

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

CALIFORNIA INSTITUTE OF TECHNOLOGY,
Patent Owner.

Case IPR2017-00211
Patent No. 7,116,710

**PATENT OWNER'S PRELIMINARY RESPONSE
PURSUANT TO 37 C.F.R. § 42.107**

TABLE OF CONTENTS

I.INTRODUCTION	1
II.THE PRESENT PETITION RECYCLES PREVIOUS CHALLENGES PRESENTED TO THE OFFICE	2
III.THE PETITION RELIES ON IMPROPER EVIDENCE AND UNSUBSTANTIATED ALLEGATIONS	5
A. The Petition Fails to Establish That the Frey Slides (Ex. 1113) Qualify as Prior Art.....	7
B. The Petition Fails to Establish That the Pfister Slides Qualify as Prior Art.....	13
C. The Testimony of Petitioner’s Expert Should be Accorded No Weight	16
IV.THE PROPOSED GROUNDS OF CHALLENGE FAIL	18
A. Ground 1 fails	18
1. The Frey Slides Do Not Anticipate 1 and 3	18
B. Ground 2 fails	20
1. Divsalar in view of the Frey Slides does not render obvious claims 1-8 and 11-14	20
2. Undisclosed limitations in claim 11 and its dependent claims.....	29
C. Ground 3 fails	30
1. Divsalar in view of Frey Slides and further in view of Luby97 nonetheless does not render obvious claims 15-17, 19-22, and 24-33	30
D. Ground 4 fails	35
E. Ground 5 fails	35
V.CONCLUSION.....	36

I. INTRODUCTION

The Board should not institute *inter partes* review (IPR) on claims 1-8, 10-17, and 19-33 of U.S. Patent No. 7,116,710 (“the ’710 patent”) because petitioner Apple Inc. (“Petitioner” or “Apple”) has not met its burden of showing that it has a reasonable likelihood of prevailing on any of its proposed grounds of unpatentability.

The petition should be denied at least because the Petitioner failed to establish that all references in each of its grounds qualify as prior art. For example, each of the grounds of challenge relies on the “Frey Slides,” which the petition vaguely alleges were “presented” at a conference. The petition, however, leaves both Caltech and the Board in the dark as to what particular prior art theory is being advanced and whether it is even one commensurate in scope with statutory restrictions on *inter partes* review under AIA §311 (*i.e.*, review based on prior art patents and printed publications). Assuming *arguendo* the Petitioner is asserting the Frey Slides as a printed publication, the evidence of such is insufficient, as Petitioner points to only a cryptic comment in an unsworn “report” lifted from a different litigation proceeding, but which is inadmissible hearsay in this proceeding. Other references, such as the Pfister Slides, (Ex. 1105), have similar problems.

Even assuming the references relied upon do qualify as prior art—which Petitioner fails to establish—the proposed grounds of challenge fail to demonstrate that each feature of claims 1-8, 10-17 and 19-33 of the '710 patent is found in the references.

Accordingly, institution of *inter partes* review should be *denied*.

II. THE PRESENT PETITION RECYCLES PREVIOUS CHALLENGES PRESENTED TO THE OFFICE

The instant petition presents one in a series of challenges to the '710 patent, but rehashes substantially the same art and arguments already presented to the Office and rejected by the Board. 35 U.S.C. § 325(d) (“In determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, the Director may take into account whether, and reject the petition or request because, *the same or substantially the same prior art or arguments* previously were presented to the Office.”) (emphasis added).

The present petition fails to offer any art or arguments substantially different compared to what has already been presented to, and rejected by, the Board. Petitioner acknowledges that the '710 patent was already “challenged in two petitions for *inter partes* review.” (Pet. p. 3.) The Board rejected both of those petitions. *See Hughes Network Systems, LLC v. California Institute of Tech.*, Case No. IPR2015-00067, Paper 18 (Apr. 27, 2015); *see also Hughes Network Systems, LLC v. California Institute of Tech.*, Case No. IPR2015-00068, Paper 18 (Apr. 27,

015).¹ Petitioner has also filed two more pending petitions challenging claims of the '710 patent. *See* IPR2017-00210; *see also* IPR2017-00219.²

One of the rejected Hughes IPRs, IPR2015-00067, similarly presented grounds based on the references to Frey and Divsalar. Concurrent with the present petition, this Petitioner filed an IPR petition (IPR2017-00210) based on the very same Frey and Divsalar references and advancing substantially the same arguments.

The present petition differs from the -00210 petition in that the Frey reference, (Ex. 1102), has been replaced with the Frey Slides (Ex. 1113).³ But Petitioner has not explained why either this petition or the -00210 petition

¹ Counsel for Petitioner Apple also represented Hughes in the previous Hughes district court litigation.

² Accordingly, the '710 patent has been challenged in five total IPR proceedings to date—thereby indicating patent owner harassment with serial petitions. *See, e.g., Ube Maxell Co., Ltd. v. Celgard, LLC*, Case No. IPR2015-01511, Paper 10 (Jan. 7, 2016) (denying institution of sixth petition under § 325(d)).

³ Petitioner argues that the Frey paper (Ex. 1102) and the Frey Slides (Ex. 1113) provide substantially the same content. As such, it is unclear how petitioner believes that the present petition is meaningfully distinct from the -00210 petition or from the Hughes IPR2015-00067 case.

substantially differs either from each other, or from the rejected Hughes IPR, such that the additional burden on Caltech and Board resources is reasonable. The Board should deny the instant petition under a plain and ordinary reading of § 325(d) because it presents “the same or substantially the same prior art or arguments previously [] presented to the Office.” *Cf. Maxell Co., Ltd.*, Case No. IPR2015-01511, Paper 10 at 15-16 (factoring in failure to explain the need for redundant proceeding).

Accordingly, because the instant petition presents the same or substantially the same prior art or arguments previously presented to the Office and because Petitioner appears to have used previously rejected petitions as a roadmap⁴ to bolster its petition, with the effect of harassing Caltech, the Board should exercise its authority under § 325(d) to deny the petition.

⁴ In fact, Petitioner has already effectively had multiple bites at the apple in this case. During the course of litigation, and after filing its IPR petitions, Petitioner learned of certain critical defects in the petition materials. Petitioner then re-filed different versions of the references on which its challenges relied in an effort to cure those defects. See, e.g., Paper No. 15.

III. THE PETITION RELIES ON IMPROPER EVIDENCE AND UNSUBSTANTIATED ALLEGATIONS

Each of Petitioner's five grounds can be denied on the basis that they rely on references that have not been established as a prior art available for this proceeding.⁵

- Each of Grounds 1-5 rely on the Frey Slides (Ex. 1113), but nothing in the petition or elsewhere in the record establishes the Frey Slides qualify as a "printed publication" or are otherwise available as prior art in this IPR.
- Grounds 4 and 5 rely on the Pfister Slides (Ex. 1105), but the petition never establishes the Pfister Slides as prior art to the '710 patent.

A petitioner bears the burden of "mak[ing] a sufficient showing that [a purported prior art reference] is a printed publication, i.e., that it was publicly accessible." *Square, Inc. v. Unwired Planet, LLC*, CBM2014-00156, Paper 11 at

⁵ For many of the cited references, the petition does not explain any particular theory of how the cited references qualify as prior art. For example, the petition generically states that the references "qualify as prior art under 35 U.S.C. §102," but fails to identify any particular subsection of §102. (Pet. p. 6.) This is prejudicial since not all subsections of 35 U.S.C. §102 provide prior art that may form a basis of challenge in an IPR.

19-20 (Dec. 24, 2014) (citing *In re Lister*, 583 F.3d 1307, 1317) (Fed. Cir. 2009); *see also Nestle Oil Oyj v. Reg Synthetic Fuels, LLC*, IPR2013-00578, Paper 54 at 15 (March 12, 2015). This burden must be satisfied *in the petition*. *See, e.g., Symantec Corp. v. Trustees of Columbia University*, IPR2015-00370, Paper 13 at 9 (June 17, 2015) (denying institution for failure of proof on publication date in the petition). *Intelligent Bio-Systems, Inc. v. Illumina, Inc.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (noting the “obligation for petitioners to make their case in their petition”).

Public accessibility is a touchstone in determining whether a reference constitutes a printed publication. *See, e.g., In re Wyer*, 655 F.2d 221, 227 (CCPA 1981). A reference is “publicly accessible” upon a satisfactory showing that: (1) the “document has been disseminated”; or (2) “otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it...” *Cordis Corp. v. Boston Scientific Corp.*, 561 F.3d 1319, 1333 (Fed. Cir. 2009); *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374, 1378 (Fed. Cir. 2006) (quoting *In re Wyer*, 655 F.2d at 226); *see also Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1350 (Fed. Cir. 2008) (quoting *SRI Int’l, Inc. v. Internet Sec. Sys. Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008)).

As discussed below, Petitioner has not met its burden and has failed to establish the cited references as prior art.

A. The Petition Fails to Establish That the Frey Slides (Ex. 1113) Qualify as Prior Art

Each of Petitioner's five grounds relies on a set of slides purportedly presented by Brendan Frey at the Allerton Conference in September 1999. (Pet. pp. 29-31; Ex. 1113 ("Frey Slides")). The petition, however, lacks the requisite explanation and supporting evidence that the Frey Slides are prior art of any type, let alone prior art available to serve as a basis of challenge in an *inter partes* review.

The petition merely states that "[t]he Frey Slides (Ex. 1113) were presented by Brendan Frey at the Allerton Conference in September, 1999." (Pet. p. 29.) The petition makes no specific assertion of the Frey Slides' prior art status, nor does explain how and why the Slides are believed prior art, nor does it discuss any supporting evidence.⁶

⁶ In order to meet its burden, Petitioner must at least identify its position and *explain* the evidence it believes supports its position; neither the Board nor Caltech is responsible for operating on supposition. 37 C.F.R. § 42.22(a)(2) (petition must include "a detailed explanation of the significance of the evidence."). *See also* 35

Assuming that Petitioner is asserting the Frey Slides as a “printed publication,” nothing in the petition or corresponding materials substantiates the Frey Slides as such. The petition merely directs reference to “Ex. 1117, p. 36.” (Pet. p. 29.) No other evidence is submitted.⁷ Exhibit 1117 is the Expert Report of Dr. Brendan Frey, which was not prepared under oath and was submitted in an entirely different proceeding—the district court litigation between Patent Owner and Hughes entities and Dish Network entities. (Pet. p. 29; Ex. 1117.) The cited portion of Dr. Frey’s expert report contains one cryptic statement that he “presented [Frey Slides] at the Allerton Conference in September 1999.” (Ex. 1117, p. 36.) No details about the presentation are provided. While two slides are included in the text of the report (one of which differs from the corresponding slide in Ex. 1113), no copy of the Frey Slides is attached to Dr. Frey’s Report. Petitioner’s evidence fails for several reasons.

As an initial matter, Dr. Frey’s expert report, (Ex. 1117)—which is not a declaration or statement made under oath—is inadmissible hearsay. Fed. R. Evid.

U.S.C. §311(b) (limiting *inter partes* review to prior art patents and printed publications).

⁷ The petition does cite to Dr. Davis’s declaration (Ex. 1106, ¶71), but Dr. Davis professes no personal knowledge regarding presentation of the Frey Slides and instead merely parrots the same statements provided at p. 29 of the petition.

801(c) defines hearsay as “a statement that: (1) the declarant does not make while testifying at the current trial or hearing; and (2) the party offers in evidence to prove the truth of the matter asserted in the statement.” The report is not testimony at all (a report is notice, not testimony) and Dr. Frey has not appeared as a witness in this proceeding. And Petitioner offers the report as evidence to prove the truth of the matter asserted—that Dr. Frey presented the slides at the Allerton Conference in September 1999. (Pet. p. 29; Ex. 1117 ¶ 114.) Hearsay is generally inadmissible under Fed. R. Evid. 802 unless it falls under one of the exceptions listed in Fed. R. Evid. 803.⁸ Petitioner does not contend that the statements in Dr. Frey’s expert report qualify as one of the exceptions. Accordingly, Dr. Frey’s expert report is inadmissible and cannot be used to substantiate the Frey Slides as a prior art printed publication.⁹

⁸ Additionally, because the report is not testimony (for any proceeding) made under oath or subject to the laws of perjury, it is inherently unreliable—thereby providing another reason why Ex. 1117, at a minimum, should be given no weight.

⁹ Each of Grounds 2-5 also rely on inadmissible hearsay in support of Divsalar (Ex. 1103). The petition (p. 31-32) cites to Ex. 1112, which is a declaration from a librarian (Ms. Fradenburgh), submitted in the IPR2015-00059 case. Ms. Fradenburgh is not a witness in this proceeding, and Petitioner offers the report as evidence to prove the truth of the matter asserted—that Divsalar is 102(b) prior art

Even if the Board chooses to consider Dr. Frey's expert report, the report still would not establish that Ex. 1113 is a printed publication. First, there is insufficient evidence that the slides to which Dr. Frey's expert report refers correspond to Ex. 1113. Dr. Frey's expert report states that he "prepared the "Frey Slides ... and presented them at the Allerton Conference in September, 1999." (Ex. 1117 ¶ 114.) But he does not cite any exhibit to his report containing the "Frey Slides" to which he refers. Nor does the petition link the "Frey Slides" discussed in Dr. Frey's report with Ex. 1113. There is no evidence that the "Frey Slides" discussed in Dr. Frey's report are the same version of the slides in Ex. 1113¹⁰, or whether Ex. 1113 represent slides he purportedly presented at the September 1999 Allerton Conference. Therefore, the Board cannot conclude that any of the information in Dr. Frey's expert report necessarily corresponds to Exhibit 1113, let alone whether that information is sufficient to substantiate Ex. 1113 as a printed publication. *Temporal Power Ltd. v. Beacon Power, LLC*,

to the '710 patent. (Pet., pp. 31-32.) As such, Ex. 1112 is inadmissible hearsay. Fed. R. Evid. 801(c). Ms. Fradenburgh's availability as a witness, in fact, was a source of significant contention in the Hughes IPR, when Ms. Fradenburgh refused to appear for cross-examination following institution in the Hughes IPR.

¹⁰ While two slides are embedded in the text of Dr. Frey's report, Slide 5 (Ex. 1117, p. 36) is different than Slide 5 of Ex. 1113.

IPR2015-00146, Paper 10 at 8-9 (“Temporal does not provide sufficient evidence that the version of the Lazarewicz PowerPoint filed in this proceeding was the version actually presented at the conference, much less evidence to support that this particular version was available or distributed to the public interested in the art.”) (finding that petitioner did not demonstrate sufficiently that PowerPoint slides qualify as a prior art reference).

Second, regardless of whether Ex. 1113 is the same set of slides to which Dr. Frey’s expert report refers, the content of the report is insufficient to establish that Ex. 1113 qualifies as a prior art *printed publication*. Dr. Frey’s cryptic statement that he presented the slides at the Allerton Conference in September 1999 is woefully deficient regarding any relevant details. (Ex. 1117 ¶ 114.) Both the Federal Circuit and the Board have instructed that the mere presentation of slides accompanying an oral presentation at a professional conference is insufficient to establish the presentation slides as a “printed publication.” *In re Klopfenstein*, 380 F.3d 1345, n. 4 (Fed. Cir. 2004); *Temporal Power Ltd.*, IPR2015-00146 Paper 10 at 10 (quoting *In re Klopfenstein*). Relevant “factors” for consideration include whether documents were distributed or indexed, the length of time the display was exhibited, evidence of who actually attended a presentation and the expertise of the target audience, the existence (or lack thereof) of reasonable expectations that the

material displayed would not be copied, and the simplicity or ease with which the material displayed could have been copied. *Id.* at 1350.

In this instance, the record is devoid of any information or details of the alleged presentation. Neither asserts that the Frey Slides were printed, distributed, or indexed. Neither states whether all or only some of the slides were discussed or displayed, or how long the slides were displayed. Neither addresses how many people, if anyone, actually attended the conference for Dr. Frey's alleged presentation. There is no information regarding the skill level of any attendees. And neither addresses the existence (or lack thereof) of reasonable expectations that the material displayed would not be copied or how easily they could have been copied. This lack of evidence and explanation in the petition is incurable and fatal to Petitioner's reliance on the Frey Slides as prior art in this proceeding.

The Board has disqualified slides as prior art printed publications under similar circumstances. *See, e.g., Temporal Power Ltd.*, IPR2015-00146 at 10 (Dismissing a proffered PowerPoint as a printed publication where the Board was "left with Temporal's conclusory assertion that Lazarewicz PowerPoint qualifies as a prior art printed publication because, purportedly, some version of it was presented publically at the EESAT conference"). The Board should similarly reject the Frey Slides here.

Accordingly, the Board should deny all grounds on the basis that Petitioner has not established Frey Slides as a prior art printed publication.

B. The Petition Fails to Establish That the Pfister Slides Qualify as Prior Art

Each of Petitioner's Grounds 4 and 5 relies on the Pfister Slides, (Ex. 1105). The Pfister Slides are a set of slides that was allegedly presented at the Allerton Conference. (Pet. p. 36; Ex. 1105; Ex. 1120, p. 3.) As with the Frey Slides, the petition offers no specific explanation and identifies no particular theory as to how or why the Pfister Slides are believed to qualify as prior art for this proceeding. The petition generically asserts that slides were presented in the month of "September 1999," but does not assert the Pfister Slides constitute a "printed publication." (Pet., p. 36); *see* 35 U.S.C. §311(b).

Assuming that Petitioner is asserting the Pfister Slides as a "printed publication," nothing in the petition or corresponding materials substantiates the Pfister Slides as such.

First, without corresponding explanation, the petition merely directs the Board to Ex. 1120, which is a declaration by Professor Paul H. Siegel. (Pet. p. 36.) The Board should disregard any information presented in Ex. 1120 because none of it is discussed or explained in the petition. 37 C.F.R. § 42.6(a)(3) (expressly prohibiting incorporation by reference of arguments from one document into another document); *DeSilva v. DiLeonardi*, 181 F.3d 865, 866-67 (7th Cir. 1999)

(incorporation by reference “amounts to a self-help increase in the length of the . . . brief”) (“A brief must make all arguments accessible to the judges, rather than ask them to play archaeologist with the record.”).

Second, even if the Board chooses to consider Professor Siegel’s declaration, his declaration still would not provide evidence that Ex. 1105 qualifies as a prior art ***printed publication***. Both the petition and the declaration are essentially devoid of any details surrounding the alleged presentation of materials.

Professor Siegel declares that he presented the slides at the 1999 Allerton Conference, (Ex. 1120 ¶ 6), and that the conference in general “was open to the public for attendance.” (*Id.* ¶ 5). As discussed above, the Federal Circuit and the Board, however, have noted that the mere presentation of slides accompanying an oral presentation at a professional conference does not establish such slides as a ‘printed publication.’” *In re Klopfenstein*, 380 F.3d 1345, n. 4 (Fed. Cir. 2004); *Temporal Power Ltd.*, IPR2015-00146 Paper 10 at 10 (quoting *In re Klopfenstein*).

In this instance, neither the petition nor Professor Siegel’s declaration provides any real information about the alleged presentation, other than to allege that some presentation occurred. Neither asserts that the Pfister slides were distributed to anyone, in any way or were indexed with the conference. Neither states whether all or just some of the slides were displayed/discussed, or how long any of the slides were displayed. Neither addresses how many people, if anyone,

actually attended the presentation session of the conference and the skill level of the actual attendees. And neither addresses the existence of reasonable expectations that the material displayed would not be copied or how easily they could have been copied. Dr. Siegel also provides no support showing how and when the 1999 Allerton conference and proceedings were publicized, and provides no explanation of how he knows that the proceedings were “generally known to those who were interested in topics relating to error-correcting codes and iterative decoding.” (Ex. 1120 ¶ 5.)

Such information is critical to establishing the Pfister Slides as a printed publication, assuming Petitioner is even making this assertion in the first place. Moreover, Petitioner’s burden must be satisfied *in its petition*. The lack of evidence and explanation in the Petition, however, is incurable and fatal to Petitioner’s reliance on the Pfister Slides as prior art in this proceeding.

Indeed, as noted above, the Board has disqualified slides as prior art printed publications under similar circumstances. *See, e.g., Temporal Power Ltd.*, IPR2015-00146 at 10-11. The Board should similarly reject the Pfister Slides here.

Accordingly, the Board should deny Grounds 4 and 5 on the additional basis that Petitioner has not established the Pfister Sides as a prior art printed publication.

C. The Testimony of Petitioner's Expert Should be Accorded No Weight

Should the Board review the grounds of challenge, any review should attribute little, if any, weight to the declaration of Petitioner's expert Dr. Davis, submitted as Ex. 1106. As an initial matter, it is unclear precisely what aspects of Dr. Davis' declaration represent his own generated opinion testimony as opposed to content that has simply been adopted from other sources. For example, Dr. Davis' declaration presents large swaths of content that have been literally copied from Dr. Frey's expert report, (Ex. 1117), a document generated for an entirely different litigation proceeding and produced nearly two years prior to Dr. Davis' declaration in this case. (*Compare* Ex. 1106, ¶¶ 22-46, *with* Ex. 1117, ¶¶ 35-53, 55, 57-60, 63.) Perhaps the original material was not prepared for a Board proceeding, as numerous of these paragraphs fail to cite to a single reference or shred of evidence in support of the proffered commentary. 37 CFR § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."). Dr. Davis does not credit Dr. Frey's report as a source of this content. When Dr. Davis does reference the Frey report, he simply repeats unsupported hearsay in the report without purporting to have any personal knowledge of the subject matter. (See, e.g., Ex. 1106 ¶ 281.) Apart from the content copied from the Frey Report, the vast majority of the remaining commentary is a near-verbatim recitation of the conclusory arguments

included within the Petition. (*Compare, e.g.,* Pet. at 46-49, *with* Ex. 1106 ¶¶278-82; *compare* Pet. at 49-50, *with* Ex. 1106 ¶¶ 283-84). *Edmund Optics, Inc. v. Semrock, Inc.*, IPR2014-00583, Paper 50, at 8 (Sep. 9, 2015) (“In the instant case, the experts’ testimony does little more than repeat, without citation to additional evidence, the conclusory arguments of their respective counsel.”); *see also Kinetic Techs., Inc. v. Skyworks Solutions, Inc.*, IPR2014-00529, Paper 8, at 15 (Sep. 23, 2014) (“Merely repeating an argument from the Petition in the declaration of a proposed expert does not give that argument enhanced probative value.”).

Moreover, where evidence is cited, Dr. Davis’s declaration adds confusion by referring to different exhibits compared to those cited in the petition. For example, the petition lists Exhibits 1101-1124 (Pet. at “Table of Exhibits”), which appear to correspond to the exhibits made of record. Dr. Davis’s declaration, however, fails to cite to any of these exhibit numbers—and utilizes a different numbering scheme instead. At a minimum, Petitioner’s citations to inappropriate documents places undue burden on the reader to search and compare different documents submitted in different proceedings. *Corning Inc. v. DSM IP Assets B.V.*, IPR2013-00049, Paper 88 at 14 (2014) (“The Board will not scour the record in search of evidence relevant to a particular issue, nor will it attempt to fit evidence together into a coherent explanation that supports an argument. Such activities are the province of advocacy.”) (citing *Stampa v. Jackson*, 78 USPQ2d

1567, 1571 (BPAI 2005) and *Ernst Haas Studio, Inc. v. Palm Press, Inc.*, 164 F.3d 110, 111-12 (2d Cir. 1999)); *Lam Research Corp. v. Flamm*, IPR2015-01766, Paper 7 at 19 (2016) (“A brief must make all arguments accessible to the judges, rather than ask them to play archaeologist with the record.”) (quoting *DeSilva v. DiLeonardi*, 181 F.3d 865, 866-67 (7th Cir 1999)).

IV. THE PROPOSED GROUNDS OF CHALLENGE FAIL

A. Ground 1 fails

1. The Frey Slides Do Not Anticipate 1 and 3

As set forth above, Petitioner has not established Frey Slides as a prior art printed publication, and the Board should deny Ground 1 on that basis alone.

Nonetheless, regardless of whether the Frey Slides is disqualified as available prior art, the petition fails to establish the Frey Slides anticipate claim 1. Patent Owner notes that Petitioner appears to be asserting that the Frey Slides alone anticipates claim 1, but tacitly admits the Frey Slides lack relevant content by pivoting a different document in the Frey paper (Ex. 1102)—which it does not include in its asserted ground—to fill in content of the Frey Slides. (Pet. p. 29 (“Using the same procedure described in the Frey paper, the Frey Slides show how known, regular codes can be ‘irregularized,’ step by step.”) (showing images from Frey Slides); *id.* p. 30 (“Also, using a diagram identical to Figure 2 of the Frey paper (described above), the Frey Slides show how irregular turbocodes can be implemented via irregular operation.”).) Petitioner is improperly relying on the

Frey paper, which it does not assert in its ground, to fill in content the petition tacitly admits is missing from the Frey Slides. It is evident by this fact alone that the Frey Slides do not anticipate claims 1 and 3.

Nevertheless, even if the Frey Slides contained the same disclosure as the Frey paper, the Frey Slides still would fail to teach or suggest all limitations of claims 1 and 3, e.g., partitioning a block of data into sub-blocks including a plurality of data items, and encoding the partitioned data as specifically recited in claim 1.

The '710 patent specification illustrates data partitioning and encoding. For example, the specification, referring to Fig. 2, recites an embodiment where “[t]he outer coder 202 receives the uncoded data [which] may be partitioned into blocks of fixed size, say k bits. The outer coder may be an (n,k) binary linear block coder, where $n > k$.” (Ex. 1101 at 2:41-44.) Additionally, “[t]he coder accepts as input a block u of k data bits and produces an output block v of n data bits.” (Ex. 1101 at 2:44-45.) Moreover, “[t]he rate of the coder may be irregular, . . . and may differ for sub-blocks of bits in the data block. In an embodiment, the outer coder 202 is a repeater that repeats the k bits in a block a number of times q to produce a block with n bits, where $n = qk$.” (*Id.* at 2:48-52; *see also id.* at 1:59-64 (“The data block is apportioned into two or more sub-blocks and bits in different sub-blocks are repeated a different number of times according to a selected degree profile.”), Fig.

2.) The bits output from the outer coder are also “scrambled before they are input to the inner coder 206,” where the scrambling operation “may be performed by the interleaver 204.” (*Id.* at 3:18-20.)

The petition asserts that the Frey Slides anticipate claim 1, but the petition fails to show that the Frey Slides teach or suggest each and every element of claim 1. A number of aspects of claim 1 are inadequately addressed in the petition and missing from the Frey Slides, some of which are addressed below.

a) The Frey Slides Fail to Disclose Additional Downstream Limitations

Because the petition fails to demonstrate that the Frey Slides disclose the “partitioning” limitation, it further fails to demonstrate disclosure of the downstream processing steps required by claims 1 and 3. For example, because the petition does not show that Frey Slides partitions data into sub-blocks, it also does not establish that the Frey Slides disclose “each sub-block containing a plurality of data elements.” Likewise, the petition does not show that the Frey Slides disclose “said first encoding including repeating the data elements in different sub-blocks a different number of times” or “interleaving the repeated data elements.”

B. Ground 2 fails

1. Divsalar in view of the Frey Slides does not render obvious claims 1-8 and 11-14

As explained above, the petition fails to establish that either of the Frey Slides and Divsalar qualifies as a prior art printed publication. Thus, the Board should reject Ground 2 on that basis alone.

Nonetheless, regardless of whether Divsalar and/or the Frey Slides are disqualified as prior art, the petition fails to demonstrate that claims 1-8 and 11-14 would have been obvious in view of the combination of Divsalar in view of the Frey Slides as asserted in Ground 2. Not only are numerous claim limitations undisclosed by either reference, but the petition fails to demonstrate that a person of ordinary skill in the art would have been motivated to combine the references in the manner proposed.

a) Undisclosed limitations in claim 1 and its dependent claims

The proposed combination set forth in the petition fails to disclose a number of claim limitations required by the challenged claims. For example, with respect to claim 1, as explained above in response to Petitioner's Ground 1, the Frey Slides do not disclose the claimed "partitioning" step. Further, Petitioner states that "Divsalar does not teach partitioning the data block into a plurality of sub-blocks." (Pet. pp. 52-53.) Accordingly, Petitioner has not established how the combination of Divsalar and the Frey Slides teach the claimed "partitioning" step.

Because the asserted combination does not disclose the "partitioning" step, the combination of Divsalar and the Frey Slides further fails to teach or suggest the

follow-on processing steps required by claim 1. For example, the proposed combination also does not teach or suggest “each sub-block containing a plurality of data elements.” Likewise, the combination does not teach or suggest “said first encoding including repeating the data elements in different sub-blocks a different number of times” or “interleaving the repeated data elements.”

Petitioner also states that “Divsalar does not teach partitioning the data block into a plurality of sub-blocks *and repeating information bits in different sub-blocks ‘a different number of times.’*” (*Id.* (emphasis added).) For this limitation, Petitioner relies on Frey Slides. (Pet. pp. 52-53.)

In particular, the petition suggests that “an encoding method that meets the ‘different number of times’ limitation of claim 1 necessarily meets the ‘partitioning’ limitation.” (Pet. p. 53.) However, the petition does not provide reasoning to support the assertion that any encoding method that repeats bits different numbers of times must necessarily “partition[] said data block into a plurality of sub-blocks, each sub-block including *a plurality of data elements.*” The petition asserts that repeating “different information bits different numbers of times” will “*de facto* partition information bits into sub-blocks,” (Pet. p. 53), but presents no argument suggesting that each sub-block will comprise a plurality of data elements. So even assuming that “applying different degrees of repetition to

different bits is what *defines* the different sub-blocks of the partition,” (*id.*), this does not imply that each sub-block comprises a plurality of data elements.

While the petition cites to paragraph 294 of the Davis declaration to support its assertions, the cited paragraph provides no additional analysis of this element, and in fact is nearly a verbatim copy of the last and first paragraphs of pages 52 and 53 of the petition. (*Compare* Pet. pp. 52-52 with Ex. 1106 ¶ 249 (merely replacing a handful of words with synonyms while providing no independent analysis).) Footnote 3 of the Davis declaration discusses only the relation of equivalence classes to partitioning, while saying nothing about the number of elements in any sub-block.

The challenges to the dependent claims fail at least by virtue of their dependency from the independent claims noted above, as well as on their own merits. For example, the arguments in the petition are also deficient for claim 7, which requires that the first coder comprises a low-density generator matrix. The petition and the Davis declaration merely rely on a description of a low-density generator matrix in order to conclude that Divsalar in view of the Frey Slides discloses a low-density generator matrix. (Pet. p. 58-59; Ex. 1106, ¶¶ 311-316.) Petitioner points to no disclosure in Divsalar or the Frey Slides of the claimed low-density generator matrix.

b) Petitioner's motivation to combine Divsalar and the Frey Slides is insufficient and illogical

Beyond Petitioner's failure to identify disclosure of each claim limitation in either Divsalar or the Frey Slides, the petition also fails to reasonably describe the combination of the two references, including how the references would be combined and why one of ordinary skill in the art would do so. The petition fails to provide the requisite "articulated reasoning with some rational underpinning" to support the asserted conclusion of obviousness. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 419 (2007), citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

As an initial matter, the petition is vague and unclear in its explanation of how the references would be combined, or what overall encoding method would result. The petition states that "[i]ncorporating the irregular repetition of the Frey Slides into the RA codes of Divsalar [sic] would have required only a trivial change to the implementation of the encoder," yet the only support for this assertion is a paragraph from the Davis declaration, which parrots the petition and provides no independent reasoning. (*Compare* Pet. pp. 48-49 *with* Ex. 1106 at ¶ 282.)

Accordingly, the manner of combination of the Frey Slides and Divsalar and the resulting functionality that a person of ordinary skill in the art would have expected is left substantially unexplained.

Furthermore, insofar as the petition suggests the creation of a combined encoding system using the "irregular repetition of Frey," (Pet. p. 47), as a first

encoding step and the “rate-1 accumulator” of Divsalar, (Pet. p. 52), as a second encoding step, the stated justifications for combining the references in this manner do not withstand scrutiny. The petition alleges that “Frey Slides teaches that making a turbocode irregular can lead to codes (*i.e.*, “irregular turbocodes”) with better performance than classical turbocodes.” (Pet. p. 47 (citing Ex. 1113 p. 11).) However, this does not square with the teachings that the Frey Slides are argued by the petition to provide.

According to the petition, the Frey Slides teach that introducing irregularity also requires changing the rate of the convolutional code, identified by the petition as “the second encoding,” (Pet. p. 43), so as to maintain the overall rate of the resulting code at 1/2 or 1/3. (*See* Pet. at 44 (defining \bar{R} in terms of a fixed $R = 1/2$); Ex. 1113 at 8, 9, 10, 11, 12, 13 (repeatedly showing “ R ” fixed at 1/2 or 1/3).) These examples, and the teachings of Divsalar (*e.g.*, Ex. 1103 at 205, showing fixed-rate “1/ q ” encoding), indicate that the overall code rate R should be fixed at 1/2 (or 1/3, 1/4, ... 1/ q , for higher-repetition encoders). In particular, the overall code rate should always be less than 1, as otherwise the code would lack any redundant information, and therefore fail to function according to its intended purpose of error-correcting. (*See* Pet. at 9 (“Error-correcting codes work by adding redundant information to the original message).)

However, far from suggesting that improved performance would result by introducing irregularity while using a second encoder with a rate $\bar{R} = 1$, Frey Slides in fact predicts the opposite—that such a combination would fail to function. In analyzing Frey Slides in ground 1, the petition relies on equation 9 of Frey Slides, reproduced below.

$$1 - \bar{R} = \frac{1 - R}{(1 - R) + 2(R - f_e) + d_e f_e}$$

(Pet. p. 44, quoting Ex. 1113 at 6.)

This equation is a rearrangement of an equation shown on page 5 of the Frey Slides, which relates the rate of the alleged second encoder (\bar{R}) to the overall code rate R and the average degree \bar{d} :

$$1 - R = \bar{d}(1 - \bar{R})$$

(Ex. 1102 at 2.)

Replacing the Frey Slides’ alleged “second encoder” with a rate 1 accumulator as allegedly taught by Divsalar would result in setting the rate \bar{R} to 1 in the above equation. Simple algebra shows that the overall rate R of the resulting code must equal 1 as well:

$$\begin{aligned} 1 - R &= \bar{d}(1 - 1) \\ 1 - R &= 0 \\ R &= 1 \end{aligned}$$

As discussed above, an overall coding rate of $R = 1$ would result in an inoperative code.

Petitioner provides no reasoning to explain this discrepancy, nor does the petition suggest any modifications to the Frey Slides' or Divsalar's systems that a person of ordinary skill in the art could apply to overcome this problem. At the very least, it is clear that the alleged benefit taught by the Frey Slides would not apply to the combination described in the petition. Accordingly, based on the teachings of the Frey Slides, a person of ordinary skill in the art would conclude that introducing irregularity in the manner disclosed in the Frey Slides, in combination with a "second encoder" with a rate $\bar{R} = 1$, would result in an encoding with an overall encoding rate of $R = 1$. There would be no expectation of success in using such an encoder, nor would a person of ordinary skill in the art be motivated to create it based on the teachings of Divsalar and the Frey Slides.

c) Petitioner's motivation to combine is further flawed because it relies on inadmissible hearsay

The Board should also reject Petitioner's argument regarding motivation to combine because it relies on two inadmissible hearsay statements that were not made in a declaration or under oath. As explained above, Dr. Frey's report, (Ex. 1117), is inadmissible hearsay. The first hearsay statement relied upon in the petition regarding motivation to combine is Dr. Frey's statement in an expert report from a district court litigation. (Pet. p. 48 ("As Dr. Frey explains [in his district

court litigation expert report], ‘[c]onsistent with the email I sent to Dr. Divsalar, making RA codes irregular was merely an obvious application of my earlier work on irregular turbocodes, which I presented at the Allerton 1999 conference....’”); Ex. 1117, ¶ 129.) The second is the inadmissible double hearsay statement that Dr. Frey purportedly made in an email to Dr. Divsalar. (Pet. p. 48 (citing to statements in Dr. Frey’s report in which he “explain[s] ‘it would [be] interesting to extend the work that you and Bob [McEliece] have done to the case of irregular turbocodes’”); Ex. 1117, p. 54.))

Fed. R. Evid. 801(c) defines hearsay as “a statement that: (1) the declarant does not make while testifying at the current trial or hearing; and (2) the party offers in evidence to prove the truth of the matter asserted in the statement.” Hearsay is generally inadmissible under Fed. R. Evid. 802 unless it falls under any of the exceptions listed in Fed. R. Evid. 803. Dr. Frey’s expert report was not created and submitted for this proceeding. Petitioner offers Dr. Frey’s statements in his report, in which he purportedly claims that making RA codes irregular was obvious, as evidence to prove the truth of the matter asserted—that making RA codes irregular was obvious. (Pet. p. 48 (citing Ex. 1117, p. 40); *see also* Ex. 1117, p. 42.) Petitioner does not contend that the statement in Dr. Frey’s expert report qualifies as one of the exceptions to the hearsay rule, nor can it.

Accordingly, Dr. Frey's expert report is inadmissible hearsay and cannot be considered.

In addition, the statements that Dr. Frey purportedly made in the email to Dr. Divsalar are inadmissible double hearsay. Petitioner again presents Dr. Frey's expert report—which, as explained above, is inadmissible hearsay—to show an email Dr. Frey purportedly sent to Dr. Divsalar, in which he discussed “extend[ing] [Dr. Divsalar's] work ... to the case of irregular turbocodes.” (Pet. p. 48; Ex. 1117, p. 54.) Like his expert report, Dr. Frey's email was not created and submitted for this proceeding. And Petitioner offers the statements in Dr. Frey's email to prove the truth of the matter asserted—that extending Divsalar's work to irregular turbocodes would have been obvious. (*Id.*) Thus, Petitioner relies on hearsay (Dr. Frey's email statements) within hearsay (Dr. Frey's expert report). Hearsay within hearsay is inadmissible unless each part of the combined statements conforms with an exception to the rule. Fed. R. Evid. 805. Petitioner does not establish or even argue that Dr. Frey's statements in his expert report and his email fall under one of the exceptions to the rule. Thus, Dr. Frey's email statements are also inadmissible and cannot be considered.

Accordingly, Petitioner presents no admissible and logical rationale to combine Divsalar and the Frey Slides.

2. Undisclosed limitations in claim 11 and its dependent claims

The petition presents substantially similar arguments with respect to claim 11 as it does for claim 1. (*See* Pet. pp. 59-61.) Accordingly, Petitioner's arguments for claim 11 fail for similar reasons to those discussed above with regard to claim 1. For example, there would have been no reasonable expectation of success or motivation to combine the coding methods of Frey Slides with a system including an accumulator from Divsalar, as explained above. The petition uses the same reasoning with regard to motivation to combine and expectation of success for claim 11 as for claim 1 (*see* Pet. pp. 46-50, 59-61), and accordingly the argument fails for substantially the same reasons. Claims 12-14 depend from claim 11, and therefore the deficiencies respect to claim 11 apply to these claims as well.

C. Ground 3 fails

1. Divsalar in view of Frey Slides and further in view of Luby97 nonetheless does not render obvious claims 15-17, 19-22, and 24-33

As explained above, the petition fails to establish the Frey Slides and Divsalar as prior art. Thus, the Board should reject Ground 3 on that basis alone. Nonetheless, regardless of whether Divsalar and/or the Frey Slides are disqualified as prior art, the petition fails to demonstrate that claims 15-17, 19-22, and 24-33 would have been obvious in view of the combination asserted in Ground 3. Not only are numerous claim limitations undisclosed by any of these references, but the

petition fails to demonstrate that a person of ordinary skill in the art would have been motivated to combine the references in the manner proposed.

a) Insufficient rationale to combine

The petition fails to provide the requisite “articulated reasoning with some rational underpinning” to support the asserted conclusion of obviousness. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 419 (2007), citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The petition fails to reasonably describe the combination of Luby97 with Divsalar and the Frey Slides, including how the references would be combined and why one of ordinary skill in the art would do so. The petition presents no more detailed explanation as to how such a combination would have been carried out. As a result, the petition presents little more than a mapping exercise of identifying disparate elements with no meaningful explanation of how the base reference Divsalar can reasonably be modified by Frey Slides and by Luby97 to arrive at the subject matter of the challenged claims.

Additionally, the stated justifications for combining the references do not withstand scrutiny. The petition proposes that a person of ordinary skill in the art would have had reason to combine Divsalar with Luby97 because “both relate to error-correcting codes and the performance thereof.” (Pet. p. 63.) General statements that the references are in the same general field of inquiry do not

provide motivation to combine specific references. Moreover, the petition never identifies precisely what problem is at issue, nor does the cited portion of the Davis declaration. The assertion appears based entirely on the petition asserting that Luby “teaches this ‘stream of bits’ limitation.” (*Id.* p. 63.) Based only on this, the petition concludes that “it would have been obvious to incorporate Luby’s teaching of ‘stream of bits’ into Divsalar and Frey ... to make the encoder capable of receiving and processing ‘streams’ as opposed to just blocks.” (*Id.*)

b) Undisclosed limitations in claim 15 and its dependent claims

The proposed combination set forth in the petition fails to disclose a number of claim limitations required by claim 15 and its dependent claims. For example, claim 15 requires “a first coder having an input configured to receive a stream of bits, said first encoder operative to repeat said stream of bits irregularly and scramble the repeated bits.” For this limitation, Petitioner mostly relies on its analysis of claim 1 without addressing the difference in claim language between claim 1 and claim 15. (Pet. pp. 64-64.) It then goes on to conclude that “one of ordinary skill in the art would understand that the ‘stream’ teachings of Luby⁹⁷ can be incorporated into the coders taught by Divsalar,” (*id.* at 63), without any support or explanation as to how or why a skilled artisan would understand this assertion. Thus, the petition fails to establish that this combination renders obvious claim 15. These deficiencies also apply to dependent claims 16-17 and 19-22. In

addition, challenges to several dependent claims fail with respect to additional limitations looking beyond claim 15.

For example, claims 16 and 17 fail with respect to additional limitations looking beyond claim 15. Claim 16 requires that “the stream of bits includes a data block, and wherein the first encoder is operative to apportion said data block into a plurality of sub-blocks and to repeat bits in each sub-block a number of times, wherein bits in different sub-blocks are repeated a different number of times.” (Ex. 1101, 8:7-12.) Here, again, Petitioner relies on Luby⁹⁷ for the disclosure of a “stream of bits,” (Pet. p. 65), but for the rest of the limitation relies entirely on its analysis of Divsalar in view of the Frey Slides for claims 1 and 6 without addressing any differences in claim language between elements in the claims. Assuming Petitioner is referring to its analysis of the “partitioning” limitation of claim 1, the combination of Divsalar and the Frey Slides fail to disclose this limitation, as explained above. This deficiency for claim 16 also applies to claim 17, which depends from claim 16.

Claim 20 depends from claim 15 and further requires that “the first coder comprises a low-density generator matrix coder.” For this claim, Petitioner directs the Board to its analysis for claim 7. (Pet. p. 66.) As explained above, Petitioner and its expert, Dr. Davis, merely rely on a description of what a low-density generator matrix is in order to conclude that Divsalar in view of Frey Slides

discloses a low-density generator matrix. (Pet. pp. 58-59; Ex. 1106, ¶¶ 311-12, 314-16.) Petitioner points to no disclosure in Divsalar or the Frey Slides of the claimed low-density generator matrix. Accordingly, Petitioner fails to show that claim 20 is obvious in view of the asserted combination.

c) Undisclosed limitations in claim 25 and its dependent claims

The proposed combination set forth in the petition also fails to disclose a number of claim limitations required by claim 25 and its dependent claims. For the preamble and the first two limitations of claim 25, Petitioner refers the Board to its analysis for claim 15. (Pet. pp. 67-68.) As explained above, however, the asserted combination fails to disclose “a first coder having an input configured to receive a stream of bits, said first encoder operative to repeat said stream of bits irregularly and scramble the repeated bits.” Thus, the petition fails to show that this combination renders claim 25 obvious. The deficiencies stated above for claim 25 also apply to dependent claims 26-33. In addition, challenges to dependent claims fail with respect to additional limitations looking beyond claim 15.

For example, claim 28 requires that “the first coder comprises a low-density generator matrix coder,” and Petitioner refers the Board to its analysis for claim 7. (Pet. p. 71.) As explained above for claim 7 and claim 20, Petitioner fails to show this limitation is obvious in view of the asserted combination.

D. Ground 4 fails

As explained above, the petition fails to establish the Frey Slides, Divsalar, and the Pfister Slides as prior art. Thus, the Board should reject Ground 4 on that basis alone. Nonetheless, regardless of whether the Frey Slides, Divsalar, and the Pfister Slides are disqualified as prior art, the petition fails to demonstrate that claim 10 would have been obvious in view of the asserted combination.

Claim 10 depends from claim 1. As discussed above, both Divsalar and the Frey Slides—either alone or in combination—fails to disclose or render obvious the limitation “partitioning said data block into a plurality of sub-blocks, each sub-block including a plurality of data elements.” Petitioner presents the Pfister Slides in this ground only for the limitation in claim 10 requiring that the “second encoding utilizes two accumulators.” (Pet. pp. 74-75.) Petitioner does not argue that the Pfister Slides disclose the “partitioning” limitation found in claim 1. Accordingly, the Pfister Slides do not cure the deficiencies of Divsalar and the Frey Slides, and the combination fails to render claim 10 obvious. In addition, Petitioner has not presented a sufficient motivation to combine at least Divsalar and Frey Slides, as discussed above. Accordingly, Petitioner’s ground 4 fails.

E. Ground 5 fails

As explained above, the petition fails to establish that all of Frey Slides, Divsalar, and the Pfister Slides qualify as prior art. Thus, the Board should reject

Ground 5 on that basis alone. Nonetheless, regardless of whether these references are disqualified as prior art, the petition fails to demonstrate that claim 23 would have been obvious in view of the combination of the asserted combination.

Claim 23 depends ultimately from independent claim 15. As discussed above for Petitioner's Ground 3, Divsalar in view of the Frey Slides and further in view of Luby97 does not render obvious claim 15. Petitioner relies on the Pfister Slides in this ground only for the additional limitation that the "second coder further comprises a second accumulator." (Pet. p. 76.) This combination does not cure the deficiencies found in Petitioner's ground 3. Accordingly, the combination fails to render claim 10 obvious.

V. CONCLUSION

The Board should not institute *inter partes* review because Petitioner has failed to meet its burden to show it has a reasonable likelihood of prevailing on any of its proposed ground of unpatentability. Accordingly, institution of *inter partes* review should be denied.

Respectfully submitted,

Date: April 3, 2017

/ Michael T. Rosato /
Michael T. Rosato, Lead Counsel
Reg. No. 52,182

CERTIFICATE OF COMPLIANCE

Pursuant to §42.24(d), the undersigned certifies that this paper contains no more than 14,000 words, not including the portions of the paper exempted by §42.24(b). According to the word-processing system used to prepare this paper, the paper contains 8,362 words.

Respectfully submitted,

Date: April 3, 2017

/ Michael T. Rosato /
Michael T. Rosato, Lead Counsel
Reg. No. 52,182

CERTIFICATE OF SERVICE

I certify that the foregoing Patent Owner's Preliminary Response Pursuant to 37 C.F.R. § 42.207 was served on this 3rd day of April, 2017, on the Petitioner at the correspondence address of the Petitioner as follows:

Richard Goldenberg
Brian M. Seeve
Dominic Massa
WILMER CUTLER PICKERING HALE AND DORR LLP
60 State Street
Boston, MA 02109
richard.goldenberg@wilmerhale.com
brian.seeve@wilmerhale.com
dominic.massa@wilmerhale.com

Respectfully submitted,

Date: April 3, 2017

/ Michael T. Rosato /
Michael T. Rosato, Lead Counsel
Reg. No. 52,182