

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

PROCOMM INTERNATIONAL
INCORPORATED PTE. LTD.,
Plaintiff

v.

VERIZON COMMUNICATIONS, INC.,
CELLCO PARTNERSHIP d/b/a VERIZON
WIRELESS, TELEFONAKTIEBOLAGET
LM ERICSSON and ERICSSON, INC.,
Defendants

Case No. 2:24-cv-00009-RWS-RSP

JURY TRIAL DEMANDED

**DEFENDANTS' P.R. 3-3 AND 3-4 DISCLOSURES FOR U.S. PAT. NOS. 8,583,100,
7,103,377, 8,497,813, 7,724,521, 7,834,721**

I. INTRODUCTION

Pursuant to P.R. 3-3 and 3-4 and the Docket Control Order (Dkt. 23), Defendants Verizon Communications, Inc. and Cellco Partnership d/b/a Verizon Wireless (collectively, “Verizon”); Defendants Ericsson Inc. and Telefonaktiebolaget LM Ericsson (all Defendants collectively, “Defendants”) hereby disclose their P.R. 3-3 and 3-4 disclosures (“Invalidity Contentions”) in view of Procomm International PTE. LTD. (“Procomm” or “Plaintiff”) various P.R. 3-1 Disclosure of Asserted Claims and Infringement Contentions (collectively, “Infringement Contentions”), served March 20, 2024. Per ongoing correspondence between the parties (including on May 31, 2024 and June 11, 2024), Procomm’s Infringement Contentions are deficient and do not properly disclose Procomm’s infringement theories and apparent interpretation of the claims. Defendants’ ability to investigate prior art has been prejudiced by Procomm’s deficient infringement contentions. In the event that Procomm is granted leave or otherwise permitted to amend or supplement its Infringement Contentions (including to address the deficiencies identified by Defendants) or its infringement theories, these Invalidity Contentions may change, and Defendants reserve the right to amend or supplement these Invalidity Contentions. Moreover, Procomm has purported to reserve the right to supplement its Infringement Contentions after review of Defendants’ source code. In the event that Procomm is permitted to supplement and/or amend its Infringement Contentions based on its review of Defendants’ source code, Defendants likewise reserve the right to supplement and/or amend these contentions in response.

Defendants contend that each of the Asserted Claims (as defined below) by Plaintiff is invalid under 35 U.S.C. §§ 102, 103, and/or 112 for at least the reasons provided below.¹

A. Asserted Claims

Procomm served Infringement Contentions alleging infringement of the following patents and claims (collectively, the “Asserted Patents” and “Asserted Claims”):

- Claims 15 and 19 of U.S. Patent No. 8,583,100 (the ‘100 Patent”);
- Claim 1 of U.S. Patent No. 7,103,377 (the “’377 Patent”);
- Claims 1 and 4 of U.S. Patent No. 8,497,813 (the “’813 Patent”);
- Claims 1, 4, 5, and 14–16 of U.S. Patent No. 7,724,521 (the “’521 Patent”);
- Claims 1 and 2 of U.S. Patent No. 7,834,721 (the “’721 Patent”);

These Invalidity Contentions address only the Asserted Claims specifically set forth in Plaintiff’s Infringement Contentions. Defendants do not concede that the claims that Plaintiff has not asserted are valid and reserve all rights to amend these contentions if Plaintiff asserts additional claims and/or patents.

B. Ongoing Discovery and Disclosures

Defendants base their Invalidity Contentions on their current knowledge and understanding of the Asserted Claims and review of prior art, as of the date of these Invalidity Contentions. Defendants’ Invalidity Contentions are made without the benefit of discovery regarding the parties’ claim construction contentions, expert discovery, third-party discovery, and claim construction opinion or order by the Court. These Invalidity Contentions are provided without

¹ All Asserted Patents have priority dates prior to March 16, 2013. Accordingly, all references to 35 U.S.C. §102 refer to the pre-AIA version of that statute defining prior art.

prejudice to Defendants' right to revise, amend, correct, supplement, modify, or clarify their Invalidity Contentions.

Defendants also base their Invalidity Contentions on their current understanding of the Asserted Claims in view of Plaintiff's Infringement Contentions. Defendants reserve all of their rights both to seek leave to amend or supplement and to amend or supplement these contentions if Plaintiff supplements or amends its infringement contentions.

Defendants incorporate by reference all other bases for invalidity identified in Defendants' Answers, Initial Disclosures, and interrogatory responses in this matter, and the prosecution or post-grant review (e.g., during *Inter Partes* Review) of the Asserted Patents and all related patents and/or patent applications, including but not limited to statements made by both the patent applicant and patent examiners, and references cited therein.

Defendants further incorporate by reference all admissions regarding the Asserted Patents including, but not limited to, admissions in the specification of the Asserted Patents, and the prosecution or post-grant review of the Asserted Patents and related patents and/or patent applications. Defendants further incorporate any and all invalidity contentions previously served or subsequently served in any related litigation, or served in any prior litigation involving the Asserted Patents and related patents (collectively, the "Other Actions").

C. Claim Construction

The Court has not construed the Asserted Claims. Defendants map the prior art references to the Asserted Claims based on Plaintiff's apparent constructions, to the extent understood, of the Asserted Claims as advanced in Plaintiff's Infringement Contentions. However, nothing stated in this document or accompanying claim charts should be treated as an admission or suggestion that Plaintiff's apparent claim constructions are correct, or that any claim terms of the Asserted Claims

are not invalid under 35 U.S.C. § 112 for being indefinite, failing to satisfy the written description requirement, or failing to satisfy the enablement requirement. In fact, Defendants specifically deny that Plaintiff's apparent claim constructions are proper.

Depending on the Court's construction of the Asserted Claims of the Asserted Patents, and/or positions that Plaintiff or its expert witness(es) may take concerning claim interpretation, infringement, and/or invalidity issues, the asserted prior art references may be of greater or lesser relevance. Given this uncertainty, the charts may reflect alternative applications of the prior art against the Asserted Claims. Thus, no chart or position taken by Defendants should be construed as an admission or a waiver of any particular construction of any claim term. Defendants also reserve the right to challenge any of the claim terms under 35 U.S.C. § 112, including by arguing that they are indefinite, not supported by the written description, and/or not enabled.

D. Effective Dates

Procomm asserted under P.R. 3-1(e) that the Asserted Claims of the '100 Patent are entitled to a priority date of January 25, 2007.

Procomm asserted under P.R. 3-1(e) that the Asserted Claims of the '377 Patent are entitled to a priority date of December 3, 2002.

Procomm asserted under P.R. 3-1(e) that the Asserted Claims of the '721 Patent are entitled to a priority date of June 26, 2007.

Procomm asserted under P.R. 3-1(e) that the Asserted Claims of the '813 Patent are entitled to a priority date of June 26, 2007. Defendants disagree that the '813 Patent is entitled to this priority date based on the lack of supporting disclosure in application no. PCT/US2009/066345 and provisional application no. 61/119,114. Thus, Defendants contend the '813 Patent is entitled to a priority date no earlier than June 2, 2010.

Procomm asserted under P.R. 3-1(e) that the Asserted Claims of the '521 Patent are entitled to a priority date of June 11, 2008.

For each patent above, Defendants reserve the right to rely on prior art dated after Procomm's claimed priority date to the extent Procomm fails to prove entitlement to the above priority dates for any Asserted Claim. To the extent Procomm in the future seeks and is granted leave to amend its disclosures in an attempt to establish an earlier effective date, Defendants reserve the right to amend these contentions in response, including by disclosing additional prior art or earlier versions or evidence of the prior art disclosed herein.

E. Prior Art Identification and Citation

The accompanying invalidity claim charts (Exhibits A-E) cite to particular teachings and disclosures of the prior art references as applied to features of the Asserted Claims. However, persons having ordinary skill in the art may view an item of prior art generally in the context of other publications, literature, products, and understanding. Accordingly, the cited portions are only exemplary and are intended to put Procomm on notice of the basis for Defendants' contentions. Defendants have endeavored to identify the most relevant portions of the references, but the references may contain additional support for particular claim limitations. Defendants reserve the right to rely on uncited portions of the prior art references, other documents, and/or operational systems, as well as fact and expert testimony, to provide context or to aid in understanding the cited portions of the references and interpreting the teachings of the prior art and to establish bases for combinations of certain cited references that render the Asserted Claims obvious.

Defendants reserve the right to rely on any prior art system referenced, embodied, or described in any of the prior art references identified herein, or which embodies any of the prior art references identified herein. Moreover, Defendants reserve the right to rely on inventor

admissions concerning the scope of the prior art relevant to the asserted patents found in, *inter alia*, the prosecution histories or post-grant review proceedings of the asserted patents and related patents and/or patent applications, any testimony or declarations of the named inventors concerning the asserted patents or related patents, and any papers or evidence submitted by Procomm in connection with this litigation, any other pending or future litigation brought by Procomm involving the asserted patents or related patents. Defendants also may establish what was known to a person having ordinary skill in the art through treatises, published industry standards other publications, products, and/or testimony.

Where the invalidity claim charts cite to a particular figure in a reference, the citation should be understood to encompass the caption of the figure and other text relating to and/or describing the figure. Similarly, where the invalidity claim charts cite to particular text referring to a figure, the citation should be understood to include the figure and related figures as well.

The prior art references listed herein and in the accompanying claim charts may disclose the elements of the Asserted Claims explicitly and/or inherently. The prior art references are also relevant for their showing of the state of the art and reasons and motivations for making improvements, additions, and combinations. The suggested obviousness combinations are provided in the alternative to Defendants' anticipation contentions and are not to be construed to suggest that any reference is not itself anticipatory.

Further, the combinations of prior art references contained herein demonstrating the obviousness of the Asserted Patents under 35 U.S.C. § 103 are merely exemplary and are not intended to be exhaustive. All such combinations are intended to include and are in view of the knowledge of a person of ordinary skill in the art. Additional obviousness combinations of the identified prior art references are possible, and Defendants reserve the right to use any such

combination(s) in this Action. In particular, Defendants are currently unaware of the extent, if any, to which Procomm will contend that limitations of any particular claim(s) is/are not disclosed in the art that Defendants have identified as anticipatory. To the extent that Procomm does so, Defendants reserve the right to identify other evidence or references that anticipate or render obvious the particular claim(s).

Nothing in these Invalidity Contentions should be treated as an admission that any of Defendants' accused instrumentalities meet any limitation of the Asserted Claims. Defendants deny infringing the Asserted Claims. To the extent that any prior art reference identified by Defendants contains a claim element that is the same as or similar to an element in an accused instrumentality, based on a claim construction inferred from Procomm's Infringement Contentions, inclusion of that reference in Defendants' Invalidity Contentions is not a waiver by Defendants of any claim construction or non-infringement position, nor is it an admission or suggestion by Defendants that any accused instrumentality satisfies the limitations of the Asserted Claims under a proper construction of those claims.

F. Lack of Inventorship and Proper Ownership

Defendants reserve the right to assert that the Asserted Claims are invalid under 35 U.S.C. § 102(f) and/or § 102(g) in the event that Defendants obtain evidence that the named inventor of the Asserted Patents did not invent (either alone or in conjunction with other parties) the subject matter claimed in the Asserted Patents. Should Defendants obtain such evidence, Defendants will provide the name of the person(s) from whom and the circumstances under which the invention or any part of it was derived, and/or the circumstances surrounding the making of the invention before the patent application.

G. Additional Reservation of Rights

Defendants' identification in the prior art of claim elements recited in the preamble of any claims is not intended to indicate that any such preamble is limiting. All such disclosures are made only to the extent the preamble is determined to be limiting.

As described above, Defendants also intend to diligently seek discovery from third parties to demonstrate the inventions were known or used by others under 35 U.S.C. § 102(a), in public use and/or on-sale under 35 U.S.C. § 102(b), and/or earlier invention of the claimed inventions under 35 U.S.C. § 102(g). Defendants may therefore modify, amend, and/or supplement these Invalidity Contentions if and when further information becomes available.

Additionally, Defendants incorporate by reference into these contentions every claim element cross-referenced in Procomm's Infringement Contentions. For any element in Procomm's Infringement Contentions for which Procomm refers to the information from one or more other elements (whether in the same or a different patent), Defendants incorporate by reference the same cross-reference for these contentions.

Subject to the foregoing statements and qualifications, Defendants provide the following disclosures.

II. P.R. 3-3 DISCLOSURES AND CONTENTIONS

The following Exhibits (also referred to as Appendices) include claim charts of prior art references that, alone and/or in combination with other references, render the Asserted Claims of the Asserted Patents invalid under §§ 102 or 103, including (directly and/or in combination with other references that would have been obvious to combine with a charted prior art reference. Examples of such references and the motivations for making such combinations are discussed in more detail in Section II.B.

Exhibit A	U.S. Patent No. 8,583,100 (“the ’100 Patent”)
Exhibit B	U.S. Patent No. 7,103,377 (“the ’377 Patent”)
Exhibit C	U.S. Patent No. 7,834,721 (“the ’721 Patent”)
Exhibit D	U.S. Patent No. 8,497,813 (“the ’813 Patent”)
Exhibit E	U.S. Patent No. 7,724,521 (“the ’521 Patent”)

A. P.R. 3-3(a) Disclosures: Identification of Items of Prior Art that Anticipate

Subject to Defendants’ reservation of rights, Defendants contend that the following prior art patents, printed publications, and systems, alone and/or in combination, anticipate and/or render obvious the Asserted Claims of the Asserted Patents.

As noted above, however, Procomm’s infringement contentions are deficient, prejudicing Defendants’ ability to identify and evaluate prior art and complete these contentions. To the extent Procomm is permitted to supplement or amend its Infringement Contentions (including to address the deficiencies identified by Defendants), Defendants reserve the right to supplement or amend these contentions. Moreover, discovery is ongoing, and Defendants’ prior art investigation and third party discovery are therefore not yet complete. Accordingly, Defendants reserve the right to present additional items of prior art under 35 U.S.C. § 102(a), (b), (e), (f) and/or (g), and/or § 103 located during the course of discovery or further investigation. For example, Defendants expect to issue subpoenas to third parties believed to have knowledge, documentation, and/or corroborating evidence concerning some of the prior art listed in this and the following sections and/or additional prior art. These third parties include, without limitation, the authors, inventors, or assignees of the references listed in these disclosures. In addition, Defendants reserve the right to assert invalidity under 35 U.S.C. §§ 102(c) or (d) to the extent that discovery or further investigation yields information forming the basis for such invalidity.

While the categories of art (patents/applications, non-patent publications, and systems) below are organized by asserted patent number, because of the overlapping nature of the asserted patents, Defendants identify each reference in each category as art applicable to each of the asserted patents.

1. Prior Art Patents and Published Patent Applications

Defendants disclose the following patents and patent application publications:

a. The '100 Patent

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
A-01	WO2006/040653	WO	Aarflot	April 20, 2006	October 12, 2004	Aarflot
A-03	6,963,552	US	Sabat, Jr.	November 8, 2005	March 27, 2000	Sabat '552
A-04	6,584,146	US	Bose	June 24, 2003	March 31, 2000	Bose '146
A-06	7,899,495	US	Laroia	March 1, 2011	July 14, 2006	Laroia
A-07	6,785,558	US	Stratford	August 31, 2004	December 6, 2002	Stratford
A-08	6,985,484	US	Wiedeman	January 10, 2006	January 26, 1999	Wiedeman

b. The '377 Patent

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
B-01	98/00996	WIPO	Naidu	January 8, 1998	January 8, 1998	Naidu
B-02	98/10600	WIPO	Sabat	March 12, 1998	March 12, 1998	Sabat
B-03	5,867,763	US	Dean	February 2, 1999	February 2, 1999	Dean

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
B-04	6,188,678	US	Prescott	February 13, 2001	February 13, 2001	Prescott
B-05	01/95427 A2	WIPO	Owen	December 13, 2001	June 5, 2001	Owen
B-06	02/28120 A2	WIPO	Kasapi	April 4, 2002	September 29, 2000	Kasapi
B-07	2003/0162516 A1	US	Solum	August 28, 2003	February 25, 2002	Solum
	5,669,066	US	Borg	September 16, 1997	September 16, 1997	Borg
	5,301,364	US	Arens	April 5, 1994	April 5, 1994	Arens
	2002/0061738 A1	US	Simmons	May 23, 2002	November 21, 2000	Simmons

c. The '721 Patent

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
C-01	2004/084340	WIPO	Jouni	September 30, 2004	September 30, 2004	Jouni
C-02	7,205,868	U.S.	Park	April 17, 2007	November 17, 2003	Park
C-03	6,255,919	U.S.	Smith	July 3, 2001	September 17, 1999	Smith
C-04	2007/005249 5	U.S.	Wada	N/A	March 8, 2007	Wada
C-05	2006/010349 3	U.S.	Kley	N/A	May 18, 2006	Kley
C-06	2006/058965	WIPO	Jouni	June 8, 2006	June 8, 2006	Jouni 965
C-07	2004/105173	WIPO	Park	December 2, 2004	December 2, 2004	Park 173

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
C-08	2006/0139128	U.S.	Ala-Kojola	June 29, 2006	March 17, 2004	Ala-Kojola
C-09	6,255,922	U.S.	Malmström	July 3, 2001	July 3, 2001	Malmström
	4,024,481	U.S.	Kivi	May 17, 1977	January 7, 1976	Kivi
	4,477,786	U.S.	Tamura	October 16, 1984	January 26, 1982	Tamura
	2001/0043132	U.S.	Saito	November 22, 2001	March 28, 2001	Saito

d. The '813 Patent

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
D-01	U.S. Patent No. 5,986,618	U.S.	Aakalu	November 16, 1999	November 16, 1999	Aakalu
D-02	U.S. Patent Application Pub. No. 2007/0296518 A1	U.S.	Avramis	December 27, 2007	December 27, 2007	Avramis
D-03	U.S. Patent App. Pub. No. 2006/0250311 A1	U.S.	Bishop	November 9, 2006	November 9, 2006	Bishop
D-04	U.S. Patent No. 3,495,176	U.S.	Harner	February 10, 1970	February 10, 1970	Harner
D-05	JPH06101646 B2	Japan	Fujitsu Ltd.	December 12, 1994	December 12, 1994	Fujitsu

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
D-06	U.S. Patent App. Pub. No. 2009/0134755 A1	U.S.	Lakoduk	May 28, 2009	May 28, 2009	Lakoduk
D-07	U.S. Patent No. 7,043,280	U.S.	Shields	May 9, 2006	May 9, 2006	Shields

e. The '521 Patent

Exh.	Patent/Publication No.	Country of Origin	First Named Inventor	Issue/Publication Date	Relevant Priority Date	Short Title
E-01	2010/0072001	US	Chen	March 25, 2010	January 11, 2007	Chen
E-02	7,027,300	US	Lord	April 11, 2006	April 11, 2006	Lord
E-03	7,450,382	US	Fischer	November 11, 2008	May 15, 2007	Fischer
E-04	7,028,753	US	Sterner	April 18, 2006	April 18, 2006	Sterner
E-05	5,894,407	US	Aakalu	April 13, 1999	April 13, 1999	Aakalu
	2007/0080590	US	Vinson	April 12, 2007	October 11, 2005	Vinson
	6,494,252	US	Takala	December 17, 2002	December 17, 2002	Takala
	6,788,535	US	Dodgen	September 7, 2004	September 7, 2004	Dodgen
	2010/0302728	US	Knaup	December 2, 2010	December 2, 2010	Knaup

2. Prior Art Non-Patent Publications

In addition to the patents and patent and patent application publications, Defendants disclose the following additional publications:

a. The '100 Patent

Exh.	Title	Author / Publisher	Date Published	Short Title
A-02	The Vanu Anywave™ Base Station Subsystem – A Radio Access Network for 2G/3G and Future Wireless Standards	Vanu, Inc.	April 2006	Vanu White Paper
A-02	Distributed antenna systems plus software radio: Range extension and other benefits	Vanu, Inc.	November 2006	Vanu SDR2006
A-02	Mobile Phone System Passes Texas Test	IEEE Spectrum	February 2004	IEEE Spectrum News
A-02	Vanu GSM Base Station System – ADC Digivance and Telos Sonata Configuration	Vanu, Inc.	August 2004	Vanu-ADC-Telos GSM Configuration Guide
A-05	Improving Reliable Transport and Handoff Performance in Cellular Wireless Networks	H. Balakrishnan (UC Berkeley)	December 1995	Balakrishnan

b. The '813 Patent

Exh.	Title	Author / Publisher	Date Published	Short Title
D-11	EMI Shielding Engineering Handbook	Chomerics	November 11, 2000	EMI Shielding Handbook
D-12	FlexWave Base Station System 2x1 microBTS Installation Manual	ADC Telecommunications, Inc.	2008	Flexwave
	ZXG10-GS30 Compact Outdoor BTS Installation Manual	ZTE Corp.	2006	Cabinet Installation

Exh.	Title	Author / Publisher	Date Published	Short Title
	Technical Guide to EMI/RFI Suppression in Electronic Cabinets	Equipto Electronics Corp.	April 1, 2005	Technical Guide to EMI/RFI Suppression
	Designing an RF Shielded Enclosure	Ron Brewer	May 7, 2008	Brewer

c. The '521 Patent

Exh.	Title	Author / Publisher	Date Published	Short Title
	Fluid Mechanics, 5 th ed.	Frank M. White / Elizabeth A Jones	2003	White
	Fundamentals of Fluid Mechanics, 4 th ed.	Bruce R. Munson et al. / John Wiley & Sons	2002	Munson

In addition to the prior art patents, published patent applications and non-patent publications identified above, other references are discussed in the Section II.B below that are not separately charted in an exhibit.

3. Prior Art Systems

Defendants also contend that the Asserted Claims are invalid in view of public knowledge, uses and/or offers for sale or sales of products and services that are prior art under 35 U.S.C. § 102(a) and/or 35 U.S.C. § 102(b) and/or prior inventions made in this country by other inventors who had not abandoned, suppressed, or concealed them under 35 U.S.C. § 102(g), and that anticipate or render obvious the Asserted Claims.

The following lists each system that is now known by Defendants to constitute prior art under 35 U.S.C. §§ 102(a), (b) and/or (g). Defendants contend that the following descriptions and

events are stated on information and belief, and are supported by the information and documents that will be produced by Defendants and/or third parties. As discovery is ongoing, Defendants will continue to investigate these systems, and reserve the right to supplement or amend these contentions as additional information becomes available.

Defendants also reserve the right to rely upon any system, public knowledge or use embodying or otherwise incorporating any of the prior art disclosed below, alone or in combination. Defendants further reserve the right to rely upon any other documents or references describing any such system, knowledge or use.

The following systems, and any other systems identified in these contentions, are prior art under one or more of 35 U.S.C. § 102(a), (b), and (g).

a. '100 Patent

- Vanu, Inc.'s Anywave Base Station System, which was publicly available and/or in public use as of 2006. Exhibit A-02.

b. '813 Patent

- MT-900007 Integrated Antenna Enclosure and Mounting Kit, which was publicly available and/or in public use as of March 17, 2006. Exhibit D-08
- Two-Way Signal Booster System, by TX RX Systems, Inc., which was publicly available and/or in public use as of 2003. Exhibit D-09
- E-YZ.net Panel Antenna, by e-zy.net, which was publicly available and/or in public use as of 2008. Exhibit D-10
- Flexwave Base Station System, by ADC Telecommunications, Inc., which was publicly available and/or in public use as of June, 2008. Exhibit D-12.
- Ubidyne System, which was publicly available and/or in public use as of 2008. Exhibit D-13.

B. P.R. 3-3(b) Disclosures: Each Item of Prior Art that Anticipates and/or Renders Obvious the Asserted Claim, and Obviousness Combinations and Motivations to Combine

Based on presently known information and the apparent constructions Procomm is asserting in its Infringement Contentions, the prior art references identified above anticipate the Asserted Claims or, alone or in combination with the knowledge in the art, render the Asserted

Claims obvious. To the extent Procomm asserts that any of the prior art references charted in the attached Exhibits fail to explicitly or inherently disclose any element of the Asserted Claims, Defendants contend that it would have been obvious to modify such reference to include the allegedly missing element, in view of the knowledge of one of ordinary skill in the art, the admitted prior art of the Asserted Patents, and/or in combination with any of the other prior art references identified in the Exhibits for that respective patent. To the extent Procomm contends that any reference does not anticipate the Asserted Claims, it would have been obvious to combine or modify the references with concepts from other prior art.

In particular, for each limitation of the Asserted Claims that Procomm contends is not met by a particular reference, Defendants contend that the limitation (and claim as a whole) is obvious based on a combination of that particular reference with (1) any other charted reference disclosing that limitation, (2) any other reference as identified as disclosing that limitation, (3) any admitted prior art, as explained in the background of each patent or discussed in the file history, and/or (4) the knowledge of a person of ordinary skill in the art including any of the references and concepts discussed herein regarding the relevant background and state of the art. The specific combinations of prior art that Defendants contend render the Asserted Claims obvious are readily determinable as described herein and as provided in the associated Exhibits. Defendants' obviousness grounds for each dependent claim incorporate the obviousness grounds for the claim(s) from which the dependent claim depends in addition to any obviousness grounds identified in the charts for the dependent claim.

Defendants do not yet have the benefit of Procomm positions on the prior art, including what (if any) elements it contends are missing in each prior art reference, whether Procomm agrees that a reference is in fact prior art, and whether Procomm agrees that a person of ordinary skill in

the art would be motivated to combine specific references. Defendants reserve the right to supplement these obviousness positions (including identifying additional prior art combinations and the associated reasons to combine) as discovery in the case progresses, including expert discovery.

While the categories of art (patents/applications, non-patent publications, and systems) below are organized by asserted patent number, because of the overlapping nature of the asserted patents, Defendants identify each reference in each category as art applicable to each of the asserted patents.

1. Background and State of the Art

Defendants set forth below a summary of their current understanding of the state of the art as understood as of the asserted priority dates of the Asserted Patents for the general subject matter of each of the Asserted Patents. The information discussed in this section may have formed the background knowledge of a person of ordinary skill in the art at the time the Asserted Patents were filed and may have been used in determining whether and how to combine references to achieve the claimed inventions. *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013) (stating that “the knowledge [of a person of ordinary skill in the art] is part of the store of public knowledge that must be consulted when considering whether a claimed invention would have been obvious”). Defendants expressly reserve the right to rely on each of the prior art references, systems, concepts, and technologies discussed in this Section with respect to each of the Asserted Patents. In addition to the prior art identified in Section II.A, Defendants reserve the right to rely on each of the prior art references in its prior art document production. Further, Defendants identify additional prior art references below for each patent that provide information concerning the state of the art at or before the priority date of the Asserted Claims.

a. '100 Patent

The '100 Patent is directed to “a distributed antenna system that effectively and efficiently processes wireless communications signals.” '100 Patent, 1:27-32. The '100 Patent acknowledges that it was known, in wireless communication systems, to “have distributed antenna systems expand the range of a centralized base station.” *Id.*, 1:15-17. The '100 Patent explains that one problem in wireless communications systems including a centralized base station and a distributed antenna system was that “[a]ny signals received by the distributed antennas must be sent back to the centralized base station for processing regardless of where the ultimate destination of the signal is located”, which “causes unneeded transmission of signals and results in increased latencies for users of the system.” *Id.*, 1:17-21. The '100 Patent also explains that another problem in these systems was that “each remote antenna [wa]s required to share capacity with every other antenna connected to the centralized base station”, which “causes unacceptable disruption of services for some users of the system.” *Id.*, 1:21-26.

The '100 Patent asserts that the solution to these problems was to distribute at least some of the signal processing capability (*e.g.*, digital-to-analog upconverters, analog-to-digital downconverters, OBSAI/CPRI-to-digital RF-to-OBSAI/CPRI converters, baseband processing (*e.g.*, IP packetized-to-baseband-to-OBSAI/CPRI-to-baseband-to-IP packetized converters, etc.)) – that was previously in a centralized base station – to the distributed antenna locations. *Id.*, 1:42-43, 2:42-47, 2:58-59, 7:27-31, 7:41-61 & 8:53-55 (FIG. 1), 7:31-35, 7:62-8:29, 8:57-60 & 8:66-9:2 (FIG. 6), 7:35-40, 8:30-48 & 8:55-57 (FIG. 7). The '823 Patent asserts that its solution – distributing prior base station signal processing capabilities to the distributed antenna locations – permits the antenna locations to send and receive digital (or OBSAI/CPRI, or baseband, or IP packetized) data signals over various transport mechanisms (*e.g.*, fiber optic cables, EBand/millimeter wave, etc.), and permits the antenna locations, without sending received RF data

signals back to a base station/central node for processing, to route the data signals toward their ultimate destination (*e.g.*, among other antenna locations for RF transmission at a different antenna location, to a central node/host unit connected to the Internet, etc.). *Id.*, 1:43-46, 2:52-56, 9:19-57, FIGS. 8-9.

During the prosecution of the application that eventually issued as the '100 Patent, the Patent Office examiner issued a Final Rejection of all claims except for dependent claim 14, including (i) claim 20 (which eventually, after amendment, issued as asserted claim 15) as anticipated by U.S. Patent Publication No. 2009/0129314 to Weniger et al. ("Weniger"), and (ii) claim 25 (which eventually issued, after amendment, as asserted claim 19) as anticipated by both Sabat '552 and Weniger respectively. Claim 14, which was dependent on rejected claims 9 and 13 (as being anticipated by Weniger), recited the additional bolded limitations that the Examiner found to be allowable over the prior art of record (with the rejected claim elements of claims 9 and 13 identified in italics):

A method of transmitting a wireless communication signal comprising:
receiving a first RF signal at a first remote wireless communication station;
routing a first transport signal based on the first RF signal to a second
remote wireless communication station via a network layer router co-located with
the first remote wireless communication station;
receiving the first transport signal at a co-located, network layer router at
the second remote wireless communication station;
processing the first transport signal by a base station at the second remote
wireless communication station;
receiving a second RF signal at the first remote wireless communication
station;
sending a second transport signal to a host unit based on the second RF
signal;
generating a fourth RF signal at the base station;

transmitting the fourth RF signal from an antenna of the second remote wireless base station;

sending a duplicate of the fourth RF signal to a third remote wireless communication station; and

transmitting the duplicate of the fourth RF signal from an antenna at the third remote wireless communication station.

See '100 Patent File History at 5-9-2013 Final Office Action at 2-7, 12.

Following a pair of Examiner interviews, in which the Examiner maintained his position that the pending claims (without amendment) were anticipated by either Sabat '552 or Weniger, the Applicant agreed to "amend[] the claims based on allowable claim 14", specifically stating, in part, "[i]ndependent claims 1 ... 9, 20 and 25 have been amended based on allowable claim 14." *See '100 Patent File History at 7-9-2013 Amendment at 7-12.* The amendments to claims 20 and 25 (which eventually issued as asserted claims 15 and 19) are reproduced below (with strikethroughs and brackets to show deleted limitations, and underlining to show added limitations):

20. A method of transmitting a wireless communication signal comprising:

receiving a first RF signal at an antenna of a first remote wireless communication station;

processing the first RF signal by a base station at the first remote wireless communication station;

generating a second RF signal and a first transport signal representing a duplicate of the second RF signal at the first remote wireless communication station;

transmitting the second RF signal from the antenna at the first remote wireless communication station;

routing ~~[[a]]~~ the first transport signal ~~based on the processing of the first RF signal~~ through a network of remote wireless communication stations to a second

remote wireless communication station, each remote wireless communication station having a co-located, network layer router;

transmitting a duplicate of the second RF signal based on the first transport signal from the antenna of the second remote wireless communication station;

receiving a third RF signal at the first remote wireless communication station; and

sending a second transport signal to a host unit based on the second RF signal.

25. A remote wireless communication station for transmitting high speed wireless data comprising:

a remote unit;

a router co-located with and coupled to the remote unit;

a baseband unit co-located with and coupled to the remote unit; and

an antenna coupled to the remote unit;

wherein the remote unit is configured to send uplink RF sampled data to a host unit based on RF signals received, and is configured to route data corresponding to RF signals transmitted and/or received ~~to and from a remote base station~~ over a network of ~~other~~ remote units of which the remote unit is a member;

wherein the baseband unit is configured to generate a first RF signal and a transport signal representing a duplicate of the first RF signal, wherein the remote unit is configured to:

process the first RF signal to be transmitted from the antenna coupled to the remote unit: and

send the transport signal over the network to be routed to a second of the remote units, such that a duplicate of the first RF signal can be transmitted from the second of the remote units.

See '100 Patent File History at 7-9-2013 Amendment at 7-9.

The Patent Office issued a Notice of Allowance based on these amendments, and the '100 Patent issued on November 12, 2013. *See '100 Patent File History at 7-15-2013 NOA; '100 Patent*

at 1. Thus, the examiner deemed the inventive aspects of issued claims 15 and 19 to be: (i) a remote antenna unit (ia) “generating [an] RF signal and a []transport signal representing a duplicate of th[is] RF signal”, and (ib) “transmitting” this generated RF signal from its antenna; and (ii) another remote antenna unit, after this generated transport signal was routed to it, (iia) transmitting, from its antenna, a “duplicate of th[is] RF signal” (*i.e.*, a duplicate of the RF signal generated and transmitted by the other remote antenna unit). However, these additional limitations were well known in the prior art, including the prior art cited in these invalidity contentions.

For example, there were several well-known reasons and circumstances in the art to transmit an RF signal from a remote antenna unit, send a transport signal representing a duplicate of that RF signal to another remote antenna unit, and then transmit the duplicate RF signal from the other remote antenna unit, including, for example, macro-diversity, transmit (downlink) diversity, soft-handoffs (*e.g.*, multicast handoffs, bicast handoffs, etc.), simulcasting, broadcasting, virtual patch, flood routing to avoid retransmission timeouts, etc... *See, e.g.*, Balakrishnan at 8-12; Laroia at 1:22-26, 1:40-49, 5:55-58, 6:66-7:4, 13:1-37 (FIG. 6); Stratford at 4:8-17, 13:15-21, 15:63-65, 18:45-46, 18:53-19:11; Bose '146 at 12:5-25; Sabat '552 at 7:67-8:4, 6:49-55, 9:31-35 (FIGS. 6-7); Wiedeman at 12:42-57, 13:53-62, 27:16-19. Moreover, as discussed in more detail in Section IV.B below, the '100 Patent does not disclose these steps and, accordingly, either the patent assumes (and implicitly acknowledges) that the performance of these steps, and the circumstances under which they would be performed, was well within the knowledge, skill and creativity of a POSITA, or the asserted claims are invalid under 35 U.S.C. § 112. *See* § IV.B below; *see also* '100 Patent at 8:66-9:48 (disclosing a remote station receiving an RF signal at its antenna (from a first mobile device, a fixed internet user), processing the received RF signal (which includes “form[ing] a second RF signal”), and then “rout[ing]” the formed second RF signal

“toward [its] destination” by, for example, sending it to a centralized host unit (if the “destination [is]... on the internet via IP gateway at central node 801”) or to another remote station (if the “destination [is] ... a second mobile device ... within transmission range of [the other] remote station 812”). In other words, to the extent that Plaintiff contends that the feature claimed in these added steps to gain allowance was not obvious as of the priority date of the ’100 Patent, then the asserted claims are invalid under § 112. *See also* § IV.B below. On the other hand, to the extent that Plaintiff contends that it was unnecessary to provide a more detailed description or enabling disclosure for this claimed feature, then such feature is anticipated or obvious.

As was well understood in the art, each remote antenna unit served a particular geographic area, sector, or cell (*see, e.g.*, Aarflot at [0005]; Stratford at 1:26-28, 3:44-36, 15:61-63; Sabat ’552 at 3:1-7; Laroia at 1:21-22, 14:45-48 (FIG. 7); Balakrishnan at 8-9), and hand offs may be required when a mobile device leaves the geographic area (or sector or cell) handled by one remote antenna unit into that served by another remote antenna unit (*see, e.g.*, Balakrishnan at 8-9; Laroia at 1:31-34, 1:40-47, 5:55-58, 11:57-64; Wiedeman at 13:48-60; Bose ’146 at 12:4-9, 12:20-25). Thus, when traversing geographic areas, sectors, or cells, the mobile device may require the same RF signal to be transmitted by multiple, different remote antenna units. A soft handoff, allows the mobile device to receive the same RF signal from different remote antenna units and select from the strongest signal. *See, e.g.*, Balakrishnan at 8-9; Bose ’146 at 12:4-9, 12:20-25; Laroia at 1:31-34, 1:40-47, 5:55-58, 11:57-64. Additionally simulcasting, bicasting, multicasting and/or broadcasting over multiple coverage areas was well known in the art. *Id.*; *see also, e.g.*, Sabat ’552 at 7:67-8:4, 6:49-55, 9:31-35 (FIGS. 6-7); Stratford at 4:8-17, 13:15-21, 15:63-65, 18:45-46, 18:53-19:11; Bose ’146 at 12:5-20; Wiedeman at 12:42-57, 13:53-62, 27:16-19.

The Asserted Claims of the '100 Patent require “processing the [received] first RF signal by a base station at the first remote wireless communication station” (claim 15) and “the remote unit is configured to: process the first RF signal to be transmitted from the antenna coupled to the remote unit” (claim 19). Distributing signal processing capability (*e.g.*, digital-to-analog upconverters, analog-to-digital downconverters, OBSAI/CPRI-to-digital RF-to-OBSAI/CPRI converters, baseband processing (*e.g.*, IP packetized-to-baseband-to-OBSAI/CPRI-to-baseband-to-IP packetized converters, etc.) – that was previously in a centralized base station – to distributed antenna locations was well-known in the art. *See, e.g.*, Aarflot at FIGS. 6, 8A, 8B (and accompanying disclosure); Vanu White Paper at 4-8, 10, Figures 3, 4, 7, 10, 11; Vanu-ADC-Telos GSM Configuration Guide at 1, 3, 5, Figure 3; Sabat '552 at 7:5-16, FIG. 4, 4:43-44, 10:6-16, FIG. 8; Bose '146 at 6:10-19, 6:24-28, 7:8-15, 9:8-24, 10:15-19, 11:10-22, 7:32-37, FIGS. 2, 3; Stratford at 6:35-48, 15:58-65, 16:13-17:17, 17:32-34, 17:45-56, FIGS. 3, 7, 8, 15, 16, 17; Laroia at 5:11-17, 5:39-48, 6:58-7:22, 9:21-23, FIG. 2, FIG. 6.²

The Asserted Claims of the '100 Patent require “a baseband unit co-located with and coupled to the remote unit”, and wherein this co-located “baseband unit is configured to generate a first RF signal and a transport signal representing a duplicate of the first RF signal”, (claim 19), and “generating a second RF signal and a first transport signal representing a duplicate of the second RF signal at the first remote wireless communication station” (claim 15). Co-locating, at a remote unit, an interface to/from sources of backhaul data was known in the art. *See, e.g.*, Vanu White Paper at 7, 10, Figures 10-11; Bose '146 at 7:32-37, FIGS. 2-3; Laroia at 5:39-48, 6:58-7:4,

² Moreover, as discussed in § IV.B below, Plaintiff’s apparent interpretation of the '100 Patent Asserted Claims of the '100 Patent - that the “processing” steps can be performed at , or through, a centralized, “common base station” (small cell) connected to each of the remote antennas of the DAS via fiber – would bring in significantly more prior art, and would be yet another reason that these claims are anticipated and/or obvious. *See 01 Communique*, 889 F.3d at 742-743.

7:5-22, 9:21-23, 12:50-56, 13:16-23, 5:11-17, FIGS. 2, 6, 7; Wiedeman at 14:29-47. And, to the extent that, as Plaintiff appears to allege in its Infringement Contentions, these claim requirements can be met by either a remote unit generating an RF signal for transmission over its antenna from a received baseband signal or from a received CPRI/OBSAI-formatted signal, or by a baseband unit at a common, centralized base station that is connected to the remote antennas by optical fiber, (e.g., the remote unit receives fronthaul or midhaul data), such functionality was well-known in the art. *See, e.g.*, Vanu White Paper at 2, 9, Figures 3, 6; Aarflot at [0056], [0060], [0063]-[0064], [0066]-[0067], Figures 6, 8A, 8B, 2D-2F, 5; Sabat '552 at 6:62-7:4, FIG. 4, 4:43-44; Bose '146 at 6:24-28, 11:13-18, 12:4-9, 12:20-25, FIG. 1 (and accompanying description); Stratford at 15:58-61, 16:45-17:17, 17:32-34, 17:45-56, FIGS. 3, 16, 17.

The Asserted Claims of the '100 Patent require “routing the first transport signal through a network of remote wireless communication stations to a second remote wireless communication station, each remote wireless communication station having a co-located, network layer router” (claim 15), and “a router co-located with and coupled to the remote unit”, “wherein the remote unit ... is configured to route data corresponding to RF signals transmitted and/or received over a network of remote units of which the remote unit is a member” and “wherein the remote unit is configured to: ... send the transport signal over the network to be routed to a second of the remote units” (claim 19). Having remote units communicate with each other over OSI network layer 3 (or higher) communication protocols (e.g., TCP/IP, TCP, etc.) was well-known in the art. *See, e.g.*, Vanu White Paper at 8, 10, Figures 10-11, 8; Vanu SDR2006 at §3.4, §4.1; at 6; Vanu-ADC-Telos GSM Configuration Guide at 3-4, Figures 1-3; Sabat '552 at 10:6-16, FIG. 8, 9:63-10:3, claim 2; Bose '146 at 9:1-5, 7:54-61, 7:65-8:18, 9:62-63, 10:1-15, 10:35-41, 7:32-37, FIG. 2, 12:4-25, 10:56-11:22, 11:65-12:3, FIG. 3; Aarflot at [0078], [0071]; Wiedeman at 4:2-9, 9:22-24, 9:31-

33, 9:35-38, 9:46-49; Laroia at 4:47-51, 5:39-48, 6:45-52, 14:7-10; Balakrishnan at 2, 8-9. And, to the extent that, as Plaintiff appears to allege in its Infringement Contentions, these claim requirements can be met by having remote units communicate with each other over Ethernet, OBSAI, or CPRI, this functionality was also well-known in the art. *See, e.g.*, Aarflot at claims 32-33, [0051]-[0054], FIG. 5, [0081], [0005], FIGS. 2D-2F, [0045], [0062], FIG. 7, [0056], FIG. 6, [0016], [0063]-[0064], [0066], [0067], FIGS. 8A-8B; Sabat '552 at 6:49-55; Bose '146 at 2:62-65; Vanu White Paper at 6, Figures 3, 6; Vanu SDR2006 at §3.2, §3.4, §4.1; Stratford at 4:25-33.

To the extent that, despite its allegations in its Infringement Contentions, Plaintiff attempts to argue that, for example, references describing remote antenna units communicating with each other using OBSAI and/or CPRI, do not explicitly disclose packetizing data, and/or do not explicitly disclose including destination information in packets, and Plaintiff attempts to argue that these are technical differences between the “routing” alleged in its Infringement Contentions and the “routing” disclosed in the prior art, the use of packetizing and destination information was well-known in prior art versions of OBSAI and CPRI which would have been well-known, and part of the background knowledge of, a person of ordinary skill in the art. For example:

- prior art versions of the OBSAI standard protocol (*e.g.*, Reference Point 3 Specification Version 3.1 and BTS System Reference Document Version 2.0 (publicly accessible in 2006) were based on packetizing communications between a local baseband module and a remote RF module (remote radio unit). *See, e.g.*, RP3 Spec at 24 (“The protocol stack is based on a *packet concept*...”), 24 (Figure 9 showing “Address” included in each packet), 42-44, 48, 77-78; Figures 25, 49-50; *see also* BTS Sys. Ref. at 53 (“Addressing Principles”). As another example, Figure 11 of the prior art OBSAI specification shows the packet with an address field. RP3 Spec at 26. The address of the packet identifies the remote unit intended to receive the packet. *Id.*
- prior art versions of the CPRI standard protocol (*e.g.*, CPRI Interface Specification V2.1) disclosed packetizing and using addresses such as MAC addresses to route signals to a desired RE node. CPRI defines a standard protocol for base station equipment sub-components to digitally interface or communicate with each other. *See, e.g.*, CPRI2.1 at p. 4 (“Introduction”); p. 5 (“This specification defines the protocols for...”). The standard divides the base station functions into two halves or components which are labeled Radio

Equipment Control (REC) components and Radio Equipment (RE) components. CPRI2.1 at 4 (“Introduction”), 5 (“Definitions/Nomenclature”). The REC and RE are also called nodes in the CPRI standard, and the CPRI interface communication protocol permits the RE subcomponent to be located remotely from the REC subcomponent. CPRI2.1 at 7 (“2.2 System Architecture. [R]adio base stations should provide deployment flexibility for the mobile network operators, i.e., in addition to a concentrated radio base station, more flexible radio base station system architectures involving remote radio equipment shall be supported.”); p. 4 (“The physical layer (layer 1) supports...an optical interface (e.g. for radio base stations with remote radio equipment).”) The CPRI standard defines a specific protocol for mapping and framing IQ payload data into defined CPRI frames for transmission over the CPRI link. CPRI2.1 at 26 (“4.2.7.2 Mapping of IQ-data”); at 26-27 (“Mapping of IQ Samples within one AxC Container. An AxC Container is a sub-part of the IQ data block of a basic frame.”). The framing structure is defined and discussed at length in section 4.2.7 of the CPRI standard. CPRI2.1 at 24-37 (“4.2.7 Frame Structure”), Figures 7, 14, 16. The CPRI protocol discloses the use of destination addresses for more complex networked topologies (e.g., chained remote units as taught by, for example, Aarflot). CPRI2.1 at 68-69 (6.3.2 and 6.3.3) (“address table...used for switching...addresses to all REs”); at 7-8 (“The common public radio interface may also be used as a link between two nodes in system architectures supporting networking.”), Figs. 5A, 5B, 5C. CPRI teaches that address information can be used in combination with address tables to enable an RE in a networked topology (such as tree or ring) to switch the signals it receives between multiple different output ports (*i.e.*, the “general solution” applicable to “chain, tree or ring” topologies). *See, e.g.*, CPRI2.1 at 68-69 (“The application layer defines the address table used for switching. It is managed in the REC that has full knowledge of the topology and all addresses to all RE’s. The HDLC or Ethernet address can be used to define a table that maps a CPRI port to an address ...”)

Thus, any reference teaching to use CPRI and OBSAI expressly and inherently disclose packetizing and including destination information. To the extent Plaintiff disputes whether the CPRI and OBSAI standard go beyond the four corners of a reference that teaches to use these standards, alternatively and additionally, it would be obvious to combine any of the charted references teaching to use CPRI and OBSAI with the CPRI/OBSAI standard documents to perform packetizing and to include destination information.

The Asserted Claims of the ’100 Patent require “sending a second transport signal to a host unit based on the second RF signal” (claim 15), and “wherein the remote unit is configured to send uplink RF sampled data to a host unit based on RF signals received” (claim 19). Having remote antenna units include bi-directional conversion functionality to convert to/from analog RF signals

from/to digital sampled RF, to convert between serial digital data and digital RF sampled data, and/or to convert between OBSAI/CPRI protocol data and digital RF sampled data, for communicating with a centralized host unit was well-known in the art. *See, e.g.*, Aarflot at [0005], [0046], [0063]-[0065], [0067]; FIGS. 8A, 8B; Vanu White Paper at 6, Figure 7, 9, 10, Figures 10-11; 6:1-5; Sabat '552 at 6:1-6, FIGS. 1, 8, 10:6-16, 7:14-17, 9:63-10:3, 3:1-7; 3:41-43, 6:31-36; Bose '146 at 6:14-19, 6:24-28, 7:8-15, 9:8-24, 10:15-19, 11:10-22, 7:54-61, 7:65-8:18, 9:62-63, 10:1-15, 10:35-41, 12:4-25, 10:56-11:22, 11:65-12:3; Laroia at 4:45-52, 14:3-38 (FIG. 7), 15:52-16:2, 16:13-36 (FIG. 9).

b. '377 Patent

The '377 Patent is directed to “a method for proportional gain distribution in a system comprising a plurality of distributed antennas.” '377 Patent, 1:59-61. The goal of the disclosed proportional gain distribution method is to solve the problem of “adequately controlling the aggregate signal in a single path distributed antenna system.” *Id.* at 1:53-55. According to the Description, the disclosed method solves this problem “[b]y distributing signal attenuation and control of the attenuation” in order to “retain the original system dynamic range.” *Id.* at 2:41-43. The disclosed method accomplishes this goal by using a “signal level threshold [that] prevents small but valid signals from being attenuated to the point of being useless while the unused dynamic range is redistributed to signals that require the additional dynamic range.” *Id.* at 2:43-47.

All of the originally filed claims, including independent claim 1, were allowed without amendment. According to the examiner, the cited references did not disclose or render obvious:

comparing at least one of the plurality of signal levels from an antenna with a dynamic range fair share threshold; and attenuating each of the at least one of the compared signal levels that is greater than the dynamic range fair share threshold with a gain factor that is determined in response to a remaining portion of the total

system dynamic range after attenuation of other signal levels, as specified in the independent claims 1, 7, 10, 13-14, 18, 21 and 22.

'377 Patent File History, Notice of Allowance mailed 04/26/2006, page 2. Thus, the examiner deemed the inventive aspects of claim 1 to be “a dynamic range fair share threshold” and “a gain factor that is determined in response to a remaining portion of the total system dynamic range after attenuation” of other signals. However, gain control techniques with these features were well known in the prior art, including the prior art charted in these invalidity contentions.

For example, at least as early as the 1990s, it was well known in the art to variably control gain of signals transmitted in a communications system in order to keep the signals within the dynamic range of the system and optimize performance. Such well-known techniques operated by comparing received signals to a threshold or reference signal and then varying a gain factor applied to the signals to reduce noise interference and avoid saturation. *See, e.g.*, U.S. Patent No. 5,669,066 (*e.g.*, Abstract; Claim 1 (6:65-7:34); Claim 5 (7:51-6:29); Claim 11 (9:3-61); Claim 17 (10:49-11:12)); U.S. Patent No. 5,301,364 (*e.g.*, Abstract; 4:52-66; Claim 1 (7:13-8:2); Claim 6 (8:20-10:5)); U.S. Pub. No. 2002/0061738 A1 (*e.g.*, Abstract; paras. [0010]-[0015]).

The need to employ automatic gain control techniques for signals transmitted in distributed antenna systems where the effects of multiple signals present within a transmission path must be taken into account to optimize performance was also well known in the art at the time of the claimed invention. For example, at least as early as the mid-1990s, Naidu had recognized that a problem in distributed antenna networks was to “adequately control gain so that strong signals do not saturate the system and weak signals are not unnecessarily reduced below the noise floor.” Naidu, page 3, lines 20-22. To address this problem, Naidu discloses a technique that “control[s] the level of signals transmitted from remote antenna units over transmission media in a distributed antenna network so that signals covering a wide range of amplitudes may be transmitted over

transmission media having a more narrow range of amplitudes for transmitting signals.” *Id.*, page 3, lines 24-28.

Others had developed gain control techniques to optimize performance in distributed antenna systems. For example, it was well known in the art to implement gain control to provide “selective interference mitigation (or nulling)” (*see, e.g.*, Kasapi at Abstract) and beam-shaping (*see, e.g.*, Owen at Abstract). Further, to avoid the problem of a single large signal saturating the system or limiting the amount of traffic the system can handle, it was well known in the art at the time of the claimed invention to implement gain control techniques in a distributed manner so that the combined power of all signals in a distributed antenna system does not exceed a system threshold. *See, e.g.*, Solum, paras. [0001], [0002], [0019].

The Asserted Claim of the ’377 Patent is directed to a method for “gain distribution in a system comprising a plurality of distributed antennas and a total system dynamic range.” Gain distribution techniques in communication systems having a dynamic range, including in distributed antenna systems having a total system dynamic range were well known in the art. For example, Naidu at Abstract; Solum at Abstract; Kasapi at Abstract; Owen at Abstract.

The Asserted Claim of the ’377 Patent requires “sensing a signal level at each of the plurality of distributed antennas.” Gain control techniques for communication systems which sense the signal level at an antenna, including at each of a plurality of distributed antennas, were well known in the art. *See, e.g.*, Solum at para. [0017] (“Signal levels at each input port [] are monitored by input power calculators”); Naidu at Abstract (“each remote antenna unit includes a signal level comparator for comparing the level of the signals received by the respective antenna unit with a predetermined reference level”).

The Asserted Claim of the '377 Patent requires “comparing” at least one of the signal levels with “a dynamic range fair share threshold.” Gain control techniques that include comparing a signal level with a threshold or reference signal were well known in the art. For example, Solum discloses a controller that determines fair weights for individually controlling the gain of received signals “so that the signals do not exceed a predetermined threshold.” Solum at para. [0014]. *See also* Solum at para. [0017] (“Signal levels at each input port [] are monitored and evaluated by input power calculators [] to determine whether any transmission link [] is providing a signal that exceeds a predetermined level.”); Naidu at Abstract (“each remote antenna includes a signal level comparator for comparing the level of the signals received by the respective antenna unit with a predetermined reference level”).

The Asserted Claim of the '377 Patent requires “attenuating” each of the compared signal levels that exceeds the threshold “with a gain factor.” Gain control techniques that include attenuating signal levels that exceed a threshold with a gain factor were well known. For example, Naidu discloses “a gain controller for reducing the gain of the remote antenna unit when the signal level comparator determines that the level of the received signal exceeds said predetermined threshold.” Naidu at Abstract. *See also* Solum at paras. [0014]-[0017].

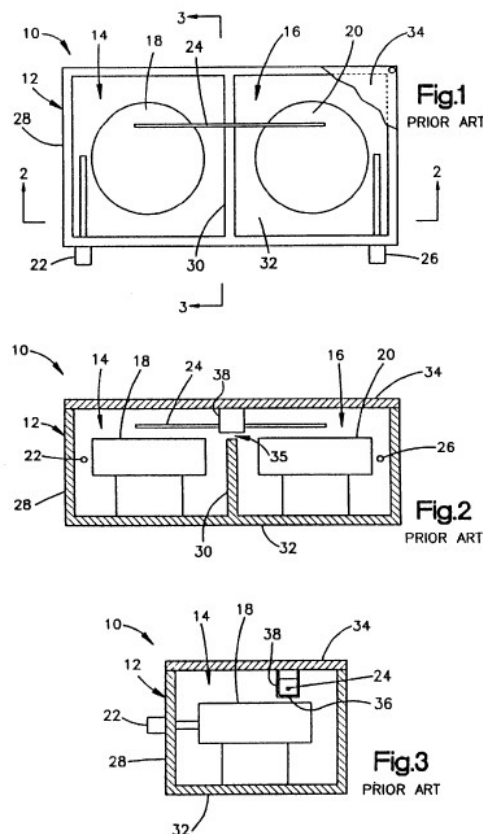
The Asserted Claim of the '377 Patent requires that the “gain factor” “is determined in response to a remaining portion of the total system dynamic range after attenuation of other signal levels.” Gain control techniques that dynamically determine the gain factor to retain the system dynamic range after attenuation of other signal levels were well known in the art. For example, Solum discloses distributed gain control measures that use a fair weighting function to individually control gain of each signal so that the combined power of all signals does not exceed a threshold. *E.g.*, Solum at paras. [0001], [0014]-[0017], [0019]. *See also* Naidu at Abstract.

c. '721 Patent

The '721 Patent is directed to a system for “selectively tuning multicavity filter of high frequency signals (HF), in particular microwave filters.” '721 Patent, 1:6–8. One of the purposes of a microwave filter is to minimize the insertion loss within a pass band filter and maximize the rejection of undesired signals outside the pass band based upon the determined electrical specifications. *See* '721 Patent, 1:22–27. The '721 Patent acknowledges that “[u]sually regulating means are introduced for each resonator and between any contiguous cavity: tuning properly these means, typically in the form of screws that pass through the lid and stick inside the body filter for a proper quote, makes the desired frequency response possible to be obtained.” '721 Patent, 1:28–32. The '721 Patent explains “[i]t is also known that a filter could be tuned in different frequency bands by simply changing synchronously the resonant frequency of each cavity, maintaining the same coupling strength.” '721 Patent, 1:34–37.

Further, Smith explains “[a] prior art microwave resonator filter 10 is shown schematically in FIG. 1-3.” Smith, 1:17–18. “The filter 10 includes an enclosure structure 12 which defines first and second cavities 14 and 16.” *Id.*, 1:18–20. “The cavities 14 and 16 contain first and second resonators 18 and 20, respectively.” *Id.*, 1:20–21. “An electromagnetic (“EM”) wave is received by the filter 10 through an input device 22 which is coupled to the first resonator 18.” *Id.*, 1:22–24. “The EM wave is transmitted to the second resonator 20 through a coupling member 24, and is transmitted from the filter 10 by an output device 26, which is coupled to the second resonator 20.” *Id.*, 1:24–27. “The structure of the cavities 14, 16, the resonators 18, 20, and the coupling member 24 affect the frequency response of the filter 10, as is known in this art.” *Id.*, 1:27–30. “The enclosure 12 includes a peripheral outer wall 28, an inner wall 30, a base wall 32 and a removable closure wall 34.” *Id.*, 1:31–33. “The inner wall 30 is shorter than the outer wall 28 such that a gap 35 (FIG. 2) is defined between the inner wall 30 and the closure

wall 34.” *Id.*, 1:33–35. “As shown in FIG. 3, the coupling member 24 is a wire surrounded by an insulating material 36.” *Id.*, 1:35–37. “A holding device 38 holds the coupling member 24 beneath the closure wall 34 in a position extending longitudinally between the two cavities 14 and 16 through the gap 35.” *Id.*, 1:37–40. “The positioning of the coupling member 24 affects the transmission of the electromagnetic wave between the resonators 18 and 20 in the cavities 14 and 16.” *Id.*, 1:40–42. “Therefore, the coupling element 24 must be positioned precisely relative to the resonators 18 and 20.” *Id.*, 1:42–44.



Smith FIGS. 1–3.

The Asserted Claims of the ’721 Patent are directed to a “system for tuning a simple or complex multicavity high frequency and microwave filter, including a body filter; [and] a removable lid.” ’721 Patent, cl. 1. A system for tuning a simple or complex multicavity high

frequency and microwave filter, including a body filter; and a removable lid were well known in the art, as acknowledged by the specification of the '721 Patent: “[u]sually regulating means are introduced for each resonator and between any contiguous cavity: tuning properly these means, typically in the form of screws that pass through the lid and stick inside the body filter for a proper quote, makes the desired frequency response possible to be obtained.” ’721 Patent, 1:28–32. Other prior art also discloses said claim 1 limitation. *See, e.g.*, Jouni, Pg. 5, ln. 6–20; Park, 3:43–53; and Smith, 2:21–33.

The Asserted Claims of the '721 Patent also require “n resonant cavities in said body filter; n resonant rods, disposed in the middle of each cavity.” ’721 Patent, cl. 1. This claim limitation was well known in the art, as acknowledged by the specification of the '721 Patent: “[u]sually regulating means are introduced for each resonator and between any contiguous cavity: tuning properly these means, typically in the form of screws that pass through the lid and stick inside the body filter for a proper quote, makes the desired frequency response possible to be obtained”— “[i]t follows that getting a selective filter tuned in translated bands with the same electric response is possible by simply changing synchronously each cavity’s natural frequency.” ’721 Patent, 1:28–32; 1:38–40. Other prior art also discloses said claim 1 limitation. *See, e.g.*, Jouni, Pg. 8 ln 3–19; Park, 3:43–53; and Smith, 3:10–20.

The Asserted Claim of the '721 requires “n tuners passing through the filter lid in correspondence to each resonating rod and tuner moving device.” ’721 Patent, cl. 1. This claim limitation was well known in the art, as acknowledged by the specification of the '721 Patent: “[i]t follows that getting a selective filter tuned in translated bands with the same electric response is possible by simply changing synchronously each cavity’s natural frequency.” ’721 Patent, 1:38–

40. Other prior art also disclosed said claim 1 limitation. *See, e.g.*, Park, Abstract; Smith, 3:10–20; and

The Asserted Claims of the '721 Patent requires “a subsystem is associated with each tuner to compensate for vibrations and oscillations.” '721 Patent, cl. 1. This claim limitation was well known in the art. *See, e.g.*, Park, 24:57–25:12; Park 173, Pg. 8, ln. 12–33; and Malmström, Claim 1.

The Asserted Claims of the '721 Patent requires “the lid is provided with n slots, which are longitudinally placed over the middle of the cavity and have a length sufficient to assure the tuning in every frequency band.” '721 Patent, cl. 1. This claim limitation was well known in the art. *See, e.g.*, Jouni, Pg. 5, ln. 6–20; Park, Abstract; and Ala-Kojola, [0010].

The Asserted Claims of the '721 Patent further requires “the subsystem [to] comprise[] means for longitudinal translation of said tuners and means for making the tuner components elastic.” '721 Patent, cl. 1. This claim limitation was well known in the art. *See, e.g.*, Park, 24:57–25:12; Park 173, Pg. 8, ln. 12–33; and Malmström, Claim 1.

d. '813 Patent

The '813 Patent was amended during prosecution to overcome prior art rejections, including a rejection of the asserted claims under 35 U.S.C. § 103(a) in view of U.S. Pat Pub. 2006/0250311 A1 to Bishop (“Bishop”) and U.S. 3,495,173 to Hamer et al. (“Hamer”). The examiner explained that “Bishop discloses an enclosure 102 including a rear panel, a first side wall, and a second side wall, a top wall and a bottom wall, the rear panel and the walls defining a cavity (figure 1), the walls further defining an aperture through which the cavity of the enclosure may be accessed an internal cover 106, the internal cover being dimensioned to overlap an area defined by the aperture of the enclosure and providing an environmental seal (via lip 314, figure 3) and electromagnetic shielding (via conductive ground plane 306) for the cavity, the internal

cover having at least one RF radiating module 308,310 fastened to an exterior surface thereof, at least one micro radio 304 mounted inside the enclosure, the micro radio being coupled to the RF radiating module; and a radome 312 mounting to the internal cover and enclosing the RF radiating module (figures 1-5).” The examiner stated that Bishop did not disclose “first/second micro radio mounted to an internal surface of the side walls; communications hub and calibration radio.” The examiner explained that Horner taught those aspects: “Horner et al teach micro radio mounted to an internal surface of the side wall (figure 9); heat sinks 69 mounted to an external surface of the side walls and communications hub 78.” The examiner explained that “[i]t would have been obvious to provide Bishop with first/second micro radio mounted to an internal surface of the side walls; a first/second/third heat sink mounted to an external surface of the side walls; communications hub and calibration radio for the purpose of enabling heat to be dissipated from electronic components sealed within the enclosure so as to improve the antenna gain.”

The examiner noted that dependent claim 8 was objected to as depending from a rejected base claim, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims. Thus, the examiner found that the only inventive aspect of the claims of the '813 Patent over the prior art was the combination of the disclosure of asserted claim 1 (which was known in the art), with the additional limitations of pending claim 8, which required: “[t]he panel antenna of claim 1, wherein a flange joins the first and second side walls and the top and bottom wall, and a lip extends from the flange, further defining the aperture through which the cavity of the enclosure may be accessed, the lip being engaged by the internal cover to provide the environmental seal.”

In response to this rejection, the applicants amended claim 1 to include the limitations of dependent claim 8, as follows:

1. (currently amended) A panel antenna, comprising:

an enclosure, the enclosure including a rear panel, a first side wall, and a second side wall, a top wall and a bottom wall, the rear panel and the walls defining a cavity, the walls further defining an aperture through which the cavity of the enclosure may be accessed,

an internal cover, the internal cover being dimensioned to overlap an area defined by the aperture of the enclosure and providing an environmental seal and electromagnetic shielding for the cavity, the internal cover having at least one RF radiating module fastened to an exterior surface thereof,

at least one micro radio mounted to an internal surface of the first side wall, the micro radio being coupled to the RF radiating module;

a first heat sink, mounted to an external surface of the first side wall, and

a radome, the radome mounting to the internal cover and enclosing the RF radiating module[.].

wherein a flange joins the first and second side walls and the top and bottom wall, and a lip extends from the flange, further defining the aperture through which the cavity of the enclosure may be accessed, the lip being engaged by the internal cover to provide the environmental seal.

As shown in the prior art cited in these contentions, these additional limitations were also well known in the prior art. For example, Avramis discloses a flange and lip that is engaged by the cover. *See, e.g.*, Avramis at Fig. 5, [0014]. Bishop likewise discloses a flange and lip. *See, e.g.*, Bishop at Fig. 3; [0010], [0046]. Lakoduk also discloses a flange and lip, as claimed. *See, e.g.*, Lakoduk at Figs. 8, 13, 23C, [0101], [0106], [0109], [0110], [0124]. *See also, e.g.*, DE102006020504A1 at Fig. 1, [0001]. NHTSA also discloses enclosures using flanges for sealing

from harsh environments. *See* NHTSA at 3.3.3.1 (“The enclosure is designed to provide protection from a harsh environment. The box has a flanged edge around the perimeter of the opening to provide a good sealing surface. This flange also increases the rigidity of the opening.”).

The Asserted Claims of the ’813 Patent are directed to a “panel antenna”. ’813 Patent, cl. 1, 4. Panel antennas were well known in the art, as acknowledged by the specification of the ’813 Patent: “A typical known Cellular Telephone Base Station System comprises several elements, including one or more panel antennas...” ’813 Patent at 1:14-1. *See also, id.* at 1:44-445 (“Another type of panel antenna is one where individual radio elements are associated with the radiating elements.”). Other prior art also discloses panel antennas. *See, e.g.,* E-Zy; Aakalu; Avramis; Shields; and MT-900007; Flexwave at p. 1, 42.

The Asserted Claims of the ’813 Patent require “an enclosure” “defining a cavity” that includes “a rear panel, a first side wall, and a second side wall, a top wall and a bottom wall”, in which the walls further “define an aperture through which the cavity of the enclosure may be accessed”. ’813 Patent, cl. 1. Enclosures with these requirements were well known in the art. *See, e.g.,* Avramis, Bishop, Fujitsu, Lakoduk, Two-Way Signal Booster System, and EMI Shielding Handbook.

The Asserted Claims of the ’813 Patent require “an internal cover” that overlaps “an area defined by the aperture of the enclosure and providing an environmental seal”. ’813 Patent, cl. 1. Enclosures with internal covers overlapping an aperture and providing an environmental seal were well known in the art. For example, Brewer discloses “Plain pan covers can be used but without bosses or segmented edges it is difficult to assure good contact around the perimeter”. Brewer at 9. *See also* Cabinet Installation at p. 37, Technical Guide to EMI/RFI Suppression at 3, 4, 7 and EMI Shielding Handbook, disclosing enclosures for electrical equipment, such as

antennas. Moreover, it was well known that electrical components intended to be used outside would need to be environmentally sealed. *See, e.g.*, E-ZY; MT-900007; Aakalu; Avramis; Bishop; Fujitsu; Lakoduk; FlexWave, and Two-Way Signal Booster System. *See also* NHTSA at 3.3.3.1 (“The enclosure is designed to provide protection from a harsh environment. The box has a flanged edge around the perimeter of the opening to provide a good sealing surface. This flange also increases the rigidity of the opening.”).

The Asserted Claims of the '813 Patent also require that the “internal cover” provides “electromagnetic shielding for the cavity” and that it has “at least one RF radiating module fastened to” its exterior. '813 Patent, cl. 1. It was well known in the art to provide electromagnetic shielding for electrical components in enclosures. *See, e.g.*, EMI Shielding Handbook, Aakalu, Avramis, Bishop, Fujitsu, Lakoduk, and Two-Way Signal Booster System. Moreover, the patent specification acknowledges that it was known to have RF radiating modules mounted in panel antennas. '813 Patent at 1:14-26 (“A typical known Cellular Telephone Base Station System comprises several elements, including one or more panel antennas, each panel antenna comprising an array of radiating elements mounted at an elevation above the ground, and base station electronics mounted remotely from the antenna arrays. . . . The radiating elements and feed network may be mounted on a panel antenna plate. . . . In some antennas, a ground plane for the radiating elements may be used as part of the antenna structure.”). *See also*, E-ZY, MT-900007, Aakalu, Avramis, Bishop, Fujitsu, and Lakoduk.

The Asserted Claims of the '813 Patent require “at least one micro radio mounted to an internal surface of the first side wall” and that is “coupled to the RF radiating module”. '813 Patent, cl. 1. The use of micro radios coupled with RF radiating modules was known in the art, as acknowledged by the specification. *See id.* at 1:44-445 (“Another type of panel antenna is one

where individual radio elements are associated with the radiating elements.”); *id.* at 1:50-52 (“The Communication Hub distributes the digital signal to a plurality of micro radios. An antenna radiating element is associated with each micro radio.”). *See also, e.g.,* Bishop; Harner; Fujitsu; Lakoduk; Shields; MT-900007; and Two-Way Signal Booster System.

The Asserted Claims of the ’813 Patent require “a first heat sink, mounted to an external surface of the first side wall.” ’813 Patent, cl. 1. Heat sinks were well known in the art. For example, heat sinks were disclosed in E-YZ, Aakalu, Avramis, Harner, Fujitsu, Shields, Two-Way Signal Booster System, and EMI Shielding Handbook.

The Asserted Claims of the ’813 Patent require “a radome, the radome mounting to the internal cover and enclosing the RF radiating module.” ’813 Patent, cl. 1. It was well known in the art to cover a RF radiating module with a radome to protect it and avoid interference. For example, radomes are disclosed and illustrated in E-YZ, Antenna Systems, EMI Shielding Handbook, Aakalu, Bishop, Shields, and MT-900007.

e. ’521 Patent

During prosecution, the applicant made amendments to overcome prior art rejections. For example, the Examiner rejected claim 14-16 (among others) under 35 U.S.C. 103(a) as being unpatentable over Aakalu et al (5,894,407) in view of Dellapi et al (6,142,595), stating:

“Aakalu teaches the broad method for cooling an enclosure 10 for housing electronics, the method comprising: directing heat generated by one or more electronic devices 16 housed within enclosure 10 to a heat sink/plate 32 (rear wall 20) thermally coupled to an external environment; drawing a first airflow across (as air flow crosses into the channel/opening 40 through channel 42 as seen in Fig. 3) one or more convective channels/openings 40 of the heat sink/plate 32 (rear wall 20); drawing a second airflow (the airflow coming up through the channel /opening 40 from the bottom of the plate 32/rear wall 20 in Fig. 3) of heated air from (heated air goes out the top of the channel(s)/opening(s) 40) the one or more convective channels/openings 40 using a Venturi effect created by drawing the first airflow. The Venturi chamber is considered the

channel(s)/opening(s) with the offset fan being one of the fans 72 to force the first airflow and the second airflow out of the Venturi chamber.”

Office Action of September 29, 2009, pp. 3-4.

In response, the applicant amended claim 14 as follows:

14. (Currently Amended) A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:

directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;

drawing a first airflow across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;

drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.

Response dated Dec. 15, 2009 to Office Action of September 29, 2009, p. 9, 34.

As shown in the prior art cited in these contentions, these additional limitations were also well known in the prior art.³ For example, Sterner discloses drawing a first airflow across one or more convective openings of a heat sink, wherein the first airflow does not flow into the one or more convective openings of the heatsink. Sterner 2:63-3:9, 3:21-33, 5:14-30, FIG. 8. Additional references also disclose this feature. *See, e.g.*, Chen [0007-11], [0017]; Lord 2:58-63, FIG. 1, 3:15-17, 3:44-51, FIG. 3, FIG. 8, 3:62-53, FIG. 9; Fischer 5:13-25, FIGs. 6-7; Jones 3:55-4:51, FIGs. 1-3; Aakalu 1:18-30; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6.

³ Additionally, based on Defendants’ current understanding of Plaintiff’s Infringement Contentions, Plaintiff’s apparent interpretation of these added limitations would improperly recapture the prior art for which these limitations were added to overcome the cited art, as argued by the applicant. Response date Dec. 15, 2009 to Office Action of September 29, 2009, p. 15.

Each of the Asserted Claims of the '521 Patent are directed to cooling, or a cooling unit for, an enclosure (for) housing electronics. '521 Patent cls. 1, 14. Some of the Asserted Claims of the '521 Patent require this enclosure to have a “sealed environment.” '521 Patent cl. 14. It was well known in the art to cool, or use a cooling unit for, an enclosure (for) housing electronics. See, e.g., Chen [0013], illustrated figure; Lord 1:5-9, 1:53-56, 2:58-3:7, FIG. 1; Fischer Abstract, 2:42-54, FIG. 1, 3:34-42, 4:53-61, Sterner Abstract, 3:10-44, FIG. 2, 3:45-4:7, FIG. 3A; Aakalu Abstract, 1:18-30, 2:43-3:5, FIGs. 1-2, 5, 10; Jones Abstract, 1:29-36, 2:15-38, 3:17-54, FIGs. 1-3; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6; Takala Abstract, 1:40-60, 3:34-59, FIGs. 1-8; Dodgen Abstract, 4:48-6:20, FIGs. 1-7b Additionally, it was known in the art to cool, or use a cooling unit for, a sealed environment of an enclosure housing electronics, as well as ventilated enclosure, as well as the design tradeoffs and considerations for using either a sealed or ventilated enclosure. *Id.*; see also Jones 1:15-2:7; Knaup [0005].

Each of the asserted claims require a structure capable of drawing a heated airflow, or the step of drawing a heated airflow, “using a Venturi effect.” '521 Patent cls. 1, 14. Some of the Asserted Claims require that this drawing is a result of a “Venturi chamber compris[ing] a wall for directing [an] airflow air from the surrounding environment in from [a] second inlet and across [a] heated airflow from [a] heatsink...when a fan is on” and that this fan is “electrical” and is part of a “fan shroud.” '521 Patent cl. 1. This fan may be electrical. Others require that the Venturi effect is “created by drawing [a] first airflow” “across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink” without any express requirement of using a fan. '521 Patent cl. 14; *cf.* '521 Patent cls. 15 and 16. It was well known in the art to draw fluid flows, such as airflows, including heated airflows “using a Venturi effect.” See, e.g., Chen [0010], illustrated figure; Lord 2:5-11, 2:61-3:4,

3:52-62 FIGs. 1, 7, 9; Sterner Abstract, 3:2-44, FIGs, 2, 5, 10, 11; Aakalu 2:43-58, 3:25-35, 4:55-5:10, FIG. 10; Munson 28-30, 126-27 (including V3.6), 129-131, 148, 151-53, 515-16; White 189-90, 415-19; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6; Dodgen 4:5-31. Further, it was well known in the art to achieve the Venturi effect using “Venturi Chambers” that direct a first airflow across an opening to draw a second fluid flow, including drawing a heated airflow from that opening. *Id.* It was further known to achieve this Venturi effect using a Venturi Chamber by using a fan to draw, from an outlet, or push, from an inlet, the first airflow, and the design considerations for choosing one or the other was also well known. *Id.* It was further well known to use electrical fans, including in Venturi’s. *Id.* Further, it was well known in the art to use Venturi’s in cooling applications, including directing airflows across heat sinks. *Id.*

Some of the Asserted Claims of the ’521 Patent require “a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on.” ’521 Patent cl. 1. It was well known in the art to use Venturi Chambers having a first inlet for receiving a heated airflow from a heatsink a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on. *Id.*

Some of the Asserted Claims of the ’521 Patent require “directing heat generated by one or more electronic devices” housed within the sealed environment of the enclosure “to a heatsink thermally coupled to an external environment.” ’521 Patent cl. 14. It was well known in the art to direct heat generated by components, including electronic devices, to a heatsink thermally coupled to an external environment, including where those electronics are housed in a sealed environment of an enclosure. See, e.g., Chen [0007-11, 17], illustrated figure; Lord 2:5-11, 3:24-

38 , FIGs. 1-9, FIGs. 10-17; Fischer 5:13-25; Sterner 3:45-4:7, 5:14-30, FIGs. 3A, 8; Aakalu Abstract, 1:5-8, 1:18-30, 2:59-3:5, FIGs. 1-5; Jones 1:8-11, 1:15-21, 1:29-36, 1:45-53, 2:2-7, 3:17-54, FIGs. 1-3; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6; Takala Abstract, 1:40-60, 3:34-59, FIGs. 1-8; Dodgen Abstract, 4:48-6:20, FIGs. 1-7b.

2. Obviousness and Motivations to Combine Prior Art

Defendants contend that, to the extent the references identified in these Preliminary Invalidity Contentions do not anticipate the Asserted Claims, it would have been obvious to combine those references with any of the other references, systems, concepts, or technologies discussed in this Section. Defendants believe that no showing of a specific motivation to combine prior art is required to combine the references disclosed in the attached charts; there was a reason to make each combination, each combination of art would have produced no unexpected results, and each combination at most would simply represent a known alternative to one of ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 414–18 (2007) (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test instead espousing an “expansive and flexible” approach). Indeed, the Supreme Court held that a person of ordinary skill in the art is “a person of ordinary creativity, not an automaton” and “in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like a pieces of a puzzle.” *Id.* at 420–21.

In view of *KSR*, the PTO issued a set of new Examination Guidelines. *See Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg. 57,526 (Oct. 10, 2007). Those Guidelines identified various rationales for finding a claim obvious, including:

- a) Combining prior art elements according to known methods to yield predictable results;
- b) Simple substitution of one known element for another to obtain predictable results;

- c) Use of known technique to improve similar devices (methods, or products) in the same way;
- d) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- e) “Obvious to try”—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- f) 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 would have been predictable to one of ordinary skill in the art;
- g) 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 reference teachings to arrive at the claimed invention.

Id. at 57, 529.

In addition, the motivation to combine or modify prior art references is significantly stronger when, as here, the references seek to solve the same problem, come from the same field, and correspond well. *In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001) (allowing two references to be combined as invalidating art under similar circumstances where the art “focus[ed] on the same problem . . . [,] c[a]me from the same field of art [and] . . . the identified problem found in the two references correspond[ed] well”).

Defendants have identified several exemplary motivations and reasons to combine the various references cited herein, and those motivations would have been supported, in part, by a reasonable expectation of success. The various teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references in Exhibits A-E come from various sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, the nature of the problem faced, and/or the knowledge possessed by one of ordinary

skill in the art. In addition, it would have been obvious to try combining the prior art references identified above.

These exemplary combinations demonstrate that there were only a finite number of predictable solutions to known problems addressed by the Asserted Patents. Furthermore, known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of features found in the prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options, with each such option having a reasonable expectation of success. Additionally, one of ordinary skill in the art would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less expensive, become more commonly used, provide better performance and reliability, reduce costs, or predictably achieve other clearly desirable results.

To the extent Procomm alleges that any other claimed limitation or limitations are not disclosed in any reference, it would have been obvious to combine the teachings of the reference with the background knowledge of a person of ordinary skill in the art and/or it would have been obvious to incorporate the missing limitation(s), including as disclosed in Exhibits A-E, into the reference for the reasons disclosed herein. For example, one of ordinary skill in the art would have found substantial motivation to combine one or more of the references with one more of the other references in order to disclose the alleged inventions recited in the Asserted Claims. Each of the references disclosed herein as invalidating an Asserted Patent was directed at the same or similar field of technology and the same or similar problem as that Asserted Patent. To the extent Procomm alleges that any particular claim limitation is not disclosed or inherent in the charted references, it would have been obvious to combine

the charted reference with one or more of the references identified herein for the particular claim limitations. Also, as Defendants are currently unaware of the extent, if any, to which Procomm will contend that limitations of the Asserted Claims are not disclosed in the art identified herein as anticipatory, Defendants reserve the right to identify other references and combinations that may render an allegedly missing limitation obvious. In addition, if and to the extent that Procomm challenges the relevance of any of these references with respect to particular limitations of the Asserted Claims of the Asserted Patents, Defendants reserve its right to identify further motivation to combine particular references with additional particularity.

Defendants reserve the right to rely on the discussions of the state of the art and prior art in each of the Asserted Patent specifications and their file histories including foreign file histories of related patents in explaining the state of the art. Defendants further expressly reserve the right to supplement their summary of the background and state of the art, including, for example, with information from any of the authors or named inventors on any of the prior art references, by personnel familiar with systems based on any of the prior art references, or any prior art systems related to prior art references, or by technical experts retained on behalf of any party. Defendants also expressly reserve the right to rely on any admissions by any of the named inventors, institutions with which they were associated, and Procomm, regarding the state of the art.

a. Exemplary Combinations and Motivations to Combine for The '100 Patent

In the following discussion, the claim elements refer to the elements as charted in the charts for this patent (*e.g.*, Exhibits A-01 to A-08). In the asserted combinations between two or more references that are charted in the Exhibit A charts, the combination would be to use the citations for one of the elements (as shown in the charts) from the reference(s) to fill in the gaps for the

other reference(s). For example, if Procomm alleges that element 1[b] is not present in chart A-01, the combination of A-01 and A-02 would include the content of A-02 for element 1[b].

Defendants have identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge of a person of skill and/or any other reference in the charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

It would be obvious to combine each of the references discussed below because they are analogous art generally directed to wireless communications networks with distributed antenna units and where at least some of the signal processing capability (*e.g.*, digital-to-analog upconverters, analog-to-digital downconverters, OBSAI/CPRI-to-digital RF-to-OBSAI/CPRI converters, baseband processing (*e.g.*, IP packetized-to-baseband-to-OBSAI/CPRI-to-baseband-to-IP packetized converters, etc.)) – that the '100 Patent described as being previously included in a centralized base station in the prior art that it allegedly distinguishes – is included at one or more of the distributed antenna locations. *See also* § II.B.1.a above. The cited art demonstrates that, at the time of the claimed invention, there were several well-known reasons and circumstances in the art to transmit an RF signal from a remote antenna unit, send a transport signal representing a duplicate of that RF signal to another remote antenna unit, and then transmit the duplicate RF signal from the other remote antenna unit, including, for example, macro-diversity, transmit (downlink) diversity, soft-handoffs (*e.g.*, multicast handoffs, bicast handoffs, etc.), simulcasting, broadcasting, virtual patch, flood routing to avoid retransmission timeouts, etc. *See, e.g.*, Balakrishnan at 8-12; Laroia at 1:22-26, 1:40-49, 5:55-58, 6:66-7:4, 13:1-37 (FIG. 6); Stratford at

4:8-17, 13:15-21, 15:63-65, 18:45-46, 18:53-19:11; Bose '146 at 12:5-25; Sabat '552 at 7:67-8:4, 6:49-55, 9:31-35 (FIGS. 6-7); Wiedeman at 12:42-57, 13:53-62, FIG. 15E, 21:3-12, 27:16-19, 27:25-34.

As was well understood in the art, each remote antenna unit served a particular geographic area, sector, or cell (*see, e.g.,* Aarflot at [0005]; Stratford at 1:26-28, 3:44-36, 15:61-63; Sabat '552 at 3:1-7; Laroia at 1:21-22, 14:45-48 (FIG. 7); Balakrishnan at 8-9), and hand offs may be required when a mobile device leaves the geographic area (or sector or cell) handled by one remote antenna unit into that served by another remote antenna unit (*see, e.g.,* Balakrishnan at 8-9; Laroia at 1:31-34, 1:40-47, 5:55-58, 11:57-64; Wiedeman at 13:48-60; Bose '146 at 12:4-9, 12:20-25). Thus, when traversing geographic areas, sectors, or cells, the mobile device may require the same RF signal to be transmitted by multiple, different remote antenna units. A soft handoff, allows the mobile device to receive the same RF signal from different remote antenna units and select from the strongest signal. *See, e.g.,* Balakrishnan at 8-9; Bose '146 at 12:4-9, 12:20-25; Laroia at 1:31-34, 1:40-47, 5:55-58, 11:57-64. Additionally simulcasting, bicasting, multicasting and/or broadcasting over multiple coverage areas was well known in the art. *Id.; see also, e.g.,* Sabat '552 at 7:67-8:4, 6:49-55, 9:31-35 (FIGS. 6-7); Stratford at 4:8-17, 13:15-21, 15:63-65, 18:45-46, 18:53-19:11; Bose '146 at 12:5-20; Wiedeman at 12:42-57, 13:53-62, 27:16-19.

Therefore, it would have been obvious to a POSITA to send, in a transport signal, a representation of a duplicate RF signal (*i.e.,* a representation of the RF signal transmitted by the serving remote antenna unit) to the other remote antenna units in the overlapping or nearby coverage areas for transmission as a duplicate RF signal from the antennas of such other remote antenna units. A POSITA would have been motivated to make the modification to allow a soft handoff as a mobile device travels between the respective coverage areas of the different remote

antenna units, as well as allowing the corresponding network to broadcast over the areas covered by the different remote antenna units. Such a modifications enables, for example:

- seamless overlapping coverage with the network during mobile device movement across the respective geographic boundaries (soft handoff);
- seamless communications between the network and mobile devices operating in areas with multiple interfering obstacles;
- delivery of the same information over the multiple geographic areas to mobile devices within those areas covered by the networked remote antenna units
- querying of a mobile device to determine whether the device is within the geographic areas served by a first remote antenna unit and/or by a second remote antenna unit.

In addition, such a modification would be merely:

- combining prior art elements according to known methods to yield predictable results, *i.e.*, the elements of sending a duplicate of the RF signal to another remote antenna unit, and transmitting the RF signal from the sending remote antenna unit, are known methods that predictively result in macro diversity, a simulcast, broadcast and/or multicast signal;
- use of known technique to improve similar methods in the same way; *i.e.*, macro diversity enabled by the sending and transmission of the duplicate RF signal would improve the wireless communications within networked remote antenna units (*e.g.*, distributed base stations, distributed antenna units) in the same way it improves other conventional base station systems; and
- choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Conventional RF communications systems, including, for example, Aarflot's distributed base station TDMA network may operate using a limited number of methodologies, macro diversity, soft handoff (using, for example, multi-cast), and simulcast among them. Using the known solutions, the macro diversity, soft handoff (using, for example, multi-cast), and/ or simulcast would have predicable results. A POSITA would also be confident of the success because the proposed modification would not result in rearrangement of the network devices, network topology, nor a deviation from their common and intended operation/uses. Offering wireless communications by transmitting duplicate RF signals from multiple antenna units was well understood and a predictable endeavor.

The motivation to combine with each of these references (beyond the other motivations identified herein) includes several factors including the following:

- For the Asserted Claims of the '100 Patent, to the extent the references charted in any of Exhibits A-01 to A-08 do not disclose “transmitting the second RF signal from the antenna at the first remote wireless communication station”, “generating ... a first transport signal representing a duplicate of the second RF signal at the first remote wireless communication station”, and “transmitting a duplicate of the second RF signal based on the first transport signal from the antenna of the second remote wireless communication station” (and similar requirements in claim 19), it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Balakrishnan, Sabat '552, Laroia, Stratford, Bose '146, Wiedeman. A person of ordinary skill in the art would be motivated to combine these references because they each disclose wireless communications networks with distributed antenna units serving mobile units in the same general field. It is the nature of those of skill in the art of wireless communications networks to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems performed handoffs between servicing areas, sectors and cells without dropping calls and/or minimizing packet losses and/or achieved macro diversity and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the wireless communications networks space performed handoffs and/or achieved macro diversity. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '100 Patent, to the extent the references charted in any of Exhibits A-01 to A-08 do not disclose “processing the [received] first RF signal by a base station at the first remote wireless communication station” (and similar requirements in claim 19), it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Aarflot, Vanu Anywave BSS System, Vanu White Paper, Vanu-ADC-Telos GSM Configuration Guide, Sabat '552, Bose '146, Laroia, Stratford, Wiedeman. A person of ordinary skill in the art would be motivated to combine these references because they each disclose wireless communications networks with distributed antenna units serving mobile units in the same general field. It is the nature of those of skill in the art of wireless communications networks to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems distributed base station functionality to the remote antenna locations. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the wireless communications networks space distributed OBSAI/CPRI-to-digital RF-to-OBSAI/CPRI converter functionality, and/or baseband processing (e.g., IP packetized-to-baseband-to-OBSAI/CPRI-to-baseband-to-IP packetized converters, etc.)

functionality, to remote antenna locations. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '100 Patent, to the extent the references charted in any of Exhibits A-01 to A-08 do not disclose “a baseband unit co-located with and coupled to the remote unit”, and wherein this co-located “baseband unit is configured to generate a first RF signal and a transport signal representing a duplicate of the first RF signal”, (and similar requirements in claim 15), it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Vanu Anywave BSS System, Vanu White Paper, Bose '146, Aarflot, Laroia, Wiedeman. A person of ordinary skill in the art would be motivated to combine these references because they each disclose wireless communications networks with distributed antenna units serving mobile units in the same general field. It is the nature of those of skill in the art of wireless communications networks to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems distributed baseband processing functionality (*e.g.*, IP packetized-to-baseband-to-OBSAI/CPRI-to-baseband-to-IP packetized converters, etc.) to the remote antenna locations (rather than in a centralized, common base station). These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '100 Patent, to the extent the references charted in any of Exhibits A-01 to A-08 do not disclose “routing the first transport signal through a network of remote wireless communication stations to a second remote wireless communication station, each remote wireless communication station having a co-located, network layer router” (and similar requirements in claim 19), it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Vanu Anywave BSS System, Vanu White Paper, Vanu SDR2006, Vanu-ADC-Telos GSM Configuration Guide, Sabat '552, Bose '146, Aarflot, Laroia, Wiedeman. A person of ordinary skill in the art would be motivated to combine these references because they each disclose wireless communications networks with distributed antenna units serving mobile units in the same general field. It is the nature of those of skill in the art of wireless communications networks to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems would have had remote units communicate with each other over OSI network layer 3 (or higher) communication protocols (*e.g.*, TCP/IP, TCP, etc.), such as implemented and/or described in, for example, the Vanu Anywave BSS System, Vanu White Paper, Vanu SDR2006, Vanu-ADC-Telos GSM Configuration

Guide, Sabat '552, Bose '146, Laroia, Balakrishnan and/or Wiedeman. And, for example, a person of ordinary skill would have been motivated to look at how other products and systems would have had remote units communicate with each other over Ethernet, OBSAI, or CPRI, such as described in, for example, Aarflot, Sabat '552, Bose '146, Vanu White Paper, Vanu SDR2006, Stratford and/or Balakrishnan. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '100 Patent, to the extent the references charted in any of Exhibits A-01 to A-08 do not disclose “sending a second transport signal to a host unit based on the second RF signal”, and/or “wherein the remote unit is configured to send uplink RF sampled data to a host unit based on RF signals received”, it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Aarflot, Vanu Anywave BSS System, Vanu White Paper, Sabat '552, Bose '146, and/or Laroia. A person of ordinary skill in the art would be motivated to combine these references because they each disclose wireless communications networks with distributed antenna units serving mobile units in the same general field. It is the nature of those of skill in the art of wireless communications networks to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems would have included in remote antenna units, rather than in a centralized base station, bi-directional conversion functionality to convert to/from analog RF signals from/to digital sampled RF, to convert between serial digital data and digital RF sampled data, and/or to convert between OBSAI/CPRI protocol data and digital RF sampled data, for communicating with a centralized host unit. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

b. Exemplary Combinations and Motivations to Combine for the '377 Patent

In the following discussion, the claim elements refer to the elements as charted in the charts for Exhibits B (e.g., B-01 - B-07). In the asserted combinations between two or more references that are charted in the Exhibit B charts, the combination would be to use the citations for one of the elements (as shown in the charts) from the reference(s) to fill in the gaps for the other

reference(s). For example, if Procomm alleges that element 1[b] is not present in chart B-01, the combination of B-01 and B-02 would include the content of B-02 for element 1[b].

Defendants have identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge of a person of skill and/or any other reference in the charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

It would have been obvious to combine each of the references discussed below because they are analogous art generally directed to automatic gain control techniques in communication systems, including in distributed antenna systems. The cited art demonstrates that at the time of the claimed invention, implementing automatic gain control in distributed antenna systems was well known and considered important to optimize performance of communication systems. Accordingly, as more and more distributed antenna systems were being implemented to address coverage holes and increased traffic demands, gain control techniques to ensure that signals would not exceed the system's total dynamic range (or saturate the system) or create interference with other signals were increasingly becoming a critical issue in communication networks. Conventional techniques did not adequately control gain in distributed antenna systems because they often did not prevent a strong signal from saturating the system while also unnecessarily rendering weak signals effectively useless by attenuating them below the noise floor.

Many techniques were known at the time of the claimed invention to address gain control in distributed antenna systems. These techniques included distributed gain control measures that

used a weighting function to individually control gain of each signal so that the combined power of all signals would not exceed a threshold.

The motivation to combine with each of these references (beyond the other motivations identified herein) includes several factors including the following:

- For the Asserted Claims of the '377 Patent, to the extent the references charted in any of Exhibits B-01 to B-07 do not disclose “gain distribution in a system comprising a plurality of distributed antennas and a total system dynamic range,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Naidu at Abstract; Solum at Abstract; Kasapi at Abstract; Owen at Abstract. A person of ordinary skill in the art would be motivated to combine these references because they each disclose automatic gain control techniques in communication systems, including distributed antenna systems, which inherently have a dynamic range. It is the nature of those of skill in the art of communication systems to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems implemented automatic gain control and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the communications system space control the gain of signals to retain the dynamic range of the communication path in order to optimize system performance. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results. *See also, e.g.,* Borg at Abstract, Claim 1 (6:65-7:34), Claim 5 (7:51-6:29), Claim 11 (9:3-61), Claim 17 (10:49-11:12); Arens at Abstract; 4:52-66; Claim 1 (7:13-8:2); Claim 6 (8:20-10:5); Simmons at Abstract; paras. [0010]-[0015].
- For the Asserted Claims of the '377 Patent, to the extent the references charted in any of Exhibits B-01 to B-07 do not disclose “sensing a signal level at each of the plurality of distributed antennas,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Solum at para. [0017]; Naidu at Abstract. A person of ordinary skill in the art would be motivated to combine these references because they each disclose automatic gain control techniques in communication systems, including distributed antenna systems. It is the nature of those of skill in the art of communication systems to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems implemented automatic gain control and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the communication system space control the gain of signals to retain the dynamic range of the communication path, which would include first sensing the level of signals to determine the appropriate gain control to

apply to those signals. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results. *See also, e.g.*, Borg at Abstract, Claim 1 (6:65-7:34), Claim 5 (7:51-6:29), Claim 11 (9:3-61), Claim 17 (10:49-11:12); Arens at Abstract; 4:52-66; Claim 1 (7:13-8:2); Claim 6 (8:20-10:5); Simmons at Abstract; paras. [0010]-[0015].

- For the Asserted Claims of the '377 Patent, to the extent the references charted in any of Exhibits B-01 to B-07 do not disclose “comparing at least one of the plurality of signal levels with a dynamic range fair share threshold,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Solum at paras. [0014], [0017]; Naidu at Abstract. A person of ordinary skill in the art would be motivated to combine these references because they each disclose automatic gain control techniques in communication systems, including distributed antenna systems. It is the nature of those of skill in the art of communication systems to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems implemented automatic gain control and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the communication system space control the gain of signals to retain the dynamic range of the communication path, which would include techniques to determine the appropriate gain control to apply to those signals such as comparing the signal level to a threshold or reference signal. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results. *See also, e.g.*, Borg at Abstract, Claim 1 (6:65-7:34), Claim 5 (7:51-6:29), Claim 11 (9:3-61), Claim 17 (10:49-11:12); Arens at Abstract; 4:52-66; Claim 1 (7:13-8:2); Claim 6 (8:20-10:5); Simmons at Abstract; paras. [0010]-[0015].
- For the Asserted Claims of the '377 Patent, to the extent the references charted in any of Exhibits B-01 to B-07 do not disclose “attenuating each of the at least one of the compared signal levels that is greater than the dynamic range fair share threshold,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Solum at paras. [0014]-[0017]; Naidu at Abstract. A person of ordinary skill in the art would be motivated to combine these references because they each disclose automatic gain control techniques in communication systems, including distributed antenna systems. It is the nature of those of skill in the art of communication systems to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems implemented automatic gain control and mimic those same

techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the communication system space control the gain of signals to retain the dynamic range of the communication path and how such solutions determine whether a particular signal should be attenuated. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results. *See also, e.g., Borg at Abstract, Claim 1 (6:65-7:34), Claim 5 (7:51-6:29), Claim 11 (9:3-61), Claim 17 (10:49-11:12); Arens at Abstract; 4:52-66; Claim 1 (7:13-8:2); Claim 6 (8:20-10:5); Simmons at Abstract; paras. [0010]-[0015].*

- For the Asserted Claims of the '377 Patent, to the extent the references charted in any of Exhibits B-01 to B-07 do not disclose “attenuating ... with a gain factor that is determined in response to a remaining portion of the total system dynamic range after attenuation of other signal levels of the plurality of signal levels,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Solum at paras. [0001], [0014]-[0017], [0019]; Naidu at Abstract. A person of ordinary skill in the art would be motivated to combine these references because they each disclose automatic gain control techniques in communication systems, including distributed antenna systems. It is the nature of those of skill in the art of communication systems to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems implemented automatic gain control and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the communication system space control the gain of signals, including how to determine the gain factor to apply to a particular signal of a plurality of signals in order to retain the dynamic range of the system. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results. *See also, e.g., Borg at Abstract, Claim 1 (6:65-7:34), Claim 5 (7:51-6:29), Claim 11 (9:3-61), Claim 17 (10:49-11:12); Arens at Abstract; 4:52-66; Claim 1 (7:13-8:2); Claim 6 (8:20-10:5); Simmons at Abstract; paras. [0010]-[0015].*

c. Exemplary Combinations and Motivations to Combine for The '721 Patent

In the following discussion, the claim elements refer to the elements as charted in the charts for Exhibits C (e.g., C-01). In the asserted combinations between two or more references that are charted in the Exhibit C charts, the combination would be to use the citations for one of the

elements (as shown in the charts) from the reference(s) to fill in the gaps for the other reference(s). For example, if Procomm alleges that element 1[b] is not present in chart C-01, the combination of C-01 and C-02 would include the content of C-02 for element 1[b].

Defendants have identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge of a person of skill and/or any other reference in the charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

It would have been obvious to combine each of the references discussed below because they are analogous art generally directed to wave filters. The cited art demonstrates that at the time of the claimed invention, microwave resonator filters are a particular type of bandpass filter that is widely used in communications systems, such as cellular, PCS, and satellite system. Specifically, in the telecommunications arena, it was and still is of critical importance to have variable frequency band filter capable of varying the resonance frequency band because wireless communication service providers are allocated a frequency band and may divide its allocated frequency band into a number of channels having predetermined bandwidths, when needed by a communications system and/or improve the efficiency of using the frequency.

The prior art illustrates that by at least 2004, it was well understood and known, the need for cavity filters with the ability of varying the frequency band so that a single product can be used for different frequency bands. *See* Park, 3:27–32. Further, the prior art recognizes the issues of vibrations and oscillations with variable frequency band filters by at least 2000, i.e. “[t]he rod may be displaceable by a translator or rotary motion”—“the resiliently biased clamping element, [a spring], will; hold the

tuning body in a well-defined position, even if the claiming element and/or the rod would expand or contract due to thermal variations. Malmström, 1:52–58; 1:59–62.

Furthermore, to the extent that it is determined that any of the above charted references do not disclose “a subsystem is associated with each tuner to compensate for vibrations and oscillations,” specifically, “in which the subsystem comprises means for longitudinal translation of said tuners and means for making the tuner components elastic, it would further have been obvious to modify the teachings of that reference to include said limitations in view of the teaching of at least Kivi. The ’721 Patent states “[t]he mechanical features of the spring should be considered for the best elastic subsystem design.” ’721 Patent, 5:58–59. Further, the ’721 Patent notes “[t]he element BLO62, working as a support of the tuner can shift into the filter lid’s slots and can maintain its position thanks to an elastic constraint (EL)” — “[t]he vibrations caused by the movement are compensated by the aforesaid elastic device, in this case represented by a spring. ’721 Patent, 5:53–57. The prior art, Kivi, relates to “cavity filters and more particularly to an arrangement to compensate for frequency drift due to temperature variations in such cavities.” Kivi, 1:7–10. Furthermore, Kivi discloses “[t]he capacitive change becomes independent of the linear thermal expansion of the cavity walls . . . since rod 20 or 24 is de-coupled from cavity walls . . . by the electrical contact made between rod 20 or 24 and wall 4 or 12 through **spring fingers** 23 or 27” — “[t]his permits the spring fingers 23 or 27 to travel with the cavity walls . . . without changing the position of rod 20 or 24.” Kivi, 4:7–14 (emphasis added). Therefore, it would have been obvious to modify the teaching of any above charted references in view of Kivi as the references are directed to wave filters. Lastly, because the teaching of any of the above references are so similar and use such similar technologies, a POSITA would have a reasonable expectation of success in such combinations.

Furthermore, to the extent that it is determined that any of the above charted references do not disclose “a subsystem is associated with each tuner to compensate for vibrations and oscillations,” specifically, “in which the subsystem comprises means for longitudinal translation of said tuners and

means for making the tuner components elastic, it would further have been obvious to modify the teachings of that reference to include said limitations in view of the teaching of at least Tamura et al. The '721 Patent states “[t]he mechanical features of the spring should be considered for the best elastic subsystem design.” ’721 Patent, 5:58–59. Further, the ’721 Patent notes “[t]he element BLO62, working as a support of the tuner can shift into the filter lid’s slots and can maintain its position thanks to an elastic constraint (EL)” — “[t]he vibrations caused by the movement are compensated by the aforesaid elastic device, in this case represented by a spring. ’721 Patent, 5:53–57. The prior art, Tamura, discloses a semi-coaxial cavity resonator filter with a “circular hole 23 having an adequate area is opened at the rear side wall of the outer conductor 11 bonded with the electrode 17 of the dielectric substrate 15, and a capacity adjustment knob 25 made of an insulating material having a semicircular pattern electrode 24 shown in FIG. 6a is rotatably placed in the circular hole 23 by means of a **suitable spring member** 26 so that the surface of the semicircular electrode 24 is contacted under pressure with the surface of the electrode 17 of the dielectric substrate 15.” Tamura, 4:45–54 (emphasis added). Therefore, it would have been obvious to modify the teaching of any above charted references in view of Tamura as the references are directed to wave filters. Lastly, because the teaching of any of the above references are so similar and use such similar technologies, a POSITA would have a reasonable expectation of success in such combinations.

Furthermore, to the extent that it is determined that any of the above charted references do not disclose “a subsystem is associated with each tuner to compensate for vibrations and oscillations,” specifically, “in which the subsystem comprises means for longitudinal translation of said tuners and means for making the tuner components elastic, it would further have been obvious to modify the teachings of that reference to include said limitations in view of the teaching of at least Saito et al. The ’721 Patent states “[t]he mechanical features of the spring should be considered for the best elastic subsystem design.” ’721 Patent, 5:58–59. Further, the ’721 Patent notes “[t]he element BLO62, working as a support of the tuner can shift into the filter lid’s slots and can maintain its position thanks

to an elastic constraint (EL)”—“[t]he vibrations caused by the movement are compensated by the aforesaid elastic device, in this case represented by a spring. ’721 Patent, 5:53–57. The prior art, Saito, discloses “[t]he structure described above makes it possible to electrically and mechanically support each dielectric core unit in the corresponding cavity. Furthermore, because the flange portions of the dielectric core units 3 are **elastically supported inside the cavity member via the spring portions** and the cured adhesive, thermal stress between each dielectric core unit and the cavity member is reduced. Furthermore, the size difference between each dielectric core unit and the cavity is **absorbed by the spring portions, and thus no excessive stress occurs in the bonding portions.**” Saito, [0083] (emphasis added). Therefore, it would have been obvious to modify the teaching of any above charted references in view of Saito as the references are directed to wave filters. Lastly, because the teaching of any of the above references are so similar and use such similar technologies, a POSITA would have a reasonable expectation of success in such combinations.

The motivation to combine with each of these references (beyond the other motivations identified herein) includes several factors including the following:

- For the Asserted Claims of the ’721 Patent, to the extent the references charted in any of Exhibits C do not disclose “[s]ystem for tuning a simple or complex multicavity high frequency and microwave filter, including a body filter; a removable lid,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: “[t]he filter 100 is preferably a microwave resonator filter including an enclosure 102 which defines first and second cavities 104 and 106.” Smith 2:22–24. A person of ordinary skill in the art would be motivated to combine these references because they each disclose frequency filter systems in the same general field. It is the nature of those of skill in the art of frequency filters to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems allow for the ability to vary frequency bands, while minimizing vibrations and oscillations caused by tuning of resonator cavities and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the frequency filter space minimize cost, have a simple method for production, and maintain electrical specifications in terms of insertion loss within the pass band filter and rejection of undesired signals outside the pass band. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply

implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '721 Patent, to the extent the references charted in any of Exhibits C do not disclose “n resonant cavities in said body filter; n resonant rods, disposed in the middle of each cavity,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: “[t]he structure comprises further a uniform dielectric tuning body, which consists of resonator-dedicated tuning elements, such as the tuning element 728 of the second resonator, and of a rod part 708.” Jouni, Pg. 8 ln. 3–6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose frequency filter systems in the same general field. It is the nature of those of skill in the art of frequency filters to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems allow for the ability to vary frequency bands, while minimizing vibrations and oscillations caused by tuning of resonator cavities and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the frequency filter space minimize cost, have a simple method for production, and maintain electrical specifications in terms of insertion loss within the pass band filter and rejection of undesired signals outside the pass band. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '721 Patent, to the extent the references charted in any of Exhibits C do not disclose “n tuners passing through the filter lid in correspondence to each resonating rod and tuner moving device,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: “[t]he frequency variation unit being coupled to an end of the tuning support and adapted to vary the position of the tuning rods, as the tuning support is slid, according to the frequency band.” Park, Abstract. A person of ordinary skill in the art would be motivated to combine these references because they each disclose frequency filter systems in the same general field. It is the nature of those of skill in the art of frequency filters to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems allow for the ability to vary frequency bands, while minimizing vibrations and oscillations caused by tuning of resonator cavities and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the frequency filter space minimize cost, have a simple method for production, and maintain electrical specifications in terms of insertion loss within the pass band filter and rejection of undesired signals outside the pass band. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to

simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '721 Patent, to the extent the references charted in any of Exhibits C do not disclose “a subsystem is associated with each tuner to compensate for vibrations and oscillations,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: “wherein said rod is provided with a resilient biased clamping element, biased by a spring means, said spring means is located outside said-cavity, where said clamping element is adapted to clamp the dielectric tuning body against said stop means on the rod.” Malmström, Claim 1. A person of ordinary skill in the art would be motivated to combine these references because they each disclose computer security systems in the same general field. It is the nature of those of skill in the art of computer security systems to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill in the art would be motivated to combine these references because they each disclose frequency filter systems in the same general field. It is the nature of those of skill in the art of frequency filters to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems allow for the ability to vary frequency bands, while minimizing vibrations and oscillations caused by tuning of resonator cavities and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the frequency filter space minimize cost, have a simple method for production, and maintain electrical specifications in terms of insertion loss within the pass band filter and rejection of undesired signals outside the pass band. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '721 Patent, to the extent the references charted in any of Exhibits C do not disclose “the lid is provided with n slots, which are longitudinally placed over the middle of the cavity and have length sufficient to assure the tuning in every frequency band,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: “The tuning elements are advantageously arranged to be moved by a common control, to shift the filter's band through equal displacements of the natural frequencies of the resonators. When the tuning element is moved e.g. horizontally sideways from the resonator axis, the electrical length and natural frequency of the resonator change. The tuning elements can be movable in each resonator separately, too, to implement the basic tuning of a filter.” Ala-Kojola, [0010]. A person of ordinary skill in the art would be motivated to combine these references because they each disclose frequency filter systems in the same general field. It is the nature of those of skill in the art of frequency filters to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have

been motivated to look at how other products and systems allow for the ability to vary frequency bands, while minimizing vibrations and oscillations caused by tuning of resonator cavities and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the frequency filter space minimize cost, have a simple method for production, and maintain electrical specifications in terms of insertion loss within the pass band filter and rejection of undesired signals outside the pass band. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '721 Patent, to the extent the references charted in any of Exhibits C do not disclose a “[s]ystem according to claim 1, in which the substem comprises means for longitudinal translation of said tuners and means for making the tuner components elastic,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: “wherein said rod is provided with a resilient biased clamping element, biased by a spring means, said spring means is located outside said-cavity, where said clamping element is adapted to clamp the dielectric tuning body against said stop means on the rod.” Malmström, Claim 1. A person of ordinary skill in the art would be motivated to combine these references because they each disclose frequency filter systems in the same general field. It is the nature of those of skill in the art of frequency filters to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems allow for the ability to vary frequency bands, while minimizing vibrations and oscillations caused by tuning of resonator cavities and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the frequency filter space minimize cost, have a simple method for production, and maintain electrical specifications in terms of insertion loss within the pass band filter and rejection of undesired signals outside the pass band. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

d. Exemplary Combinations and Motivations to Combine for The '813 Patent

In the following discussion, the claim elements refer to the elements as charted in the charts for Exhibits D (e.g., D-01). In the asserted combinations between two or more references that are charted in the Exhibit D charts, the combination would be to use the citations for one of the

elements (as shown in the charts) from the reference(s) to fill in the gaps for the other reference(s). For example, if Procomm alleges that element 1[b] is not present in chart D-01, the combination of D-01 and D-02 would include the content of D-02 for element 1[b].

Defendants have identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge of a person of skill and/or any other reference in the charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

It would be obvious to combine each of the references discussed below because they are analogous art generally directed to RF electrical components and enclosures. The cited art demonstrates that at the time of the claimed invention, RF antennas were becoming more and more prevalent due to the popularity and importance of wireless communication. Electrical RF components needed to be located in a variety of places in order to ensure adequate wireless communication coverage, including outdoors and in harsh environments. This required protecting the electrical components from both electromagnetic interference and environmental conditions, including by protecting the electrical components with sealable (e.g., through the use of a flange and lip) enclosure.

The motivation to combine with each of these references (beyond the other motivations identified herein) includes several factors including the following:

- For the Asserted Claims of the '813 Patent, to the extent the references charted in Exhibit D do not disclose "a panel antenna," it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: E-Zy; Aakalu; Avramis; Shields; Ubidyne System; MT-900007. A person of ordinary skill in the art would be motivated to combine these references because they each disclose electrical components and related enclosures intended for outdoor use, and could be used in connection with a panel antenna intended for outdoor use. It is the nature of those of

ordinary skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems packaged electrical components of RF communications equipment and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the RF communications equipment space packaged and protected RF components and antennas, particularly for use in harsh environments where these types of components must often be located for optimal performance. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '813 Patent, to the extent the references charted in Exhibit D do not disclose "an enclosure, the enclosure including a rear panel, a first side wall, and a second side wall, a top wall and a bottom wall, the rear panel and the walls defining a cavity, the walls further defining an aperture through which the cavity of the enclosure may be accessed," it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Avramis, Bishop, Fujitsu, Lakoduk, Two-Way Signal Booster System, Ubidyne System, FlexWave, and EMI Shielding. A person of ordinary skill in the art would be motivated to combine these references because they each disclose electrical components and related enclosures intended for outdoor use. It is the nature of those of ordinary skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems packaged electrical components of RF communications equipment and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the RF communications equipment space packaged and protected RF components, particularly for use in harsh environments where these types of components must often be located for optimal performance. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '813 Patent, to the extent the references charted in Exhibit D do not disclose "an internal cover, the internal cover being dimensioned to overlap an area defined by the aperture of the enclosure and providing an environmental seal and electromagnetic shielding for the cavity, the internal cover having at least one RF radiating module fastened to an exterior surface thereof," it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: MT-900007, EMI Shielding Handbook, FlexWave, Aakalu, Avramis, Bishop, Fujitsu, Lakoduk, and Two-Way Signal Booster System. Additional references also show

that electrical enclosures with electromagnetic shielding and environmental seals were known in the art. *See, e.g.*, Brewer at 8, 9; Cabinet Installation at 37- 38; Technical Guide to RFI/EMI Suppression at 3, 4, 7. A person of ordinary skill in the art would be motivated to combine these references because they each disclose electrical components and related enclosures intended for RF transmission in harsh environments. It is the nature of those of skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems packaged and protected electrical components of RF communications equipment in harsh environments, and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the RF communications equipment space packaged and protected RF components for use in harsh environments where these types of components must often be located for optimal performance. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '813 Patent, to the extent the references charted in Exhibit D do not disclose “at least one micro radio mounted to an internal surface of the first side wall, the micro radio being coupled to the RF radiating module,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Bishop, Harner, Fujitsu, Lakoduk, Shields, MT-900007, Ubidyne System, FlexWave, and Two-Way Signal Booster System. A person of ordinary skill in the art would be motivated to combine these references because they each disclose electrical components and related enclosures used for RF communication. It is the nature of those of skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems packaged electrical components of RF communications equipment and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the RF communications equipment space packaged and configured the necessary components for RF communications. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '813 Patent, to the extent the references charted in Exhibit D do not disclose “a first heat sink, mounted to an external surface of the first side wall,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Aakalu, Avramis, Harner, Fujitsu, Shields, Two-Way Signal Booster System, and EMI Shielding Handbook. A person of skill in the art would be motivated to combine these references because they each disclose

electrical components and related enclosures intended for outdoor use or use in harsh environments. It is the nature of those of skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems packaged electrical components of RF communications equipment and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill in the art to look at how other solutions in the RF communications equipment space packaged and protected RF components from heat, given that it was well-known that the electronic components required for RF communications generate heat, and that such equipment needs to be sealed to protect it in harsh environments (where these types of components must often be located for optimal performance). These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results. For example, one of ordinary skill in the art would have known that a heat sink is a common way to dissipate heat for electrical components.

- For the Asserted Claims of the '813 Patent, to the extent the references charted in Exhibit D do not disclose "a radome, the radome mounting to the internal cover and enclosing the RF radiating module," it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: EMI Shielding Handbook, Aakalu, Bishop, Shields, MT-900007, and E-YZ. A person of skill in the art would be motivated to combine these references because they each disclose electrical components and related enclosures used for RF communication. It is the nature of those of skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill in the art would have been motivated to look at how other products and systems packaged and protected electrical components of RF communications equipment and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the RF communications equipment space packaged and protected the RF radiating modules. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '813 Patent, to the extent the references charted in Exhibit D do not disclose an enclosure "wherein a flange joins the first and second side walls and the top and bottom wall, and a lip extends from the flange, further defining the aperture through which the cavity of the enclosure may be accessed, the lip being engaged by the internal cover to provide the environmental seal," it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Avramis, Bishop, Fujitsu, Lakoduk, Shields, MT-900007, Two-Way Signal

Booster System, FlexWave, NHTSA at 3.3.3.1 (“The enclosure is designed to provide protection from a harsh environment. The box has a flanged edge around the perimeter of the opening to provide a good sealing surface. This flange also increases the rigidity of the opening.”), Brewer at 8, and EMI Shielding Handbook. A person of skill in the art would be motivated to combine these references because they each disclose electrical components and related enclosures used for RF communication. It is the nature of those of skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill in the art would have been motivated to look at how other products and systems packaged electrical components of RF communications equipment and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions in the RF communications equipment space packaged the necessary components for RF communications. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results. For example, one of ordinary skill in the art would have known that a flange could be used to form an enclosure with an environmental seal.

- For the Asserted Claims of the ’813 Patent, to the extent the references charted in Exhibit D do not disclose a panel antenna “further comprising a communications hub coupled to each micro radio,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Bishop, Harner, Fujitsu, MT-900007, Two-Way Signal Booster System, E-YZ, FlexWave, Ubidyne System, and EMI Shielding Handbook. A person of skill in the art would be motivated to combine these references because they each disclose electrical components used for RF communication. It is the nature of those of skill in the art of RF communications equipment to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems packaged electrical components of RF communications equipment and mimic those same techniques. For example, it would have been obvious to a person of skill in the art to look at how other solutions in the RF communications equipment space packaged and configured the necessary components for RF communications, including communications hubs required for micro radios. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

e. **Exemplary Combinations and Motivations to Combine for The '521 Patent**

In the following discussion, the claim elements refer to the elements as charted in the charts for Exhibits E (e.g., E-01-E-06). In the asserted combinations between two or more references that are charted in the Exhibit E charts, the combination would be to use the citations for one of the elements (as shown in the charts) from the reference(s) to fill in the gaps for the other reference(s). For example, if Procomm alleges that element 1[b] is not present in chart E-01, the combination of E-01 and E-02 would include the content of E-02 for element 1[b].

Defendants have identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge or a person of skill and/or any other reference in the charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

It would be obvious to combine each of the references discussed below because they are analogous art generally directed cooling an enclosure housing electronics. The cited art demonstrates that at the time of the claimed invention, cooling of electronic components, including those housed in enclosures, whether sealed or ventilated, was an important design consideration. Accordingly, the prior art had developed a finite number of well-known and widely implemented solutions to cool such enclosures, including by using the Venturi effect to draw airflows across heatsinks to cool components.

The motivation to combine with each of these references (beyond the other motivations identified herein) includes several factors including the following:

- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “an enclosure housing electronics,” it would have

been obvious to combine any of these charted references with any of the other charted references, including, for example: Lord 1:5-9, 1:32-38, 1:53-56, 2:58-3:7, 3:44-51, FIG. 1; Fischer Abstract, 1:47-67, 2:42-54, FIG. 1; Sterner Abstract, 1:9-11, 3:2-9, 3:45-4:7, FIG. 3A; Aakalu Abstract, 1:48-2:3, 2:59-3:5, FIGs. 1-2; Jones Abstract, 3:17-54, FIG. 1. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “a fan shroud,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [0003, 11-12]; Lord 2:58-3:7, 1:53-56, FIGs. 1-9; Fischer 4:53-61, 5:13-25, FIGs. 7-8; Sterner 3:2-9, 3:45-4:7, 6:7-9, FIGs. 3A, 8; Aakalu 4:55-5:10, FIG. 10; Jones 1:29-36, 3:17-54, FIG. 1. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose the fan shroud “having at least one electrical fan,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Lord 2:58-3:7, 1:53-56, FIGs. 1-9; Fischer

4:53-61, 5:13-25, FIGs. 7-8; Sterner 1:58-62, 3:2-9, 3:45-4:7, 6:7-9, FIGs. 3A, 8; Aakalu 2:43-58, 3:25-35, 4:55-5:10, FIG. 10; Jones 1:29-36, 3:17-54, FIG. 1; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “an outlet coupled to the fan shroud,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Lord 1:32-38, 2:58-3:7, 1:53-56, 3:44-51, FIGs. 1-9; Fischer 4:53-61, 5:13-25, FIGs. 7-8; Sterner 3:2-9, 3:45-4:7, 6:7-9, FIGs. 3A, 8; Aakalu 4:55-5:10, FIG. 10; Jones 1:29-36, 3:17-54, FIG. 1; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on,” it would have been obvious to combine any of

these charted references with any of the other charted references, including, for example: Chen [007-12, 17, 19-21], illustrated figure; Lord 1:32-38, 1:53-56, 2:5-11, 2:61-3:4, 3:24-41, 3:44-4:3, FIGs. 1-9; Fischer 5:1-25, FIGs. 6-8; Sterner Abstract, 1:9-11, 3:10-44, 4:20-26, 5:14-30, FIGs. 2, 8; Aakalu 3:25-35, 4:55-5:10, FIG. 10; see also Munson 28-30, 126-27 (including V3.6), 129-131, 148, 151-53, 515-16; White 189-90, 415-19; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose "a heatsink," it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [0007-12, 17, 19], illustrated figure; Lord 1:32-38, 1:53-56, 3:24-41, 3:52-62, 3:63-4:3, 5:7-11, FIGs. 1-9; Fischer 3:34-41, 4:48-61, 5:1-12, FIGs. 6-8, 1-5C; Sterner 5:14-30, 6:27-29, FIG. 8; Aakalu Abstract, 1:18-30, 2:2-21, 3:6-25, FIG. 5; Lord 2:2-7; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6; Dodgen Abstract, 4:48-6:20, FIGs. 1-7b. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on,” or “drawing a first airflow across one or more convective openings of the heatsink...; drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [007-12, 17, 19-21], illustrated figure; Lord 1:32-38, 1:53-56, 2:5-11, 2:61-3:4, 3:24-41, 3:44-4:3, 3:63-4:3, 4:40-47, FIGs. 1-9; Fischer 5:1-25, FIGs. 6-8; Sterner Abstract, 1:9-11, 3:2-9, 3:10-44, 4:20-26, 5:14-30, FIGs. 2, 8; Aakalu 3:6-35, 4:55-5:10, FIG. 10; see also Munson 28-30, 126-27 (including V3.6), 129-131, 148, 151-53, 515-16; White 189-90, 415-19; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “one or more convective openings of [a] heatsink,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [0007-12, 17, 19], illustrated figure; Lord 1:32-38, 1:53-56, 3:24-41, 3:44-51, 3:52-62, 3:63-4:3, 5:7-11, FIGs. 1-9; Fischer 4:53-61, 5:1-25, FIGs. 6-8; Sterner 5:14-30, 6:27-28, FIG. 8; Aakalu Abstract, 1:23-30, 2:2-21, 3:6-25, FIG. 5; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that

there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “wherein the Venturi chamber first inlet encircles” the one or more convective openings of the heatsink, it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [007-12, 17, 19-21], illustrated figure; Lord 1:32-38, 1:53-56, 2:5-11, 2:61-3:4, 3:24-41, 3:44-4:3, 4:40-47, FIGs. 1-9; Fischer 5:1-25, FIGs. 6-8; Sterner Abstract, 1:9-11, 3:2-9, 3:10-44, 4:20-26, 5:14-30, FIGs. 2, 8; Aakalu 3:6-25, 4:55-5:10, FIG. 10; see also Munson 28-30, 126-27 (including V3.6), 129-131, 148, 151-53, 515-16; White 189-90, 415-19; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “wherein the airflow from the surrounding environment is cooler than the heated airflow,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [0007-10]; Lord 1:32-38, 3:64-4:3, 1:5-9, 1:32-38, 1:53-56, 2:58-3:7, FIGs 1-9; Fischer 5:1-25, FIGs. 7-8, 4:53-61; Sterner 3:2-9, 3:45-4:7, 4:20-26, 5:14-30, FIGs. 3A, 8; Aakalu 1:18-30, 4:11-15, 4:55-5:10, FIG. 10; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-

generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “a sealed environment of an enclosure for housing electronics,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [0013]; Lord 1:32-38, 1:53-56, 2:5-11, 2:58-3:7, FIGs. 1-9; Fischer 1:7-42, 5:13-25 FIGs. 6-8; Sterner 2:63-3:9, 5:14-30, FIG. 8; Aakalu 2:43-58, 2:59-3:25, FIGs. 1-2, 5; Jones 1:15-21, 1:45-53, 3:17-54, FIG. 1; Takala Abstract, 1:40-60, 3:34-59, FIGs. 1-8; Dodgen Abstract, 4:48-6:20, FIGs. 1-7b; Knap [0005]. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.
- For the Asserted Claims of the '521 Patent, to the extent the references charted in any of Exhibits E-01 to E-06 do not disclose “wherein the first airflow does not flow into the one or more convective openings of the heatsink,” it would have been obvious to combine any of these charted references with any of the other charted references, including, for example: Chen [0007-12], illustrated figure; Lord 1:32-38, 1:53-56, 3:44-51, 3:52-62, 3:64-4:3, FIGs. 1-9; Fischer 5:13-25, FIGs. 7-8; Sterner 1:9-11, 3:10-44, 4:20-26, 5:14-30, FIGs. 2, 8; see also Munson 28-30, 126-27 (including V3.6), 129-131, 148, 151-53, 515-16; White 189-90, 415-19; Vinson Abstract, [0017-20, 23], FIGs. 1-2, 6. A person of ordinary skill in the art would be motivated to combine these references because they each disclose using an airflow to cool heat-generating components in the same general field. It is the nature of those of skill in the art of cooling components, including electronics, to monitor developments in competing products and combine relevant features and functionalities. A person of ordinary skill would have been motivated to look at how other products and systems cooled heat-generating components, including electrical components and mimic those same techniques. For example, it would have been obvious to a person of ordinary

skill to look at how other solutions provided cooling for heat-generating components, including electrical components, using natural air circulation, forced air circulation, or a combination thereof. These combinations would have also been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field. Moreover, these combinations would have been the result of applying known techniques to a known method that was ready for improvement to yield predictable results.

III. P.R. 3-3(C) DISCLOSURES: CHARTS IDENTIFYING WHERE IN EACH ITEM OF PRIOR ART EACH ELEMENT OF THE ASSERTED CLAIM IS FOUND

Exhibits A-E., of these contentions are charts that specifically identify where each element of each Asserted Claim is found in the prior art. The claim charts in these contentions (Exhibits A-E) provide example sections within the prior art references that teach or suggest each and every element of the assert claims either expressly or inherently. The contentions set forth obviousness arguments based on the disclosures in each of the references, teachings well known at the time of filing, admitted prior art, and the knowledge of a person of ordinary skill in the art at the time the respective patent application was filed. If needed, all of the exhibited art can be used in combination for an obvious determination.

For Asserted Claims governed by 35 U.S.C. §112 ¶ 6, the exhibits include identity of structure(s), act(s), or materials in each prior art reference that performs the claimed function. To the extent any limitation of any of the Asserted Claims is construed to have a similar meaning, or to encompass similar feature(s) and function(s), as apparently contended by Procomm in its Infringement Contentions, or later determined by the Court, and to the extent at least one claim chart in the associated Exhibits identifies any prior art reference, or a portion thereof, as disclosing or teaching such similarly construed claim limitation, such identified prior art reference, or the portion thereof, and Defendants' contentions with respect to such claim limitation and such prior art reference as found in such claim chart, are incorporated by reference, and are part of,

Defendants' invalidity contentions with respect to each of the Asserted Claims that includes such similarly construed claim limitation.

IV. P.R. 3-4(D) DISCLOSURES: INVALIDITY UNDER 35 U.S.C. § 112

Pursuant to Local Rule 3-3(d), Defendants contend that certain claims of the Asserted Patents are invalid under 35 U.S.C. § 112 because: (1) the claims are indefinite; (2) the claims are not enabled; and/or (3) the claims lack adequate written description. Defendants' contentions that the following claims are invalid under 35 U.S.C. § 112 are made in the alternative, and do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Patents, or that any of the claims of the Asserted Patents are not anticipated or rendered obvious by any prior art.

These contentions are based on Defendants' current understanding of Procomm's Infringement Contentions. To the extent Procomm contends that the prior art references identified above would not enable a person of ordinary skill to make or use the elements of the Asserted Claims against which they are cited, or to the extent Procomm contends that the Asserted Claims cover something different from what Defendants understands them to cover, the Asserted Claims do not comply with the enablement, written description, and/or definiteness requirements of 35 U.S.C. § 112 ¶¶ 1 & 2. Because compliance with the requirements of 35 U.S.C. § 112 ¶¶ 1 & 2 depends on the construction of those phrases—and no claim construction positions have been exchanged, no claim construction order issued in this case, and no expert discovery undertaken—Defendants' positions on written description, enablement, and/or indefiniteness are necessarily preliminary at this early stage of the case. A more detailed basis for Defendants' indefiniteness, enablement, and/or written description defenses will be set forth in Defendants' claim construction briefing and/or expert reports on invalidity and/or in Motion[s] for Summary Judgment of Invalidity, to be served in accordance with the Court's Docket Control Order. Defendants have not

taken any depositions related to these issues and discovery is on-going. Defendants specifically reserve the right to amend and/or supplement these contentions based on further developments in the case in accordance with the Court's Rules or as otherwise authorized by the Court.

The written description and enablement requirements are analyzed by comparing the claims with the disclosure in the specification. If the claimed invention does not appear in the specification, the claim fails regardless of whether one of skill in the art could make or use the claimed invention. *See, e.g., Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1348 (Fed. Cir. 2010). To satisfy the enablement requirement, a patentee must "describe the manner and process of making and using the invention so as to enable a person of skill in the art to make and use the full scope of the invention without undue experimentation." *See, e.g., LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1344-45 (Fed. Cir. 2005). To satisfy the written description requirement, the patentee must convey to those skilled in the art that, as of the filing date, the applicant was in possession of the invention, and demonstrate that possession by disclosing the invention in the specification. *See, e.g., Ariad*, 598 F.3d at 1352. A patent must also be precise enough to afford clear notice to what is claimed. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014). A patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention. *Id.* The standard for assessing if a patent claim is sufficiently definite to satisfy the statutory requirement is whether "one skilled in the art would understand the bounds of the claim when read in light of the specification." *See Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1358 (Fed. Cir. 2003). Claims that depend from claims that are invalid for lack of enablement or written description support inherit the deficiencies of the claims from which they depend and are also invalid.

A claim term can be indefinite based on multiple grounds ranging from the substantive concerns to unresolvable drafting errors, each of which can be fatal to the validity of the claims as a matter of law. For example, the Federal Circuit has repeatedly held that apparatus claims that contain method claim limitations are indefinite because it is impossible to determine when direct infringement occurs. *See, e.g., Rembrandt Data Techs., LP v. AOL, LLC*, 641 F.3d 1331, 1339-40 (Fed. Cir. 2723) (an independent claim that recited both an apparatus and a method of using that apparatus was indefinite, as was its dependent claims); *IPXL Holdings v. Amazon.com*, 430 F.3d 1377, 1384 (Fed. Cir. 2005); *In re Katz Interactive Call Processing Patent Litigation*, 639 F.3d 1303, 1318 (Fed. Cir. 2723) (mixed claims “create confusion as to when direct infringement occurs because they are directed both to systems and to actions performed by” users). Claim terms that lack antecedent basis are indefinite. *See, e.g., Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1348-49 (Fed. Cir. 2002) (claim ending in the middle of a claim limitation was indefinite because it was “impossible to discern the scope of such a truncated limitation”). Furthermore, means-plus-function claims, which invoke 35 U.S.C. § 112 ¶6, may be invalid as indefinite where a patent owner has failed to disclose adequate corresponding structure linked to the recited claim functionality. *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311-12 (Fed. Cir. 2012).

In the Supreme Court’s decision in *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014), the Court clarified that a patent is invalid “for indefiniteness if its claims read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014). “[I]t cannot be sufficient that a court can ascribe some meaning to a patent’s claim; the definiteness inquiry trains on the understanding of a skilled artisan at the time of the patent application, not that of a court viewing matters post hoc.”

Id. at 2130. The definiteness inquiry necessarily demands that the “patent and prosecution history disclose a single known approach or establish that, where multiple known approaches exist, a person of ordinary skill in the art would know which approach to select.” *Id.* Claims that depend from claims that are indefinite inherit the indefiniteness of the claims from which they depend and are also indefinite.

The Asserted Claims of the Asserted Patents are invalid because the Asserted Patents do not include sufficient written description of the purported inventions claimed therein, and of the manner and process of making and using said inventions, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which the inventions pertain, or which they are most nearly connected, to make and use any of the claimed inventions. 35 U.S.C. § 112 ¶1.

Defendants contend that the specifications to which priority is sought fail to describe the full scope of the claimed inventions in sufficient detail such that one skilled in the art could reasonably conclude that the inventor had possession of the claimed invention as of the filing dates to which the Asserted Patents claim priority. The specifications of the Asserted Patents fail to describe the claimed inventions in a manner understandable to one of ordinary skill in the art and fail to show that the listed inventors actually invented the claimed inventions. Accordingly, each of the Asserted Claims is invalid for lack of adequate written description under 35 U.S.C. § 112 ¶1.

In addition, Defendants contend that, at the time of Procomm’s claimed priority date, the patent applications to which Procomm claims priority did not enable one of ordinary skill in the art to make and use the full scope of the claimed inventions without undue experimentation. Accordingly, each of the Asserted Claims is invalid for lack of enablement under 35 U.S.C. § 112 ¶1.

Defendants also contend that the Asserted Claims fail to particularly point out and distinctly claim the subject matter that the listed inventor regarded as his invention. Defendants contend that one of ordinary skill in the art would not understand the scope of each of the Asserted Claims when the claim is read in light of the specification. Accordingly, each of the Asserted Claims is invalid for indefiniteness under 35 U.S.C. § 112, ¶1.

Defendants contend that Procomm's apparent claim constructions render the Asserted Claims overly broad in scope and well beyond the purported inventions described in the Asserted Patents. Procomm is attempting to construe the Asserted Claims in an idiosyncratic manner that is entirely inconsistent with the written specification and prosecution history of the Asserted Patents as well as with the understanding of one of ordinary skill in the art at the time the applications that issued as the Asserted Patents were filed. These allegations are inconsistent with the plain language of the claims, the supporting description, and the prosecution history.

Defendant provides below an identification of terms in Asserted Claims that render the Asserted Claims, at least as apparently construed by Procomm in its Infringement Contentions as discussed above, invalid pursuant to 35 U.S.C. § 112 as not enabled or lacking sufficient written description.

These are merely examples and are not intended to be limiting. Defendants reserve all rights to amend their Invalidity Contentions under 35 U.S.C. § 112, including after an Asserted Claim is ultimately construed by the Court, in response to any interpretation of an Asserted Claim embodied in Procomm's infringement positions, and/or to account for any changes in the law concerning invalidity under 35 U.S.C. §112. Defendants additionally reserve the right to provide additional explanation and/or argument for their Invalidity Contentions under § 112, including, for example, based on expert testimony.

Defendants provide the following grounds for invalidity under 35 U.S.C. § 112, ¶¶ 1–2. Defendants’ investigation of the Asserted Patents is ongoing, and Defendants reserve the right to amend or supplement these disclosures based on further investigation and in a manner consistent with the Federal Rules of Civil Procedure, the Local Patent Rules for the Eastern District of Texas, and the Docket Control Order, or otherwise in accordance with any order or direction of this Court or agreement of the parties. Further, Plaintiff’s Infringement Contentions fail to provide sufficient detail to fully understand its proposed application of the Asserted Claims, and Defendants reserve the right to assert additional grounds for invalidity under 35 U.S.C. § 112 in response to Plaintiff’s claim interpretations. Defendants also reserve the right to supplement, modify, or otherwise amend these grounds for invalidity under 35 U.S.C. § 112 based on the Court’s claim construction rulings or opinions or the parties’ positions or arguments taken in connection with the claim construction process. Defendants’ Invalidity Contentions under 35 U.S.C. § 112 may depend, in part, on the Judge’s claim construction, as well as Plaintiff’s alleged scope of the asserted claims of the Asserted Patents. Consequently, Defendants only identify the issues under 35 U.S.C. § 112 of which they are presently aware.

In addition, Defendants identify claims below that are indefinite under 35 U.S.C. § 112 ¶ 2, which Defendants will more fully address as part of claim construction.⁴ Defendants reserve the right to provide additional explanation and/or argument for their Invalidity Contentions under Section 112, including, for example, based on expert testimony, and after understanding Plaintiff’s position on the construction of the terms at issue.

⁴ Any dependent claim is invalid if it depends, directly or indirectly, on another claim that is invalid under 35 U.S.C. § 112.

A. Indefiniteness

Defendants are currently investigating whether any of the asserted claims are invalid for indefiniteness under § 112 because they fail to inform, with reasonable certainty, those skilled in the art about the scope of the claimed invention. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120 (2014). As one example, based on Defendants’ investigation and Plaintiff’s infringement contentions, the following terms require the exercise of subjective judgment to determine their metes and bounds, and are indefinite:

a. ’100 Patent

Claim Term	Asserted Claims
“generating a second RF signal and a first transport signal representing a duplicate of the second RF signal”	15
“transmitting a duplicate of the second RF signal based on the first transport signal”	15
“sending a second transport signal to a host unit based on the second RF signal”	15
“generate a first RF signal and a transport signal representing a duplicate of the first RF signal”	19
“send the transport signal over the network to be routed to a second of the remote units, such that a duplicate of the first RF signal can be transmitted from the second of the remote units”	19
“wherein the remote unit ... is configured to route data corresponding to RF signals transmitted and/or received over a network of remote units of which the remote unit is a member ... wherein the remote unit is configured to ... send the transport signal over the network to be routed to a second of the remote units, such that a duplicate of the first RF signal can be transmitted from the second of the remote units”	19

b. ’377 Patent

Claim Term	Asserted Claims
“a dynamic range fair share threshold”	1

Claim Term	Asserted Claims
“a gain factor that is determined in response to a remaining portion of the total system dynamic range after attenuation of other signal levels of the plurality of signal levels”	1

c. **'721 Patent**

Claim Term	Asserted Claims
“a subsystem”	1
“tuner to compensate for vibrations and oscillations”	1
“length sufficient to assure the tuning in every frequency band”	1
“means for longitudinal translation of said tuners”	2
“means for making the tuner components elastic”	2

d. **'813 Patent**

Claim Term	Asserted Claims
“an internal cover”	1
“electromagnetic shielding”	1
“micro radio”	1
“RF radiating module”	1
“wherein the flange joins the first and second side walls and the top and bottom wall”	1
“further defining the aperture”	1
“environmental seal”	1
“communications hub”	4

e. **'521 Patent**

Claim Term	Asserted Claims
“fan shroud”	1
“Venturi chamber”	1, 4, 15
“a surrounding environment”	1, 5
“wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink”	4
“a sealed environment”	14
“directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink”	14

Claim Term	Asserted Claims
“drawing a first airflow across one or more convective openings of the heatsink”	14
“wherein the first airflow does not flow into the one or more convective openings of the heatsink”	14
“drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow”	14

A claim that requires the exercise of subjective judgment without restriction renders the claim indefinite. *In re Musgrave*, 431 F.2d 882, 893 (CCPA 1970). Claim scope cannot depend solely on the unrestrained, subjective opinion of a particular individual purported to be practicing the invention. *Datamize LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1350 (Fed. Cir. 2005).

These terms also may require subjective judgment and lack objective metes and bounds. *Seattle Box Co., Inc. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984); *see GE Lighting Sols., LLC v. Lights of Am., Inc.*, 663 F. App'x 938, 941 (Fed. Cir. 2016); *Liberty Ammunition, Inc. v. United States*, 835 F.3d 1388 (Fed. Cir. 2016). Defendants have been unable to identify any baseline in the specification from which to measure these terms.

Plaintiff has not yet revealed its proposed constructions for the terms in these patents. Once Plaintiff has identified its proposed constructions, Plaintiff's constructions may render certain terms indefinite. Defendants reserve the right to raise any indefiniteness arguments to Plaintiff's proposed constructions that are not yet available.

1. Lack of Adequate Structure

Defendants are further investigating whether terms are governed by 35 U.S.C. § 112(6), now 35 U.S.C. § 112(f) and whether they lack corresponding structure associated with the claimed function, rendering them indefinite under section 112(2).

Here, the asserted claims recite functions without identifying adequate structure for performing those functions.

a. '100 Patent

Claim Term	Asserted Claims
“a remote unit” that is “configured to”: • “send uplink RF sampled data to a host unit based on RF signals received”; • “route data corresponding to RF signals transmitted and/or received over a network of remote units of which the remote unit is a member”; • “process the first RF signal to be transmitted from the antenna coupled to the remote unit”; and • “send the transport signal [representing the duplicate of the first RF signal] over the network to be routed to a second of the remote units, such that a duplicate of the first RF signal can be transmitted from the second of the remote units”	19

b. '721 Patent

Claim Term	Asserted Claims
“tuner to compensate for vibrations and oscillations”	1
“length sufficient to assure the tuning in every frequency band”	1
“means for longitudinal translation of said tuners”	2
“means for making the tuner components elastic”	2

Defendants have not yet identified an algorithm for performing any functions claimed in the specifications either. If there is no structure sufficient to perform the recited function, then each of the terms governed by 112(6) is indefinite under 112(2).

These patents also include method claims reciting the same or similar functional limitations that the apparatus claims recite. Accordingly, if the apparatus claims invoke § 112(6), they, too, invoke § 112(6). *See Cummins-Allison Corp. v. Glory Ltd.*, No. 02 C 7008, 2003 WL 355470, at *13–14 (N.D. Ill. Feb. 12, 2003) (holding that § 112(6) applied to a method for “processing

currency” that recited the function of “automatically denominating” currency but did not specify the way that function was performed), *adopted*, No. CIV.A. 02 C 7008, 2003 WL 22125212 (N.D. Ill. Sept. 5, 2003). The fact that certain claims claim methods rather than apparatuses does not change the requirement of an algorithm for performing the recited functions. When distinguishing apparatus and method claims, courts have long warned against “exalt[ing] form over substance” where “the claim is really to the . . . series of functions itself.” *Fed. Home Loan Mortgage Corp. v. Graff/Ross Holdings LLP*, 893 F. Supp. 2d 28, 36 (D.D.C. 2012) (“The equivalence of the [method and apparatus claims] is readily apparent and the only real difference between the claims is the form in which they were drafted.”) (citation omitted).

Defendants further note that these terms may be indefinite under *Advanced Ground* and its progeny. *See, e.g., Advanced Ground*, 830 F.3d at 1346–50 (affirming final judgment entered at claim construction and holding claims invalid as indefinite because there was no algorithm for performing the claimed “symbol generator” function); *Media Rights Techs. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1371–75 (Fed. Cir. 2015) (affirming judgment on the pleadings because there was no algorithm for “compliance mechanism”); *Twin Peaks Software, Inc. v. IBM Corp.*, 690 F. App’x 656, 661–65 (Fed. Cir. 2017) (affirming invalidity judgment entered at claim construction because there was no algorithm for “mechanism for managing said component”); *Huawei Techs. Co. Ltd. v. T-Mobile US, Inc.*, 2017 WL 2691227, *36–37 (E.D. Tex. June 21, 2017) (granting invalidity judgment at claim construction because there was no algorithm for “selection module” and “key derivation module”); *Synachronoss Techs., Inc. v. Dropbox, Inc.*, 2017 WL 6059302, at *5–9 (N.D. Cal. Dec. 7, 2017) (granting invalidity judgment at claim construction because there was no algorithm for “user identifier module,” “authentication module,” and “user login authenticator”); *Verint Sys. Inc. v. Red Box Records Ltd.*, 166 F. Supp.

3d 364, 379–84 (S.D.N.Y. 2016) (granting invalidity judgment at claim construction because there was no algorithm for “computer application” and “monitoring device”); *Farstone Tech. v. Apple Inc.*, 2015 WL 5898273, at *3–5 (C.D. Cal. Oct. 8, 2015) (granting invalidity judgment at claim construction because there was no algorithm for “backup/recovery module”). Defendants are investigating whether this term is anything more than a “black box” that prioritizes data without any corresponding algorithm.

2. Indefiniteness under *IPXL*

a. '721 Patent

Claim Term	Asserted Claims
“tuning in every frequency band”	1
“means for longitudinal translation of said tuners”	2
“means for making the tuner components elastic”	2

b. '521 Patent

Claim Term	Asserted Claim(s)
“the fan drawing air from the Venturi chamber via the outlet when the fan is on”	1
“wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on”	1
“wherein the airflow from the surrounding environment is cooler than the heated airflow”	5

B. Lack of Written Description and/or Enablement

The Asserted Claims are invalid for failure to comply with the written description and/or enablement requirements of Section 112, ¶ 1. Pursuant to pre-AIA 35 U.S.C. § 112, first paragraph, “[t]he specification shall contain a written description of the invention, and the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any

person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.”

To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. *See, e.g., Moba B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319 (Fed. Cir. 2003). The Federal Circuit has explained that a specification cannot always support expansive claim language and satisfy the requirements of 35 U.S.C. § 112 “merely by clearly describing one embodiment of the thing claimed.” *LizardTech*, 424 F.3d at 1346. The issue is whether a person skilled in the art would understand the applicant to have invented, and been in possession of, the invention as broadly claimed.

Furthermore, “actual ‘possession’ or reduction to practice outside of the specification is not enough.” *Id.* at 1352. A “description that merely renders the invention obvious does not satisfy the requirement” because “it is the specification itself that must demonstrate possession.” *Id.*

Enablement under 35 U.S.C. § 112, ¶ 1 is a question of law. *Alza Corp. v. Andrx Pharms., LLC*, 603 F.3d 935, 940 (Fed. Cir. 2010). For a patent to satisfy the enablement requirement, “the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’” *MagSil Corp. v. Hitachi Global Storage Techs.*, 687 F.3d 1377, 1381 (Fed. Cir. 2012) (emphasis added). “[T]he ‘enablement inquiry necessarily depends on an interpretation of the claims.’” *McRO, Inc. v. Bandai Namco Games America Inc.*, 959 F.3d 1091, 1100 (Fed. Cir. 2020).

The Asserted Patents fail to provide sufficient written description or an enabling disclosure with respect to the below-identified claim terms (and any other similar terms in any of the Asserted

Claims). In this case, under at least the claim interpretations on which Plaintiff apparently relies for its infringement allegations, the Asserted Claims would be invalid for failure to satisfy the written description requirement and/or the enablement requirement because they would be drawn to subject matter that exceeds or otherwise differs from what one of ordinary skill in the art would understand the named inventors to have had in their possession based on the written description of each Asserted Patents.

The Asserted Claims therefore do not meet the written description or enablement requirements of 35 U.S.C. § 112 for at least the reason that the patent specification does not provide support for the full scope of the claims to the extent Plaintiff asserts that the claims are broad enough to cover Defendants' accused products. *See LizardTech*, 424 F.3d at 1345. The patent specification as interpreted by Plaintiff would not enable a person of ordinary skill in the art to practice the alleged invention without undue experimentation. Also, a person of ordinary skill in the art would not understand the named inventor to be in possession of the purported invention as interpreted by Plaintiff. *See id.* Thus, the claims are invalid under the first paragraph of 35 U.S.C. § 112 for lack of written description and lack of enablement. *See id.*; *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351-52 (Fed. Cir. 2010) (en banc); *Strick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008).

The specification of the Asserted Patents does not provide sufficient written description or enablement of the aspects of the alleged invention corresponding to following claim limitations, rendering the Asserted Claims in which they appear (and any claims depending therefrom) invalid:

1. Asserted Patents

a. '100 Patent

Defendants contend that the full scope of each Asserted Claim of the '100 Patent was not described with particularity in the specification to which priority is sought, so as not to set forth

enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed. Accordingly, each Asserted Claim of the '100 Patent is invalid for lack of adequate written description and/or enablement under 35 U.S.C. § 112, ¶ 1, based at least on the following claim terms/phrases:

Claim Term	Asserted Claims
“generating a second RF signal and a first transport signal representing a duplicate of the second RF signal at the first remote wireless communication station; transmitting the second RF signal from the antenna at the first remote wireless communication station; routing the first transport signal through a network of remote wireless communication stations to a second remote wireless communication station ... transmitting a duplicate of the second RF signal based on the first transport signal from the antenna of the second remote wireless communication station ... sending a second transport signal to a host unit based on the second RF signal”	15
“a remote unit; ... a baseband unit co-located with and coupled to the remote unit; ... wherein the remote unit is configured to send uplink RF sampled data to a host unit based on RF signals received, and is configured to route data corresponding to RF signals transmitted and/or received over a network of remote units of which the remote unit is a member; ... wherein the baseband unit is configured to generate a first RF signal and a transport signal representing a duplicate of the first RF signal, wherein the remote unit is configured to: process the first RF signal to be transmitted from the antenna coupled to the remote unit; and send the transport signal over the network to be routed to a second of the remote units, such that a duplicate of the first RF signal can be transmitted from the second of the remote units.”	19

Moreover, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '100 Patent is that they are broad enough to encompass, e.g., “a first wireless communication station” (“remote unit”) as encompassing the combination of a centralized, “common base station” (small cell) and the “antennas that are connected to and distribute signals from [this] common base station via fiber”;

and where the “antenna of a first wireless communication station” (“antenna coupled to the remote unit” is one of these antennas, and “the antenna of the second wireless communication station” (“transmitt[er]” of “the second of the remote units” is another one of these antennas; *i.e.*, both required “wireless communication station[s]” (“remote unit[s]”) only communicate with each other via the centralized, “common base station” (small cell). *See, e.g.*, March 20, 2024 Infringement Contentions at Appendix A at pp. 2, 5-7, 10, 11, 14, 18-23, 26-27 (under heading “DAS systems”); *cf.* 8:66-9:41, 7:66-8:29, FIGS 6, 8 (patent explicitly distinguishes the only embodiment in which the “distributed base station functionality” at remote stations is described as “[p]rocess[ing] the [received] RF signal” by “form[ing] a second RF signal which is then routed toward the destination of the RF signal” from systems in which the remote stations have to “transmit signals ... to a central node ... for base station processing.”).

Additionally, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’100 Patent is that they are broad enough to encompass, *e.g.*, several steps that are explicitly required to be performed “at the first remote wireless communication station”, or “through a network of remote wireless communications stations”, (*e.g.*, the “processing”, “generating”, “routing”, “having a co-located network layer router”, etc.) steps of claim 15) as being performed at, or through, a centralized, “common base station” (small cell) connected to each of the remote antennas of the DAS via fiber. *See, e.g.*, March 20, 2024 Infringement Contentions at Appendix A at pp. 2, 5-7, 10, 11, 14 (under heading “DAS systems”); *cf.* 8:66-9:41, 7:66-8:29, FIGS 6, 8.

Moreover, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’100 Patent is that they are broad enough to encompass, *e.g.*, several components that are explicitly required to be

“co-located with ... the remote unit”, and the functions explicitly required to be performed by such components, (e.g., the “baseband unit”, “router”) as being the centralized, “common base station” (small cell) connected to each of the remote antennas of the DAS via fiber (and functions allegedly performed by this centralized common base station). *See, e.g.*, March 20, 2024 Infringement Contentions at Appendix A at pp. 19-23, 27 (under heading “DAS systems”); *cf.* 8:66-9:41, 7:66-8:29, FIGS 6, 8.

Further, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’100 Patent is that they are broad enough to encompass, e.g., “routing the first transport signal through a network of remote wireless communication stations to a second remote wireless communication station, each remote wireless communication station having a co-located, network layer router”, “the remote unit ... is configured to route data corresponding to RF signals transmitted and/or received over a network of remote units of which the remote unit is a member”, and “the remote unit is configured to ... send the transport signal over the network to be routed to a second of the remote units” as being met by communications over a “fronthaul interface, eCPRI ... [a]n Ethernet based transport [that] enables switched front-haul” and “uses the packet-based Ethernet protocol.” *See, e.g.*, March 20, 2024 Infringement Contentions at Appendix A at pp. 11-12, 19-20, 23, 27-29 (under heading “mTRP”); *cf.* 7:31-40, 7:62-8:48, 8:55-60, 8:66-9:41, FIGS 6-8.

Under these overly broad interpretations of the Asserted Claims (to the extent Plaintiff’s deficient infringement contentions are understood by Defendants)⁵, each of the Asserted Claims of the ’100 Patent is invalid for lack of written description and/or is not enabled.

⁵ Furthermore, to the extent that Plaintiff maintains that this broad interpretation renders the ’100 Patent Asserted Claims infringed, this breadth would render the claims anticipated and/or

b. '377 Patent

Defendants contend that the full scope of each Asserted Claim of the '377 Patent was not described with particularity in the specification to which priority is sought, so as not to set forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed. Accordingly, each Asserted Claim of the '377 Patent is invalid for lack of adequate written description and/or enablement under 35 U.S.C. § 112, ¶ 1, based at least on the following claim terms/phrases:

Claim Term	Asserted Claims
"a dynamic range fair share threshold"	1
"a gain factor that is determined in response to a remaining portion of the total system dynamic range after attenuation of other signal levels of the plurality of signal levels"	1

Moreover, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '377 Patent is that they are broad enough to encompass, e.g., comparing "potential resource allocations for the TRPs to determine ... "whether the allocations will interfere with neighboring TRPs" as "comparing at least one of the plurality of signal levels with a dynamic range fair share threshold." Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '377 Patent is that they are broad enough to encompass, e.g., "allocat[ing] resources ... as necessary to ensure beam-shaping, null-forming, cell-forming" and "other signal modifications to optimally share the available system dynamic range between the various TRPs" as "attenuating each of the at least one of the compared signal levels that is greater than the dynamic range fair share threshold with a gain factor that is

obvious over similar functionality in the prior art. *01 Communique Lab., Inc. v. Citrix Sys., Inc.*, 889 F.3d 735, 742-43 (Fed. Cir. 2018); *see also* §II above.

determined in response to a remaining portion of the total system dynamic range after attenuation of other signal levels of the plurality of signal levels.”

Under these overly broad interpretations of the Asserted Claims, each of the Asserted Claims of the ’377 Patent is invalid for lack of written description and/or is not enabled.

c. ’721 Patent

Defendants contend that the full scope of each Asserted Claim of the ’721 Patent was not described with particularity in the specification to which priority is sought, so as not to set forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed. Accordingly, each Asserted Claim of the ’721 Patent is invalid for lack of adequate written description and/or enablement under 35 U.S.C. § 112, ¶ 1, based at least on the following claim terms/phrases:

Claim Term	Asserted Claims
“a subsystem”	1
“tuner to compensate for vibrations and oscillations”	1
“length sufficient to assure the tuning in every frequency band”	1
“means for longitudinal translation of said tuners”	2
“means for making the tuner components elastic”	2

Moreover, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’721 Patent is that they are broad enough to cover, *e.g.*, any frequency filter including switchable filters as a tunable filter. Further, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’721 Patent is that they are broad enough to encompass, *e.g.*, fixedly tuned filters, in which there is a switch, or switches, on inputs and outputs for selecting the required filter or a by-pass path as containing “a subsystem [that] is associated with each tuner to compensate for vibrations and oscillations.” ’721 Patent, Claim 1.

Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '721 Patent is that they are broad enough to encompass, e.g., switchable filters that have no possibility to dynamically change the tuning of said switchable filter as containing a "tuner moving device" and having a lid with n slots "sufficient to assure the tuning in every frequency band." '721 Patent, Claim 1.

Under these overly broad interpretations of the Asserted Claims, each of the Asserted Claims of the '721 Patent is invalid for lack of written description and/or is not enabled.

d. '813 Patent

Defendants contend that the full scope of each Asserted Claim of the '813 Patent was not described with particularity in the specification to which priority is sought, nor to Application No. 12/792,367, so as not to set forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed. Accordingly, each Asserted Claim of the '813 Patent is invalid for lack of adequate written description and/or enablement under 35 U.S.C. § 112, ¶ 1, based at least on the following claim terms/phrases:

Claim Term	Asserted Claims
"wherein the flange joins the first and second side walls and the top and bottom wall"	1
"environmental seal"	1
"communications hub coupled to each micro antenna"	4

Moreover, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '813 Patent is that they are broad enough to cover, e.g., any antenna arrangement as a "panel antenna". Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '813 Patent is that they are broad enough to

encompass, e.g., an antenna that is not attached to the outside of a cover as “the internal cover having at least one RF radiating module fastened to an exterior surface thereof.” Further, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’813 Patent is that they are broad enough to encompass, e.g., a micro radio mounted to the back or bottom of an enclosure as “at least one micro radio mounted to an internal surface of the first side wall.” Further, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’813 patent is that they are broad enough to encompass, e.g., part of the side wall as “a first heat sink, mounted to an external surface of the first side wall.” Finally, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’813 patent is that they are broad enough to encompass, e.g., a portion of an enclosure to which a top cover attaches to a bottom cover as satisfying “a flange joins the first and second side walls and the top and bottom wall, and a lip extends from the flange . . . the lip being engaged by the internal cover to provide the environmental seal”.

Under these overly broad interpretations of the Asserted Claims, each of the Asserted Claims of the ’813 Patent is invalid for lack of written description and/or is not enabled.

e. ’521 Patent

Defendants contend that the full scope of each Asserted Claim of the ’521 Patent was not described with particularity in the specification to which priority is sought, so as not to set forth enough detail to allow a person of ordinary skill in the art to understand what is claimed and to recognize that the inventor invented what is claimed. Accordingly, each Asserted Claim of the ’521 Patent is invalid for lack of adequate written description and/or enablement under 35 U.S.C. § 112, ¶ 1, based at least on the following claim terms/phrases:

Claim Term	Asserted Claims
“the cooling unit comprising ... a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on”	1
“wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on”	1
“drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow”	14
“Venturi chamber”	4, 15

Moreover, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’521 Patent is that they are broad enough to encompass, e.g., devices having no Venturi effect or having two inlets and an outlet and a reduction of cross sectional area between the inlets and outlet as having a “Venturi Chamber” and being capable of “drawing the first airflow into a Venturi chamber,” “drawing the second airflow further comprises drawing the second airflow into the Venturi chamber,” and “operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.” Further, to the extent Defendants understand Plaintiff’s deficient infringement contentions, Plaintiff’s apparent interpretation of the Asserted Claims of the ’521 Patent is that they are broad enough to encompass, e.g., devices having two inlets and an outlet and a reduction of cross sectional area between the inlets and outlet as “draw[ing an]... airflow ... using a Venturi effect” and “drawing a second airflow ... using a Venturi effect created by drawing [a] first airflow.” Further, to the extent Defendants understand Plaintiff’s deficient infringement

contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., two parallel and/or collinear flowing airflows as "directing [one] airflow air ... across the [other] airflow" and "directing [one] airflow air... across the [other] airflow." Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., devices without fans as having "a fan shroud having at least one electrical fan" and "operating a fan to draw" airflows and "operating a fan to pull" airflows.⁶ Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., an inlet upstream of a heat exchanger and/or drawing in surrounding air as the "Venturi Chamber" "inlet for receiving a heated airflow from a heatsink." Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., a fan exhaust as the "Venturi Chamber" "an outlet coupled to the fan shroud." Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., a wall parallel to flow of the "heated airflow" and/or creating a "narrowing pathway" that follows the direction of flow through a heatsink as " a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect." Further, to the extent Defendants understand

⁶ Plaintiff has not articulated an infringement theory that the asserted claims are met when one or more fans are located in physically separated units. Defendants expressly reserve the right to amend these Invalidity Contentions should Plaintiff put forward such a theory.

Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., the air flow flowing to a heatsink as "the air flow from the first inlet surrounds the convective openings to the heat sink." Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., surrounding air entering one (a first) inlet as being hotter than the same surrounding air entering another (a second) inlet as "wherein the airflow from the surrounding environment is cooler than the heated airflow." Further, to the extent Defendants understand Plaintiff's deficient infringement contentions, Plaintiff's apparent interpretation of the Asserted Claims of the '521 Patent is that they are broad enough to encompass, e.g., air flow through the convective openings as an "airflow [that] does not flow into the one or more convective openings of the heatsink." Under these overly broad interpretations of the Asserted Claims, each of the Asserted Claims of the '521 Patent is invalid for lack of written description and/or is not enabled.

V. P.R. 3-4 DISCLOSURES AND CONTENTIONS

A. P.R. 3-4(a) Disclosures

Pursuant to P.R. 3-4(a), Defendants have produced representative technical documentation within their possession, custody, and control that show the operation of aspects or elements of the Accused Instrumentality identified by Procomm in its Infringement Contentions for each Defendant. Defendants reserve the right to supplement these disclosures with additional documentation.

B. P.R. 3-4(b) Disclosures

In accordance with P.R. 3-4(b), Defendants are producing a single set of prior art references identified in these Invalidity Contentions for prior art related to patents asserted against more than one Defendant. Defendants are also producing prior art references concerning prior art systems

and methods. Such documents can be found at the following Bates range: DEFS-PRCM-PA_0000001 - DEFS-PRCM-PA_0004866.

. Any prior art references not in English are produced with an English translation of the portion(s) relied upon. These prior art references are cited herein and support the contentions presented. Defendants’ search for prior art references, additional documentation, and/or corroborating evidence concerning prior art apparatuses and methods is ongoing. Accordingly, Defendants reserve the right to supplement their production, as provided by the local rules, as additional prior art references, additional documentation, and/or corroborating evidence concerning prior art documents/apparatuses, and methods are obtained during the course of discovery.

VI. PATENT SUBJECT MATTER INELIGIBILITY CONTENTIONS

The Asserted Claims are ineligible under 35 U.S.C. § 101 because they “are directed to [a] patent-ineligible concept[]” and, further, do not contain “additional elements [that] ‘transform the nature of the claim’ into a patent-eligible application.” *Alice Corp. Pty. v. CLS Bank Int’l*, 573 U.S. 208, 217-18 (2014). In considering whether an alleged “invention” is directed to a patent-ineligible concept, “both [the Federal Circuit] and the Supreme Court have found it sufficient to compare claims at issue to those claims already found to be directed to an abstract idea in previous cases.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). Such a concept as that contemplated by the Asserted Claims and presently advanced by Plaintiff—and similar concepts—have been repeatedly rejected as abstract. *See, e.g., Broadcom Corp. v. Netflix Inc.*, No. 3:20-CV-04677-JD, 2021 WL 4170784, at *9 (N.D. Cal. Sept. 14, 2021); *see also, e.g., BSG Tech LLC v. BuySeasons, Inc.*, 899 F.3d 1281 (Fed. Cir. 2018); *OpenTV, Inc. v. Netflix, Inc.*, No. 14-cv-01525, 2014 WL 7185921, at *4, 8 (N.D. Cal. Dec. 16, 2014).

Moreover, the various steps set forth in the Asserted Claims were well-understood, routine, and conventional at the time of the priority date of each patents. The Asserted Claims therefore provide no inventive concept. The bases for Defendants' subject matter ineligibility contentions is set forth more fully in the charts attached hereto as Appendix C and E.

Dated: June 12, 2024

Respectfully submitted,

/s/ Kevin P. Anderson

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Telefonaktiebolaget LM Ericsson and Ericsson,
Inc.*

CERTIFICATE OF SERVICE

I hereby certify that on June 12, 2024, the foregoing document was served via e-mail upon all counsel of record in this case.

/s/ Kevin P. Anderson
Kevin P. Anderson

INVALIDITY CONTENTIONS FOR U.S. PATENT NO. 7,724,521 B2
BASED ON US 2010/0072001 A1 TO CHEN (“CHEN”)

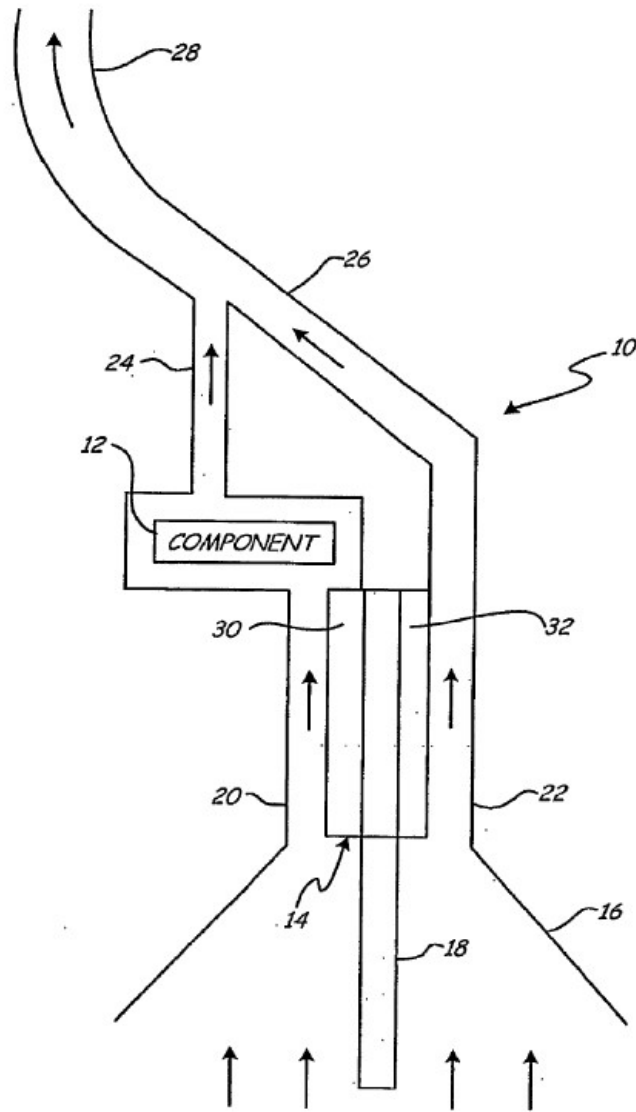
Based upon Plaintiff’s Complaint, Infringement Contentions, and apparent claim constructions and application of the claims to Defendant’s accused products, as best as they can be deciphered, the reference charted below anticipates or at least renders obvious the asserted claims. These invalidity contentions are not an admission by the Defendant that the accused products are covered by or infringe the asserted claims, particularly when these claims are properly construed and applied. These invalidity contentions are not an admission that the Defendant concedes or acquiesces to any claim construction implied or suggested by Plaintiff’s Complaint or Infringement Contentions. Nor is Defendant asserting any claim construction positions through these charts, including whether the preamble is a limitation. The portions of the prior art reference cited below are not exhaustive but are exemplary in nature.

U.S. Patent Application Publication No. 2010/0072001 A1 to Chen (“Chen”) was filed on July 13, 2009, published on March 25, 2010, and claims priority to PCT/US07/00745 filed January 11, 2007. This patent publication is prior art under at least 35 U.S.C. § 102(e) and 103(a). As described in the following claim chart, the asserted claims of U.S. Patent No. 7,724,521 (the “’521 Patent”), are invalid as anticipated by Chen.

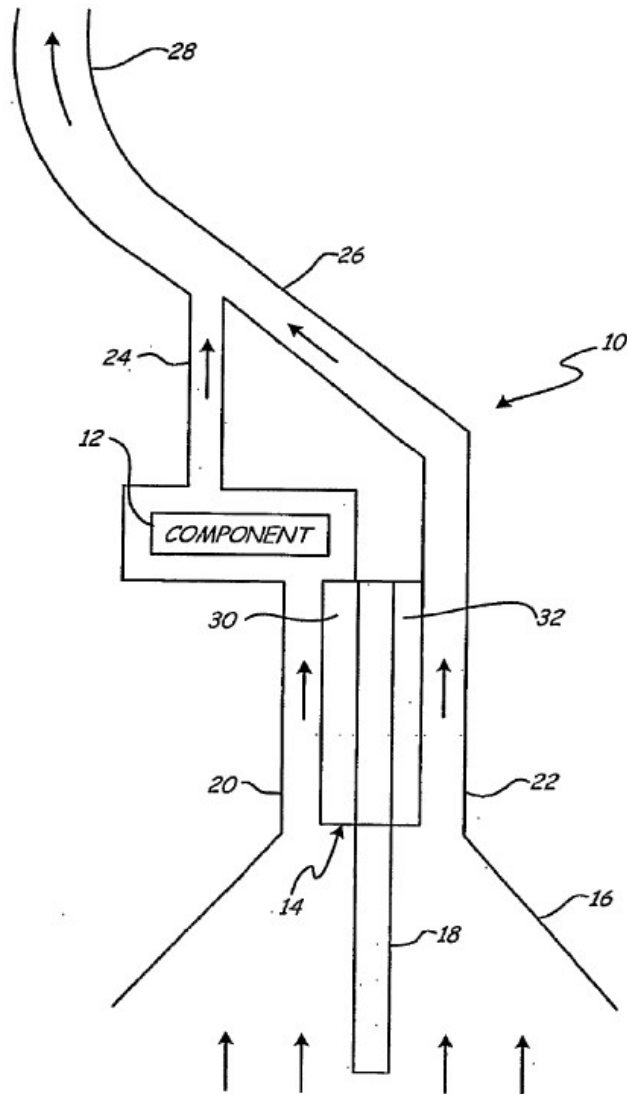
To the extent that Chen is found not to anticipate one or more of the asserted claims of the ’521 Patent, these claims are invalid as obvious in view of Chen alone or in combination with other prior art references disclosed in Defendant’s Invalidity Contentions and accompanying charts, including without limitation as set forth below.

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
1[pre]	A cooling unit for an enclosure housing electronics, the cooling unit comprising:	To the extent the preamble is limiting, Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Components of an elevator system are cooled using natural convective airflow in conjunction with thermoelectric heating and cooling. Rising air within the hoistway is funneled into a cold air duct (20) and a warm air duct (22). As air flows vertically upward through the cool air duct (20) and the warm air duct (22), a thermoelectric module (14) cools air in the cool air duct (20) and heats air in the warm air duct (22). The cool

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		air stream in the cool air duct (20) is circulated past the elevator component (12), and is drawn upward into a common exhaust duct (28) by the faster flowing warm air stream in the warm air duct (22).” Abstract “In particular, the present invention relates to a thermal management system using thermoelectric heating and cooling to maintain components of an elevator system in a desired operating temperature range. Ambient conditions for an elevator system may range, for example, from below 0° C. to about 45° C., with humidity ranging up to 95%. Components of the elevator system may be located in the machine room or the hoistway or the system, where the temperature can vary even more because these locations are not air-conditioned.” [0002] “A temperature control system for an elevator system makes use of natural convective airflow in conjunction with a thermoelectric device to provide cooling or heating of elevator components such as energy storage devices, motor drive electronics, and elevator hoist motors. The temperature management system includes a warm air duct and a cool air duct which receive rising air flow at their lower inlet ends, and which are connected together at their upper outlet ends. A thermoelectric device is positioned to heat air flowing in the warm air duct and to cool air flowing in the cool air duct. An elevator component is positioned to be cooled by air flowing in the cool air duct.” [0004]. “Temperature control system 10 shown in the figure provides cooling of elevator component 12 through the use of natural convective airflow and cooling and heating of air provided by thermoelectric module 14. Temperature control system 10 is particularly suitable to be implemented in an upper portion of a hoistway of an elevator system, where warmer air flows.” [0006].



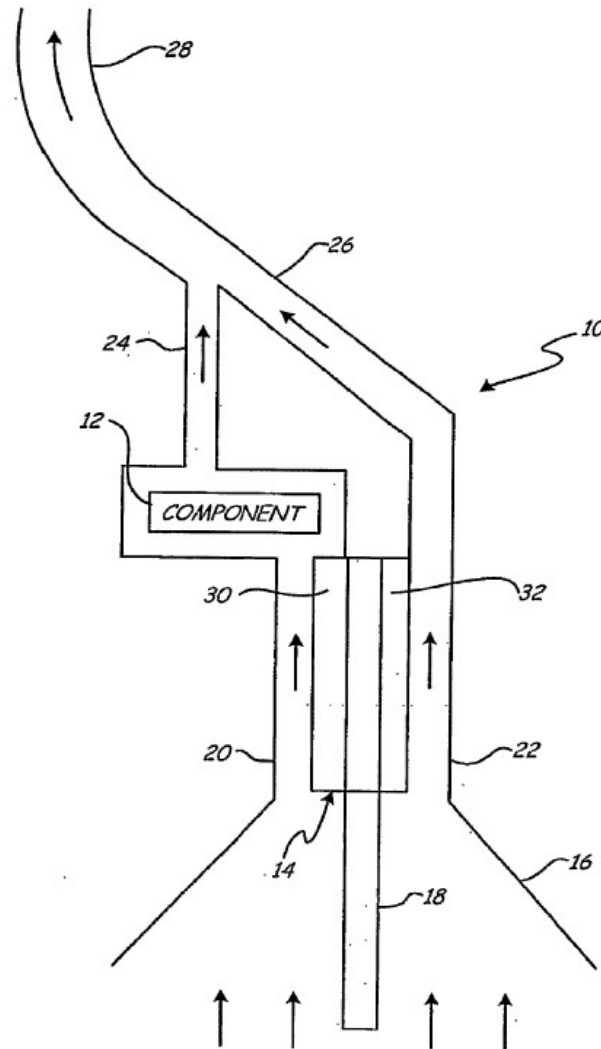
Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		“Elevator component 12 may be, for example, a part of an electrical energy storage system used to store electrical energy produced by the elevator drive system when operating in a regenerative mode. The components may be batteries, capacitors, or circuitry used in conjunction with the energy storage.” [0013]. “In other embodiments, elevator component 12 may be the elevator hoist motor or the motor drive and regenerative electronics of the elevator system.” [0016]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[a]	a fan shroud having at least one electrical fan; and	Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Exhaust duct 28 may be connected to a vent at the exterior of the building, or may be connected to a building ventilation system which further draws the air upward through exhaust duct 28.” [0011].



Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		“By heating the warm air stream in warm air duct 22 while cooling the cool air stream in cool air duct 22, a difference inflow rates is created that aids the Venturi effect to draw the cooling air upward past elevator component 12 and into exhaust duct 28. By taking advantage of the Venturi effect and vertical convective airflow, temperature control of elevator component 12 can be achieved either without a fan or with limited use of fans. As a result, noise associated with other cooling systems used with elevators can be avoided.” [0012]. “Although system 10 offers the ability to provide airflow for the cooling function without the need for a large fan, in Some cases a small fan may be advantageous to facilitate the airflow. The fan may not be required to operate at all times, and can be turned on only as needed. Whether system 10 operates with no fan, or with a small fan used only as needed, noise can be significantly reduced and parasitic energy loss resulting from the operation of fans is also reduced.” [0021]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[b]	a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an	Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Temperature control system 10 includes air funnel 16, separator 18, cold air duct 20, warm air duct 22, cool air exhaust port 24, warm air exhaust 26, and common exhaust conduit 28. Control system 10 is vertically mounted so that warm air within the hoistway enters at the lower end of system 10 at funnel 16. The inlet air

Exhibit – E-01

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
	airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on;	is separated into two flow paths by separator 18. One flow path enters cold air duct 20, while the other enters warm air duct 22.” [0007].

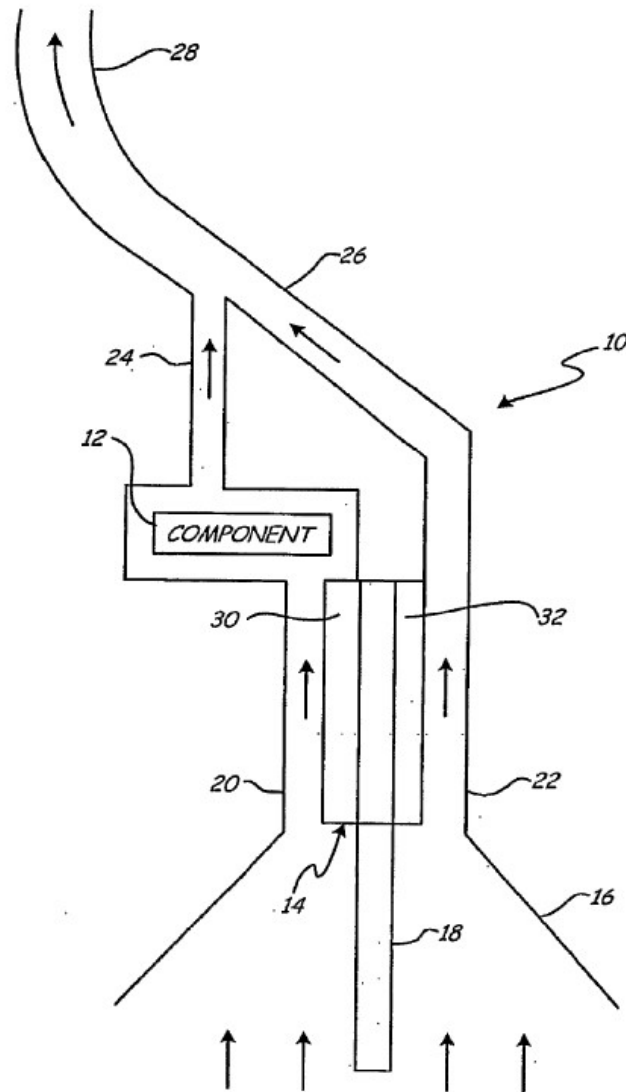


“Thermoelectric module 14 is positioned between cold air duct 20 and warm air duct 22. Cooling surface 30 of thermoelectric module 14 cools air that is flowing upward through cold air duct 20. At the same time,

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		heating surface 32 on the opposite side of thermoelectric module 14 is in contact with air flowing through warm air duct 22. Heating surface 32 acts as heat sink for thermoelectric module 14, and transfers heat to the air flowing through warm air duct 22. As a result, the warm airflow through warm air duct 22 is accelerated as it flows toward warm air exhaust port 26.” [0008]. “The air flowing in cold air duct 20, after being cooled by cooling surface 30 of thermoelectric module 14, flows past elevator component 12 and then upward towards cold air exhaust port 24.” [0009] “The warm airflow in warm air duct 22 flows out of warm air exhaust port 26 and into common exhaust duct 28. The warm air stream from warm air exhaust port 26 creates suction of the cooled air flowing to cool air exhaust port 24 due to the Venturi effect.” [0010]. “Exhaust duct 28 may be connected to a vent at the exterior of the building, or may be connected to a building ventilation system which further draws the air upward through exhaust duct 28.” [0011]. “By heating the warm air stream in warm air duct 22 while cooling the cool air stream in cool air duct 22, a difference inflow rates is created that aids the Venturi effect to draw the cooling air upward past elevator component 12 and into exhaust duct 28. By taking advantage of the Venturi effect and vertical convective airflow, temperature control of elevator component 12 can be achieved either without a fan or with limited use of fans. As a result, noise associated with other cooling systems used with elevators can be avoided.” [0012]. “In the figure, elevator component 12 has been schematically illustrated as being positioned within cool air duct 20 so that air circulates around elevator component 12 on all sides. In some cases, only one or some of the surfaces of the elevator component 12 may be exposed to the airflow within cool air duct 20.” [0017]. “Although cool air duct 20 and warm air duct 22 are shown receiving air from a common air funnel 16 with a separator 18, the inlets to ducts 20 and 22 could have their own individual air funnel inlets.” [0019].

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		“Although not shown the figure, cool air duct 20 and warm air duct 22 are thermally insulated from one another, so that a temperature differential is maintained between air flowing through cool air duct 20 and air flowing through warm air duct 22. The temperature differential results in different air velocities of the two air streams, which aids in drawing the cool air upward into common exhaust duct 28.” [0020]. “Although system 10 offers the ability to provide airflow for the cooling function without the need for a large fan, in some cases a small fan may be advantageous to facilitate the airflow. The fan may not be required to operate at all times, and can be turned on only as needed. Whether system 10 operates with no fan, or with a small fan used only as needed, noise can be significantly reduced and parasitic energy loss resulting from the operation of fans is also reduced.” [0021]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[c]	wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow	Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Temperature control system 10 includes air funnel 16, separator 18, cold air duct 20, warm air duct 22, cool air exhaust port 24, warm air exhaust 26, and common exhaust conduit 28. Control system 10 is vertically mounted so that warm air within the hoistway enters at the lower end of system 10 at funnel 16. The inlet air is separated into two flow paths by separator 18. One flow path enters cold air duct 20, while the other enters warm air duct 22.” [0007].

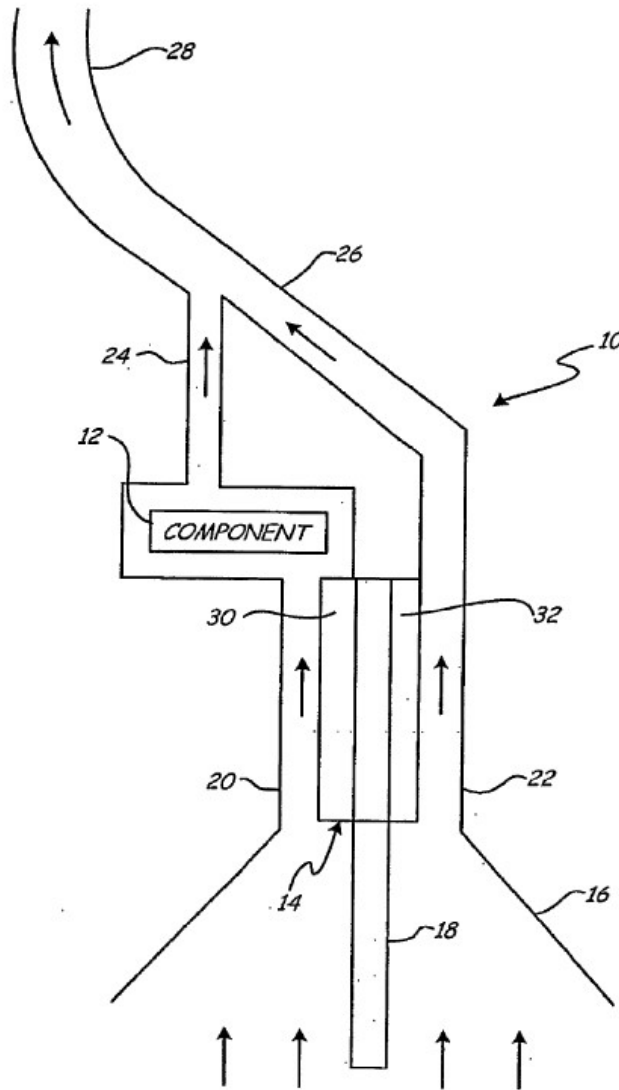
from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.



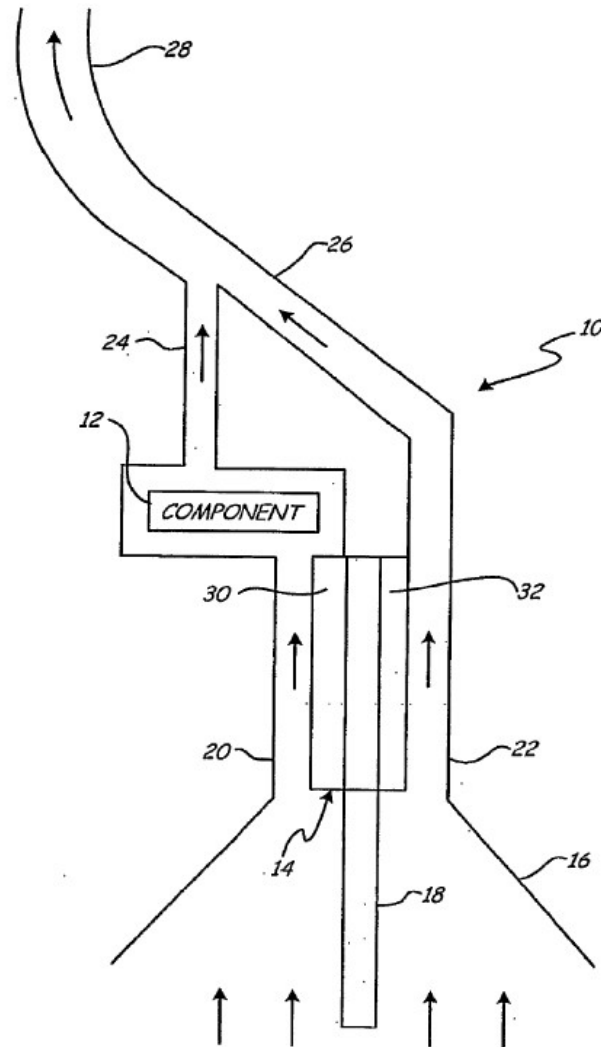
Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		“Although cool air duct 20 and warm air duct 22 are shown receiving air from a common air funnel 16 with a separator 18, the inlets to ducts 20 and 22 could have their own individual air funnel inlets.” [0019]. <i>See also</i> [1b]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
4	The cooling unit of claim 1, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.	Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> [1b] To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
5	The cooling unit of claim 1, wherein the	Chen expressly or inherently discloses this claim element.

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
	airflow from the surrounding environment is cooler than the heated airflow.	<i>See, e.g.,</i> “Temperature control system 10 includes air funnel 16, separator 18, cold air duct 20, warm air duct 22, cool air exhaust port 24, warm air exhaust 26, and common exhaust conduit 28. Control system 10 is vertically mounted so that warm air within the hoistway enters at the lower end of system 10 at funnel 16. The inlet air is separated into two flow paths by separator 18. One flow path enters cold air duct 20, while the other enters warm air duct 22.” [0007]. “Thermoelectric module 14 is positioned between cold air duct 20 and warm air duct 22. Cooling surface 30 of thermoelectric module 14 cools air that is flowing upward through cold air duct 20. At the same time, heating surface 32 on the opposite side of thermoelectric module 14 is in contact with airflowing through warm air duct 22. Heating surface 32 acts as heat sink for thermoelectric module 14, and transfers heat to the air flowing through warm air duct 22. As a result, the warm airflow through warm air duct 22 is accelerated as it flows toward warm air exhaust port 26.” [0008]. “The air flowing in cold air duct 20, after being cooled by cooling surface 30 of thermoelectric module 14, flows past elevator component 12 and then upward towards cold air exhaust port 24.” [0009] “The warm airflow in warm air duct 22 flows out of warm air exhaust port 26 and into common exhaust duct 28. The warm air stream from warm air exhaust port 26 creates suction of the cooled air flowing to cool air exhaust port 24 due to the Venturi effect.” [0010]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
14[pre]	A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:	To the extent the preamble is limiting, Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Components of an elevator system are cooled using natural convective airflow in conjunction with thermoelectric heating and cooling. Rising air within the hoistway is funneled into a cold air duct (20) and a warm air duct (22). As air flows vertically upward through the cool air duct (20) and the warm air duct (22), a thermoelectric module (14) cools air in the cool air duct (20) and heats air in the warm air duct (22). The cool air stream in the cool air duct (20) is circulated past the elevator component (12), and is drawn upward into a common exhaust duct (28) by the faster flowing warm air stream in the warm air duct (22).” Abstract “In particular, the present invention relates to a thermal management system using thermoelectric heating and cooling to maintain components of an elevator system in a desired operating temperature range. Ambient conditions for an elevator system may range, for example, from below 0° C. to about 45° C., with humidity ranging up to 95%. Components of the elevator system may be located in the machine room or the hoistway or the system, where the temperature can vary even more because these locations are not air-conditioned.” [0002] “Temperature control system 10 shown in the figure provides cooling of elevator component 12 through the use of natural convective airflow and cooling and heating of air provided by thermoelectric module 14. Temperature control system 10 is particularly suitable to be implemented in an upper portion of a hoistway of an elevator system, where warmer air flows.” [0006].



Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		“Elevator component 12 may be, for example, a part of an electrical energy storage system used to store electrical energy produced by the elevator drive system when operating in a regenerative mode. The components may be batteries, capacitors, or circuitry used in conjunction with the energy storage.” [0013]. “In other embodiments, elevator component 12 may be the elevator hoist motor or the motor drive and regenerative electronics of the elevator system.” [0016]. <i>See also</i> Chen claims 17-23, 1[pre]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
14[a]	directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;	Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Temperature control system 10 includes air funnel 16, separator 18, cold air duct 20, warm air duct 22, cool air exhaust port 24, warm air exhaust 26, and common exhaust conduit 28. Control system 10 is vertically mounted so that warm air within the hoistway enters at the lower end of system 10 at funnel 16. The inlet air is separated into two flow paths by separator 18. One flow path enters cold air duct 20, while the other enters warm air duct 22.” [0007].



“Thermoelectric module 14 is positioned between cold air duct 20 and warm air duct 22. Cooling surface 30 of thermoelectric module 14 cools air that is flowing upward through cold air duct 20. At the same time,

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
		heating surface 32 on the opposite side of thermoelectric module 14 is in contact with air flowing through warm air duct 22. Heating surface 32 acts as heat sink for thermoelectric module 14, and transfers heat to the air flowing through warm air duct 22. As a result, the warm airflow through warm air duct 22 is accelerated as it flows toward warm air exhaust port 26.” [0008]. “The air flowing in cold air duct 20, after being cooled by cooling surface 30 of thermoelectric module 14, flows past elevator component 12 and then upward towards cold air exhaust port 24.” [0009] “The warm airflow in warm air duct 22 flows out of warm air exhaust port 26 and into common exhaust duct 28. The warm air stream from warm air exhaust port 26 creates suction of the cooled air flowing to cool air exhaust port 24 due to the Venturi effect.” [0010] “Exhaust duct 28 may be connected to a vent at the exterior of the building, or may be connected to a building ventilation system which further draws the air upward through exhaust duct 28.” [0011]. “In the figure, elevator component 12 has been schematically illustrated as being positioned within cool air duct 20 so that air circulates around elevator component 12 on all sides. In some cases, only one or some of the surfaces of the elevator component 12 may be exposed to the airflow within cool air duct 20.” [0017]. <i>See also</i> 14[pre]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
14[b]	drawing a first airflow across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;	Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> “The warm airflow in warm air duct 22 flows out of warm air exhaust port 26 and into common exhaust duct 28. The warm air stream from warm air exhaust port 26 creates suction of the cooled air flowing to cool air exhaust port 24 due to the Venturi effect.” [0010] <i>See also</i> 14[a]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
14[c]	drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.	Chen expressly or inherently discloses this claim element. <i>See, e.g.,</i> 14[b], 1[b]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
15[a]	The method of claim 14 wherein drawing the first airflow further comprises drawing the first airflow into a Venturi chamber;	Chen expressly or inherently discloses this claim element. <i>See, e.g., 1[b-c], 14.</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[b]	wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;	Chen expressly or inherently discloses this claim element. <i>See, e.g., 1[b-c], 14.</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[c]	the method further comprising operating a fan to pull the first	Chen expressly or inherently discloses this claim element. <i>See, e.g., 1[b-c], 14.</i>

Claim No.	U.S. Patent No. 7,724,521 B2	Chen
	airflow and the second airflow out of the Venturi chamber.	To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
16	The method of claim 14, further comprising operating a fan to draw the first airflow and the second airflow.	Chen expressly or inherently discloses this claim element. <i>See, e.g., 15[a-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

INVALIDITY CONTENTIONS FOR U.S. PATENT NO. 7,724,521 B2
BASED ON US 7,027,300 B2 TO LORD (“LORD”)

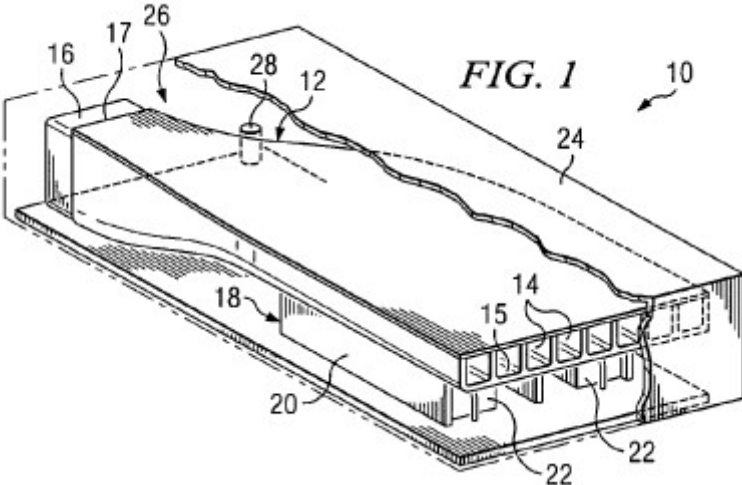
Based upon Plaintiff’s Complaint, Infringement Contentions, and apparent claim constructions and application of the claims to Defendant’s accused products, as best as they can be deciphered, the reference charted below anticipates or at least renders obvious the asserted claims. These invalidity contentions are not an admission by the Defendant that the accused products are covered by or infringe the asserted claims, particularly when these claims are properly construed and applied. These invalidity contentions are not an admission that the Defendant concedes or acquiesces to any claim construction implied or suggested by Plaintiff’s Complaint or Infringement Contentions. Nor is Defendant asserting any claim construction positions through these charts, including whether the preamble is a limitation. The portions of the prior art reference cited below are not exhaustive but are exemplary in nature.

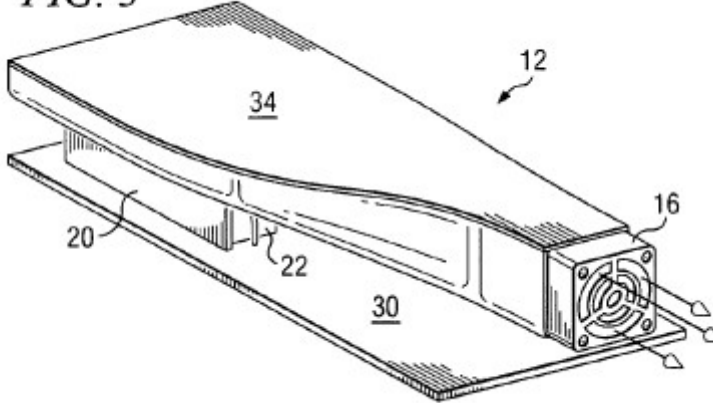
U.S. Patent No. 7,027,300 to Lord (“LORD”) was filed on September 16, 2003, issued on April 11, 2006. This patent is prior art under at least 35 U.S.C. § 102(b), and 103(a). As described in the following claim chart, the asserted claims of U.S. Patent No. 7,724,521 (the “’521 Patent”), are invalid as anticipated by LORD.

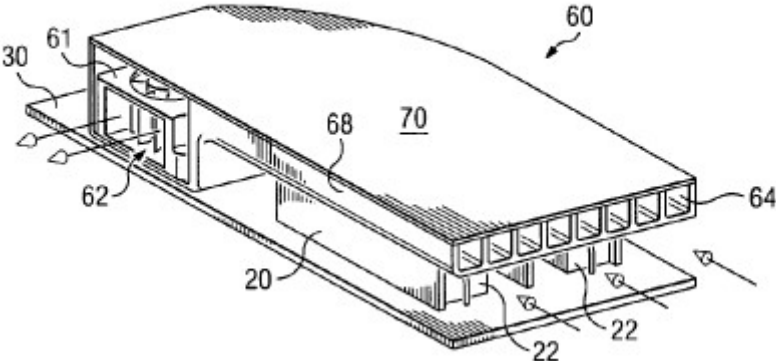
To the extent that LORD is found not to anticipate one or more of the asserted claims of the ’521 Patent, these claims are invalid as obvious in view of LORD alone or in combination with other prior art references disclosed in Defendant’s Invalidity Contentions and accompanying charts, including without limitation as set forth below.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
1[pre]	A cooling unit for an enclosure housing electronics, the cooling unit comprising:	To the extent the preamble is limiting, Lord expressly or inherently discloses this claim element. <i>See, e.g.,</i> “The present invention is generally related to heat cooling systems for portable electronic devices, and more particularly to a heat cooling system including a plenum to remove heat from ultra-compact devices including power converters, transmitters, amplifiers, and so forth.” 1:5-9 “The present invention achieves technical advantages as a compact cooling system including a plenum formed of a thermally conductive material, the plenum including both a plurality of passageways adapted to pass air

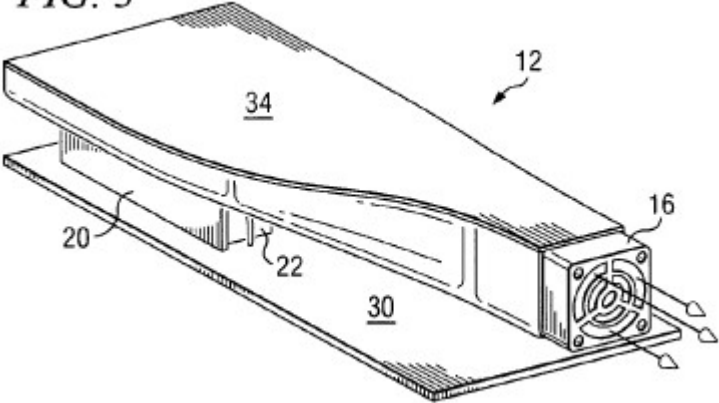
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		therethrough, and also having an integral receptacle adapted to wick heat from a heat generating component and transfer the heat to the passageways.” 1:32-38 “Advantageously, heat is efficiently transferred from the heat generating component to the plenum, and the plenum is efficiently cooled flowing air created the fan so as to provide an extremely compact design.” 1:53-56. “In one embodiment of the present invention, the base may also include a plurality of openings extending therethrough and communicating with the passageways. These openings are adapted to generate a venturi effect when air is communicated thereacross and through the passageways, thereby drawing heat from inside a package, through the openings, and into the passageways for dispersing thereof.” 2:5-11. “Referring now to FIG. 1, there is generally illustrated at 10 a power converter device thermally coupled to a plenum 12 according to a first preferred embodiment of the present invention. Plenum 12 is seen to have a plurality of passage ways 14 each having an intake opening 15, and an opposing fan 16 at a exhaust opening 17 and thereof. Plenum 12 is also seen to include a plurality of receptacles 18 formed by integral downwardly extending members 20, each receptacle 18 seen to frictionally receive a respective heat generating electrical component 22. Plenum 12 is advantageously configured to wick heat from the heat generating members 22, and then transfer this heat to surface areas in contact with passageways 14 Such that the flow of air therethrough removes heat therefrom. Device 10 is further seen to include a package housing 24 defining a chamber 26 therein housing other electrical component 28 forming a portion of the power converter housed therein.” 2:58-3:7.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		 FIG. 1; see also FIGs. 2-9 (and associated description), the embodiment of FIGs. 10-17 (and associated description), and the embodiment of FIGs. 18-20 (and associated description). To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[a]	a fan shroud having at least	Lord expressly or inherently discloses this claim element. <i>See, e.g.,</i>

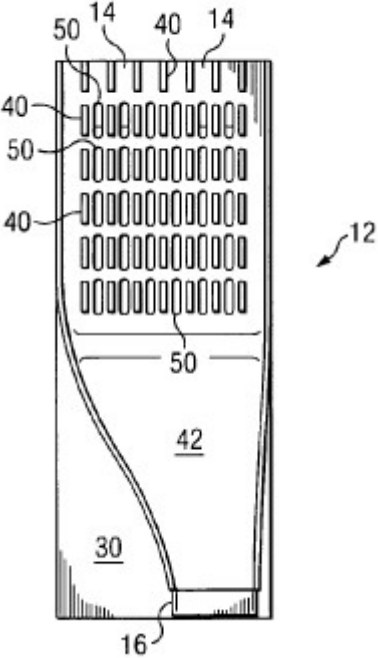
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
	one electrical fan; and	“Plenum 12 is seen to have a plurality of passage ways 14 each having an intake opening 15, and an opposing fan 16 at a exhaust opening 17 and thereof.” 2:61-63. <i>FIG. 3</i>  FIG. 3; <i>see also</i> FIGs. 1-2 and 4-9 (and associated description). “Referring now to FIG. 10, there is generally shown at 60 a plenum according to a second preferred embodiment of the present invention similar to the first embodiment depicted in FIGS. 1-9. In this embodiment, plenum 60 is provided with an exhaust fan 61 to exhaust heated air laterally of the plenum assembly 60 via an exhaust port 62. Intake openings 64 communicating with passageways 66 are defined at the proximal end thereof and are defined generally 90 degrees with respect to the exhaust port 62.” 4:4-12.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		<i>FIG. 10</i>  FIG. 10; <i>see also</i> FIGs. 11-17 (and associated description), and the embodiment of FIGs. 18-20 (and associated description). To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[b]	a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a	Lord expressly or inherently discloses this claim element. <i>See, e.g.,</i> “In one embodiment of the present invention, the base may also include a plurality of openings extending therethrough and communicating with the passageways. These openings are adapted to generate a venturi

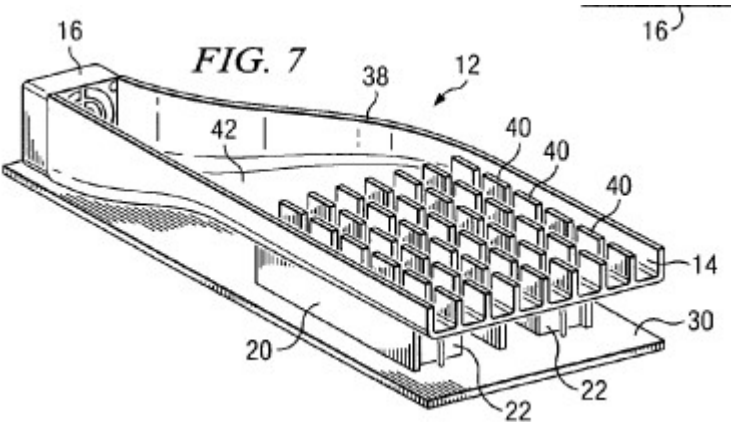
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
	second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on;	effect when air is communicated thereacross and through the passageways, thereby drawing heat from inside a package, through the openings, and into the passageways for dispersing thereof.” 2:5-11. “Plenum 12 is seen to have a plurality of passage ways 14 each having an intake opening 15, and an opposing fan 16 at a exhaust opening 17 and thereof. Plenum 12 is also seen to include a plurality of receptacles 18 formed by integral downwardly extending members 20, each receptacle 18 seen to frictionally receive a respective heat generating electrical component 22. Plenum 12 is advantageously configured to wick heat from the heat generating members 22, and then transfer this heat to surface areas in contact with passageways 14 Such that the flow of air therethrough removes heat therefrom.” 2:61-3:4. FIG. 1. “FIG. 3 depicts an end view of the plenum 12 of FIG. 2, illustrating the exhaust port 17 of the plenum 12 coupled to the fan 16 drawing air into the intake openings 15 as shown. Heat generating components 22 are depicted as resistors having leads soldered to solder pads defined on circuit board 30.”

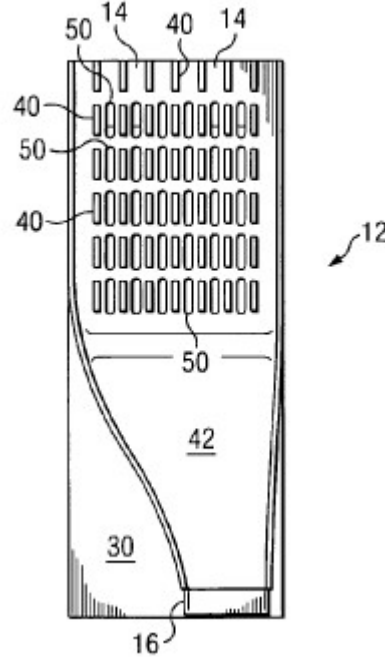
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		<i>FIG. 3</i>  FIG. 3 “Plenum assembly 12 is seen to be comprised of a unitary thermally conductive base 38, Such as comprised of aluminum oxide which advantageously is electrically non-conductive composite material but is highly thermally conductive, but may be comprised of an electrically conductive material such as copper or aluminum in some applications, such as shown in FIG. 18. Base 38 has a wide planar intake area including a plurality of integral, upwardly extending, cooling fins 40 arranged in rows, as shown. This arrangement of fins 40 resembles a brush such that air drafted into passageways 14 is exposed to the large Surface area of the collective fins 40, and can communicate between the passageways 14. The middle portion of the unitary member 38 is seen to funnel downwardly and inwardly to define the generally rectangular exhaust port 17 having fan 16 secured thereacross.” 3:24-41.

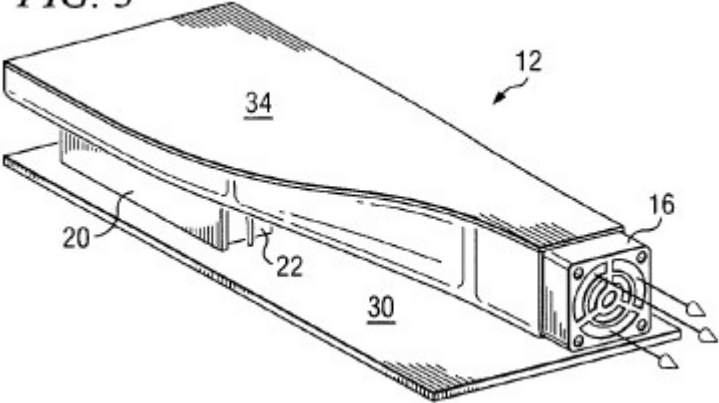
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		FIG. 7. “FIG. 8 depicts the end view of the plenum 12, further illustrating the exhaust opening 17 facing the intake openings 15 of passageways 14 at the opposing end thereof. Advantageously, air generally flows in a common plane from the intake openings 15 to the exhaust opening 17 for exhausting by fan 16. This generally planar design provides minimal resistance for air to flow therethrough and across the brush-like fin arrangement created by fins 40.” 3:44-51. “Referring now to FIG. 9, there is depicted a top view of the plenum 12 with the lid 34 removed, further depicting a linear array of openings 50 defined between each row of fins 40. Openings 50 extend through the generally planar intake end of unitary base 38, each opening into the cavity 26 of device 10 proximate the heat generating components 22, as well as other electrical components 28 shown in FIG. 1. Advantageously, as air flows across each of these openings 50, a venturi effect is created, which venturi effect draws the heating air from within cavity 26 into the passageways 14 for exhausting via fan 16.” 3:52-62.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		<i>FIG. 9</i>  FIG. 9. “Advantageously, the plenum 12 removes heat from the heat generating components 22 via heat conducting members 20, and also using convection due to the venturi effect created by air flowing across openings 50. This dual-mode plenum removes heat generated by components in a vary tight package, and provides cooling thereof in a very com pact design.” 3:63-4:3; see also FIGs. 2, 4-6 (and associated description),

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		“Embodiment 80 is similar to embodiment 68 of FIG. 15, with the exception that the base member generally shown at 82 is comprised of a first heatsink portion 84 and a second heatsink portion 86 separated from, and interconnected by, an electrically non-conductive strip portion 88.” 5:7-11. FIG. 19; see also the embodiment of FIGs. 10-17 (and associated description), and the embodiment of FIGs. 18-20 (and associated description). To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[c]	wherein the Venturi chamber comprises a wall	Lord expressly or inherently discloses this claim element.

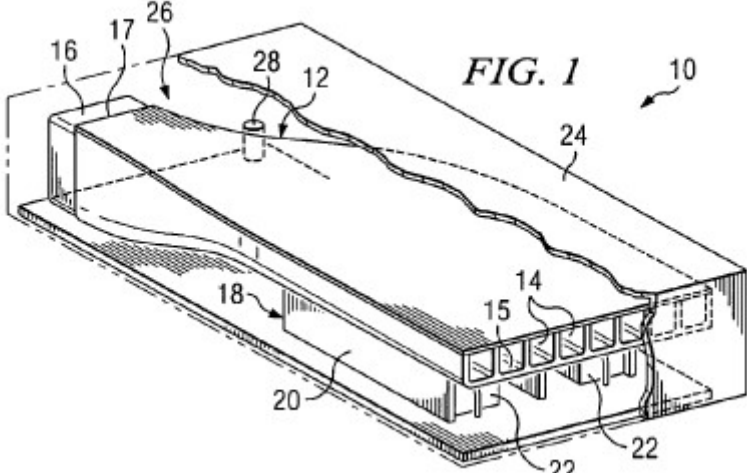
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
	for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.	<i>See, e.g.,</i> “Plenum assembly 12 is seen to be comprised of a unitary thermally conductive base 38, Such as comprised of aluminum oxide which advantageously is electrically non-conductive composite material but is highly thermally conductive, but may be comprised of an electrically conductive material such as copper or aluminum in some applications, such as shown in FIG. 18. Base 38 has a wide planar intake area including a plurality of integral, upwardly extending, cooling fins 40 arranged in rows, as shown. This arrangement of fins 40 resembles a brush such that air drafted into passageways 14 is exposed to the large Surface area of the collective fins 40, and can communicate between the passageways 14. The middle portion of the unitary member 38 is seen to funnel downwardly and inwardly to define the generally rectangular exhaust port 17 having fan 16 secured thereacross.” 3:24-41.  FIG. 7. “Referring now to FIG. 9, there is depicted a top view of the plenum 12 with the lid 34 removed, further depicting a linear array of openings 50 defined between each row of fins 40. Openings 50 extend through the generally planar intake end of unitary base 38, each opening into the cavity 26 of device 10 proximate the heat

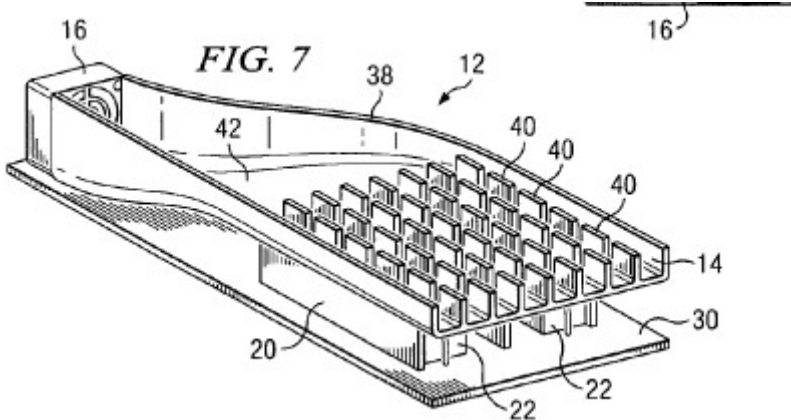
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		generating components 22, as well as other electrical components 28 shown in FIG. 1. Advantageously, as air flows across each of these openings 50, a venturi effect is created, which venturi effect draws the heating air from within cavity 26 into the passageways 14 for exhausting via fan 16.” 3:52-62. <i>FIG. 9</i>  FIG. 9.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		“FIG. 3 depicts an end view of the plenum 12 of FIG. 2, illustrating the exhaust port 17 of the plenum 12 coupled to the fan 16 drawing air into the intake openings 15 as shown. Heat generating components 22 are depicted as resistors having leads soldered to solder pads defined on circuit board 30.” <i>FIG. 3</i>  FIG. 3 <i>See also 1[pre-b].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
4	The cooling unit of claim 1,	Lord expressly or inherently discloses this claim element.

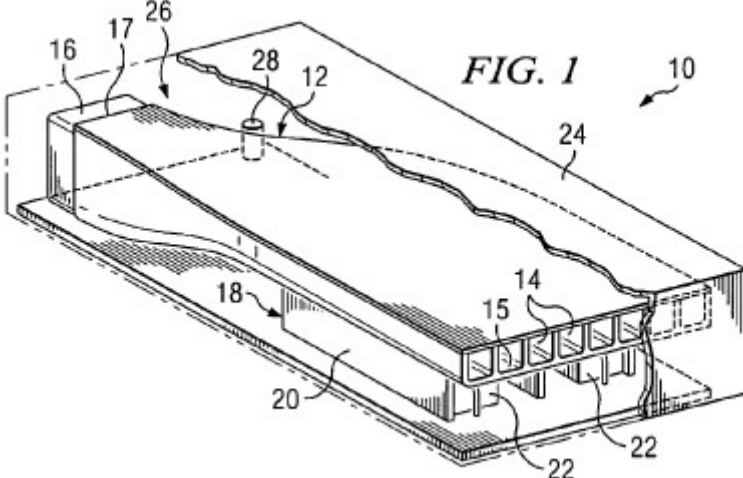
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
	wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.	<i>See, e.g.,</i> 1[pre-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
5	The cooling unit of claim 1, wherein the airflow from the surrounding environment is cooler than the heated airflow.	Lord expressly or inherently discloses this claim element. <i>See, e.g.,</i> "Advantageously, the plenum 12 removes heat from the heat generating components 22 via heat conducting members 20, and also using convection due to the venturi effect created by air flowing across openings 50. This dual-mode plenum removes heat generated by components in a vary tight package, and provides cooling thereof in a very com pact design." 3:64-4:3; <i>see also</i> 1[pre-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[pre]	A method for cooling a sealed environment of	To the extent the preamble is limiting, Lord expressly or inherently discloses this claim element.

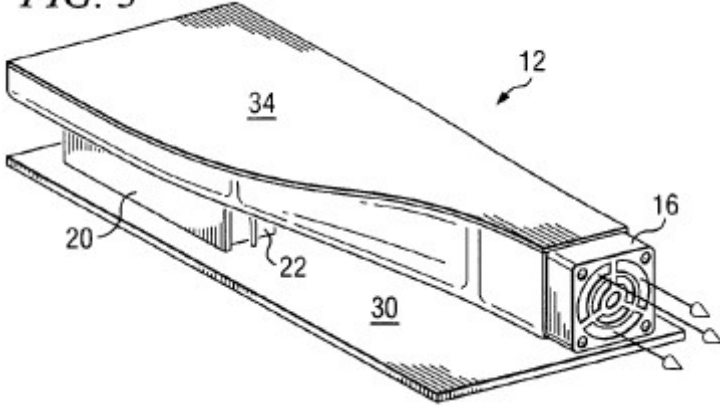
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
	an enclosure for housing electronics, the method comprising:	<i>See, e.g.,</i> “The present invention is generally related to heat cooling systems for portable electronic devices, and more particularly to a heat cooling system including a plenum to remove heat from ultra-compact devices including power converters, transmitters, amplifiers, and so forth.” 1:5-9 “The present invention achieves technical advantages as a compact cooling system including a plenum formed of a thermally conductive material, the plenum including both a plurality of passageways adapted to pass air therethrough, and also having an integral receptacle adapted to wick heat from a heat generating component and transfer the heat to the passageways.” 1:32-38 “Advantageously, heat is efficiently transferred from the heat generating component to the plenum, and the plenum is efficiently cooled flowing air created the fan so as to provide an extremely compact design.” 1:53-56. “In one embodiment of the present invention, the base may also include a plurality of openings extending therethrough and communicating with the passageways. These openings are adapted to generate a venturi effect when air is communicated thereacross and through the passageways, thereby drawing heat from inside a package, through the openings, and into the passageways for dispersing thereof.” 2:5-11. “Referring now to FIG. 1, there is generally illustrated at 10 a power converter device thermally coupled to a plenum 12 according to a first preferred embodiment of the present invention. Plenum 12 is seen to have a plurality of passage ways 14 each having an intake opening 15, and an opposing fan 16 at a exhaust opening 17 and thereof. Plenum 12 is also seen to include a plurality of receptacles 18 formed by integral downwardly extending members 20, each receptacle 18 seen to frictionally receive a respective heat generating electrical component 22. Plenum 12 is advantageously configured to wick heat from the heat generating members 22, and then transfer this heat to surface areas in contact with passageways 14 Such that the flow of air therethrough removes heat therefrom. Device 10 is further seen to include a package housing 24 defining a

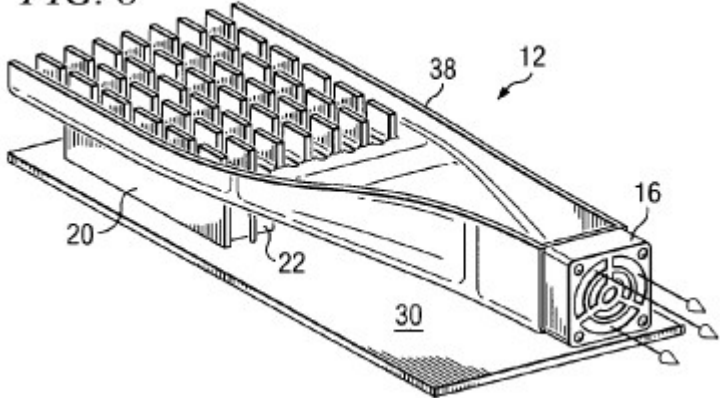
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		chamber 26 therein housing other electrical component 28 forming a portion of the power converter housed therein.” 2:58-3:7.  FIG. 1; <i>see also</i> FIGs. 2-9 (and associated description), the embodiment of FIGs. 10-17 (and associated description), and the embodiment of FIGs. 18-20 (and associated description), 1[pre-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.

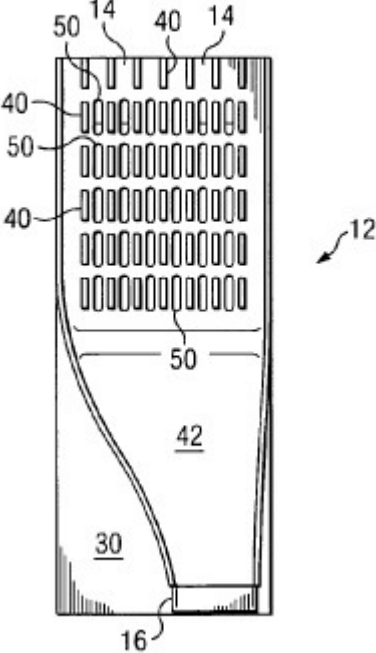
Claim No.	U.S. Patent No. 7,724,521 B2	Lord
14[a]	directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;	Lord expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Referring now to FIG. 7, there is illustrated the plenum 12 with a thermally conductive electrically non-conductive cover 34 removed therefrom. Plenum assembly 12 is seen to be comprised of a unitary thermally conductive base 38, Such as comprised of aluminum oxide which advantageously is electrically non-conductive composite material but is highly thermally conductive, but may be comprised of an electrically conductive material such as copper or aluminum in some applications, such as shown in FIG. 18. Base 38 has a wide planar intake area including a plurality of integral, upwardly extending, cooling fins 40 arranged in rows, as shown. This arrangement of fins 40 resembles a brush such that air drafted into passageways 14 is exposed to the large Surface area of the collective fins 40, and can communicate between the passageways 14.” 3:24-38.  FIG. 7.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		“Advantageously, the plenum 12 removes heat from the heat generating components 22 via heat conducting members 20, and also using convection due to the venturi effect created by air flowing across openings 50. This dual-mode plenum removes heat generated by components in a vary tight package, and provides cooling thereof in a very com pact design.” 3:63-4:3; see also FIGs. 1-6 and 8-9 (and associated description), FIG. 19; <i>see also</i> the embodiment of FIGs. 10-17 (and associated description), and the embodiment of FIGs. 18-20 (and associated description). <i>See also</i> 14[pre]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
14[b]	drawing a first airflow across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;	Lord expressly or inherently discloses this claim element. <i>See, e.g.,</i> “Referring now to FIG. 1, there is generally illustrated at 10 a power converter device thermally coupled to a plenum 12 according to a first preferred embodiment of the present invention. Plenum 12 is seen to have a plurality of passage ways 14 each having an intake opening 15, and an opposing fan 16 at a exhaust opening 17 and thereof.” 2:58-63  FIG. 1. “FIG. 3 depicts an end view of the plenum 12 of FIG. 2, illustrating the exhaust port 17 of the plenum 12 coupled to the fan 16 drawing air into the intake openings 15 as shown.” 3:15-17.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		FIG. 3  FIG. 3. “FIG. 8 depicts the end view of the plenum 12, further illustrating the exhaust opening 17 facing the intake openings 15 of passageways 14 at the opposing end thereof. Advantageously, air generally flows in a common plane from the intake openings 15 to the exhaust opening 17 for exhausting by fan 16. This generally planar design provides minimal resistance for air to flow therethrough and across the brush-like fin arrangement created by fins 40.” 3:44-51.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		<i>FIG. 8</i>  FIG. 8. “Referring now to FIG. 9, there is depicted a top view of the plenum 12 with the lid 34 removed, further depicting a linear array of openings 50 defined between each row of fins 40. Openings 50 extend through the generally planar intake end of unitary base 38, each opening into the cavity 26 of device 10 proximate the heat generating components 22, as well as other electrical components 28 shown in FIG. 1. Advantageously, as air flows across each of these openings 50, a venturi effect is created, which venturi effect draws the heating air from within cavity 26 into the passageways 14 for exhausting via fan 16.” 3:52-63.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		<i>FIG. 9</i>  FIG. 9; <i>see also</i> FIGs. 2, 4-7, and 10 (and associated description), the embodiment of FIGs. 10-17 (and associated description), and the embodiment of FIGs. 18-20 (and associated description), 14[a]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
		Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[c]	drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.	Lord expressly or inherently discloses this claim element. <i>See, e.g., 14[b].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[a]	The method of claim 14 wherein drawing the first airflow further comprises drawing the first airflow into a Venturi chamber;	Lord expressly or inherently discloses this claim element. <i>See, e.g., 14[pre-c]</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
15[b]	wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;	Lord expressly or inherently discloses this claim element. <i>See, e.g., 14[pre-c]</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[c]	the method further comprising operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.	Lord expressly or inherently discloses this claim element. <i>See, e.g., 14[pre-c]</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
16	The method of claim 14, further comprising operating a fan to draw the first	Lord expressly or inherently discloses this claim element. <i>See, e.g., 14[pre-c].</i>

Claim No.	U.S. Patent No. 7,724,521 B2	Lord
	airflow and the second airflow.	To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

INVALIDITY CONTENTIONS FOR U.S. PATENT NO. 7,724,521 B2
BASED ON US 7,450,382 B1 (“FISCHER”)

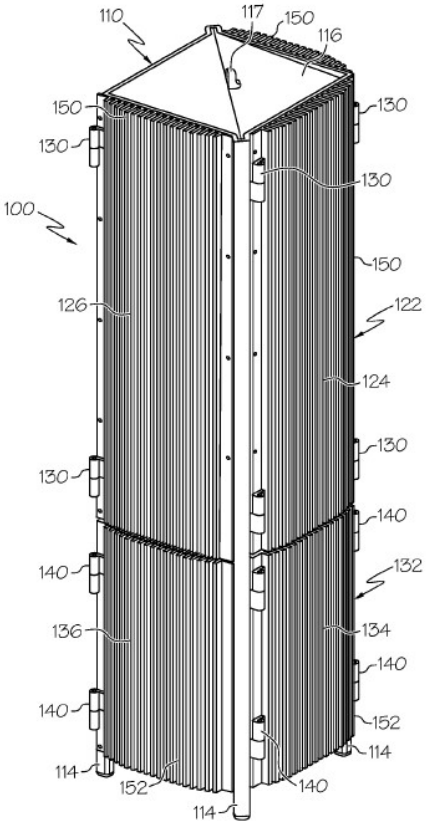
Based upon Plaintiff’s Complaint, Infringement Contentions, and apparent claim constructions and application of the claims to Defendant’s accused products, as best as they can be deciphered, the reference charted below anticipates or at least renders obvious the asserted claims. These invalidity contentions are not an admission by the Defendant that the accused products are covered by or infringe the asserted claims, particularly when these claims are properly construed and applied. These invalidity contentions are not an admission that the Defendant concedes or acquiesces to any claim construction implied or suggested by Plaintiff’s Complaint or Infringement Contentions. Nor is Defendant asserting any claim construction positions through these charts, including whether the preamble is a limitation. The portions of the prior art reference cited below are not exhaustive but are exemplary in nature.

U.S. Patent No. 7,450,382 to Fischer et al. (“Fischer”) was filed on May 15, 2007, issued on November 11, 2008. This patent is prior art under at least 35 U.S.C. § 102(e), and 103(a). As described in the following claim chart, the asserted claims of U.S. Patent No. 7,724,521 (the “’521 Patent”), are invalid as anticipated by Fischer.

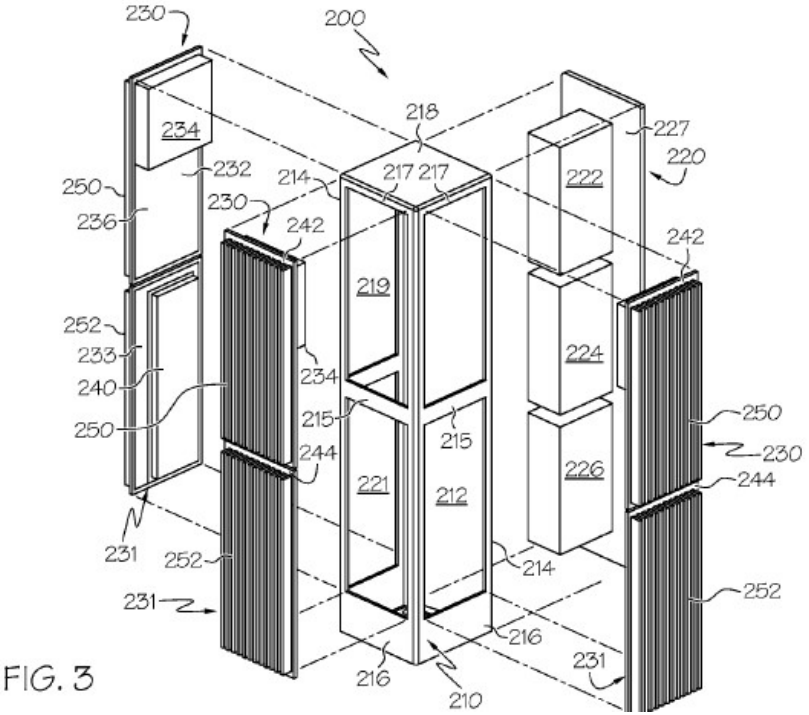
To the extent that Fischer is found not to anticipate one or more of the asserted claims of the ’521 Patent, these claims are invalid as obvious in view of Fischer alone or in combination with other prior art references disclosed in Defendant’s Invalidity Contentions and accompanying charts, including without limitation as set forth below.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
1[pre]	A cooling unit for an enclosure housing electronics, the cooling unit comprising:	To the extent the preamble is limiting, Fischer expressly or inherently discloses this claim element. <i>See, e.g.,</i> “An apparatus for enclosing electronic components comprises a chassis enclosure defining an internal chamber and having an upper portion and a lower portion. The upper portion comprises a first front wall having a length dimension greater than a width dimension, and a first pair of opposing side walls that are each contiguous with the first front wall. The lower portion comprises a second front wall having a length dimension less than the length dimension of the first front wall, and a second pair of opposing side walls that are each contiguous with the second front wall. A plurality of heat sink fins are on each of the first front and

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		side walls, and on each of the second front and side walls. Each of the heat sink fins are configured to be substantially parallel to the length dimension of the first front wall and the second front wall, and extend continuously along each wall. The plurality of heat sink fins has an arcuate like end view profile on each wall of the chassis enclosure.” Abstract, see also 1:47-67 “FIG. 1 is a perspective view of one embodiment of an apparatus 100 for enclosing electronic components used in a telecommunication system. Other views of apparatus 100 are shown in FIGS. 2A-2C. The apparatus 100 has a chassis enclosure 110 with an internal chamber. The internal chamber of chassis enclosure 110 is configured to hold various components of a telecommunication system, such as a wideband digital radio, a power amplifier, a radio frequency (RF) transport, a wideband digital transceiver, a power Supply, or other electronic components. The enclosure 110 is configured so that one or more telecommunication services can be provided therefrom, such as, for example, 800-A, 800-B, specialized mobile radio (SMR), 1900, 900, and 2100.” 2:42-54.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		 FIG. 1 FIG. 1. “The chassis enclosure 110 has a length greater than a width thereof, and has a plurality of legs 114 that support apparatus 100 in an upright position. The legs 114 also protect protruding connectors from damage during shipping or installation. The chassis enclosure 110 can be made of any material having a suitable combination of thermal properties, corrosion resistance, and strength, Such as a metallic material. For

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		example, the chassis enclosure 110 can be made from welded sheet metal or cast metal. Suitable exemplary materials for chassis enclosure 110 include aluminum, magnesium, zinc, steel, or combinations thereof.” 3:25-33. “A plurality of heatsink fins 150 are disposed on each of first front wall 124 and first side walls 126, 128. A plurality of heat sink fins 152 are also disposed on each of second front wall 134 and second side walls 136, 138. Each of the fins are configured to be substantially parallel with respect to the length dimension of the first and second front walls, and can extend continuously along the length of each wall without a gap. The fins allow apparatus 100 to utilize natural convection cooling, with no fans or heat pipes.” 3:34-42. “In one embodiment, the plurality of heat sink fins 150, 152 have an arcuate-like end view profile on each wall such as shown in FIGS. 1 and 2C. Thus, fins that are closer to the hinges protrude outwardly from each wall a shorter distance than the fins that are toward a middle portion of the wall. This configuration serves the purpose of maximizing the fin height of the central fins, which are required to dissipate the most heat, and shorten the fins on the edges that dissipate less heat. The substantially arcuate profile of the fins reduces the total cross-section and improves heat dissipation. The fins can be formed of a cast metal, an extruded metal, or a machined metal. Such as aluminum, magnesium, zinc, steel, or combinations thereof. The fins can be attached to the walls of chassis enclosure 110 by welding, latching, bolting, or other means for mechanical clamping.” 3:43-57. “FIG. 3 is an exploded perspective view of another embodiment of an apparatus 200 for enclosing electronic components used in a telecommunication system. Additional views of apparatus 200 in an assembled form are shown in FIGS. 4 and 5A-5C.” 3:58-62.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		 FIG. 3 FIG. 3. “An inner surface 232 of upper panels 230 is configured to hold a linear power amplifier (LPA) 234 and has a power supply area 236. An inner surface 233 of lower panels 231 is configured to hold a printed circuit board (PCB) assembly 240. The apparatus 200 is capable of supporting up to three telecommunication bands, with separate access for each band. Clearance is also provided in apparatus 200 for each band to have its own power supply. In an alternative embodiment, separate access is provided for each band, but with the PCB assembly, LPA, and power supply mounted to a single heat sink to reduce the number of openings.” 4:37-47. “The apparatus 200 utilizes natural convection cooling, with no fans or heat pipes. Accordingly, an outer surface 242 of each of upper panels 230 has a plurality of heat sink fins 250 thereon. Likewise, an outer

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		surface 244 of each of lower panels 231 has a plurality of heat sink fins 252 thereon. The heat sink fins 250, 252 can be positioned to be substantially parallel with respect to a length dimension L of apparatus 200 such as shown in FIG. 5A. Each of heat sink fins 250, 252 can also extend continuously along each panel without a gap.” 4:53-61. “The apparatus 200 can be mounted on a pole inside or outside. The apparatus 200 can also be mounted on a wall, a vault, or a strand such as a cable strand. “In a further embodiment depicted in FIGS. 6 and 7, an optional shroud 300 can be placed around apparatus 200 to provide a solar shield. The shroud 300 has elongated rectangular side panels 310 that cover heat sink fins 250, 252 on apparatus 200. The shroud 300 also has a vented top cover 312 with a plurality of apertures 314 to provide for escape of exhaust air. The shroud 300 can be formed of a sheet metal or machined metal. Such as aluminum, magnesium, zinc, steel, or combinations thereof.” 5:1-12.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		FIG. 6 FIG. 7 FIGS. 6-7; see also FIG. 8 (and associated description). “As shown in FIGS. 7 and 8, a plurality of fans 320, such as an outdoor rated fan array, can be disposed in a compartment of shroud 300 below vented top cover 312 and over top plate 218. The fans provide assisted forced convection cooling for extreme environments. During fan operation, air is drawn up through openings between side panels 310 and heat sink fins 252 adjacent to base support members 216 to provide for increased cooling. The exhaust air exits through vented top cover 312. The fans act to increase the air velocity over heat sink fins 250, 252 by reducing the pressure at the top of the air column. The resulting increased Volumetric airflow increases the amount of heat dissipation while still allowing the electronics to remain sealed within the enclosure.” 5:13-25.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[a]	a fan shroud having at least one electrical fan; and	Fischer expressly or inherently discloses this claim element. <i>See, e.g.,</i> "The apparatus 200 can be mounted on a pole inside or outside. The apparatus 200 can also be mounted on a wall, a vault, or a strand Such as a cable Strand. In a further embodiment depicted in FIGS. 6 and 7, an optional shroud 300 can be placed around apparatus 200 to provide a solar shield. The shroud 300 has elongated rectangular side panels 310 that cover heat sink fins 250, 252 on apparatus 200. The shroud 300 also has a vented top cover 312 with a plurality of apertures 314 to provide for escape of exhaust air. The shroud 300 can be formed of a sheet metal or machined metal. Such as aluminum, magnesium, zinc, steel, or combinations thereof." 5:1-12.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		FIG. 6 FIG. 7 FIGs. 6-7; see also FIG. 8 (and associated description). “As shown in FIGS. 7 and 8, a plurality of fans 320, such as an outdoor rated fan array, can be disposed in a compartment of shroud 300 below vented top cover 312 and over top plate 218. The fans provide assisted forced convection cooling for extreme environments. During fan operation, air is drawn up through openings between side panels 310 and heat sink fins 252 adjacent to base support members 216 to provide for increased cooling. The exhaust air exits through vented top cover 312. The fans act to increase the air velocity over heat sink fins 250, 252 by reducing the pressure at the top of the air column. The resulting increased Volumetric airflow increases the amount of heat dissipation while still allowing the electronics to remain sealed within the enclosure.” 5:13-25.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		<i>See also</i> 1[pre]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[b]	a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet	Fischer expressly or inherently discloses this claim element. <i>See, e.g.,</i> "The apparatus 200 can be mounted on a pole inside or outside. The apparatus 200 can also be mounted on a wall, a vault, or a strand such as a cable strand. "In a further embodiment depicted in FIGS. 6 and 7, an optional shroud 300 can be placed around apparatus 200 to provide a solar shield. The shroud 300 has elongated rectangular side panels 310 that cover heat sink fins 250, 252 on apparatus 200. The shroud 300 also has a vented top cover 312 with a plurality of apertures 314 to provide for escape of exhaust air. The shroud 300 can be formed of a sheet metal or machined metal. Such as aluminum, magnesium, zinc, steel, or combinations thereof." 5:1-12.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
	when the fan is on;	FIG. 6 FIG. 7 FIGS. 6-7; see also FIG. 8 (and associated description). “As shown in FIGS. 7 and 8, a plurality of fans 320, such as an outdoor rated fan array, can be disposed in a compartment of shroud 300 below vented top cover 312 and over top plate 218. The fans provide assisted forced convection cooling for extreme environments. During fan operation, air is drawn up through openings between side panels 310 and heat sink fins 252 adjacent to base support members 216 to provide for increased cooling. The exhaust air exits through vented top cover 312. The fans act to increase the air velocity over heat sink fins 250, 252 by reducing the pressure at the top of the air column. The resulting increased Volumetric airflow increases the amount of heat dissipation while still allowing the electronics to remain sealed within the enclosure.” 5:13-25.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		FIG. 8 FIG. 8. “FIG. 3 is an exploded perspective view of another embodiment of an apparatus 200 for enclosing electronic components used in a telecommunication system. Additional views of apparatus 200 in an assembled form are shown in FIGS. 4 and 5A-5C.” 3:58-62.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		FIG. 3. FIG. 3. “A plurality of rectangular upper panels 230 are configured to be removably attached to legs 214, lateral support members 215, and top support members 217 in order to cover corresponding upper openings 219 of the pair of openings along each side. Likewise, a plurality of rectangular lower panels 231 are configured to be removably attached to elongated legs 214, lateral support members 215, and base support members 216 in order to cover corresponding lower openings 221 of the pair of openings along each side. The upper and lower panels can be attached to the various portions of chassis enclosure 210 by conventional fasteners such as bolts, clamps or latches.” 4:25-36. “The apparatus 200 utilizes natural convection cooling, with no fans or heat pipes. Accordingly, an outer surface 242 of each of upper panels 230 has a plurality of heat sink fins 250 thereon. Likewise, an outer surface 244 of each of lower panels 231 has a plurality of heat sink fins 252 thereon. The heat sink fins 250, 252 can be positioned to be substantially parallel with respect to a length dimension L of apparatus 200 such

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		as shown in FIG. 5A. Each of heat sink fins 250, 252 can also extend continuously along each panel without a gap.” 4:53-61. <i>See also</i> 1[pre-a]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[c]	wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect,	Fischer expressly or inherently discloses this claim element. <i>See, e.g.,</i> 1[pre-b]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
	when the fan is on.	
4	The cooling unit of claim 1, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre]c.</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
5	The cooling unit of claim 1, wherein the airflow from the surrounding environment is cooler than the heated airflow.	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[pre]	A method for cooling a sealed	To the extent the preamble is limiting, Fischer expressly or inherently discloses this claim element.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
	environment of an enclosure for housing electronics, the method comprising:	<i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[a]	directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[b]	drawing a first airflow across one or more convective	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i>

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
	openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;	To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[c]	drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[a]	The method of claim 14 wherein drawing the first airflow further comprises drawing the first	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i>

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
	airflow into a Venturi chamber;	To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[b]	wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[c]	the method further comprising operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.	Fischer expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

Claim No.	U.S. Patent No. 7,724,521 B2	Fischer
		Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
16	The method of claim 14, further comprising operating a fan to draw the first airflow and the second airflow.	Fischer expressly or inherently discloses this claim element. <i>See, e.g.,</i> 1[pre-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

INVALIDITY CONTENTIONS FOR U.S. PATENT NO. 7,724,521 B2
BASED ON US 7,028,753 TO STERNER (“STERNER”)

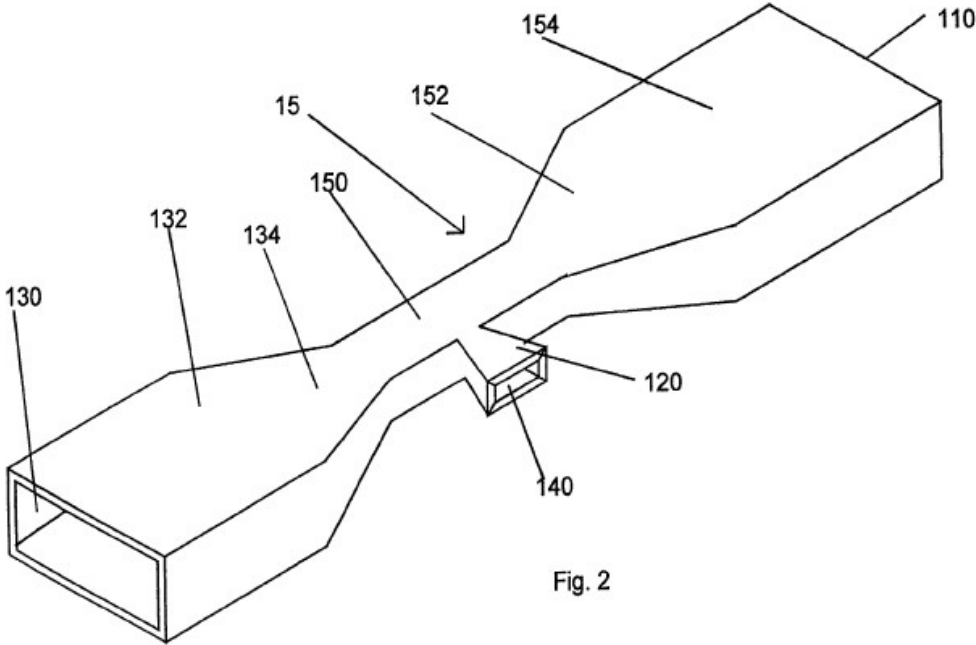
Based upon Plaintiff’s Complaint, Infringement Contentions, and apparent claim constructions and application of the claims to Defendant’s accused products, as best as they can be deciphered, the reference charted below anticipates or at least renders obvious the asserted claims. These invalidity contentions are not an admission by the Defendant that the accused products are covered by or infringe the asserted claims, particularly when these claims are properly construed and applied. These invalidity contentions are not an admission that the Defendant concedes or acquiesces to any claim construction implied or suggested by Plaintiff’s Complaint or Infringement Contentions. Nor is Defendant asserting any claim construction positions through these charts, including whether the preamble is a limitation. The portions of the prior art reference cited below are not exhaustive but are exemplary in nature.

U.S. Patent No. 7,028,753 to Sterner (“Sterner”) was filed on June 11, 2002, issued on April 18, 2006, and claims priority to U.S. Patent Application No. 09/666,869 filed September 20, 2000. This patent is prior art under at least 35 U.S.C. § 102(b), and 103(a). As described in the following claim chart, the asserted claims of U.S. Patent No. 7,724,521 (the “’521 Patent”), are invalid as anticipated by Sterner.

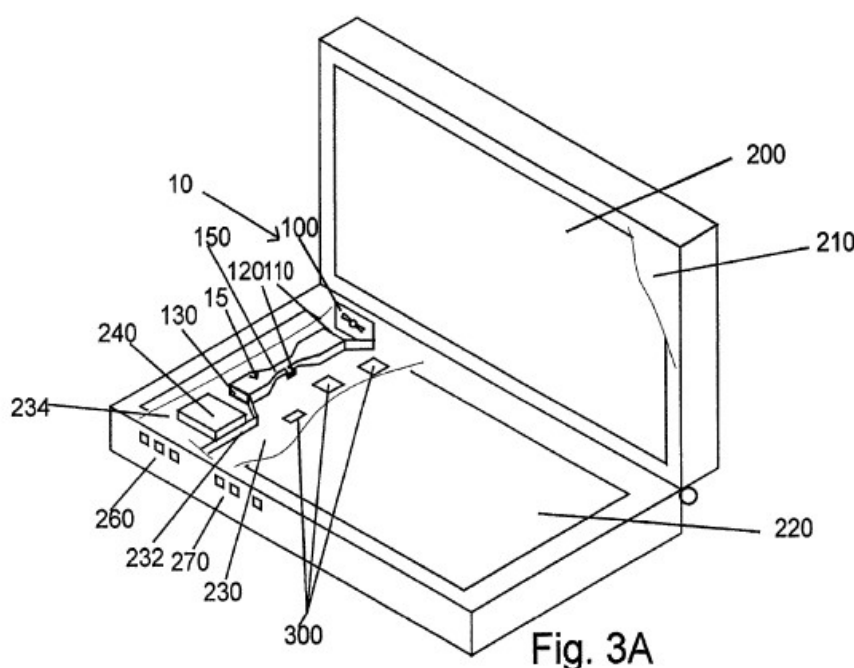
To the extent that Sterner is found not to anticipate one or more of the asserted claims of the ’521 Patent, these claims are invalid as obvious in view of Sterner alone or in combination with other prior art references disclosed in Defendant’s Invalidity Contentions and accompanying charts, including without limitation as set forth below.

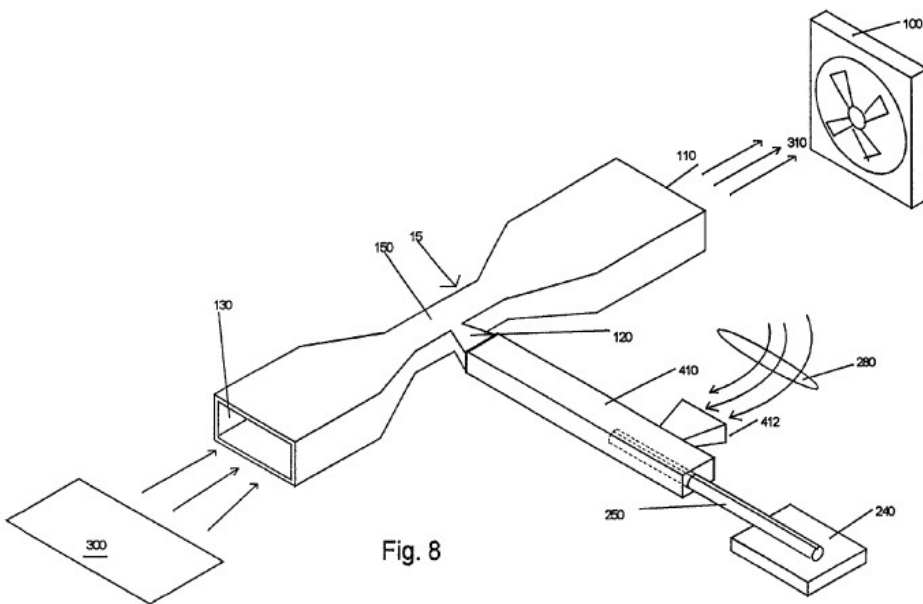
Claim No.	U.S. Patent No. 7,724,521 B2	Sterner
1[pre]	A cooling unit for an enclosure housing electronics, the cooling unit comprising:	To the extent the preamble is limiting, Sterner expressly or inherently discloses this claim element. <i>See, e.g.,</i> “An electronic device has at least one component that is capable of generating a quantity of heat. The electronic device further has an air-moving device and an air duct. The air moving device is capable of creating a flow of air that removes a portion of the quantity of heat. The flow of air enters the air duct. The air duct has a restriction chamber that includes a venturi vent in which the flow of air into the duct and through

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		the restriction chamber creates a new flow of air into the venturi vent. The new flow of air into the venturi vent does not pass over the at least one component in the electronic device.” Abstract. “This invention relates to a heat transfer system More specifically, it relates to using a venturi to create separate air flows in an electronic device to cool components.” 1:9-11. “The invention addresses the need for separate air flows by using an air-moving device, such as a fan or blower, to create an air flow having an air velocity and then a restriction chamber to create a low pressure Zone using the Bernoulli principle to create a vacuum air flow in a venturi vent which is used to evacuate either warm air from inside the product or to draw in cooler air from outside the product.” 3:2-9 “FIG. 2 illustrates an air duct 15 that comprises a venture vent 120. The venturi vent 120 has an opening 140, that is preferably flared, and which helps to couple and operatively engage air external to the air duct 15 into the venturi vent 120. The air duct 15 has an intake manifold 130 in which air is drawn into the air duct 15. The intake manifold 130 has a first volume 132 comprised of a first area and a first length Air within the first volume is compressed as it leaves the intake manifold 130 and is coupled with first coupling 134 into restriction chamber 150. As the air is compressed, its speed or Velocity must increase to conserve the amount of air mass moving through the air duct 15. When the velocity increases in the restriction chamber 150, the air pressure against the sidewalls of the air duct 15 in restriction chamber 150 reduces. This reduction in pressure as the air velocity increases is known as the Bernoulli principle. By controlling the amount of restriction of the air and thus its velocity, the ability to control the reduction in the air pressure is greatly increased leading to design flexibility. The restriction chamber 150 further has an opening or optionally a flared opening 140 on at least one sidewall to create a venturi vent 120. This venturi vent 120 then allows air outside of the air duct 15 to enter the opening thus allowing air outside of air duct 15 to mix with the air entering the intake manifold 130. This mixed air is operatively engaged by being coupled through a second coupling 152 to an exhaust manifold 110 where it exits air duct 15. The exhaust manifold 110 has a second volume 154 that comprises a second area and a second length. As the mixed air enters the exhaust manifold 110 it expands and thus slows its velocity, thereby increasing the pressure on the sidewalls and reducing the pressure differential between air

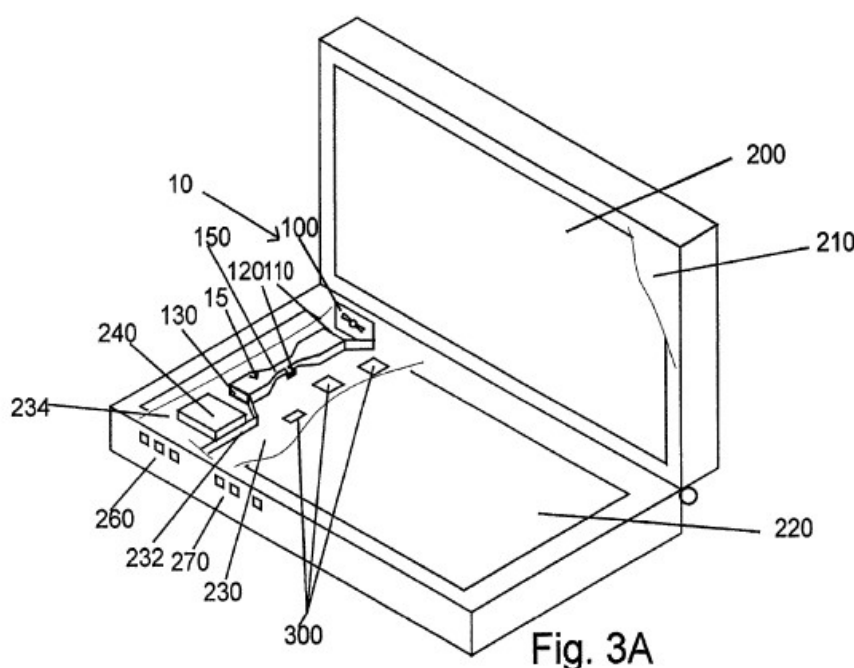
Claim No.	U.S. Patent No. 7,724,521 B2	Sterner
		inside the exhaust manifold 110 and the outside air. This normalization of pressure increases the effectiveness of moving air from the exhaust manifold 110 to outside of the air duct 15.” 3:10-44.  Fig. 2 FIG. 2. “FIG. 3A is an illustration of the preferred embodiment in which an electronic device 10, Such as a notebook computer, implements the air duct 15 of FIG. 2. The electronic device 10 comprises a keyboard 220 and display 200. The display 200 has a cavity 210. The keyboard 220 has an enclosure or cavity 234 which contains at least one heat producing component 240. Such as a microprocessor, graphics controller, memory device or combination thereof and an air duct 15 which has a venturi vent 120, an intake manifold 130 and an exhaust manifold 110. Air is pulled through the air duct 15 by the use of an air-moving device 100, such as a fan or blower. In this embodiment the air-moving device 100 is proximal to the exhaust manifold 110 of the

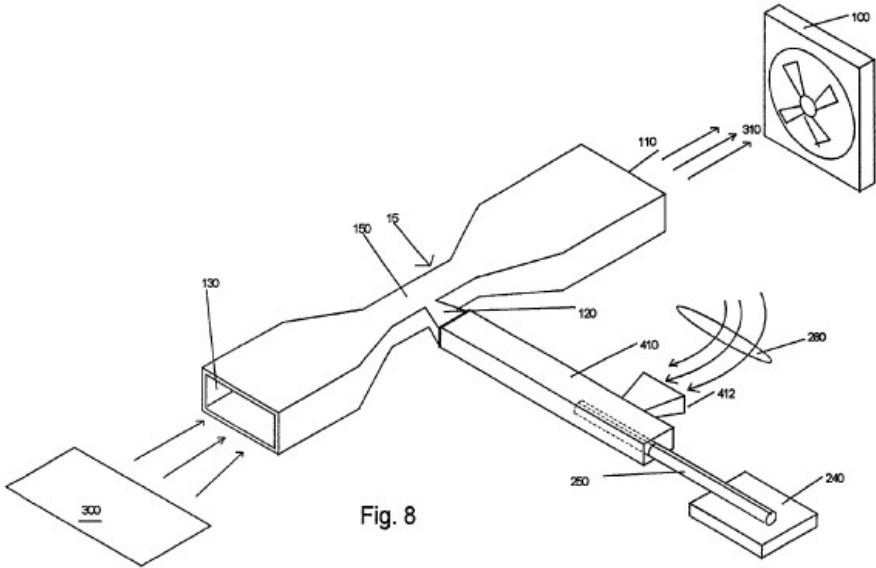
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		air duct 15. The heat producing component 240 is thermally isolated from the system components in keyboard cavity 230 by a barriers 232 to form an enclosure. Air outside of electronic device 10 is drawn into the keyboard cavity 230 through a first set of air vents 260 and a second set of air vents 270. The first set of air vents 260 direct air over heat producing component 240, while the second set of air vents 270 directs air over system components 300 in cavity 230. Thus, two separate air flows are created which are separated by barriers 232. The first air flow over heat producing component 240 enters intake manifold 130 of air duct 15 and is constricted in a restriction chamber 150 such that venturi vent 120 creates a vacuum suction force for the second air flow which draws in air from cavity 230 to cool the system components 300. The two air flows are mixed in exhaust manifold 110 before being expelled out of electronic device 10 by air-moving device 100.” 3:45-4:7.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		 Fig. 3A FIG. 3A “Optionally, rather than pulling air across system components 300, vacuum air flow 82 can be drawn into the venture vent 120 from outside the electronic device 10 to mix with the air stream 72 from across heat producing component 240 in order to cool the air before it exits the electronic device 10, thereby making the exhaust air flow 310 more comfort able to the user.” 4:20-26. “FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from

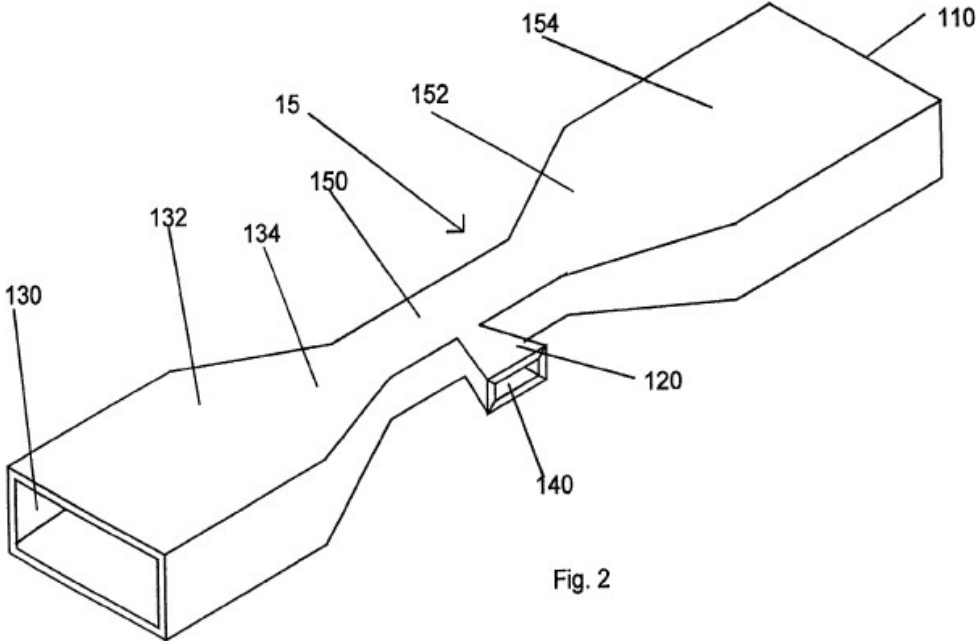
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412.” 5:14-30.  Fig. 8 FIG. 8

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		<i>See also</i> 4:27-60 (describing FIGs. 4-6), FIGs. 4-6, 10-11. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[a]	a fan shroud having at least one electrical fan; and	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> "The invention addresses the need for separate air flows by using an air-moving device, such as a fan or blower, to create an air flow having an air velocity and then a restriction chamber to create a low pressure zone using the Bernoulli principle to create a vacuum air flow in a venturi vent which is used to evacuate either warm air from inside the product or to draw in cooler air from outside the product." 3:2-9. "Air is pulled through the air duct 15 by the use of an air-moving device 100, such as a fan or blower. In this embodiment the air-moving device 100 is proximal to the exhaust manifold 110 of the air duct 15. The heat producing component 240 is thermally isolated from the system components in keyboard cavity 230 by a barriers 232 to form an enclosure." 3:54-60.

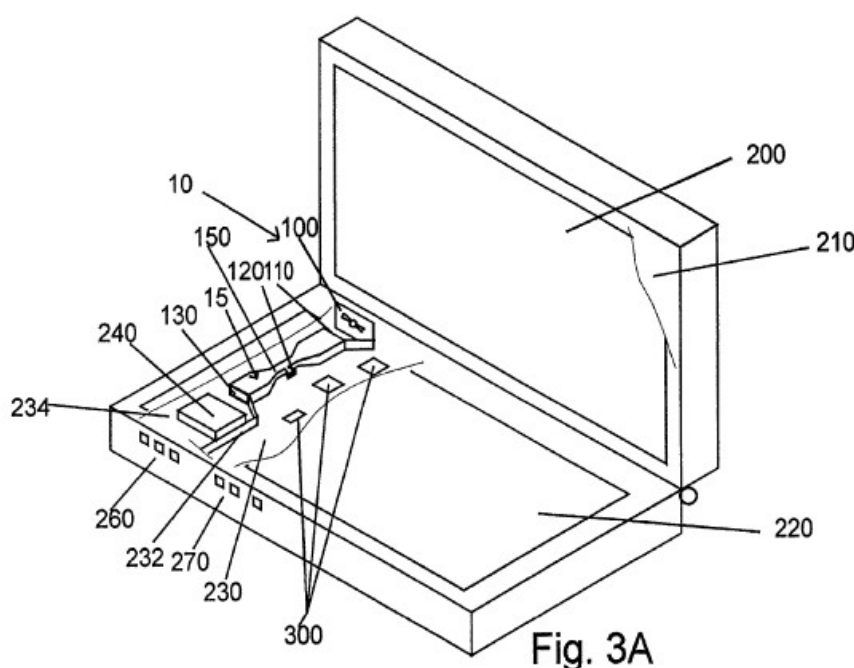
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		 Fig. 3A FIG. 3A “A brushless DC fan such as a Sunon EME fan and motor model HKDE0545PFS1-8 can be used for the air-moving device 100.” 6:7-9. “FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an air flow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from exhaust manifold 110.” 5:14-18.

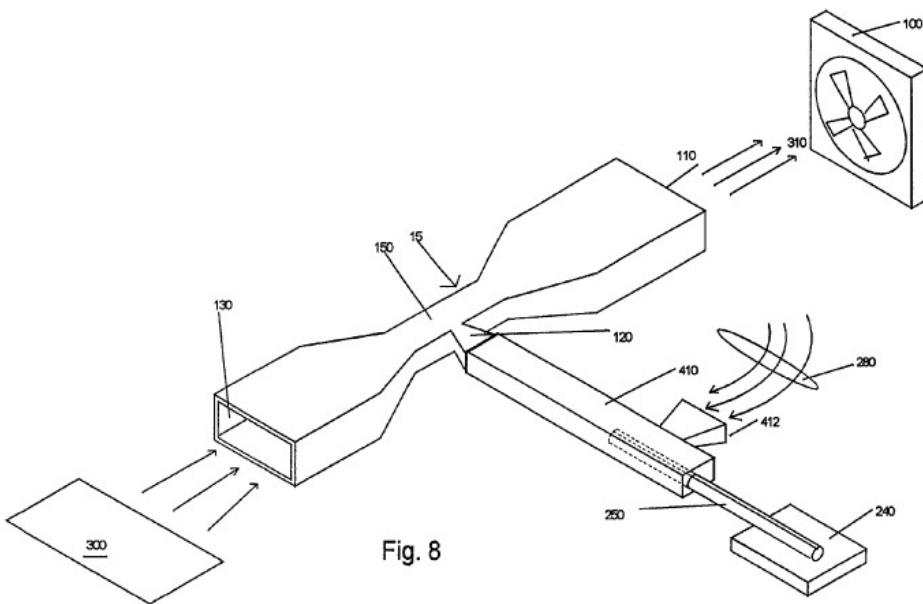
Claim No.	U.S. Patent No. 7,724,521 B2	Sterner
		 Fig. 8 FIG. 8 <i>See also 1[pre], FIGs. 10-11.</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

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1[b]	a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet-coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on;	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> “An electronic device has at least one component that is capable of generating a quantity of heat. The electronic device further has an air-moving device and an air duct. The air moving device is capable of creating a flow of air that removes a portion of the quantity of heat. The flow of air enters the air duct. The air duct has a restriction chamber that includes a venturi vent in which the flow of air into the duct and through the restriction chamber creates a new flow of air into the venturi vent. The new flow of air into the venturi vent does not pass over the at least one component in the electronic device.” Abstract. “The invention addresses the need for separate air flows by using an air-moving device, such as a fan or blower, to create an air flow having an air velocity and then a restriction chamber to create a low pressure Zone using the Bernoulli principle to create a vacuum air flow in a venturi vent which is used to evacuate either warm air from inside the product or to draw in cooler air from outside the product.” 3:2-9 “FIG. 2 illustrates an air duct 15 that comprises a venture vent 120. The venturi vent 120 has an opening 140, that is preferably flared, and which helps to couple and operatively engage air external to the air duct 15 into the venturi vent 120. The air duct 15 has an intake manifold 130 in which air is drawn into the air duct 15. The intake manifold 130 has a first volume 132 comprised of a first area and a first length Air within the first volume is compressed as it leaves the intake manifold 130 and is coupled with first coupling 134 into restriction chamber 150. As the air is compressed, its speed or Velocity must increase to conserve the amount of air mass moving through the air duct 15. When the velocity increases in the restriction chamber 150, the air pressure against the sidewalls of the air duct 15 in restriction chamber 150 reduces. This reduction in pressure as the air velocity increases is known as the Bernoulli principle. By controlling the amount of restriction of the air and thus its velocity, the ability to control the reduction in the air pressure is greatly increased leading to design flexibility. The restriction chamber 150 further has an opening or optionally a flared opening 140 on at least one sidewall to create a venturi vent 120. This venturi vent 120 then allows air outside of the air duct 15 to enter the opening thus allowing air outside of air duct 15 to mix with the air entering the intake manifold 130. This mixed air is operatively engaged by being coupled through a second coupling 152 to an exhaust

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		manifold 110 where it exits air duct 15. The exhaust manifold 110 has a second volume 154 that comprises a second area and a second length. As the mixed air enters the exhaust manifold 110 it expands and thus slows its velocity, thereby increasing the pressure on the sidewalls and reducing the pressure differential between air inside the exhaust manifold 110 and the outside air. This normalization of pressure increases the effectiveness of moving air from the exhaust manifold 110 to outside of the air duct 15.” 3:10-44.  Fig. 2 FIG. 2. “FIG. 3A is an illustration of the preferred embodiment in which an electronic device 10, Such as a notebook computer, implements the air duct 15 of FIG. 2. The electronic device 10 comprises a keyboard 220 and display 200. The display 200 has a cavity 210. The keyboard 220 has an enclosure or cavity 234 which contains at least one heat producing component 240. Such as a microprocessor, graphics controller, memory

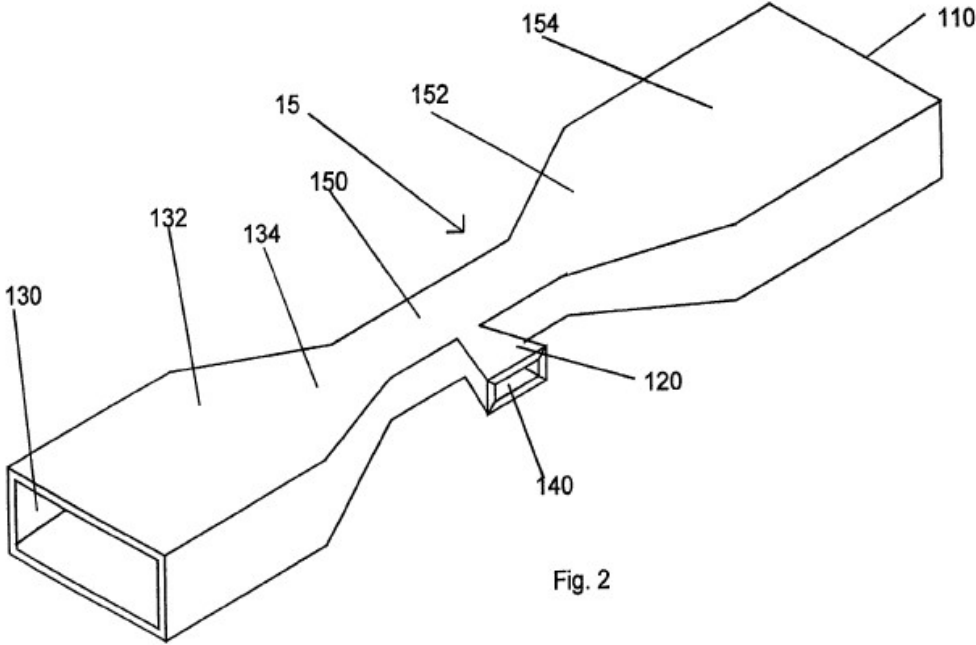
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		device or combination thereof and an air duct 15 which has a venturi vent 120, an intake manifold 130 and an exhaust manifold 110. Air is pulled through the air duct 15 by the use of an air-moving device 100, such as a fan or blower. In this embodiment the air-moving device 100 is proximal to the exhaust manifold 110 of the air duct 15. The heat producing component 240 is thermally isolated from the system components in keyboard cavity 230 by a barriers 232 to form an enclosure. Air outside of electronic device 10 is drawn into the keyboard cavity 230 through a first set of air vents 260 and a second set of air vents 270. The first set of air vents 260 direct air over heat producing component 240, while the second set of air vents 270 directs air over system components 300 in cavity 230. Thus, two separate air flows are created which are separated by barriers 232. The first air flow over heat producing component 240 enters intake manifold 130 of air duct 15 and is constricted in a restriction chamber 150 such that venturi vent 120 creates a vacuum suction force for the second air flow which draws in air from cavity 230 to cool the system components 300. The two air flows are mixed in exhaust manifold 110 before being expelled out of electronic device 10 by air-moving device 100.” 3:45-4:7.

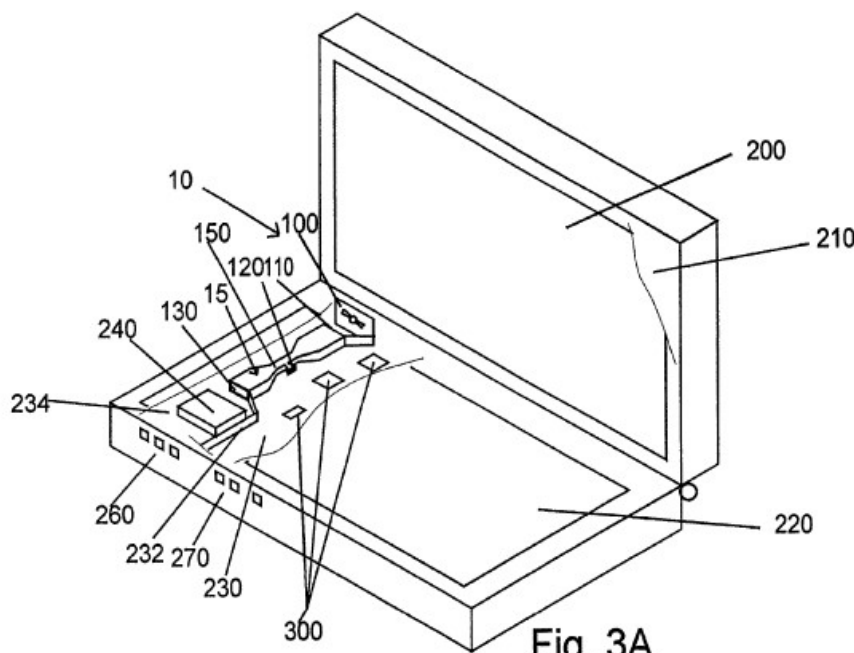
Claim No.	U.S. Patent No. 7,724,521 B2	Sterner
		 Fig. 3A FIG. 3A “Optionally, rather than pulling air across system components 300, vacuum air flow 82 can be drawn into the venture vent 120 from outside the electronic device 10 to mix with the air stream 72 from across heat producing component 240 in order to cool the air before it exits the electronic device 10, thereby making the exhaust air flow 310 more comfort able to the user.” 4:20-26. “FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412.” 5:14-30.  Fig. 8 FIG. 8

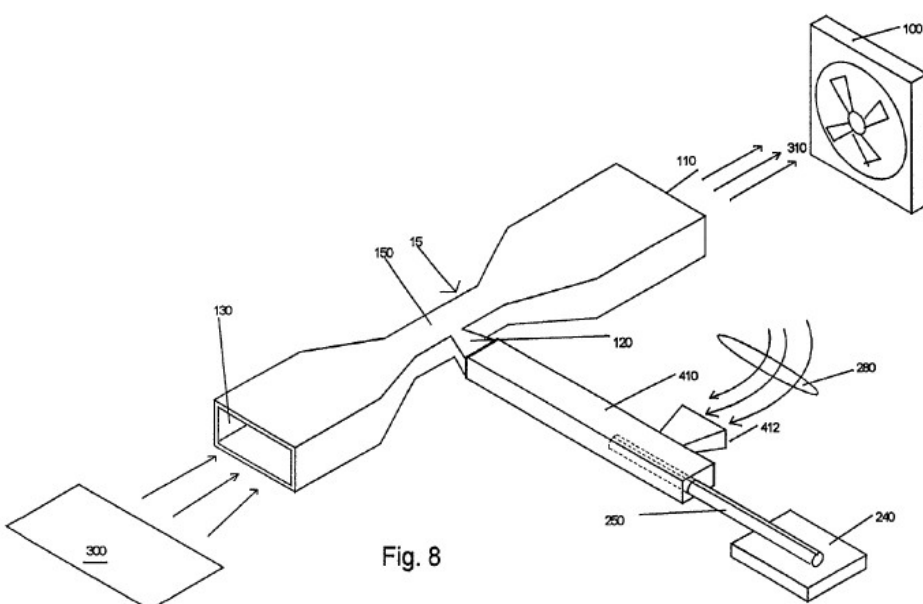
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		“To maximize AT, the air to the heat producing component 240 needs to be as cool as possible and the surface area that the air contacts with the component as large as possible.” 6:27-28. <i>See also</i> 4:27-60 (describing FIGs. 4-6), FIGs. 4-6, 10-11. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[c]	wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect,	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> “An electronic device has at least one component that is capable of generating a quantity of heat. The electronic device further has an air-moving device and an air duct. The air moving device is capable of creating a flow of air that removes a portion of the quantity of heat. The flow of air enters the air duct. The air duct has a restriction chamber that includes a venturi vent in which the flow of air into the duct and through the restriction chamber creates a new flow of air into the venturi vent. The new flow of air into the venturi vent does not pass over the at least one component in the electronic device.” Abstract. “The invention addresses the need for separate air flows by using an air-moving device, such as a fan or blower, to create an air flow having an air velocity and then a restriction chamber to create a low pressure Zone using the Bernoulli principle to create a vacuum air flow in a venturi vent which is used to evacuate either warm air from inside the product or to draw in cooler air from outside the product.” 3:2-9

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
	when the fan is on.	“FIG. 2 illustrates an air duct 15 that comprises a venture vent 120. The venturi vent 120 has an opening 140, that is preferably flared, and which helps to couple and operatively engage air external to the air duct 15 into the venturi vent 120. The air duct 15 has an intake manifold 130 in which air is drawn into the air duct 15. The intake manifold 130 has a first volume 132 comprised of a first area and a first length Air within the first volume is compressed as it leaves the intake manifold 130 and is coupled with first coupling 134 into restriction chamber 150. As the air is compressed, its speed or Velocity must increase to conserve the amount of air mass moving through the air duct 15. When the velocity increases in the restriction chamber 150, the air pressure against the sidewalls of the air duct 15 in restriction chamber 150 reduces. This reduction in pressure as the air velocity increases is known as the Bernoulli principle. By controlling the amount of restriction of the air and thus its velocity, the ability to control the reduction in the air pressure is greatly increased leading to design flexibility. The restriction chamber 150 further has an opening or optionally a flared opening 140 on at least one sidewall to create a venturi vent 120. This venturi vent 120 then allows air outside of the air duct 15 to enter the opening thus allowing air outside of air duct 15 to mix with the air entering the intake manifold 130.” 3:10-33

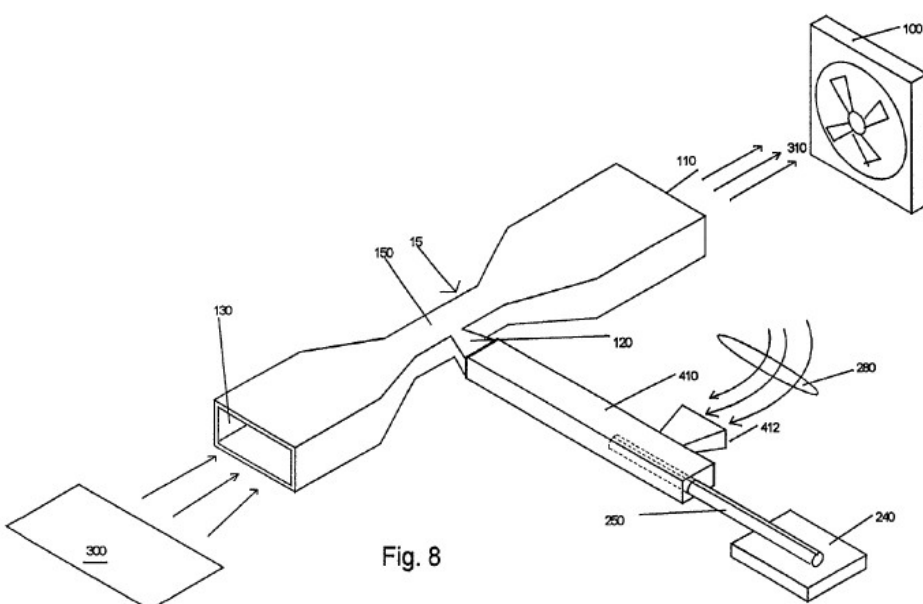
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		 Fig. 2 FIG. 2. “Air is pulled through the air duct 15 by the use of an air-moving device 100, such as a fan or blower. In this embodiment the air-moving device 100 is proximal to the exhaust manifold 110 of the air duct 15. The heat producing component 240 is thermally isolated from the system components in keyboard cavity 230 by a barriers 232 to form an enclosure. Air outside of electronic device 10 is drawn into the keyboard cavity 230 through a first set of air vents 260 and a second set of air vents 270. The first set of air vents 260 direct air over heat producing component 240, while the second set of air vents 270 directs air over system components 300 in cavity 230. Thus, two separate air flows are created which are separated by barriers 232. The first air flow over heat producing component 240 enters intake manifold 130 of air duct 15 and is constricted in a restriction chamber 150 such that venturi vent 120 creates a vacuum suction force for the second air flow

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		which draws in air from cavity 230 to cool the system components 300. The two air flows are mixed in exhaust manifold 110 before being expelled out of electronic device 10 by air-moving device 100.” 3:54-4:7.  Fig. 3A FIG. 3A “Optionally, rather than pulling air across system components 300, vacuum air flow 82 can be drawn into the venture vent 120 from outside the electronic device 10 to mix with the air stream 72 from across heat producing component 240 in order to cool the air before it exits the electronic device 10, thereby making the exhaust air flow 310 more comfort able to the user.” 4:20-26.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		“FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412.” 5:14-30.

Claim No.	U.S. Patent No. 7,724,521 B2	Sterner
		 Fig. 8 FIG. 8 <i>See also 4:27-60 (describing FIGs. 4-6), FIGs. 4-6, 10-11.</i> <i>See also 1[pre].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
4	The cooling unit of claim 1, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> “FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412.” 5:14-30.

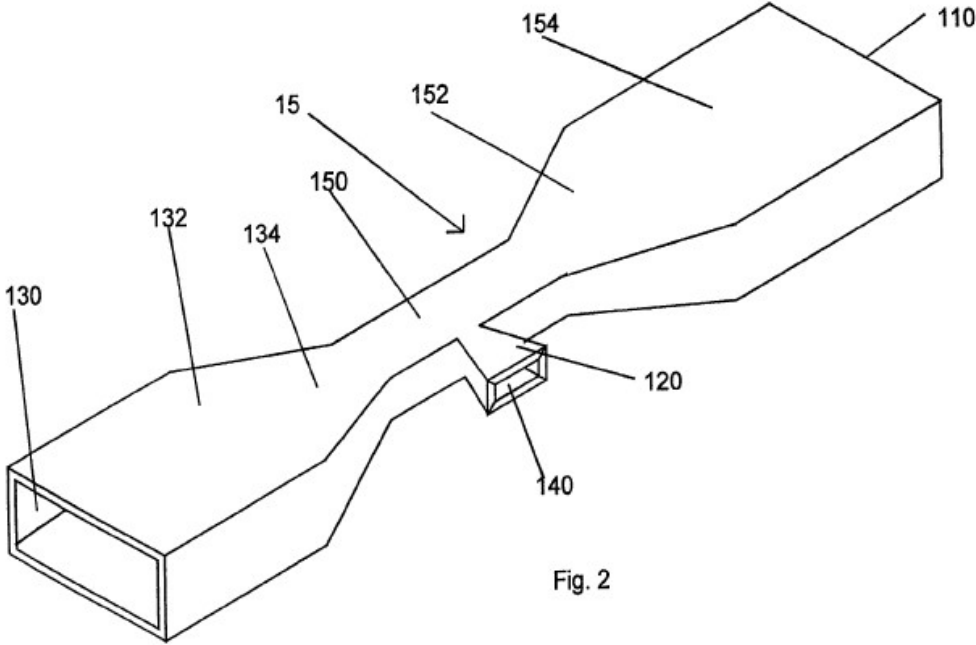
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		 Fig. 8 FIG. 8 “To maximize AT, the air to the heat producing component 240 needs to be as cool as possible and the surface area that the air contacts with the component as large as possible.” 6:27-28. “Optionally, rather than pulling air across system components 300, vacuum air flow 82 can be drawn into the venture vent 120 from outside the electronic device 10 to mix with the air stream 72 from across heat producing component 240 in order to cool the air before it exits the electronic device 10, thereby making the exhaust air flow 310 more comfort able to the user.” 4:20-26.

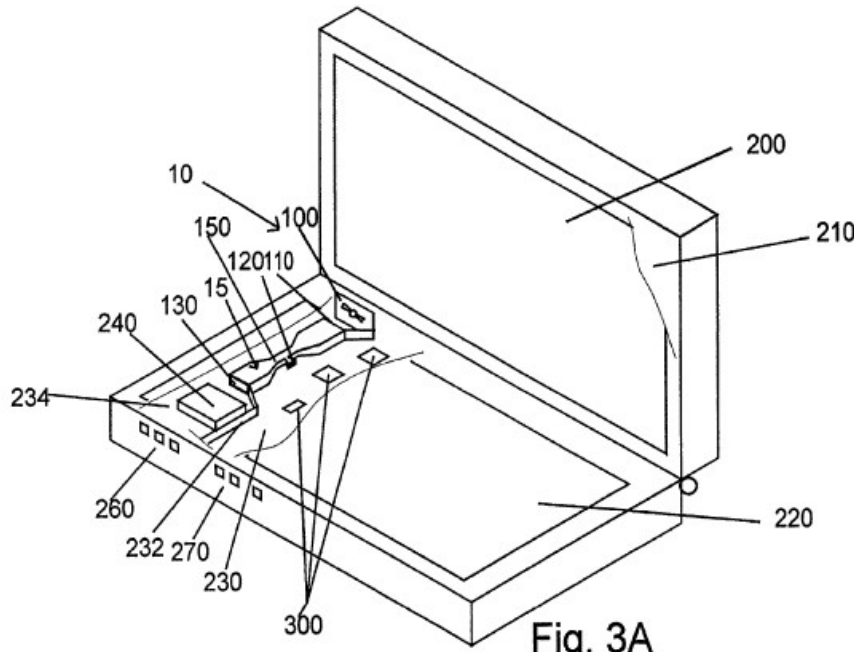
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		<i>See also</i> claim 1[pre-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
5	The cooling unit of claim 1, wherein the airflow from the surrounding environment is cooler than the heated airflow.	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> "FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412." 5:14-30.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		Fig. 8 FIG. 8 <i>See also 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

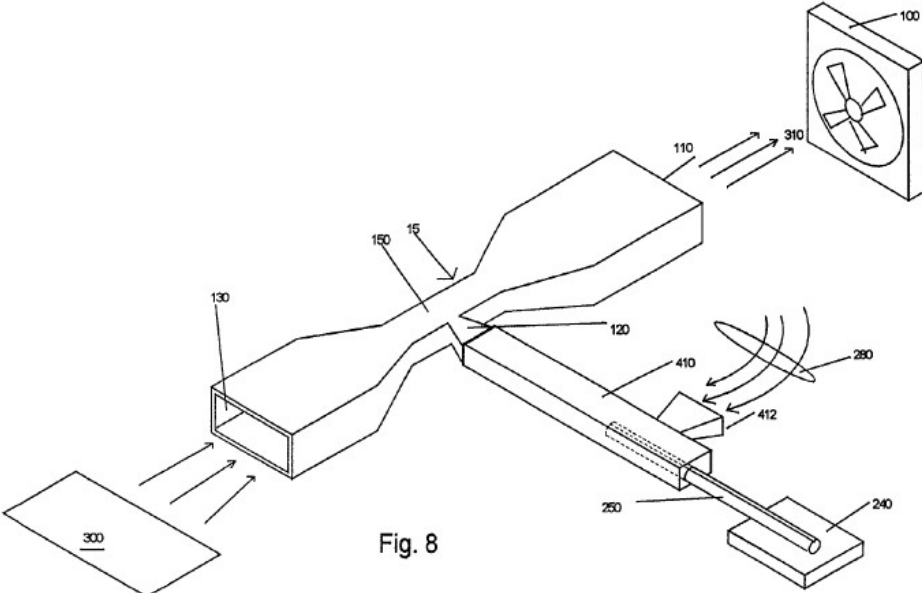
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[pre]	A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:	To the extent the preamble is limiting, Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> “An electronic device has at least one component that is capable of generating a quantity of heat. The electronic device further has an air-moving device and an air duct. The air moving device is capable of creating a flow of air that removes a portion of the quantity of heat. The flow of air enters the air duct. The air duct has a restriction chamber that includes a venturi vent in which the flow of air into the duct and through the restriction chamber creates a new flow of air into the venturi vent. The new flow of air into the venturi vent does not pass over the at least one component in the electronic device.” Abstract. “This invention relates to a heat transfer system More specifically, it relates to using a venturi to create separate air flows in an electronic device to cool components.” 1:9-11. “The invention addresses the need for separate air flows by using an air-moving device, such as a fan or blower, to create an air flow having an air velocity and then a restriction chamber to create a low pressure Zone using the Bernoulli principle to create a vacuum air flow in a venturi vent which is used to evacuate either warm air from inside the product or to draw in cooler air from outside the product.” 3:2-9 “FIG. 2 illustrates an air duct 15 that comprises a venture vent 120. The venturi vent 120 has an opening 140, that is preferably flared, and which helps to couple and operatively engage air external to the air duct 15 into the venturi vent 120. The air duct 15 has an intake manifold 130 in which air is drawn into the air duct 15. The intake manifold 130 has a first volume 132 comprised of a first area and a first length Air within the first volume is compressed as it leaves the intake manifold 130 and is coupled with first coupling 134 into restriction chamber 150. As the air is compressed, its speed or Velocity must increase to conserve the amount of air mass moving through the air duct 15. When the velocity increases in the restriction chamber 150, the air

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		pressure against the sidewalls of the air duct 15 in restriction chamber 150 reduces. This reduction in pressure as the air velocity increases is known as the Bernoulli principle. By controlling the amount of restriction of the air and thus its velocity, the ability to control the reduction in the air pressure is greatly increased leading to design flexibility. The restriction chamber 150 further has an opening or optionally a flared opening 140 on at least one sidewall to create a venturi vent 120. This venturi vent 120 then allows air outside of the air duct 15 to enter the opening thus allowing air outside of air duct 15 to mix with the air entering the intake manifold 130. This mixed air is operatively engaged by being coupled through a second coupling 152 to an exhaust manifold 110 where it exits air duct 15. The exhaust manifold 110 has a second volume 154 that comprises a second area and a second length. As the mixed air enters the exhaust manifold 110 it expands and thus slows its velocity, thereby increasing the pressure on the sidewalls and reducing the pressure differential between air inside the exhaust manifold 110 and the outside air. This normalization of pressure increases the effectiveness of moving air from the exhaust manifold 110 to outside of the air duct 15.” 3:10-44.

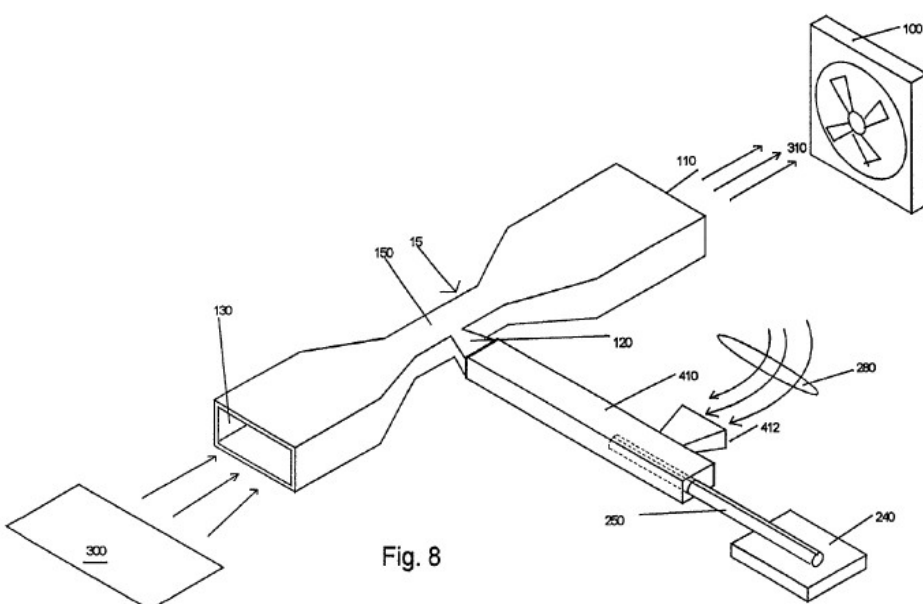
Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		 Fig. 2 FIG. 2. “FIG. 3A is an illustration of the preferred embodiment in which an electronic device 10, Such as a notebook computer, implements the air duct 15 of FIG. 2. The electronic device 10 comprises a keyboard 220 and display 200. The display 200 has a cavity 210. The keyboard 220 has an enclosure or cavity 234 which contains at least one heat producing component 24, such as a microprocessor, graphics controller, memory device or combination thereof and an air duct 15 which has a venturi vent 120, an intake manifold 130 and an exhaust manifold 110. Air is pulled through the air duct 15 by the use of an air-moving device 100, such as a fan or blower. In this embodiment the air-moving device 100 is proximal to the exhaust manifold 110 of the air duct 15. The heat producing component 240 is thermally isolated from the system components in keyboard cavity 230 by a barriers 232 to form an enclosure. Air outside of electronic device 10 is drawn into the keyboard cavity 230 through a first set of air vents 260 and a second set of air vents 270. The first set of air

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		vents 260 direct air over heat producing component 240, while the second set of air vents 270 directs air over system components 300 in cavity 230. Thus, two separate air flows are created which are separated by barriers 232. The first air flow over heat producing component 240 enters intake manifold 130 of air duct 15 and is constricted in a restriction chamber 150 such that venturi vent 120 creates a vacuum suction force for the second air flow which draws in air from cavity 230 to cool the system components 300. The two air flows are mixed in exhaust manifold 110 before being expelled out of electronic device 10 by air-moving device 100.” 3:45-4:7.  Fig. 3A FIG. 3A

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		“Optionally, rather than pulling air across system components 300, vacuum air flow 82 can be drawn into the venture vent 120 from outside the electronic device 10 to mix with the air stream 72 from across heat producing component 240 in order to cool the air before it exits the electronic device 10, thereby making the exhaust air flow 310 more comfort able to the user.” 4:20-26. “FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412.” 5:14-30.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		 Fig. 8 FIG. 8 <i>See also 4:27-60 (describing FIGs. 4-6), FIGs. 4-6, 10-11.</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
14[a]	directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> “FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412.” 5:14-30.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		 Fig. 8 FIG. 8. “The keyboard 220 has an enclosure or cavity 234 which contains at least one heat producing component 240. Such as a microprocessor, graphics control ler, memory device or combination thereof and an air duct 15 which has a venturi vent 120, an intake manifold 130 and an exhaust manifold 110.” 3:49-54. <i>See also 14[pre].</i>

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[b]	drawing a first airflow across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> "FIG. 8 illustrates a fifth alternative embodiment in which the system components 300 are cooled by creating an airflow into intake manifold 130 by air-moving device 100 which pulls an exhaust air flow 310 from exhaust manifold 110. The vacuum air flow created in restriction chamber 150 is coupled to a second duct 410, which is preferably further coupled to the condensing end of a heat pipe 250. Heatpipe 250 is thermally coupled to heat producing component 240, which is preferably separated from system components 300 by a cavity or enclosure (not shown). The second duct 410 further has an opening 412 used to draw in outside air 280, which is air external from electronic device 10 (FIG. 3A). When using heat pipe 250, the outside air 280 removes heat from the condensing end of the heat pipe before being drawn into venturi vent 120. Otherwise, if no heat pipe is used, the outside air flows over heat producing component 240 before entering opening 412." 5:14-30.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		Fig. 8 FIG. 8 “Optionally, rather than pulling air across system components 300, vacuum air flow 82 can be drawn into the venture vent 120 from outside the electronic device 10 to mix with the air stream 72 from across heat producing component 240 in order to cool the air before it exits the electronic device 10, thereby making the exhaust air flow 310 more comfort able to the user.” 4:20-26. “To maximize AT, the air to the heat producing component 240 needs to be as cool as possible and the surface area that the air contacts with the component as large as possible.” 6:27-28.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
		<i>See also</i> 14[pre]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[c]	drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> 14[b], 14[pre]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[a]	The method of claim 14 wherein drawing the first airflow further comprises drawing the first	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> 14[pre-c], 1[pre-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

Claim No.	U.S. Patent No. 7,724,521 B2	Sterner
	airflow into a Venturi chamber;	Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[b]	wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;	Sterner expressly or inherently discloses this claim element. <i>See, e.g., 14[pre-c], 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[c]	the method further comprising operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.	Sterner expressly or inherently discloses this claim element. <i>See, e.g., 14[pre-c], 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Stern
16	The method of claim 14, further comprising operating a fan to draw the first airflow and the second airflow.	Stern expressly or inherently discloses this claim element. <i>See, e.g.,</i> 14[pre-c], 1[pre-c], 15[a-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

INVALIDITY CONTENTIONS FOR U.S. PATENT NO. 7,724,521 B2
BASED ON US 5,894,407 TO AAKALU (“Aakalu”)

Based upon Plaintiff’s Complaint, Infringement Contentions, and apparent claim constructions and application of the claims to Defendant’s accused products, as best as they can be deciphered, the reference charted below anticipates or at least renders obvious the asserted claims. These invalidity contentions are not an admission by the Defendant that the accused products are covered by or infringe the asserted claims, particularly when these claims are properly construed and applied. These invalidity contentions are not an admission that the Defendant concedes or acquiesces to any claim construction implied or suggested by Plaintiff’s Complaint or Infringement Contentions. Nor is Defendant asserting any claim construction positions through these charts, including whether the preamble is a limitation. The portions of the prior art reference cited below are not exhaustive but are exemplary in nature.

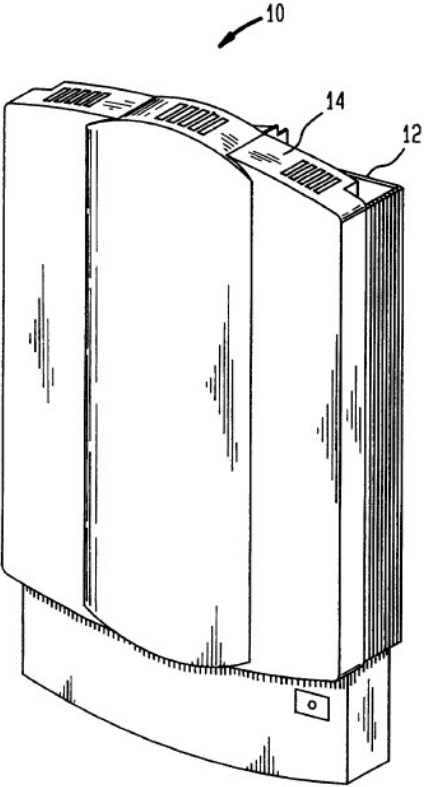
U.S. Patent No. 5,894,407 to Aakalu et al. (“Aakalu”) was filed on March 28, 1997, issued on April 13, 1999. This patent is prior art under at least 35 U.S.C. § 102(b), and 103(a). As described in the following claim chart, the asserted claims of U.S. Patent No. 7,724,521 (the “’521 Patent”), are invalid as anticipated by Aakalu.

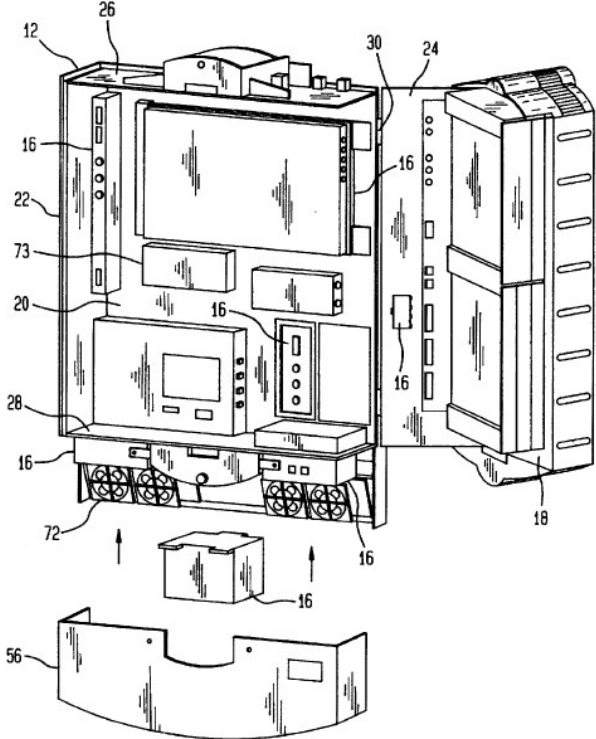
To the extent that Aakalu is found not to anticipate one or more of the asserted claims of the ’521 Patent, these claims are invalid as obvious in view of Aakalu alone or in combination with other prior art references disclosed in Defendant’s Invalidity Contentions and accompanying charts, including without limitation as set forth below.

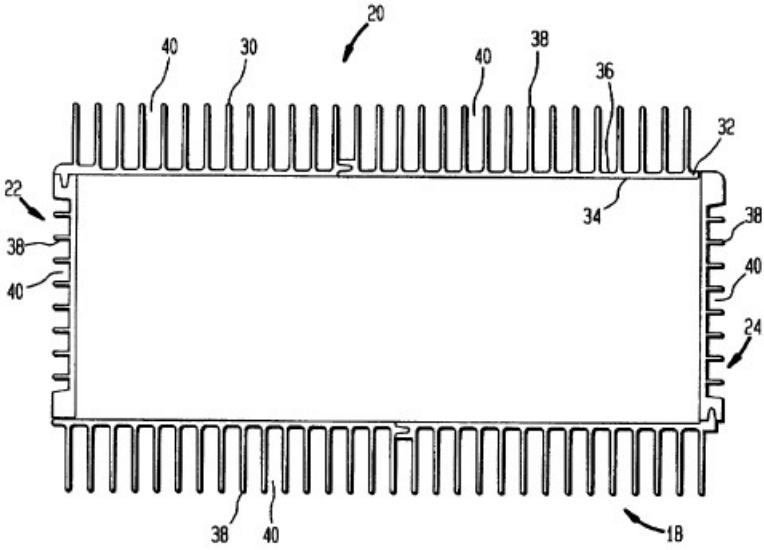
Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
1[pre]	A cooling unit for an enclosure housing electronics, the cooling unit comprising:	To the extent the preamble is limiting, Aakalu expressly or inherently discloses this claim element. <i>See, e.g.,</i> “The present invention is an enclosure with a cooling scheme for cooling heat producing devices, such as electronic components, contained within the enclosure. Specifically, the cooling scheme of the present invention shelters the enclosure from solar heat without significantly decreasing the efficiency of the convection process associated with heat sinks. In an embodiment of the present invention, the enclosure comprises a housing and a solar shield. The housing includes a plurality of heat sinks for absorbing and dissipating heat generated by the devices. Each heat sink has an interior side to which the devices are mounted

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		and an exterior side with a plurality of fins that form first and second channels. The first channels are aligned longitudinally with the prevalent direction of airflow, and the second channels are aligned in a contrasting manner to the first channels to allow fresh air to be drawn into the first channels (through the second channels) during the convection process. Positioned over the heat sinks is the solar shield for sheltering the housing from solar heat. The solar shield includes ventilators which align with the first and second channels for allowing the passage of air into the heat sinks and heat absorbed by the heat sinks to be dissipated. To prevent overcooling, the solar shield may include regulating devices positioned over the ventilators to constrict airflow through the ventilators when the enclosure is below a particular temperature.” Abstract. “The present invention relates generally to enclosures for cooling heat producing devices contained within and, in particular, to outdoor enclosures for convectively cooling electronic components.” 1:5-8. “[M]ost enclosures tend to trap heat which may be detrimental to the electronic components, particularly to integrated circuits and microprocessor chips.” 1:18-20. “To alleviate the enclosures from the former form of heat, a prior art cooling scheme includes heat sinks to which the electronic components are mounted. In this prior art cooling scheme, the heat generated by the electronic components is absorbed by the heat sinks and dissipated by a process known as convection, i.e., the heat absorbed by the heat sinks is carried away by air flowing through the heat sink.” 1:23-30. “The present invention is an enclosure with a cooling scheme for cooling heat producing devices, such as electronic components, contained within the enclosure. Specifically, the cooling scheme of the present invention shelters the enclosure from solar heat without significantly decreasing the efficiency of the convection process associated with heat sinks. In an embodiment of the present invention, the enclosure comprises a housing and a solar shield. The housing includes a plurality of heat sinks for absorbing and dissipating heat generated by the devices. Each heat sink has an interior side to which the devices are mounted and an exterior side with a plurality of fins that form first and second channels. In one embodiment, the first channels are aligned longitudinally with the prevalent direction of airflow, and the second channels are aligned in a contrasting manner to the first channels to allow fresh air to be drawn into the first channels (through the second channels) during the convection process. Positioned over the heat sinks is the solar shield for sheltering

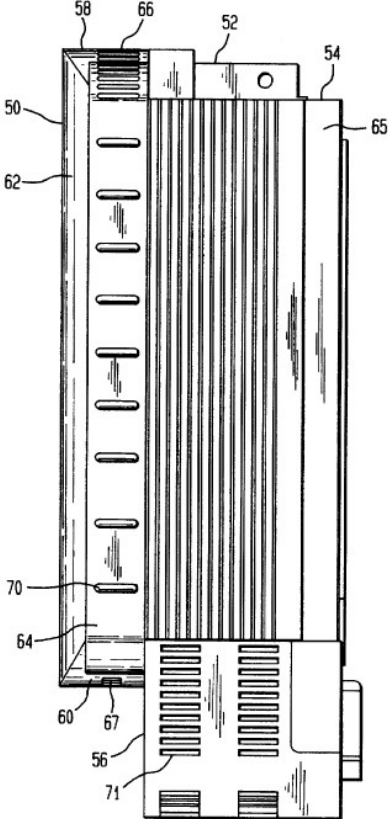
Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		the housing from solar heat. The solar shield includes ventilators which align with the first and second channels for allowing the passage of air into the heat sinks and heat absorbed by the heat sinks to be dissipated.” 1:48-2:3 “The present invention is an enclosure with a scheme for convectively cooling heat producing devices, such as electronic components, housed within the enclosure. In one embodiment, the enclosure is an microcell which houses electronic components associated with a base station. In this embodiment, the microcell will generally be mounted out doors in an elevated position where a light wind (3-5 miles per hour) is typically present in the vicinity of the microcell. The convective cooling scheme of the microcell harnesses the wind and buoyancy to dissipate heat generated by the base station electronic components. For purposes of discussion, the present invention will be described herein with respect to the microcell. This should not be construed, however, to limit the present invention to a microcell for convectively cooling base station electronic components housed within the microcell.” 2:43-58. “Referring to FIGS. 1-2, there are shown a microcell 10 in a closed and an open position in accordance with one embodiment of the present invention. As shown in FIGS. 1-2, the microcell 10 comprises a housing 12 and a solar shield 14. Mounted to the interior of the housing 12 are a plurality of base station electronic components 16, such as printed circuitboards (e.g. DRM. LIU, etc.), a duplex filter, an oscillator module, a power converting unit (PCU), a power amplifier, etc. The housing 12 comprises a front panel 18, a rear panel 20, a first side panel 22, a second side panel 24, a top panel 26, and a bottom panel 28. The second panel 24 is connected to the rear panel 20 by hinges 30, which permit the microcell to swing between the open and closed position.” 2:59-3:5.

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		 FIG. 1.

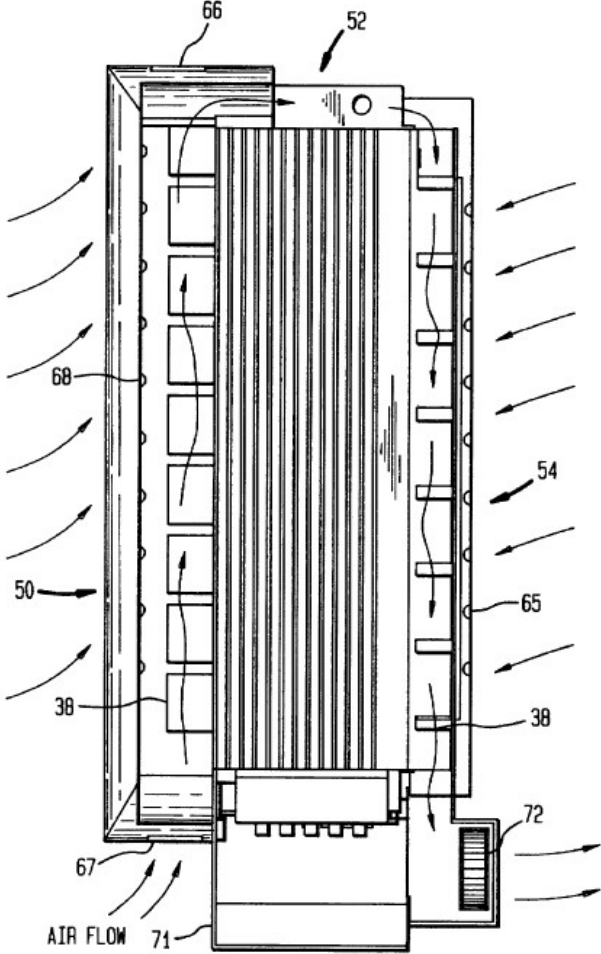
Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		FIG. 2  FIG. 2. “In one embodiment, the front, rear, and first and second side panels 18, 20, 22, 24 are heat sinks for absorbing and dissipating heat generated by the base station electronic components 16. Preferably, the heat sinks are formed from a highly heat conductive metal, such as cast aluminum. Referring to FIGS. 3-5, there are shown a front, a side, and a top view of the microcell 10, respectively, without the solar shield 14 (or the electronic components) in accordance with this embodiment of the present invention. As shown in FIGS. 3-5, each heat sink comprises a plate 32 having an interior side 34 to which the base station electronic components

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		16 are mounted and an exterior side 36 having a plurality of fins 38. The fins 38 project laterally outward from the exterior side 36 and form channels 40 (referred to herein as longitudinal channels) between through which cooling air may pass. In one embodiment, the fins 38 are parallel with respect to each other and aligned longitudinally with the prevalent direction of airflow. In an embodiment where the prevalent direction of airflow is uncertain, the exterior side 36 of the heat sink has pins (not shown) instead of fins.” 3:6-25. FIG. 5  FIG. 5; see also FIGs. 3-4. “In one mode of operation, the heat absorbed by the heat sinks is dissipated by natural convection, i.e., process by which heat absorbed by the heat sink is carried away by a relatively high speed flow of air through the longitudinal channels (as opposed to a relatively slow speed flow of air above the longitudinal channels). In

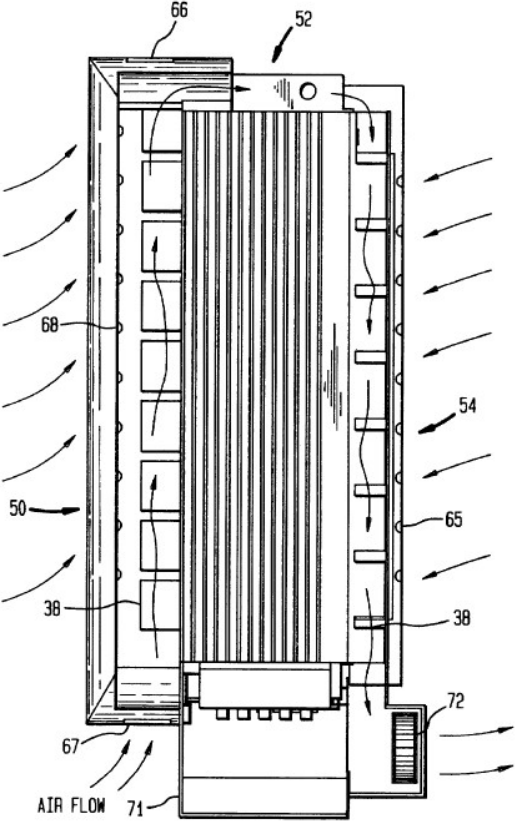
Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		another mode of operation, forced convection is used to dissipate the heat absorbed by the heat sink. In this latter mode of operation, the microcell 10 includes fans 72 which facilitate the flow of air through the heat sinks.” 3:25-35. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[a]	a fan shroud having at least one electrical fan; and	Aakalu expressly or inherently discloses this claim element. <i>See, e.g.,</i> “As shown in FIGS. 6-9, the solar shield 14 comprises a front solar shield 50, a top solar shield 52, a rear solar shield 54, and a skirt 56 for sheltering the front, top, rear and bottom panels 18, 26, 20, 28, respectively, from solar heat.” 3:63-67.

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		FIG. 7  FIG. 7; <i>see also</i> FIGs. 1-2, 6, 8-9. “In one embodiment, the rear solar shield 54 includes the same features as the front solar shield 50 with respect to the rear panel 20—that is, the rear solar shield 54 has a face, top, bottom and side walls with ventilators 65. In another embodiment of the present invention, the top solar shield 52 has no ventilators and directs airflow from the front panel 18 to the rear panel 20, whereas the skirt 56 has ventilators 71 and protects

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		the base station electronic components 26 mounted to the underside of the bottom panel 28 from solar heat and other natural elements.” 4:46-54. “FIG. 10 depicts a side cross sectional view of the micro cell 10 illustrating the path of the airflow through the microcell using forced convection. As shown in FIG. 10, air is drawn in through the bottom ventilators 67 and travels through the longitudinal channels dissipating heat absorbed by the heat sink (of the front panel), i.e., convection process. As the air flow through the longitudinal channel, it draws fresh air in through the face ventilators 68 and side ventilators (using the cross channels), not shown. Upon exiting the top of the heat sink (of the front panel), fresh air is drawn in through the top ventilators 66 and mixed with the old air as it passes over the top panel 26 and enters the longitudinal channels of the rear panel. Like the front panel, the flow of air through the longitudinal channels of the rear panel causes air to be drawn into the longitudinal channels through the ventilators 65 of the rear solar shield 54 before being exhausted by the fans 74. Note that the top ventilators 66 also functions as a metering device for airflow during forced convection. The amount of fresh air drawn into the microcell during forced convection can be controlled by the size of the top ventilators 66 and the speed of the fans 72. In other words, the ratio of air drawn in through the front solar shield 50 is determined, in part, by the size of the slots 66.” 4:55-5:10

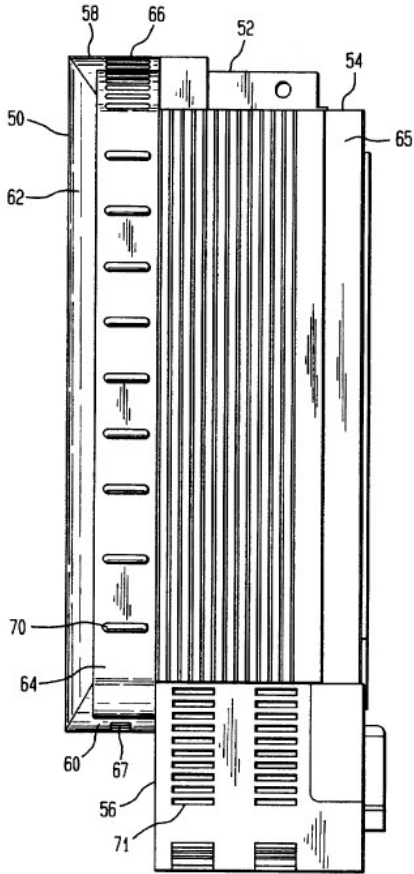
Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		FIG. 10  FIG. 10.

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		“The amount of fresh air drawn into the microcell during forced convection can be controlled by the size of the top ventilators 66 and the speed of the fans 72.” 5:6-8; see also [1pre]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[b]	a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet	Aakalu expressly or inherently discloses this claim element. <i>See, e.g.,</i> “FIG. 10 depicts a side cross sectional view of the micro cell 10 illustrating the path of the airflow through the microcell using forced convection. As shown in FIG. 10, air is drawn in through the bottom ventilators 67 and travels through the longitudinal channels dissipating heat absorbed by the heat sink (of the front panel), i.e., convection process. As the air flow through the longitudinal channel, it draws fresh air in through the face ventilators 68 and side ventilators (using the cross channels), not shown. Upon exiting the top of the heat sink (of the front panel), fresh air is drawn in through the top ventilators 66 and mixed with the old air as it passes over the top panel 26 and enters the longitudinal channels of the rear panel. Like the front panel, the flow of air through the longitudinal channels of the rear panel causes air to be drawn into the longitudinal channels through the ventilators 65 of the rear solar shield 54 before being exhausted by the fans 74. Note that the top ventilators 66 also functions as a metering device for airflow during forced convection. The amount of fresh air drawn into the microcell during forced convection can be controlled by the size of the top ventilators 66 and the speed of the fans 72. In other words, the ratio of air drawn in through the front solar shield 50 is determined, in part, by the size of the slots 66.” 4:55-5:10.

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
	when the fan is on;	FIG. 10  FIG. 10; <i>see also</i> 1[a].

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[c]	wherein the Venturi chamber comprises a wall for directing the airflow air from the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[b].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
4	The cooling unit of claim 1, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.	Aakalu expressly or inherently discloses this claim element. <i>See, e.g.,</i> “The top and bottom walls 58, 60 have top and bottom ventilators 66, 67, such as slots or openings, which align with the longitudinal channels 40 of the front panel 58, thereby allowing for the necessary airflow passage associated with the convection process (i.e. chimney effect) through the longitudinal channels 40. The face 62 has ventilators 68, such as perforations or apertures, which align with the cross and longitudinal channels 40, 42 of the front panel 18 such that fresh air may be drawn into the heat sink (of the front panel) through the face 62 during the convection process. In one embodiment, the face ventilators 68 have an aspect ratio which minimizes solar input while maximizing cool air input—for example, the height of the face ventilator is less than or equal to the thickness of the face. The side walls 64 have side ventilators 70, such as slots or openings, which align with the cross channel 42 to allow fresh air to be drawn into the heat sink (of the front panel) through the cross channels 42 during the convection process. In one embodiment, the size of the top, bottom, face, and side ventilators 66, 67, 68, 70 are designed to achieve a desired cooling effect for the microcell.” 4:2-21.

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		<i>FIG. 7</i>  FIG. 7; see also 1[pre-c].

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
		To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
5	The cooling unit of claim 1, wherein the airflow from the surrounding environment is cooler than the heated airflow.	Aakalu expressly or inherently discloses this claim element. <i>See, e.g.,</i> "In one embodiment, the face ventilators 68 have an aspect ratio which minimizes solar input while maximizing cool air input-for example, the height of the face ventilator is less than or equal to the thickness of the face." 4:11-15. "As the air flow through the longitudinal channel, it draws fresh air in through the face ventilators 68 and side ventilators (using the cross channels), not shown." 4:61-63; see also 1[pre-c]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[pre]	A method for cooling a sealed environment of	To the extent the preamble is limiting, Aakalu expressly or inherently discloses this claim element.

Claim No.	U.S. Patent No. 7,724,521 B2	Aakalu
	an enclosure for housing electronics, the method comprising:	<i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[a]	directing heat generated by one or more electronic devices housed within a sealed environment of an enclosure to a heatsink thermally coupled to an external environment;	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[b]	drawing a first airflow across one or more convective openings of the heatsink, wherein	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i>

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	the first airflow does not flow into the one or more convective openings of the heatsink;	To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[c]	drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by drawing the first airflow.	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[a]	The method of claim 14 wherein drawing the first airflow further comprises drawing the first airflow into a Venturi chamber;	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

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		Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[b]	wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[c]	the method further comprising operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

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16	The method of claim 14, further comprising operating a fan to draw the first airflow and the second airflow.	Aakalu expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c]</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

INVALIDITY CONTENTIONS FOR U.S. PATENT NO. 7,724,521 B2
BASED ON US 6,104,003 TO JONES (“JONES”)

Based upon Plaintiff’s Complaint, Infringement Contentions, and apparent claim constructions and application of the claims to Defendant’s accused products, as best as they can be deciphered, the reference charted below anticipates or at least renders obvious the asserted claims. These invalidity contentions are not an admission by the Defendant that the accused products are covered by or infringe the asserted claims, particularly when these claims are properly construed and applied. These invalidity contentions are not an admission that the Defendant concedes or acquiesces to any claim construction implied or suggested by Plaintiff’s Complaint or Infringement Contentions. Nor is Defendant asserting any claim construction positions through these charts, including whether the preamble is a limitation. The portions of the prior art reference cited below are not exhaustive but are exemplary in nature.

U.S. Patent No. 6,104,003 to Jones (“Jones”) was filed on October 7, 1999, issued on August 15, 2000, and claims priority to U.S. Patent Application 09/169,362, filed October 9, 1998. This patent is prior art under at least 35 U.S.C. § 102(b), and 103(a). As described in the following claim chart, the asserted claims of U.S. Patent No. 7,724,521 (the “’521 Patent”), are invalid as anticipated by Jones.

To the extent that Jones is found not to anticipate one or more of the asserted claims of the ’521 Patent, these claims are invalid as obvious in view of Jones alone or in combination with other prior art references disclosed in Defendant’s Invalidity Contentions and accompanying charts, including without limitation as set forth below.

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
1[pre]	A cooling unit for an enclosure housing electronics, the cooling unit comprising:	To the extent the preamble is limiting, Jones expressly or inherently discloses this claim element. <i>See, e.g.,</i> “A cabinet for housing telecommunications equipment in outdoor locations includes an enclosure for containing the telecommunications equipment. A subrack is mounted within the enclosure. A duct directs ambient air from outside the cabinet to the subrack. The duct includes an inlet disposed in a lower portion of the cabinet and a subrack inlet plenum disposed immediately below the subrack. A subrack exit plenum is disposed above the electronic subrack for exhausting air heated by the electronics equipment. A fan draws ambient air into the inlet through the duct into the subrack inlet plenum, through the electronic subrack into

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
		the subrack exit plenum, and out of the enclosure through the subrack exhaust plenum. A heater is provided for heating inlet air when ambient temperatures are low. The fan and heater are controlled by a thermal controller. At low ambient temperatures, the air flow is maintained constant by the fans and power to the heater is varied to maintain the subrack inlet temperature constant. At moderate temperatures, the heating element is turned off and the fan speed is varied up to the maximum fan speed. At high temperatures, the fans operate at full speed to maintain maximum air flow.” Abstract. “The present invention relates generally to cabinets for electronic equipment and, more particularly, to a telecommunications cabinet for housing telecommunications equipment in outdoor locations.” 1:8-11. “Telecommunications equipment is typically designed for indoor temperature controlled environments, but is often deployed in Outdoor locations. When telecommunications equipment is deployed in Outdoor locations, a cabinet is typically used to provide environmental protection and control thermal conditions within the design limits of the telecommunications equipment.” 1:15-21 “There are essentially two main approaches to housing telecommunications equipment in outdoor cabinets-sealed cabinets and ventilated cabinets. Ventilated cabinets use natural or forced convection to draw ambient air through the cabinet to cool the equipment inside. Natural convection is only feasible for low density heat dissipation. At moderate and high power densities, forced ventilation is required.” 1:22-28. “Conventional cabinet ventilation systems use one or more fans to draw enough air into the cabinet to maintain the temperature below maximum equipment limits and to return the heated air to the outside environment. At low temperatures, the fans are turned off by a thermostat. In extremely cold climates, an electric heater is used to maintain the cabinet temperature within minimum equipment temperatures.” 1:29-36. “Sealed cabinets provide an alternative to ventilated cabinets for housing telecommunications equipment in outdoor locations. Sealed cabinets provide maximum protection from airborne contaminants, but require Special attention to the task of removing heat dissipated by the equipment. A variety of methods are used for

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
		removing the heat dissipated by the telecommunications equipment. At moderate power densities, circulation fans, air-to-air heat exchangers, or heat pipes may be used.” 1:45-53. “Heat exchangers and heat pipes require a relatively large difference between the ambient temperature and the equipment cooling air temperature in order to properly transfer heat.” “Some units use variable speed-condenser blowers and/or a flooded condenser design to reduce the heat loss through the condenser and allow the air-conditioner to run at very low temperatures. Other units use a low-ambient vent to cool the cabinet with outside air when the temperature is too low to run the air conditioner.” 2:2-7. “The present invention is a telecommunications equipment cabinet particularly adapted for use in Outdoor locations. The cabinet comprises an enclosure having an electronics subrack for containing the telecommunications equipment. The enclosure includes an inlet opening in a lower portion of the cabinet for drawing cool ambient air into the cabinet. An exhaust outlet for exhausting heated air is disposed in an upper portion of the cabinet. In the preferred embodiment, the cabinet includes a segregated air routing System to direct air from the inlet, through the subrack, and out of the cabinet. The Segregated air routing System includes a duct that extends from the air inlet to a subrack plenum disposed directly below the electronics subrack. An exhaust plenum is disposed immediately above the subrack and communicates with the exhaust outlet. One or more fans draw cool ambient air into the cabinet. The cool ambient air flows through the inlet to the Subrack plenum. A heater in the inlet duct heats the air at low ambient temperatures. The air is then pulled through the electronics in the subrack where the air picks up heat dissipated by the equipment. From the subrack, the heated air enters the exhaust plenum and is expelled through the exhaust outlet. The air flow is confined by the duct work in the cabinet for more effective control of cooling air flow rate and temperature.” 2:15-38. “The cabinet of the present invention is able to cool the electronics in compliance with equipment requirements for cooling air temperature and rate of temperature change without the burdens of Size,

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
		complexity, power consumption, and noise of an air-conditioned cabinet. Protection from air-borne contaminants is provided by filters disposed in the inlet duct.” 2:56-62. “An electronic equipment cabinet 10 includes various electronics housed within a Suitable enclosure 20 having a top 22, a bottom 24, and Sides 26. For purposes of illustration, the electronic equipment cabinet 10 will be described as housing telecommunications electronics 34 Such as that required for a cellular telephone base station. Such electronic equipment cabinets 10 typically include both power electronics 32 and communications electronics 34. The power electronics 32 are typically separated from the communications electronics 34 by a suitable power distribution box 30 so as to reduce the hazards associated with Servicing the communications electronics 34. The communications electronics 34 typically include a variety of communication circuit modules 42. The circuit modules 42 typically take the form of removable circuit cards disposed in a vertical orientation and supported by an electronics subrack 40 within the cabinet enclosure 20. The particular details of the configuration and operation of the power electronics 32 and communications electronics 34 are well known to those skilled in the art and are not discussed further herein except as to assist in understanding the present invention. When operating, the communications electronics 34 within the electronic equipment cabinet 10 should be cooled to help prevent malfunctions or damage; this is particularly true for electronic equipment cabinets 10 in locations that are not in temperature controlled environments, such as outdoor environments. The electronic equipment cabinet 10 of the present invention includes a cooling system 50 to cool the communications electronics 34. The cooling system 50 provides a flow of cooling air across the communications electronics 34. In general, the airflow is in via one or more inlet vents 52, through a inlet duct 56 to a subrack inlet plenum 70, through the electronics Subrack 40 to an subrack exhaust plenum 72, and out one or more exhaust vents 74. At least one fan 80, and preferably a plurality fans 80, are disposed downstream from the electronics subrack 40 and pull external air along this airflow path.” 3:17-54.

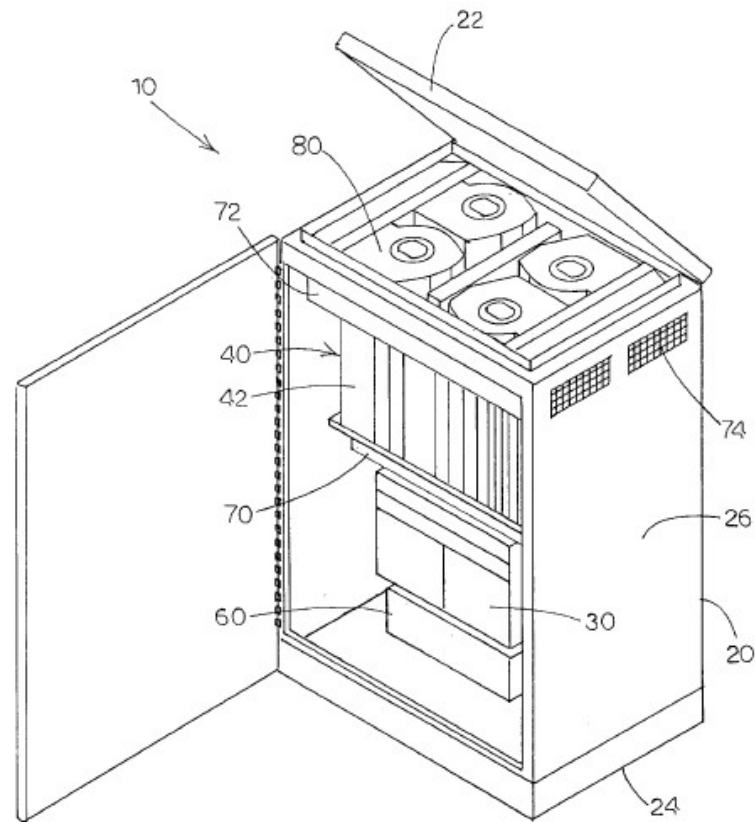
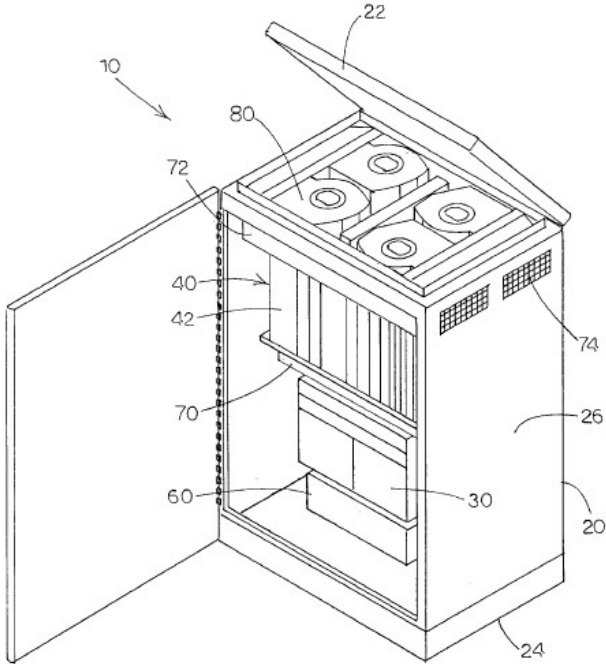
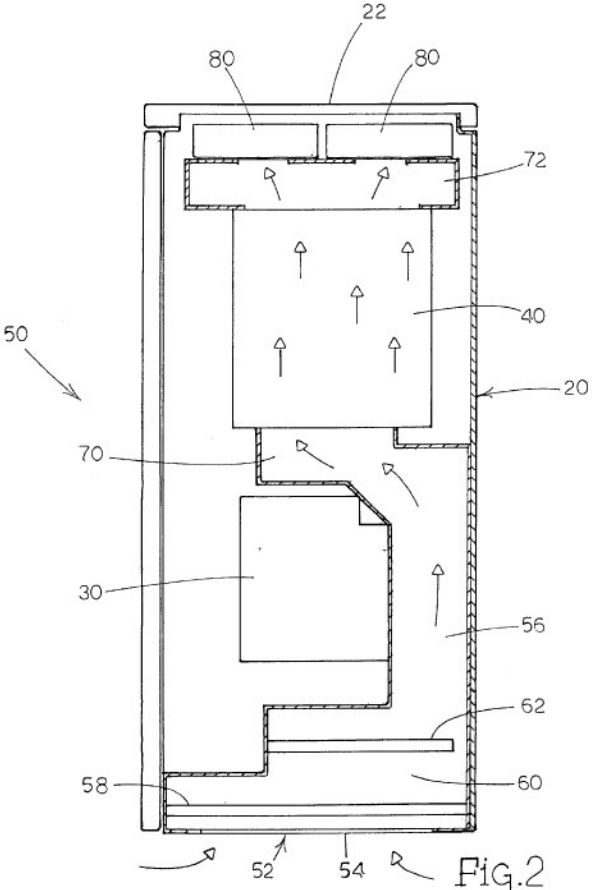


FIG.1

FIG. 1, see also FIGs. 2-3.

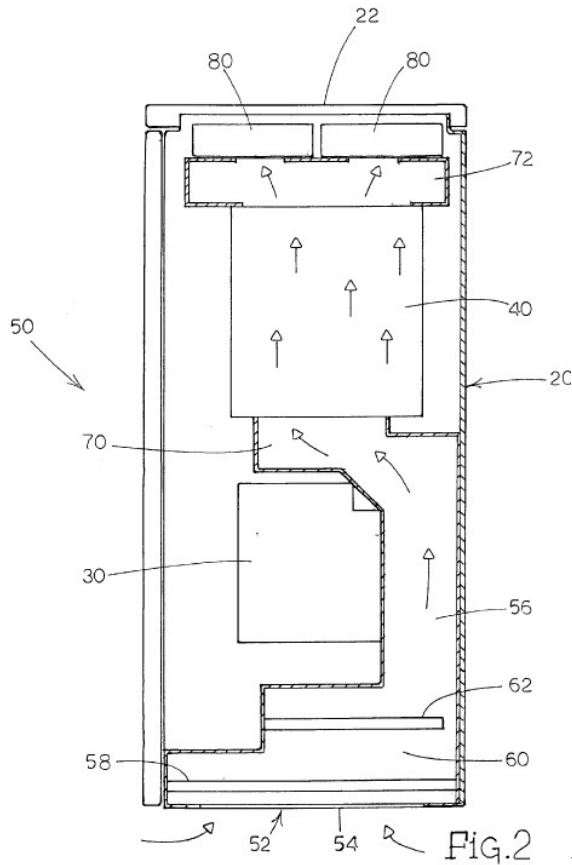
Claim No.	U.S. Patent No. 7,724,521 B2	Jones
		To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[a]	a fan shroud having at least one electrical fan; and	Jones expressly or inherently discloses this claim element. <i>See, e.g.,</i> "A fan draws ambient air into the inlet through the duct into the subrack inlet plenum, through the electronic subrack into the subrack exit plenum, and out of the enclosure through the subrack exhaust plenum. A heater is provided for heating inlet air when ambient temperatures are low. The fan and heater are controlled by a thermal controller. At low ambient temperatures, the air flow is maintained constant by the fans and power to the heater is varied to maintain the subrack inlet temperature constant. At moderate temperatures, the heating element is turned off and the fan speed is varied up to the maximum fan speed. At high temperatures, the fans operate at full speed to maintain maximum air flow." Abstract. "One or more fans draw cool ambient air into the cabinet. The cool ambient air flows through the inlet to the subrack plenum. A heater in the inlet duct heats the air at low ambient temperatures. The air is then pulled through the electronics in the subrack where the air picks up heat dissipated by the equipment. From the subrack, the heated air enters the exhaust plenum and is expelled through the exhaust outlet. The air flow is confined by the duct work in the cabinet for more effective control of cooling air flow rate and temperature." 2:29-38. "At least one fan 80, and preferably a plurality fans 80, are disposed downstream from the electronics Subrack 40 and pull external air along this airflow path." 3:53-55.

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		 FIG. 1 FIG. 1.

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		 FIG. 2; see also 1[pre].

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		To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
1[b]	a Venturi chamber having a first inlet for receiving a heated airflow from a heatsink, a second inlet for receiving an airflow from a surrounding environment, and an outlet coupled to the fan shroud, the fan drawing air from the Venturi chamber via the outlet when the fan is on;	Jones expressly or inherently discloses this claim element. <i>See, e.g.,</i> A cabinet for housing telecommunications equipment in outdoor locations includes an enclosure for containing the telecommunications equipment. A subrack is mounted within the enclosure. A duct directs ambient air from outside the cabinet to the subrack. The duct includes an inlet disposed in a lower portion of the cabinet and a subrack inlet plenum disposed immediately below the subrack. A subrack exit plenum is disposed above the electronic subrack for exhausting air heated by the electronics equipment. A fan draws ambient air into the inlet through the duct into the subrack inlet plenum, through the electronic subrack into the subrack exit plenum, and out of the enclosure through the subrack exhaust plenum. A heater is provided for heating inlet air when ambient temperatures are low. The fan and heater are controlled by a thermal controller. At low ambient temperatures, the air flow is maintained constant by the fans and power to the heater is varied to maintain the subrack inlet temperature constant. At moderate temperatures, the heating element is turned off and the fan speed is varied up to the maximum fan speed. At high temperatures, the fans operate at full speed to maintain maximum air flow.” Abstract. “The present invention is a telecommunications equipment cabinet particularly adapted for use in Outdoor locations. The cabinet comprises an enclosure having an electronics subrack for containing the telecommunications equipment. The enclosure includes an inlet opening in a lower portion of the cabinet for drawing cool ambient air into the cabinet. An exhaust outlet for exhausting heated air is disposed in an upper portion of the cabinet. In the preferred embodiment, the cabinet includes a segregated air routing system to

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		direct air from the inlet, through the Subrack, and out of the cabinet. The segregated air routing system includes a duct that extends from the air inlet to a subrack plenum disposed directly below the electronics subrack. An exhaust plenum is disposed immediately above the subrack and communicates with the exhaust outlet. One or more fans draw cool ambient air into the cabinet. The cool ambient air flows through the inlet to the subrack plenum. A heater in the inlet duct heats the air at low ambient temperatures. The air is then pulled through the electronics in the subrack where the air picks up heat dissipated by the equipment. From the subrack, the heated air enters the exhaust plenum and is expelled through the exhaust outlet. The air flow is confined by the duct work in the cabinet for more effective control of cooling air flow rate and temperature.” 2:15-38.

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		 FIG. 2, see also FIGs. 1, 3. “When operating, the communications electronics 34 within the electronic equipment cabinet 10 should be cooled to help prevent malfunctions or damage; this is particularly true for electronic equipment cabinets 10 in locations that are not in temperature controlled environments, such as outdoor environments. The electronic equipment cabinet 10 of the present invention includes a cooling system 50 to cool the communications

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
		electronics 34. The cooling system 50 provides a flow of cooling air across the communications electronics 34. In general, the airflow is in via one or more inlet vents 52, through a inlet duct 56 to a subrack inlet plenum 70, through the electronics subrack 40 to an subrack exhaust plenum 72, and out one or more exhaust vents 74. At least one fan 80, and preferably a plurality fans 80, are disposed downstream from the electronics subrack 40 and pull external air along this airflow path.” 3:39-54 “In one embodiment, the inlet vent 52 is disposed along the bottom of the enclosure 20 and is guarded by a inlet grill 54 sized to keep out larger nesting and Stinging insects and the like. Equivalently, the inlet vent 52 may be disposed along the sides 26 of the enclosure 20 near the bottom 24. The inlet duct 56 connects to the inlet vent 52 and includes a lower portion and an upper portion. The lower portion preferably includes a filter 58 and a heating chamber 60. The filter 58 helps remove airborne fibers and further helps control the ingress of insects. The heating chamber 60 includes one or more heating elements 62. The heating element 62 is used to preheat the cooling air entering from the outside when it is cold so that the air entering the subrack inlet plenum 70 is above the minimum cooling air temperature specified for the equipment. Preferably, the power density of the heating element 62 is limited, Such as in the range of 6 Watts per square inch of heater surface area or less, to minimize radiant heating of the electronics subrack 40 and other equipment within the radiation field of the heating element 62 and to avoid reaching flammability limits of adjacent components and/or foreign objects entrained in the airflow. The heating element 62 is preferably an electric resistance heater and is controlled by the thermal controller 100 as more fully described below. Preferably, the power for the heating element 62 is regulated by a triac 64 having on/off Zero crossing detection So as to minimize electromagnetic interference on any associated AC power lines. The upper portion of the inlet duct 56 connects to the subrack inlet plenum 70. The subrack inlet plenum 70 is a generally open area, preferably disposed below the electronics subrack 40, which is designed to distribute the air being supplied to the electronics subrack 40. Air from the Subrack inlet plenum 70 flows through the electronics subrack 40 so as to cool the communications electronics 34 therein. Typically, but not necessarily, the airflow is vertically through the electronics subrack 40, between the spaced apart circuit cards. Because the cooling system 50 of the present invention may not be equipped with humidity control, and to protect from other contamination, it may be advisable to employ conformal coatings, protective (but thermally conductive) barriers, sealants, or the like to

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
		keep airborne contaminants and moisture from direct contact with the communications electronics components. Air from the electronics Subrack 40 exits from the subrack into the Subrack exhaust plenum 72. The subrack exhaust plenum 72 is a generally open area which collects the airflow from the electronics subrack 40 and channels it to the fans 80. The fans 80 pull the air through the electronics subrack 40 and exhaust the same to the outside through the exhaust vents 74. While only one fan 80 is required, it is preferred that a plurality of fans 80 be used to reduce overall size and provide redundancy in case of fan failure. The capacity and number of fans 80 should vary depending on the desired capacity of the cooling system 50. Each fan 80 should be variable speed over a wide range of speeds. Each fan 80 should be equipped with a backdraft damper to prevent recirculation of cooling air through any fans 80 that are not in use. To provide a redundant backup, it is preferred that one fan 80 be held in reserve. In the event that the optional fan speed sensors indicate that one of the main fans 80 is not operating properly, Such as when the detected Speed is 75% or less than the desired speed, the reserve fan 80 may be substituted for the malfunctioning fan 80.” 3:55-4:51. See also 1[pre-a]. To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff’s apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants’ Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants’ Invalidity Contentions Cover Pleading.
1[c]	wherein the Venturi chamber comprises a wall for directing the airflow air from	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[b].</i>

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	the surrounding environment in from the second inlet and across the heated airflow from the heatsink in a manner to as to draw the heated airflow through the heatsink using a Venturi effect, when the fan is on.	To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
4	The cooling unit of claim 1, wherein the Venturi chamber first inlet encircles one or more convective openings of the heatsink.	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
5	The cooling unit of claim 1,	Jones expressly or inherently discloses this claim element.

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	wherein the airflow from the surrounding environment is cooler than the heated airflow.	<i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[pre]	A method for cooling a sealed environment of an enclosure for housing electronics, the method comprising:	To the extent the preamble is limiting, Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[pre].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[a]	directing heat generated by one or more electronic devices housed within a sealed environment of	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[pre-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

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	an enclosure to a heatsink thermally coupled to an external environment;	Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[b]	drawing a first airflow across one or more convective openings of the heatsink, wherein the first airflow does not flow into the one or more convective openings of the heatsink;	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[b-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
14[c]	drawing a second airflow of heated air from the one or more convective openings using a Venturi effect created by	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[b-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious.

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
	drawing the first airflow.	Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[a]	The method of claim 14 wherein drawing the first airflow further comprises drawing the first airflow into a Venturi chamber;	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[b-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
15[b]	wherein drawing the second airflow further comprises drawing the second airflow into the Venturi chamber;	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[b-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.

Claim No.	U.S. Patent No. 7,724,521 B2	Jones
15[c]	the method further comprising operating a fan to pull the first airflow and the second airflow out of the Venturi chamber.	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[a-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.
16	The method of claim 14, further comprising operating a fan to draw the first airflow and the second airflow.	Jones expressly or inherently discloses this claim element. <i>See, e.g., 1[a-c].</i> To the extent that this reference does not expressly disclose this claim limitation, in light of Plaintiff's apparent claim construction and infringement positions with respect to the Accused Products, a POSITA would have understood it to implicitly disclose it or would have found the claim limitation obvious. Additionally, it would have been obvious to a person of ordinary skill in the art to modify this reference with any one or more of the references disclosed in Defendants' Invalidity Contentions based on knowledge of one of ordinary skill in the art and for the reasons articulated Defendants' Invalidity Contentions Cover Pleading.