise stated, my testimony below refers to the knowledge of one of ordinary skill in the art as of April 26, 2016, the effective filing date of the '632 Patent.

28. I have been informed and understand that a Person of Ordinary Skill in the Art ("POSITA") is a hypothetical person who is presumed to be aware of all pertinent prior art, thinks along conventional wisdom in the art, and is a person of ordinary creativity.

29. With respect to the '632 Patent, I concur with the Petitioner Cisco's expert in so far that a POSITA in April 2016 would have been familiar with network communications and distributed storage systems, including network file systems. A POSITA would have a working knowledge of techniques for accessing data (reading and writing data) in distributed network storage systems, including parallel file systems. A POSITA would have gained knowledge of these concepts through a mixture of training and work experience, such as by having a Bachelor's degree in computer science and four years of experience; or by obtaining a Master's degree in computer science, but having only one to two years of experience; or by having no formal education but experience in storage systems of at least eight years.

IV. CHALLENGES

30. I have reviewed Ex. 2011, mapping the '632 Patent claims to the '632 Patent Provisionals and conclude these provisionals provide adequate support for the '632 Patent to claim priority, thus establishing April 26, 2016, as the effective filing date of the '632 Patent. It is my opinion that Ex. 2011 demonstrates that each of the Challenged Claims of the '632 patent is fully supported by the subject matter disclosed in these provisional applications. Based on Ex. 2011 and my understanding of the law regarding a patent's priority date, it is my opinion that the '632 patent is entitled to the priority date of the three provisional applications to

which the '632 patent claims priority, as listed on the face of the '632 patent: 62/327,907, 62/327,846, and 62/327,911, each filed on April 26, 2016.

31. Based on my understanding of the laws of anticipation and obviousness discussed above, Claims 1-7 of the '632 Patent (“the Challenged Claims”) are not anticipated nor invalid as being obvious over *Agarwala et al.*, U.S. Patent No. 9,582,421 (“the '421 patent”) claiming the benefit of priority to U.S. Provisional Application 61/739,685 (“the '685 provisional”).

32. Petitioner has failed to demonstrate that either the '421 patent or the '685 provisional application teach what Petitioner labelled as element “[1.4]” of claim 1 of the '632 patent: “*wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.*” (Ex. 1001 at claim 1; Pet. at 47-49.)

33. The '685 provisional application does not teach “placing the first data in the second read queue” in the '632 patent. The Petition never attempts to correlate “the first data” that is to be placed in “the second read queue” (as recited in claim element 1.4) with “first data” that was written from the first write queue to the second parallel file system (as recited in claim element 1.3). The “first data” of element 1.4 has an antecedent in element 1.3. Thus, the data being placed in the second read queue must be the same data that was written from the first write queue. The Petition makes no effort to show this sameness. For this reason alone, the Petition fails to render the challenged claims unpatentable.

34. The Petition incorrectly attempts to rely on the '685 provisional application's FIG. 9B as illustrating a queue from which "the first data" is taken, (Pet. at 46-47), to allege a disclosure of this element.

35. Petitioner asserts: "The read process is also disclosed in FIG. 9B, where at block 950 content is read from persistent storage upon a cache miss and placed in the cache storage at block 966. EX-1004 ¶¶0061-62; FIG. 9." (Pet. at 48.) Neither this statement, nor the illustrated elements of FIG. 9B disclose the concept of a "read queue".

36. The illustrated elements of FIG. 9B fail to disclose the concept of a "read queue," and neither block 966 nor paragraphs 0061 and 0062 say anything about cache miss data being placed in cache storage. To the contrary, FIG. 9B illustrates the process by which a response is generated to a request for the local file system initiated by the client.

37. Additionally, because the "MERGED CONTENTS" in block 966 of the flow chart in Figure 9B of the '685 provisional will potentially include "WRITELOG" content, Figure 9B does not disclose a queue specifically designated to hold "read" data, let alone the claimed "second read queue" residing on "the second node". Specifically, the "contents" may be obtained in place of (or in combination with) the contents of the "WRITELOG" identified at block 958 of Fig. 9B. (See Ex. 1004, FIG. 9B).

38. Again, the “contents” being described are not that of a “read queue” because the contents may, at times, be derived from the “WRITELOG” of box 958. Thus, Petitioner has wrongly confused an operation that may include “WRITE” data as the claimed operation directed only to placing the previously written “first data” into “the second read queue”.

39. As required by each of the Challenged Claims, the “first data” that is written from the first node to the second node must be placed into a “read queue”. Specifically, claim 1 requires “the first data” be placed into “the second read queue” from “the second parallel files system” of the “second node”. The concept of the ‘*same node*’ source from which this data is placed into the “read queue” is also repeated in the specification of ’632 patent. (Ex. 1001, Abstract (“[t]he read queue on each node receives data from *the parallel file system on the node itself*.”); Summary of the Disclosure at 7:38-39 (“[t]he read queue on each node receives data from *the parallel file system on the node itself*.”)). This reinforces the importance of the source location from which “the first data” is placed into “the second read queue” and indicates this is an *intra-node* movement of data. No such intra-node movement of data from a “parallel file system” to a “read queue” is disclosed in the ’685 provisional.

40. Petitioner points to Figure 3 of the ’685 provisional to argue the disclosure of “first data” being written from the “write queue” of a first node to a second node, specifically to “the second parallel file system” of the second

node. The following is a colorized annotation Petitioner created from Figure 3 of the '685 provisional, which is repeated (in some variation) on at least six occasions in the Petition.

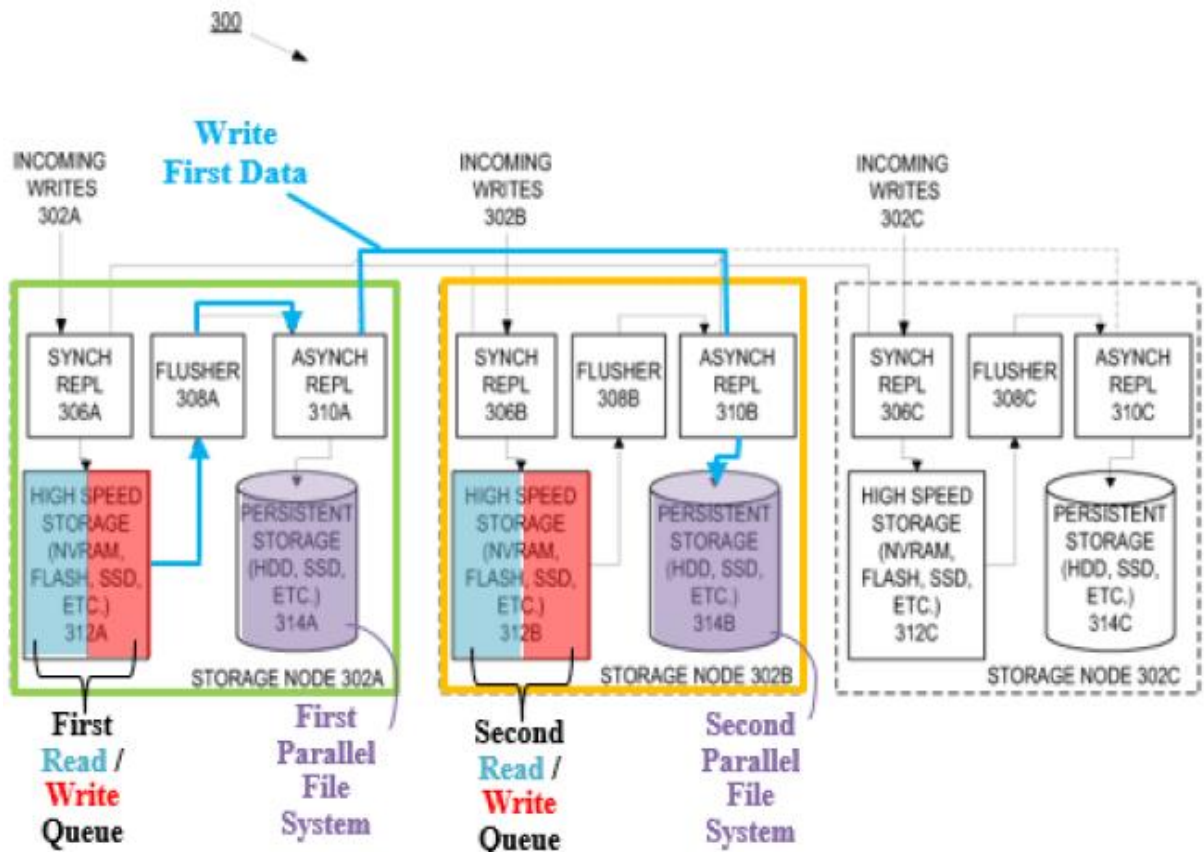


FIGURE 3

41. Figure 3 includes arrows indicating movement of data into “persistent storage” components numbered 314 (A-C), which Petitioner equates with the claimed “parallel file system[s]” of the Challenged Claims. There are no arrows in Figure 3, nor descriptions elsewhere the '685 provisional, indicating a location to which data is moved from persistent storage. Thus, Petitioner does not rely on Figure 3 as a prior art disclosure of the element of the Challenged Claims reciting

“wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.” Instead, Petitioner resorts to Figure 9B of the ‘685 provisional.

42. Figure 9B does not disclose movement of data into a parallel file system, let alone into a parallel file system at a different node. In fact, Figure 9B does not even disclose movement of data from one node to another node. Figure 9B does not disclose any placement of data into a “read queue”, let alone a “read queue” on the same node as the parallel file system from which the “read queue” data is placed. All of this is required by claim 1 of the ‘632 and all claims depending therefrom.

43. The Petition also attempts to tie the FIG. 9B embodiment of the ‘685 provisional application to the FIG. 5 embodiment of the ’421 Patent. (See Pet. at 48.) But nothing in either document ties them together. Figure 3 and Figure 9B of the ‘685 provisional do not appear in the ‘421 patent. In fact, the only common figures between the ‘685 provisional and the ‘421 patent are Figures 1 and 2, neither of which is relied upon by Petitioner for anticipation. There are many paragraphs of the ‘685 provisional that do not appear in the ‘421 patent and many paragraphs of the ‘421 patent that do not appear in the ‘685 provisional. For example, the ‘685 provisional application says nothing about L1 and L2 caches and multi-layer DOCL systems and MFU lists. As another example, the ’421 patent says nothing about reading from a combination of write logs and persistent storage.

Petitioner selects pieces from each to argue that their combination discloses the Challenged Claims.

44. Petitioner therefore fails to show that the challenged claims of the '632 patent are disclosed or rendered unpatentable by either the '421 patent or the '685 provisional application. (EX-1005).

CONCLUSION AND DECLARATION

The findings and opinions set forth in this declaration are based on my research and analysis to date. I may continue my examinations in view of additional documents or other factual evidence over the course of this proceeding that may necessitate supplementing and/or refining my opinions. I reserve the right to add to, alter, or delete my opinions and my Declaration upon discovery of additional information. I reserve the right to make such changes as necessary.

In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in the case and that cross-examination will take place by video conferencing as agreed by the Parties. If cross-examination is required of me, I will appear for cross-examination by video conferencing as agreed by the Parties during the time allotted for cross-examination.

I declare that all statements made herein on my own knowledge are true, and that all statements made on information and belief are believed to be true, and

that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: 25th October, 2024

By: /s/ Micah Beck

Dr. Micah Beck