

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICRON TECHNOLOGY, INC., and
MICRON SEMICONDUCTOR PRODUCTS, INC.,
Petitioner

v.

PALISADE TECHNOLOGIES, LLP,
Patent Owner.

Case No. IPR2025-01561
U.S. Patent No. 8,148,962

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 8,148,962**

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. MANDATORY NOTICES, STANDING, AND FEES.....	1
A. Mandatory Notices Under 37 C.F.R. § 42.8	1
B. Grounds for Standing	2
C. Fee Authorization	3
III. PRECISE RELIEF REQUESTED	3
IV. THE CHALLENGED PATENT	3
A. The '962 Patent	3
B. Prosecution History of the '962 Patent	9
C. Level of Ordinary Skill in the Art	10
V. BRIEF DESCRIPTION OF THE APPLIED PRIOR ART REFERENCES	10
A. Scott (Ex-1005)	10
B. Gradinariu (Ex-1006)	13
VI. CLAIM CONSTRUCTION	14
VII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS	17
A. Ground 1: Claims 1, 7-11, 14, and 16-20 Are Obvious Over Scott.....	17
1. Claim 1	17
2. Claim 7: The voltage regulator circuit of claim 1, wherein said second current supply circuit further comprises at least one stability capacitor arrangement.....	35
3. Claim 8: The voltage regulator circuit of claim 7, wherein said at least one stability capacitor arrangement has a capacitance of less than 30 pico-farads.	37
4. Claim 9: The voltage regulator of claim 1, wherein said load current has a magnitude that is at least one order of	

TABLE OF CONTENTS

(continued)

	Page
magnitude greater than a magnitude of a current of said second current path.	38
5. Claim 10: The voltage regulator of claim 1, wherein said load current has a magnitude of less than one amp, and wherein said current of said second current path has a magnitude of less than one milli-amp.....	39
6. Claim 11: The voltage regulator of claim 1, wherein said signal received at said pass device gate is a voltage.....	39
7. Claim 14.....	41
8. Claim 16.....	52
9. Claim 17.....	59
10. Claim 18: The method of claim 17, wherein supplying said second current includes supplying a current based on a difference between a voltage at a gate of a feedback transistor of a feedback circuit and a voltage at said load circuitry.	63
11. Claim 19: The method of claim 17, wherein supplying, to said load circuitry via said pass transistor, a load current includes increasing a magnitude of said load current if a voltage at said output decreases, and decreasing a magnitude of said load current if a voltage at said output increases.	64
12. Claim 20: The method of claim 17, wherein supplying said load current includes supplying a current with a magnitude of less than one amp, and wherein supplying first current and supplying said second current includes supplying a current with a magnitude of less than one milli-amp.....	64
B. Ground 2: Claims 1, 7-11, 14, and 16-20 Are Obvious Over Scott in view of Gradinariu	65
1. Motivation to Combine Scott and Gradinariu	65
2. Claim 1	67

TABLE OF CONTENTS
(continued)

	Page
3. Claim 14	68
4. Claim 16	69
5. Claim 19: The method of claim 17, wherein supplying, to said load circuitry via said pass transistor, a load current includes increasing a magnitude of said load current if a voltage at said output decreases, and decreasing a magnitude of said load current if a voltage at said output increases.	70
VIII. CONCLUSION.....	70

LIST OF EXHIBITS

Ex-1001	U.S. Patent No. 8,148,962 (“the ’962 Patent”)
Ex-1002	Declaration of Dr. R. Jacob Baker
Ex-1003	Curriculum Vitae of Dr. R. Jacob Baker
Ex-1004	Prosecution History of U.S. Patent No. 8,148,962 (App. No. 12/464,301)
Ex-1005	U.S. Patent No. 7,151,363 (“Scott”)
Ex-1006	U.S. Patent No. 7,026,802 (“Gradinariu”)
Ex-1007	Def.’s Opening Claim Construction Br., <i>Palisade Technologies, LLP. v. Micron Tech., Inc.</i> , ECF No. 58, No. 7:24-cv-00262 (W.D. Tex. July 30, 2025)
Ex-1008	Joint Claim Construction Statement, <i>Palisade Technologies, LLP. v. Micron Tech., Inc.</i> , ECF No. 90, No. 7:24-cv-00262 (W.D. Tex. Sept. 22, 2025)
Ex-1009	Claim Construction Order and Memorandum in Support Thereof, <i>Palisade Technologies, LLP. v. Micron Tech., Inc.</i> , ECF No. 93, No. 7:24-cv-00262 (W.D. Tex. Oct. 3, 2025)
Ex-1010	John Watson, <i>Mastering Electronics</i> (3d ed. 1990)
Ex-1011	Yuan Taur & Tak H. Ning, <i>Fundamentals of Modern VLSI Devices</i> (1998)
Ex-1012	Paul R. Gray & Robert G. Meyer, <i>Analysis and Design of Analog Integrated Circuits</i> (2d ed. 1984)
Ex-1013	[Intentionally left blank]
Ex-1014	[Intentionally left blank]
Ex-1015	[Intentionally left blank]
Ex-1016	[Intentionally left blank]
Ex-1017	[Intentionally left blank]
Ex-1018	[Intentionally left blank]
Ex-1019	[Intentionally left blank]
Ex-1020	U.S. Patent No. 8,148,962 Claim Comparison Table

I. INTRODUCTION

Micron Technology, Inc. and Micron Semiconductor Products, Inc. (collectively, “Petitioner” or “Micron”) request *inter partes* review (“IPR”) of Claims 1, 7-11, and 14 of U.S. Patent No. 8,148,962 (“the ’962 Patent”) (Ex-1001), currently assigned to Palisade Technologies, LLP (“PO”).

II. MANDATORY NOTICES, STANDING, AND FEES

A. Mandatory Notices Under 37 C.F.R. § 42.8

Real Parties-in-Interest: Petitioner identifies the following real parties-in-interest: Micron Technology, Inc. and Micron Semiconductor Products, Inc.

Related Matters: PO has asserted the ’962 Patent against the real parties-in-interest in *Palisade Technologies, LLP. v. Micron Tech., Inc.*, No. 7:24-cv-00262 (W.D. Tex. Oct. 16, 2024).

Lead and Back-Up Counsel:

- Lead Counsel:

John Kappos (Reg. No. 37,861)
O’Melveny & Myers LLP
2801 North Harwood Street, Suite 1600
Dallas, TX 75201
Telephone: (972) 360-1900
Fax: (972) 360-1901
E-Mail: jkappos@omm.com

- First Back-Up Counsel:

Xin-Yi Zhou (Reg. No. 63,366).
O’Melveny & Myers LLP
400 South Hope Street, 19th Floor

Los Angeles, CA 90071
Telephone: (213) 430-6000
Fax: (213) 430-6407
E-Mail: vzhou@omm.com

- Additional Back-Up Counsel:

Ben Haber (Reg. No. 67,129)
O'Melveny & Myers LLP
400 South Hope Street, 19th Floor
Los Angeles, CA 90071
Telephone: (213) 430-6000
Fax: (213) 430-6407
E-Mail: bhaber@omm.com

William M. Fink (Reg. No. 72,332)
O'Melveny & Myers LLP
1625 Eye Street, NW
Washington, DC 20006
Telephone: (202) 383-5300
Fax: (202) 383-5414
E-Mail: tfink@omm.com

Service Information: Petitioner consents to electronic service by email to the following addresses:

- jkappos@omm.com
- vzhou@omm.com
- bhaber@omm.com
- tfink@omm.com
- OMMPALISADEMICRON@omm.com

B. Grounds for Standing

Petitioner certifies that the '962 Patent is available for review, and Petitioner is not barred or estopped from requesting review.

C. Fee Authorization

The PTO is authorized to charge any fees due during this proceeding to Deposit Account No. 50-0639.

III. PRECISE RELIEF REQUESTED

Petitioner requests cancellation of the challenged claims based on the following grounds:

Ground	Summary
1	Claims 1, 7-11, 14, and 16-20 are obvious over U.S. Patent No. 7,151,363 (“Scott”) (Ex-1005)
2	Claims 1, 7-11, 14, and 16-20 are obvious over Scott (Ex-1005) in view of U.S. Patent No. 7,026,802 (“Gradinariu”) (Ex-1006)

IV. THE CHALLENGED PATENT

A. The ’962 Patent

Generally, the ’962 Patent relates to systems and methods for improved voltage regulation. Ex-1001, Abstract. Voltage regulation refers to the process of “stabiliz[ing] a source voltage in light of a varying output load.” *Id.*, 1:5-7.

Loads that are coupled to a power supply can selectively operate circuitry to preserve battery resources. Ex-1001, 1:11-18. However, this selective activation and deactivation of circuitry causes variations in the supply voltage. *Id.*, 1:19-24. Most

electrical circuits require a stable supply voltage to function properly. *Id.*, 1:19-24, 4:66-5:2. To address this issue, circuits may include a voltage regulator, which receives a voltage from the power supply and delivers a stable voltage to the load, even when load conditions vary. *Id.*, 1:25-27, 5:2-6.

Figure 2 of the '962 Patent (annotated below) illustrates a circuit diagram of a prior art voltage regulator. Ex-1001, 5:7-8, *see also* 1:25-34. This voltage regulator includes a differential amplifier (orange box) and a pass transistor (blue box). *Id.*, 5:8-10, Fig. 2. One end (132) of the pass transistor is connected to a load (green box) to supply power to the load (green arrow). *Id.*, 1:31-32, 5:7-18, Fig. 2. The output voltage is fed back (orange arrow) to the differential amplifier (orange box), where it is compared to a reference voltage. *Id.*, 5:7-18, Fig. 2. The output of the differential amplifier is a “control voltage” (blue arrow) that drives the gate of the pass transistor (blue box). *Id.*, 1:32-34, 5:7-18, Fig. 2. This feedback arrangement enables the pass device to maintain a constant output to the load by responding to variations in output voltage. *Id.*, 5:15-22.

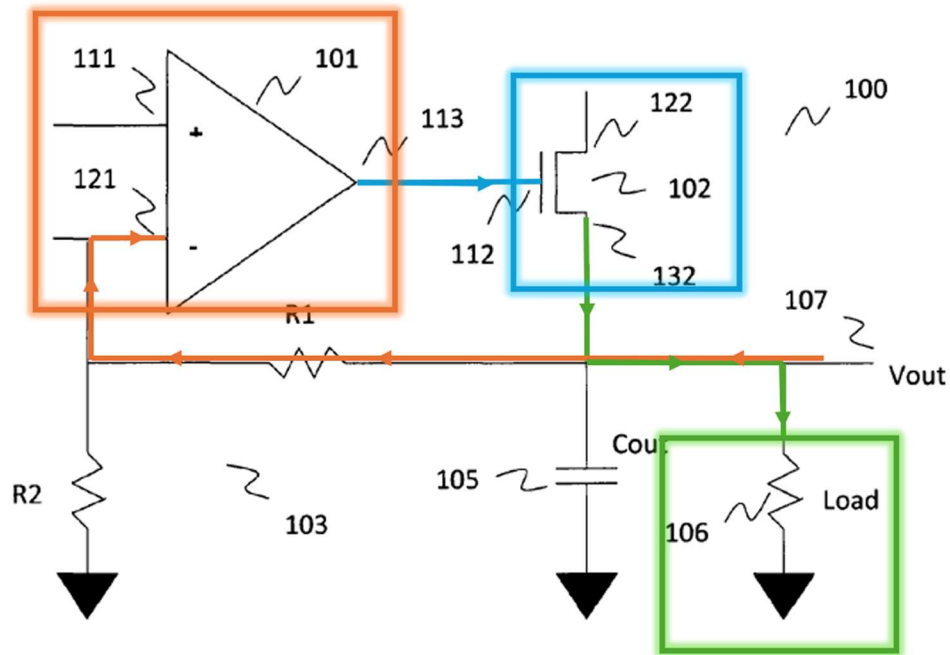
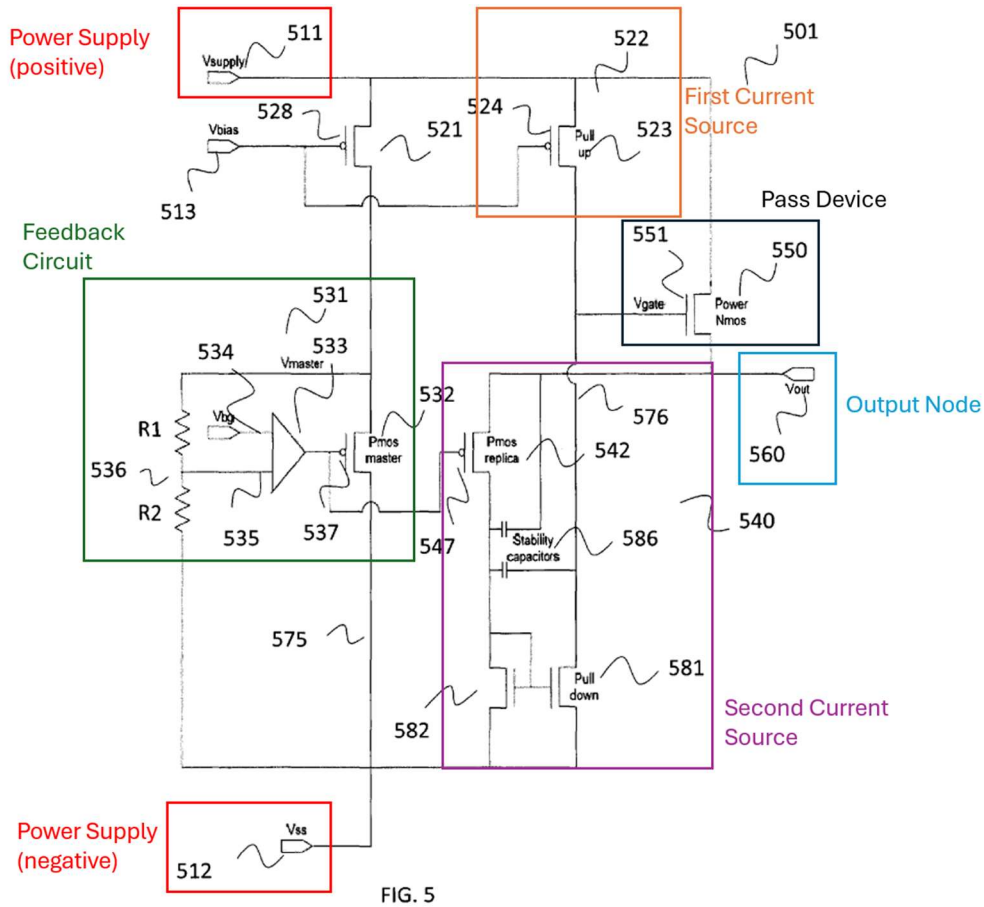


FIG. 2
Prior Art

'962 Patent, Fig. 2 (annotated).

The '962 Patent criticizes this voltage regulator because it relies on a large capacitor (105), which increases the size and complexity of the circuit. Ex-1001, 1:42-47, 5:22-32. The '962 Patent further contends that the source follower of Figure 2 “is ineffective at regulating a voltage for circuits operating at certain frequencies, such as below 100 kHz.” *Id.*, 5:32-35, *see also* 1:35-41. In view of these alleged deficiencies, the '962 Patent purports to disclose an “improved voltage regulator.” *Id.*, Abstract. According to the patentee, embodiments of the alleged invention provide a voltage regulator that does not rely on a large capacitor and is effective for circuits operating at both low and high frequencies. *Id.*, 3:62-4:8, 5:36-44.

According to the patentee, the voltage regulators of the '962 Patent “are advantageous because they supply a load source current via a single current path... thus reducing power consumption compared to other known regulators.” Ex-1001, 8:41-45. An exemplary embodiment is illustrated in Figure 5, annotated below.



Id., Fig. 5 (annotated).

The voltage regulator of Figure 5 receives input from a power supply that includes a positive terminal and a negative terminal (red boxes). Ex-1001, 5:45-51, Fig. 5. It supplies a regulated voltage to a load at the output node (blue box). *Id.*

The voltage regulator includes four main components that collectively perform the described voltage regulation: (1) a “feedback circuit” (green box); (2) a first current source (orange box); (3) a second current source (purple box); and (4) a pass device (black box). Ex-1001, 2:25-53, 8:46-9:63, Fig. 5. The details of each of these components are described below.

First, the regulator includes a “feedback circuit” (green box) coupled to the first current path (575). Ex-1001, 2:25-27, Fig. 5. The feedback circuit “maintain[s] a voltage at a gate of feedback transistor 532 substantially constant.” *Id.*, 8:48-50. To do so, it includes a differential amplifier (534) that compares two inputs: (1) a “voltage proportional to a voltage across the drain and source terminals of feedback transistor” (535); and (2) a reference voltage (534), such as the bandgap voltage. *Id.*, 8:50-57, Fig. 5. The output of this comparison is the “substantially constant” voltage, which is supplied to the gate (537) of the feedback transistor and supplied as an input to the second current source (purple box). *Id.*, 8:46-60, 9:13-15, Fig. 5.

Second, the regulator includes a first current source (orange box) that supplies a substantially constant current to the second current path (576). Ex-1001, 2:30-32, 8:61-9:8, Fig. 5. In the embodiment of Figure 5, the first current source is a slave transistor (523) because its gate is electrically coupled to the gate of a master transistor (521). *Id.*, 8:63-66, Fig. 5. The magnitude of the constant current supplied

by the first current source is determined by the bias voltage (513). *Id.*, 2:30-32, 8:67-9:8, Fig. 5.

Third, the regulator includes a second current source (purple box). The second current source supplies a variable current to the second current path (576) that is inverse to the voltage at the output node (560). When the voltage at the output node increases, the second current source causes the current in the second current path to decrease. Conversely, when the voltage at the output node decreases, the second current source causes the current in the second current path to increase.

To do so, the second current source includes a replica transistor (542) with a gate coupled to the gate of the “feedback transistor.” *Id.* The drain of the replica transistor is coupled to the output of the voltage regulator (560). *Id.*, 9:13-17. Because of this arrangement, the current through the replica transistor increases when the regulator’s output voltage increases, and decreases when the output voltage decreases. *Id.*, 9:17-20. The current through the replica transistor drives the gate of the “pull down” transistor 581. *Id.*, 9:40-44. When the current at this gate increases, the transistor pulls down more current through the second current path, reducing the overall current. *Id.*, 9:64-10:9. Conversely, when the current at the gate of the pull down transistor decreases, the transistor pulls down less current, causing the current of the second current path to increase. *Id.*

Fourth, the regulator includes a pass device (black box). *Id.*, 2:40-50, 9:55-63, Fig. 5. The pass device is a transistor with its gate coupled to the second current path. *Id.* The pass device provides load current to the output of the voltage regulator based on the current of the second current path. *Id.*

B. Prosecution History of the '962 Patent

The '962 file history is submitted as Ex-1004. The application was originally filed on May 12, 2009. A Notice to File Corrected Application Papers was issued on May 28, 2009 due to issues with erasures and overwriting in at least Figures 1-5. The applicant filed a Preliminary Amendment on July 28, 2009, replacing Figure 2 and updating Figures 1 and 3-7.

A Non-Final Rejection was issued on August 16, 2011 rejecting Claims 1-12 and 18-20 as indefinite. The applicant was instructed that “[t]he entire disclosure, i.e., specification, abstracts and claims should be revised carefully” to “facilitate finding support for the recited limitations, as well as to provide proper antecedence for all claimed limitations.” Ex-1004, 308. The applicant submitted an Amendment/Request for Reconsideration on November 16, 2011, making modest amendments to just the claims. The examiner issued a Notice of Allowance on November 29, 2011. *See generally* Ex-1004.

C. Level of Ordinary Skill in the Art

A person of ordinary skill in the art at the relevant time (“POSITA”) would have had a bachelor’s degree in electrical engineering, computer engineering, or a related field, and at least two years of experience in the research, design, or development of semiconductor devices or integrated circuits, or the equivalent, with additional education substituting for experience and vice versa. Ex-1002 ¶36.

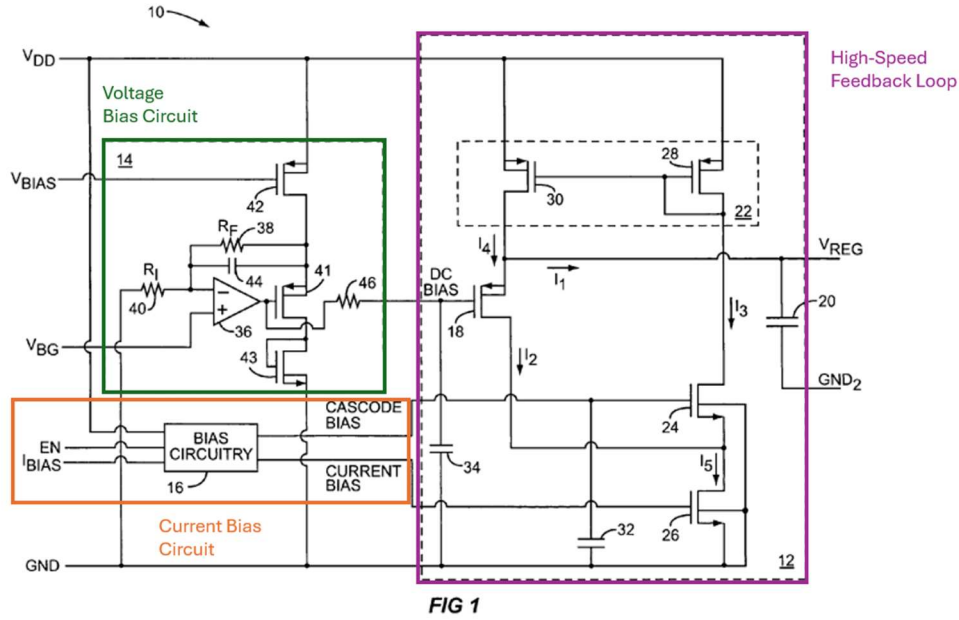
V. BRIEF DESCRIPTION OF THE APPLIED PRIOR ART REFERENCES

This petition presents two references, none of which were of record during prosecution. *See generally* Ex-1004.

A. Scott (Ex-1005)

Scott is a U.S. patent that was issued on Dec. 19, 2006. Ex-1005, Cover. It issued from a patent application originally filed on Jun. 8, 2004. *Id.* Scott qualifies as prior art under at least pre-AIA § 102(a)-(b).

Scott is directed to a voltage regulator including a “high-speed feedback loop.” Ex-1005, Abstract, 1:6-10. Figure 1 (annotated below) illustrates that in addition to a high speed feedback loop (purple box), Scott’s voltage regulator includes voltage bias circuitry (green box) and current bias circuitry (orange box). *Id.*, 3:24-28.



Id., Fig. 1 (annotated).

The high-speed feedback loop includes a reservoir capacitor (20). Ex-1005, 3:28-32. The capacitor stores a charge that corresponds to the regulated voltage (V_{REG}). *Id.*, 3:47-51. When there is a dip in the regulated voltage, charge is drawn from the reservoir capacitor to maintain a consistent output voltage. *Id.*, 3:35-38, 3:62-63.

The reservoir capacitor is also coupled to the output of an output transistor (18). Ex-1005, 3:28-32. The output transistor provides a regulated voltage to charge the reservoir capacitor. *Id.*, 3:32-33. When no charge is drawn from the reservoir capacitor, the output transistor draws a current I_2 which is based on a DC bias and the regulated voltage stored in the reservoir capacitor. *Id.*, 3:47-51. The current I_4 is

essentially equal to I_2 , such that the current I_1 is zero and the charge stored in the reservoir capacitor remains constant. *Id.*, 3:58-61.

When there is a dip in V_{REG} , charge is drawn from the reservoir capacitor, which leads to a reduction in the current I_2 by reducing the gate-source voltage of the output transistor (18). *Id.*, 3:62-66. The current source (26) is biased by the current bias circuit to produce a constant current I_5 . *Id.*, 3:66-4:1. The high-speed feedback loop is arranged such that the sum of currents I_2 and I_3 is the constant current I_5 . *Id.*, 4:1-4. Thus, the reduction in the current I_2 causes an immediate increase in the current I_3 . *Id.*

The high-speed feedback loop also includes a current mirror (22), which includes transistor 28 and transistor 30. *Id.*, 3:38-40, Fig. 1. Transistor 28 in the current mirror sinks the current I_3 , and transistor 30 provides a current I_4 , which is defined as the current I_3 multiplied by a current mirror ratio gain (M). *Id.*, 3:52-55. Thus, the current mirror operates to increase the current I_4 in response to the increase in the current I_3 . *Id.*, 4:4-8. When the current I_4 becomes larger than the current I_2 , the current I_1 increases, because the current I_1 is essentially equal to the current I_4 minus I_2 . *Id.*, 4:8-10. The increased current I_1 charges the reservoir capacitor. *Id.*, 4:10-11.

As the charge in the reservoir capacitor increases, the current I_2 increases, which causes currents I_3 , I_4 , and I_1 to decrease. *Id.*, 4:11-13. When I_2 has increased

to be equal to I_4 , the reservoir capacitor has been charged to a point where V_{REG} is back to its desired value. *Id.*, 4:14-17.

Scott's voltage regulator also includes voltage bias circuitry (green box). Ex-1005, 4:66-67, Fig. 1. The voltage bias circuitry generates the DC bias from a bandgap voltage, and provides the DC bias to the output transistor (18). *Id.*, 4:67-5:2. To do so, it includes an operational amplifier (36) that compares the bandgap voltage and a voltage determined by the resistors R_F and R_I . *Id.*, 5:2-8. The output of the operational amplifier is provided at the gate of transistor 41 and mirrored at the gate of output transistor 18, where the voltage is called the DC bias. *Id.*, 5:18-21, Fig. 1. The gate-source voltage of the output transistor adds to the DC bias to replicate the desired regulator output voltage. *Id.*

Scott's voltage regulator also includes the current bias circuitry (orange box), which maintains the current source transistor 26 and cascade transistor 24 in saturation. Ex-1005, 5:39-52, Fig. 1.

B. Gradinariu (Ex-1006)

Gradinariu is a U.S. patent that was issued on April 11, 2006. Ex-1006, Cover. It issued from a patent application originally filed on Oct. 14, 2004. *Id.* Gradinariu qualifies as prior art under at least pre-AIA § 102(a)-(b).

Gradinariu is directed to a "replica biased voltage regulator circuit" that provides "continuous and proportional load regulation." Ex-1006, Abstract, 1:8-10,

3:36-38, 6:25-31. To do so, Gradinariu includes a supply section that supplies current to two current legs—an output leg and a replica leg—which supply an output voltage and a replica voltage. *Id.*, 3:55-58, 4:1-3. Moreover, the current legs are arranged as “voltage mirrors,” such that the replica voltage is forced to track the output voltage. *Id.*, 4:3-6.

Gradinariu’s voltage regulator supplies the replica voltage to an amplifier, where it is compared to a reference voltage. Ex-1006, 3:50-54, 4:24-28. Through this comparison, the amplifier provides negative feedback: it increases output when the replica voltage falls below the reference voltage and vice versa. *Id.*, 4:38-47. Because the output voltage and replica voltage are connected, variations in the output voltage are reflected in the replica voltage. *Id.*, 5:14-23. These variations to the replica voltage are corrected by the amplifier, which are then reflected in the output voltage. *Id.*, 5:23-25.

VI. CLAIM CONSTRUCTION

In the related district court litigation, the parties have agreed that several terms in Claim 14 are governed by 35 U.S.C. § 112, ¶6. *See* Ex-1008 (Joint Claim Construction Statement). For one term, the parties agreed on the identification of structure and function; the agreed construction is provided below. *See id.*, 2-3.

Term	Agreed Construction:
“means for supplying current to said load for receiving a signal based	Function: supplying current to said load for receiving a signal based on a magnitude of said first current and a magnitude of said second current and

on a magnitude of said first current and a magnitude of said second current and for supplying a load current to said load via said output of said voltage regulator circuit with a magnitude based on a magnitude of said signal”	for supplying a load current to said load via said output of said voltage regulator circuit with a magnitude based on a magnitude of said signal Structure: pass transistor 350 of Fig. 3, pass transistor 450 of Fig. 4, pass transistor 550 of Fig. 5, pass transistor 650 of Fig. 6, and equivalents, as described and shown at 5:58-67; 6:15-24; 7:27-51; 9:55-63; 10:54-62, Figs. 3, 4, 5, 6.
---	--

Petitioner applies this agreed construction for this claim term herein.

For three terms in Claim 14, the parties agreed on the function for the terms, but disputed the corresponding structure. *See* Ex-1007 (Def.’s Opening Claim Construction Br.), 13-19. The District Court construed these terms as shown below. Ex-1009 (Claim Construction Order), 27-36, 64-66.

Term	District Court’s Construction
“feedback means for maintaining a voltage at a gate of a feedback transistor substantially constant” (Claim 14)	Function: maintaining a voltage at a gate of a feedback transistor substantially constant Structure: Feedback circuit arranged as shown in Figure 3, element 331 including differential amplifier 333, voltage divider 336, and feedback transistor 332. Feedback circuit arranged as shown in Figure 4, including differential amplifier 433, voltage divider 436, and feedback transistor 432. Feedback circuit arranged as shown in Figure 5, element 531 including differential amplifier 533, voltage divider 536, and feedback transistor 532. Feedback circuit arranged as shown in Figure 6, element 631 including differential amplifier 633, voltage divider 636, and feedback transistor 632, and equivalents.
“first current supply means for supplying to a	Function: supplying to a second current path referenced to said input a first current that is

second current path referenced to said input a first current that is substantially constant” (Claim 14)	substantially constant Structure: first current source 322 of Fig. 3, first current source 422 of Fig. 4, first current source 522 of Fig. 5, first current source 622 of Fig. 6, and equivalents, as described and shown at 6:25-41; 7:52-61; 8:61-9:8; 10:63-11:3, Figs. 3, 4, 5, 6.
“second current supply means... for receiving a first voltage reference and a second voltage reference and for supplying a second current to said second current path with a magnitude based on said first voltage reference and said second voltage reference” (Claim 14)	Function: receiving a first voltage reference and a second voltage reference and for supplying a second current to said second current path with a magnitude based on said first voltage reference and said second voltage reference Structure: second current source 340 of Fig. 3, second current source 440 of Fig. 4, second current source 540 of Fig. 5, second current source 640 of Fig. 6, and equivalents, as described and shown at 6:42-62; 7:62-8:17; 9:40-54; 10:40-53, Figs. 3, 4, 5, 6.

Petitioner applies these constructions throughout its petition.

To resolve the grounds presented herein, Petitioner does not believe that any other term requires explicit construction. The Board “need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citation omitted). The prior art discloses the Challenged Claims in a manner consistent with the ’962 Patent and under any construction proposed by Petitioner and Patent Owner. Therefore, no construction is necessary to resolve whether the prior invalidates the challenged claims. Petitioner interprets the

remaining claim terms according to the *Phillips* claim construction standard. 37 C.F.R. § 42.100(b).¹

VII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS

The '962 Patent contains 20 claims. This Petition challenges Claims 1, 7-11, 14, and 16-20. The subject matter of the challenged claims is disclosed by the prior art as shown below.

A. Ground 1: Claims 1, 7-11, 14, and 16-20 Are Obvious Over Scott

1. Claim 1

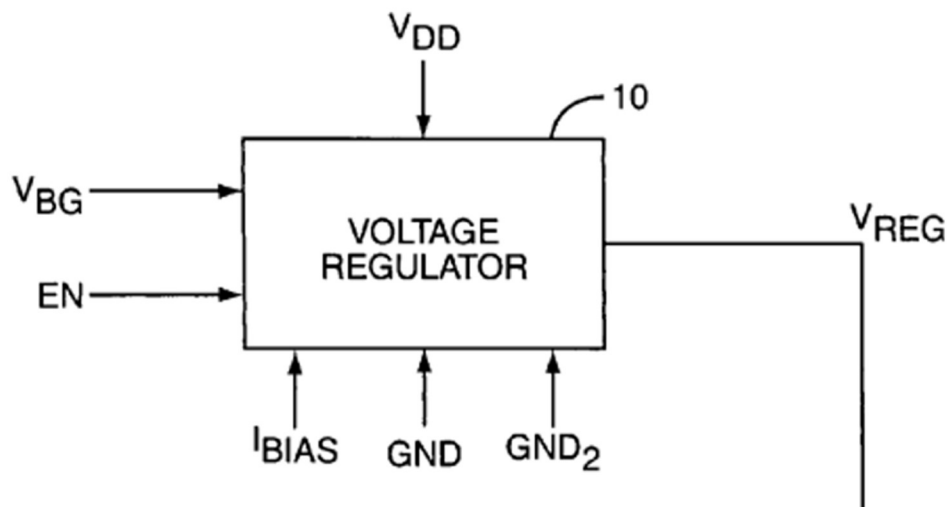
- a. **Element 1[pre]: A voltage regulator circuit integrated in an integrated circuit (IC) and adapted to provide a voltage from a power supply to a load under varying load conditions, comprising:**

To the extent the preamble is limiting, Scott discloses or teaches the preamble. See Ex-1002 ¶¶95-99. The preamble has two requirements: (1) “[a] voltage regulator circuit integrated in an integrated circuit”; and (2) the voltage regulator circuit is “adapted to provide a voltage from a power supply to a load under varying load conditions.”

¹ The parties disputed two other terms—“feedback circuit... including a feedback transistor” and “substantially constant”—in the underlying district court case. See Ex-1007, 5-13. The court has construed both terms as “plain and ordinary meaning,” and Micron has applied that construction herein. See Ex-1009, 11-27, 63.

First, Scott discloses a voltage regulator circuit. Scott's invention is titled "High PSRR, Fast Settle Time Voltage Regulator," and Figure 1 illustrates the invention's voltage regulator circuit. Ex-1005, Cover, 1:6-10, 3:24-26, Fig. 1. The specification confirms that the "present invention relates to a voltage regulator." *Id.*, 1:6-8.

Further, Scott's voltage regulator circuit is "integrated in an integrated circuit." An integrated circuit is a circuit fabricated on a single semiconductor "chip." Ex-1002 ¶97. Scott emphasizes that all of its components, including the capacitor, form a circuit integrated on "a single semiconductor die." Ex-1005, 1:43-45. Further, Scott Figure 2 (below) represents its voltage regulator as a rectangle with several input pins and an output pin, which indicates that the voltage regulator is an integrated circuit. See Ex-1002 ¶97.



Ex-1005, Fig. 2 (excerpt). Moreover, a POSITA would have understood that voltage

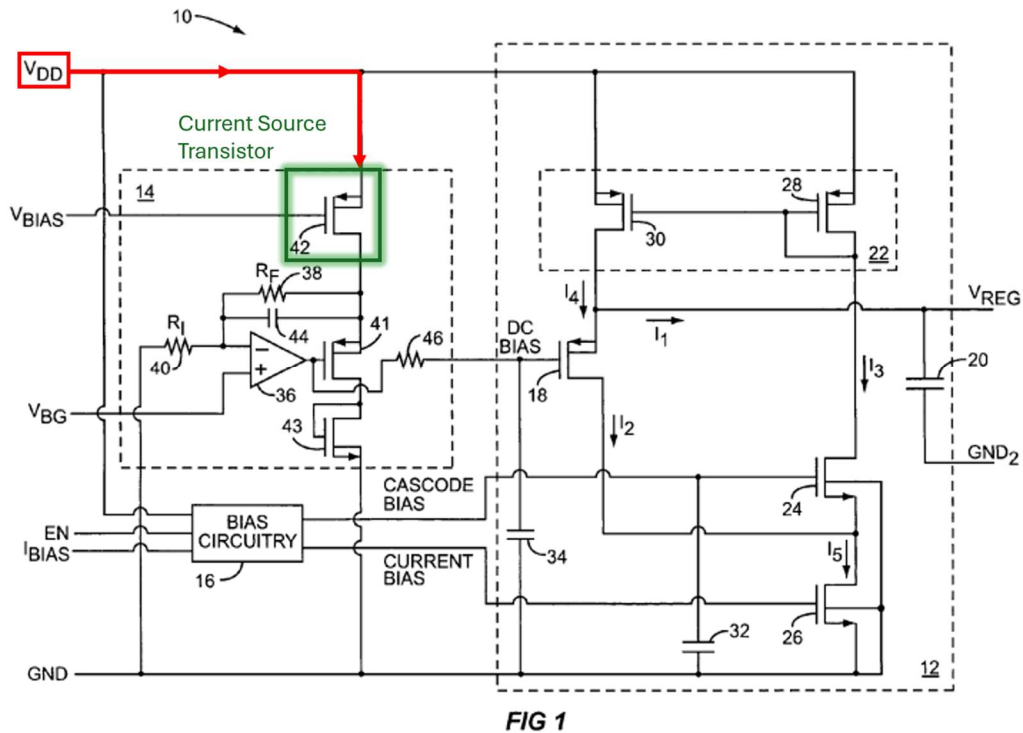
regulators are generally implemented as integrated circuit. Ex-1002 ¶97.

Second, Scott discloses a voltage regulator circuit “adapted to provide a voltage from a power supply to a load under varying load conditions.” Figure 2 (excerpted above) illustrates that Scott’s voltage regulator receives power from a power supply V_{DD} (the claimed “power supply”) and supplies a regulated voltage V_{REG} . EX-1005, Fig. 2. The regulated voltage V_{REG} is supplied to the claimed load. *Id.*, 4:38-41 (disclosing “a load... connected to the regulated voltage V_{REG} ”). Moreover, Scott discloses the claimed varying load conditions. *Id.*, 3:35-38 (“[T]he regulated voltage (V_{REG}) remains substantially constant as the load is varied.”)

Thus, Scott discloses or teaches Element 1[pre].

b. Element 1[a]: an input adapted to receive a voltage from said power supply;

As discussed in relation to Element 1[pre] (§ VII.A.1.a, *supra*), Scott discloses a voltage regulator that receives a voltage V_{DD} from a power supply. EX-1005, Figs. 1, 2. As illustrated in Figure 1 (annotated below), at least current source transistor 42 is adapted to receive a voltage V_{DD} from the power supply.



Id., Fig. 1 (annotated); *see also* 5:2-7 (labeling transistor 42 as the “current source transistor”). Thus, at least current source transistor 42 is the claimed “input adapted to receive a voltage from said power supply.” *See* Ex-1002 ¶¶100-101.

Thus, Scott discloses or teaches Element 1[a].

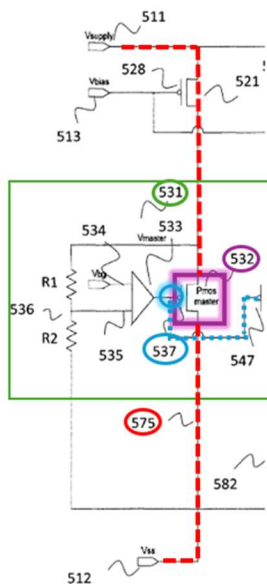
c. Element 1[b]: an output adapted to be coupled to said load;

As discussed in relation to Element 1[pre] (§ VII.A.1.a, *supra*), Scott discloses an output coupled to the load. For example, Scott discloses that “charge is drawn... by a load (not shown) connected to the regulated voltage (V_{REG}).” Ex-1005, 4:39-41. The regulated voltage V_{REG} is the voltage regulator’s output, which Scott discloses is coupled to a load. *Id*; see also Ex-1002 ¶¶102-103

Thus, Scott discloses or teaches Element 1[b].

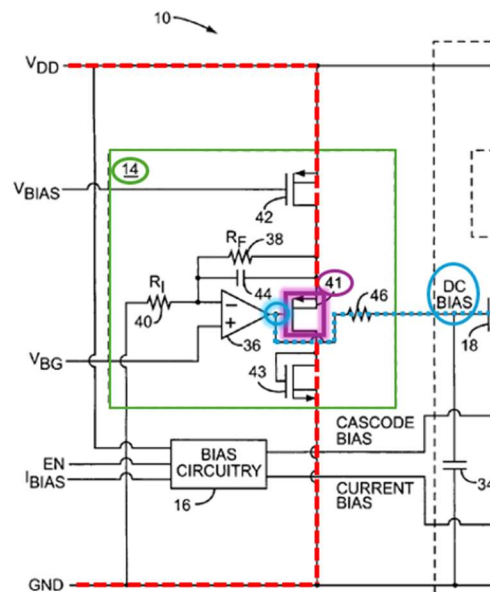
- d. **Element 1[c]: a feedback circuit coupled to a first current path and including a feedback transistor, wherein said feedback circuit is constructed to maintain a voltage at a gate of said feedback transistor substantially constant;**

Element 1[c] requires a “feedback circuit” that (1) must be coupled to a first current path; (2) must include a “feedback transistor;” and (3) must maintain a substantially constant voltage at the gate of the “feedback transistor.” Scott’s voltage regulator includes voltage bias circuitry (14) (Ex-1005, 4:66-67), which matches the claimed “feedback circuit.” See Ex-1002 ¶¶104-108. A comparison of the ’962 Patent’s Figure 5 and Scott’s Figure 1 (both annotated below) shows this. Scott’s voltage bias circuitry discloses every element of the claimed feedback circuit in the same way as the ’962 Patent.



'962 Patent, Fig. 5
(annotated excerpt)

- Feedback Circuit:**
- 1) Coupled to **First Current Path**
 - 2) Includes **Feedback Transistor**
 - 3) Maintains **Substantially Constant Gate Voltage**



Scott, Fig. 1
(annotated excerpt)

First, Scott’s voltage bias circuitry is coupled to a first current path. In Figure 5 of the ’962 Patent (annotated above) shows that the “feedback circuit” (green) is coupled to the first current path (red) between that path’s connection to a power supply (V_{supply}) and ground (V_{ss}). Ex-1001, 9:4-7, Fig. 5. Scott’s voltage bias circuitry (green) is similarly coupled to its first current path (red)—between a power supply (V_{DD}) and ground (GND). Ex-1005, Fig. 1. Moreover, the first current path of both patents includes a current source transistor. Ex-1001, Fig. 5 (element 521); Ex-1005, Fig. 1 (element 42). The amount of current supplied to the feedback circuit in both patents is determined by a bias voltage at the gate of the current source transistor. *Compare* Ex-1001, 8:65-9:4, Fig. 5; *with* Ex-1005, 5:2-21, Fig. 1.

Second, Scott’s voltage bias circuitry includes an “output matching transistor” (purple) which matches the claimed “feedback transistor.” Ex-1005, 5:2-7. The source of the ’962 Patent’s “feedback transistor” (purple) is connected to the power supply through the current source transistor 521, and its drain is connected to ground. *Id.*, Fig. 5, 8:47-50, 9:1-4. Similarly, the source of Scott’s “output matching transistor” (purple) is connected to the power supply through the current source transistor 42, and its drain is connected to ground. Ex-1005, Fig. 1, 5:14-18. Moreover, the gate of both patents’ “feedback transistors” is driven by the output of an amplifier that compares a bandgap voltage with a proportion of the supply voltage. *Compare* Ex-1001, 8:46-60, Fig. 5; *with* Ex-1005, 5:2-21, Fig. 1. Thus,

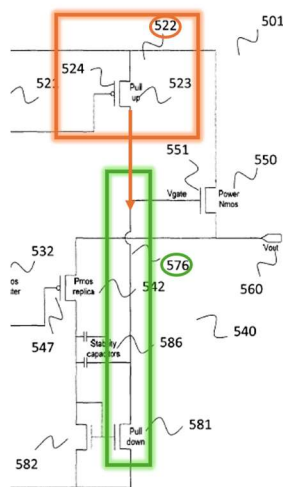
although Scott does not use the same terminology as the '962 Patent, Scott's "output matching transistor" is connected in exactly the same way as the '962 Patent's "feedback transistor." Ex-1002 ¶106.

Third, Scott's voltage bias circuitry maintains a voltage at the gate of its feedback transistor "substantially constant" in the same manner as the '962 Patent. Scott's Figure 1 (annotated above) shows that the voltage at the gate (blue) of the "feedback transistor" (purple) is maintained by an "operational amplifier 36" comparing a bandgap voltage V_{BG} and a resistor-divided voltage proportional to the transistor's source-drain voltage, which is the same as how the '962 Patent maintains the "substantially constant" voltage. *Compare* Ex-1005, 5:2-11, Fig. 1; *with* Ex-1001, 8:46-60, Fig. 5. Moreover, Scott labels the voltage provided to the gate of transistor 18 (blue line showing connection) as "DC BIAS." Ex-1005, 4:66-5:2, 5:31-35, Fig. 1. DC BIAS is a substantially constant voltage, because the inputs of the amplifier (36) that supplies the voltage are selected to "provide the desired regulator output voltage (V_{REG})," which is designed to "remain[] substantially constant" *Id.*, 5:7-14, 3:37-38.

In summary, Scott's voltage bias circuitry (green) is coupled to a first current path (red), includes a feedback transistor (purple), and maintains a voltage at the gate of the transistor substantially constant (blue). Thus, Scott discloses or teaches each limitation of Element 1[c].

- e. **Element 1[d]: a first current supply circuit constructed to supply to a second current path a first current that is substantially constant;**

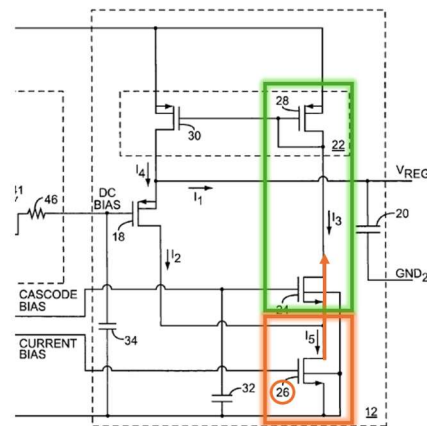
Element 1[d] requires a “first current supply circuit” that supplies a “substantially constant” current to a second current path. Scott’s voltage regulator includes a current source (26) (Ex-1005, 3:38-40), which matches the claimed first current supply circuit. A comparison of the ’962 Patent’s Figure 5 with Scott’s Figure 1 (both annotated below) shows this. Scott’s supply circuit discloses every element of the first current supply circuit in the same way as the ’962 Patent. *See* Ex-1002 ¶¶109-113.



'962 Patent, Fig. 5
(annotated excerpt)

**First Current
Supply Circuit:**

- 1) Supplies a **Substantially Constant Current**
- 2) Current Supplied to **Second Current Path**



Scott, Fig. 1
(annotated excerpt)

First, Scott’s current source (orange) supplies a substantially constant current. Ex-1005, Fig. 1. For example, Scott discloses that “[t]he current source[] 26 is biased to produce a current I_5 , where the current I_5 is a **constant current**.” *Id.*, 3:66-4:1

(emphasis added). In context, a POSITA would have understood that a constant current is “substantially constant.” *See* Ex-1002 ¶110.

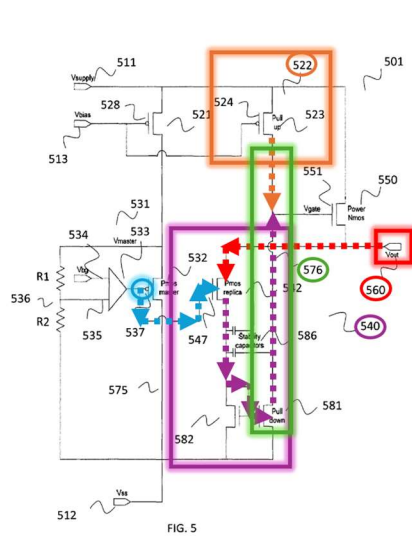
Second, Scott’s current source (orange) supplies its substantially constant current (orange arrow) to a second current path (green). Ex-1005, Fig. 1. Scott discloses that “the sum of the currents I2 and I3 is essentially equal to the constant current I5.” *Id.*, 4:1-4. Therefore, changes in the current I2 result in inverse changes in I3, such that the sum continues to equal I5. *Id.* In this way, Scott’s current source supplies a current to the second current path, because the magnitude of I5 directly impacts the magnitude of I3, which is in the second current path. *Id.*, 4:1-4, Fig. 1.

Moreover, the green box identified in Figure 1 (annotated above) is the claimed second current path. The ’962 Patent explains that the second current path is coupled to at least two elements: the first current supply circuit and the pass device. Ex-1001, 2:30-45. In addition to being coupled to a first current supply circuit, as explained above, the green box identified in Scott’s Fig. 1 (annotated above) is coupled to a pass device. *See infra*, § VII.A.1.f. Thus, the identified element is the claimed second current path.

In summary, Scott’s current source (orange) supplies a substantially constant current (orange arrow) to a second current path (green). Thus, Scott discloses or teaches every limitation of Element 1[d].

- f. **Element 1[e]: a second current supply circuit coupled to said first current supply circuit, said gate of said feedback transistor, and said output of said voltage regulator circuit and constructed to supply a second current to said second current path with a magnitude based on said voltage at said gate of said feedback transistor and a voltage at said output of said voltage regulator circuit;**

Element 1[e] requires a “second current supply circuit” coupled to three components: (a) the first current supply circuit; (b) the gate of the feedback transistor; and (c) the output of the voltage regulator. Additionally, the “second current supply circuit” must supply a current to the second current path, where the magnitude of the current is based on two quantities: (a) the voltage at the gate of the feedback transistor; and (b) the voltage at the output of the voltage regulator. Scott’s voltage regulator includes an “output transistor” (18) (Ex-1005, 3:28-32, Fig. 1), which matches the claimed “second current supply circuit.” A comparison of the ’962 Patent’s Figure 5, and Scott’s Figure 1 (both annotated below) shows this. Scott’s “output transistor” discloses every element of the second current supply circuit in the same way as the ’962 Patent. *See* Ex-1002 ¶¶114-124.



'962 Patent, Fig. 5
(annotated)

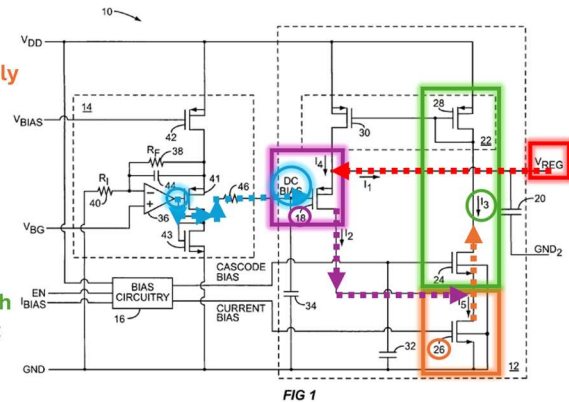
Second Current Supply Circuit:

1) Coupled to three elements:

- First Current Supply Circuit**
- Gate of Feedback Transistor**
- Output of Voltage Regulator**

2) Supplies a **Current** to the **Second Current Path** based on two quantities:

- Voltage at Gate of Feedback Transistor**
- Voltage at Output of Voltage Regulator**



Scott, Fig. 1
(annotated)

(1) The output transistor is coupled to the three required elements.

Scott's output transistor (second current supply circuit, purple) is coupled to the three required elements: (1) the first current supply circuit; (2) the gate of the feedback transistor; and (3) the output of the voltage regulator. Ex-1005, Fig. 1.

First, the output transistor's coupling to the first current supply circuit (orange) is illustrated by the current I_2 (purple arrow). *Id.* "[T]he output transistor 18 draws a current I_2 ." *Id.*, 3:47-51. The current I_2 (purple arrow) connects the output transistor (purple) to the current source (orange). *Id.*, Fig. 1. They are connected in such a way that "the sum of the currents I_2 and I_3 is essentially equal to the constant current I_5 ," which is the current produced by the current source. *Id.*, 3:66-4:4. The current source connected to the output transistor is the claimed "first current supply circuit." *Supra*, § VII.A.1.e.

Second, the output transistor's coupling to the gate of the feedback transistor (blue) is illustrated in Figure 1 by the DC BIAS (blue arrow). Ex-1005, Fig. 1. Scott's detailed description discloses that the output transistor is coupled to the DC BIAS. *See Id.*, 3:49-50 (“[T]he output transistor 18 draws a current I2 **based on a DC bias.**”) (emphasis added); *see also* 4:67-5:2, 5:33-35. Figure 1 illustrates that the output transistor receives the DC BIAS from the gate of the matching transistor (41). *Id.*, Fig. 1; *see also* 5:33-35 (“[T]he matching transistor 41 in conjunction with the operational amplifier 36 generates the DC bias voltage for the output transistor 18.”). The matching transistor (41) is the claimed “feedback transistor.” *Supra*, § VII.A.1.d.

Third, the output transistor's coupling to the output of the voltage regulator (red) is illustrated in Figure 1 by the current I1 (red arrow). Ex-1005, Fig. 1. Scott's detailed description discloses that the output transistor is coupled to V_{REG} . *See Id.*, 3:49-51 (“[T]he output transistor 18 draws a current I2 based on a DC bias and **the charge stored across the reservoir capacitor 20, which corresponds to the regulated voltage (V_{REG}).**”); *see also* 4:41-44. V_{REG} is the output of the voltage regulator, because the “load (not shown) [is] connected to the regulated voltage V_{REG} .” *Id.*, 4: 38-41; *see also supra*, § VII.A.1.c.

Thus, Scott's output transistor is coupled to the three elements required of the second current supply circuit.

(2) The output transistor supplies a current to the second current path based on the required voltages.

Scott's output transistor (purple) supplies a current (purple arrow) based on the two required quantities: (1) the voltage at the gate of the feedback transistor (blue arrow); and (2) the voltage at the output of the voltage regulator (red arrow). Ex-1005, Fig. 1.

First, the DC BIAS voltage is provided to the output transistor from the gate of the matching transistor. *Id.*, Fig. 1, 5:33-35 (“[T]he matching transistor 41 in conjunction with the operational amplifier 36 generates the DC bias voltage for the output transistor 18.”). The matching transistor (41) is the claimed “feedback transistor.” *Supra*, § VII.A.1.d. “The matching of the transistor 41 to the output transistor 18 produces a DC bias output such that the V_{GS} of the output transistor 18 will add to the DC bias voltage to replicate the desired regulator output voltage (V_{REG}).” Ex-1005, 5:18-21. Thus, the current provided by the output transistor is based in part on the DC BIAS, which is supplied by the voltage at the gate of the feedback transistor.

Second, the voltage at the output of the voltage regulator (V_{REG}) is coupled to the output transistor (red arrow showing coupling). Ex-1005, Fig. 1; *see also supra*, § VII.A.1.f.(1). Scott's detailed description discloses that changes in V_{REG} impact the current I_2 (purple arrow) provided by the output transistor. *Id.*, Fig. 1, 4:41-44

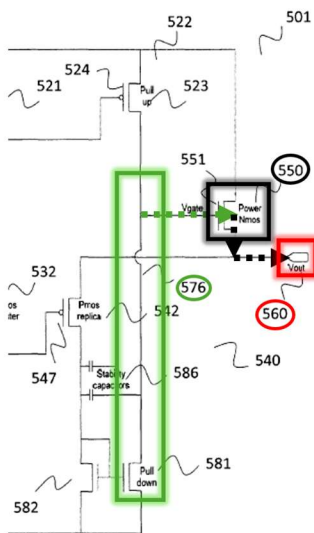
(“The dip in the regulated voltage (V_{REG}) causes an instantaneous reduction in the current I_2 proportional to the transconductance (g_m) of the output transistor 18.”). Thus, the current provided by the output transistor is based in part on the output of the voltage regulator.

The current I_2 (purple arrow) supplied by the output transistor is supplied to the second current path (green). Ex-1005, Fig. 1. The current I_3 is in the second current path. *Id.* The currents I_2 and I_3 are connected “such that the sum of the currents I_2 and I_3 is essentially equal to the constant current I_5 .” *Id.*, 4:2-4. In other words, a reduction in the current I_2 causes an increase in the current I_3 , and vice versa. *Id.*, 4:1-13. Thus, the output transistor supplies a current to the second current path. Note that the inverse arrangement—where a decrease in the voltage supplied by the second current supply circuit causes an increase in the current of the second current path—is the same as the one disclosed in the ’962 Patent. *See* Ex-1001, 9:64-10:9.

In summary, Scott’s output transistor is the disclosed “second current supply circuit,” because it is coupled to the three required elements, and supplies a current to the second current path based on the two required voltages. Thus, Scott discloses or teaches every limitation of Element 1[e].

- g. **Element 1[f]: a pass device including a gate coupled to said second current path and adapted to receive a signal based on said current of said second current path and supply a load current to said load via said output of said voltage regulator circuit with a magnitude based on said signal;**

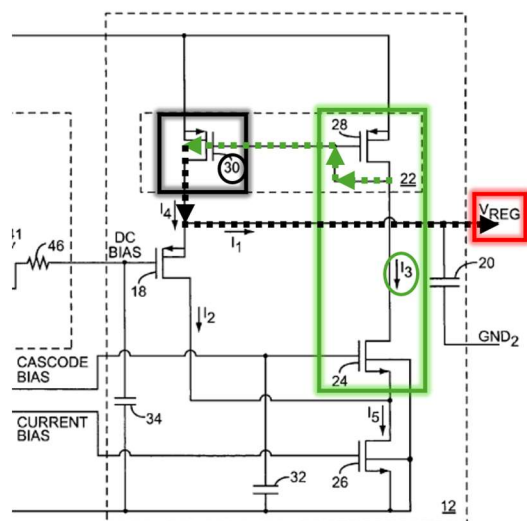
Element 1[f] requires a pass device with a gate coupled to the second current path, that receives a signal based on the current of the second current path. Additionally, the pass device must provide a load current to the load via the output of the voltage regulator based on the signal it receives from the second current path. Scott's voltage regulator includes a transistor (30) that provides a current I_4 (Ex-1005, Fig. 1, 3:52-55), which matches the claimed pass device. A comparison of the '962 Patent's Figure 5 and Scott's Figure 1 (both annotated below) shows this. Scott's transistor (30) discloses every limitation of the claimed "pass device" in the same way as the '962 Patent. Ex-1002 ¶¶125-129.



'962 Patent, Fig. 5
(annotated excerpt)

Pass Device :

- 1) Includes a **Gate** that receives a signal from **Second Current Path**
- 2) Supplies a **Load Current** to the load via the **Voltage Regulator Output**



Scott, Fig. 1
(annotated excerpt)

Scott's Figure 1 (annotated above) illustrates that the transistor 30 (black) is coupled to the second current path (green arrow showing coupling). Ex-1005, Fig. 1. Moreover, Scott's description discloses that the transistor 30 receives a signal based on the current of I3 in the second current path. *Id.*, 3:52-58. Specifically, Scott discloses that the transistor 28 "sinks a current I3" from the second current path, enabling the transistor 30 to provide a current I4, "where the current I4 is defined as the current I3 multiplied by a current mirror gain ratio." Thus, Scott's transistor 30 includes a gate coupled to the second current path, and receives a signal based on the current of the second current path.

Scott's transistor 30 also supplies a load current I4 (black arrow) to the load via the output of the voltage regulator circuit (V_{REG} , red) based on the signal it receives. As discussed above, the current I4 is based on the signal the transistor 30 receives from the second current source I3. *See id.*, 4:4-5; 4:11-13. The current I4 is supplied to the load via the output of the voltage regulator V_{REG} through that current's impact on the current I1 *See id.*, 4:8-11 ("By increasing the current I4, the current I4 becomes larger than the current I2. Accordingly, the current I1 increases and is essentially equal to $I4 - I2$."). The current I1 directly provides charge to the reservoir capacitor. *Id.*, 4:10-11. The output of the voltage regulator circuit draws its charge from the reservoir capacitor. *See id.*, 3:62-63 ("When charge is drawn from the reservoir capacitor 20, there is a dip in the regulated voltage (V_{REG})."); *see also*

id., 3:28-32. Thus, Scott's transistor 30 supplies a load current to the load via the output of the voltage regulator with a magnitude based on the signal it receives from the second current path.

To the extent Patent Owner argues that the load current must be provided directly to the load from the pass device, the claim language does not require that. Ex-1001, Cl. 1 ("a pass device... adapted to... supply a load current to said load."). Moreover, the annotated comparison above shows that the '962 Patent's pass device provides a load current (black arrow) indirectly in a way similar to Scott. *Compare* Ex-1001, Fig. 5; *with* Ex-1005, Fig. 1.

In summary, Scott's transistor 30 is the claimed pass device, because its gate is coupled to the second current path and receives a signal based on the current of that path, and supplies a load current to the load via the output of the voltage regulator based on the signal the transistor 30 receives at its gate. Therefore, Scott discloses or teaches every limitation of Element 1[f].

- h. Element 1[g]: wherein said second current supply circuit is adapted to, via said pass device, cause an increase in magnitude of said load current supplied to said output if a voltage at said output decreases and cause a decrease in magnitude of said load current supplied to said output if a voltage at said output increases; and**

Element 1[g] requires the second current supply circuit to be adapted to, via the pass device, cause an increase in the magnitude of the load current supplied to

the output when the output voltage decreases, and vice versa. As discussed above, Scott's output transistor is the claimed second current supply circuit, and operates in conjunction with the pass device to perform the claimed voltage regulation. *Supra*, §§ VII.A.1.f-g. Specifically, Scott discloses that when "a dip occurs in the regulated output voltage... the high-speed feedback loop operates to rapidly increase the charging current." Ex-1005, 1:55-63. To do so, the output transistor (the claimed "second current supply circuit") reduces the current I₂, causing an increase in the current I₃, which causes the pass device to increase the output currents I₄ and I₁. *Id.*, 3:62-4:11. Similarly, when the regulated output voltage increases, the output transistor increases the current I₂, causing the pass device to decrease the output currents I₄ and I₁. *Id.*, 4:11-13. Thus, Scott's voltage regulator operates in essentially the same way as the '962 Patent. Ex-1002 ¶130-131.

Therefore, Scott discloses or teaches every limitation of Element 1[g].

- i. **Element 1[h]: wherein said feedback circuit, said first current supply circuit, said second current supply circuit, and said pass device are integrated in an integrated circuit and referenced to said input of said voltage regulator circuit.**

Element 1[h] requires the feedback circuit, first current supply circuit, second current supply circuit, and pass device to be integrated in an integrated circuit. As discussed above, these elements of Scott are integrated in an integrated circuit. *Supra*, § VII.A.1.a; *see also* Figs. 1, 2. Additionally, Element 1[h] requires the

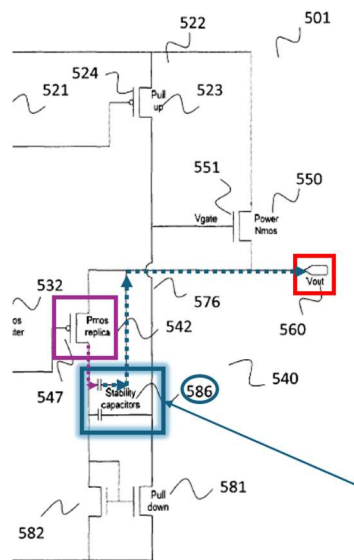
elements to be referenced to the input of the voltage regulator circuit. As discussed above, the elements are referenced to V_{DD} , the input of the voltage regulator circuit. *Supra*, § VII.A.1.b; *see also* Figs. 1, 2.

Therefore, Scott discloses or teaches every limitation of Element 1[h]. *See also* Ex-1002 ¶¶132-134.

Thus, Scott renders Claim 1 obvious.

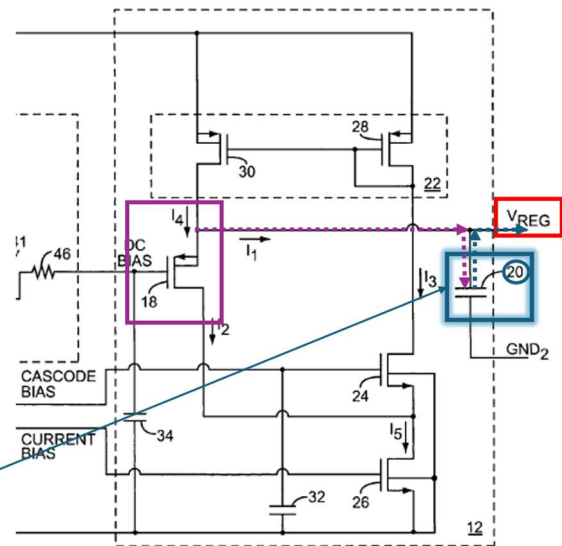
2. Claim 7: The voltage regulator circuit of claim 1, wherein said second current supply circuit further comprises at least one stability capacitor arrangement.

Scott's voltage regulator includes a reservoir capacitor (Ex-1005, 3:28-32) which is the claimed "stability capacitor arrangement." A comparison of the '962 Patent's Figure 5 and Scott's Figure 1 (both annotated below) shows this. Scott's reservoir capacitor is a stability capacitor arrangement that is connected to the same elements and operates in the same way as at least one of the '962 Patent's stability capacitor arrangements. *See* Ex-1002 ¶¶135-139.



'962 Patent, Fig. 5
(annotated excerpt)

**Stability Capacitor
Arrangement**



Scott, Fig. 1
(annotated excerpt)

Scott's reservoir capacitor (blue) is at least one "stability capacitor arrangement." Ex-1005, 3:28-38. Scott discloses that "charge is stored in the reservoir capacitor 20... such that the regulated voltage (VREG) remains substantially constant as the load is varied." *Id.*, 3:36-38. Because the reservoir capacitor ensures the regulated voltage remains substantially constant, it is a "stability capacitor arrangement." *Id.*; *see also id.*, 1:53-55. The '962 Patent explains the operation of its "stability capacitor arrangement" in the same way—the stability capacitor arrangement stores charge so as to ensure quick responses to changes in output voltage levels. Ex-1001, 9:44-49.

Scott's "stability capacitor arrangement" is also arranged in the same way as at least one of the '962 Patent's, as the annotated figures above show. *Compare* Ex-1001, Fig. 5; *with* Ex-1005, Fig. 1. In both patents, the stability capacitor is coupled

to a replica transistor in the second current supply circuit and the output of the voltage regulator. that comprises the second current supply circuit. *Compare* Ex-1001, 9:44-49, Fig. 1; *with* Ex-1005, 3:35-38, Fig. 5.

To the extent Patent Owner argues that the “stability capacitor arrangement” requires multiple capacitors, with one placed in the circuit before and one after the pass device, the claim does not expressly require that. *See* Ex-1001, Cl. 7. Moreover, a POSITA would have understood that the stability capacitor arrangement could perform its function whether placed after or before and after the pass device. *See* Ex-1002 ¶138.

Thus, Scott renders Claim 7 obvious.

3. Claim 8: The voltage regulator circuit of claim 7, wherein said at least one stability capacitor arrangement has a capacitance of less than 30 pico-farads.

Scott’s reservoir capacitor (20) is the claimed stability capacitor arrangement. *Supra*, § VII.A.2. Scott discloses that “in one embodiment, the **reservoir capacitor 20 is a 10 pF capacitor.**” Ex-1005, 4:31-32. Since 10 pico-farads is less than 30 pico-farads, Scott’s reservoir capacitor has the required capacitance. *See* Ex-1002 ¶¶140-141.

Therefore, Scott renders Claim 8 obvious.

4. **Claim 9: The voltage regulator of claim 1, wherein said load current has a magnitude that is at least one order of magnitude greater than a magnitude of a current of said second current path.**

Claim 9 requires the magnitude of the load current to be at least one order magnitude greater than the second current path. Scott discloses or teaches this limitation. Ex-1002 ¶¶142-145.

As discussed above, Scott's current I3 corresponds to the second current path, and the current I4 to the load current. *Supra*, §§ VII.A.1.d-f. Scott discloses a current mirror where one transistor sinks I3 and another provides I4, "defined as the current I3 multiplied by a current mirror gain ratio (M)." Ex-1005, 3:52-55. Scott provides an example in which I3 is 300 μ A and M is 1.5, so I4 is equal 450 μ A. *Id.*, 4:45-48.

Scott states that the "current mirror gain ratio (M) may be any number greater than zero." *Id.*, 3:55-58. Thus, if the current mirror gain ratio is 10 or greater, then I4 is at least one order of magnitude greater than I3. *See* Ex-1002 ¶144. Therefore, Scott discloses or renders obvious that I4 (Scott's "load current") is at least one order of magnitude greater than the magnitude of the current of I3 (in Scott's "second current path"). *See id.*

Thus, Scott discloses or teaches Claim 9.

5. Claim 10: The voltage regulator of claim 1, wherein said load current has a magnitude of less than one amp, and wherein said current of said second current path has a magnitude of less than one milli-amp.

Claim 10 requires the load current to have a magnitude of less than one amp, and the current of the second current path to have a magnitude of less than one milli-amp. Scott expressly discloses an example that meets these requirements. Ex-1005, 4:34-56.

As discussed above, I3 is the current of Scott's second current path, and I4 is Scott's load current. *Supra*, §§ VII.A.1.d-f. Scott discloses one example wherein I3 (the claimed "second current path" current) ranges from 200 μ A (0.2 milli-amps) to 300 μ A (0.3 milli-amps), so it is less than one milli-amp. Ex-1005, 4:34-56. In the same example, I4 (the claimed "load current") ranges from 300 μ A (0.00030 amps) to 450 μ A (0.00045 amps), so it is less than one amp. *Id.* Thus, Scott discloses this limitation. Ex-1002, ¶¶146-148.

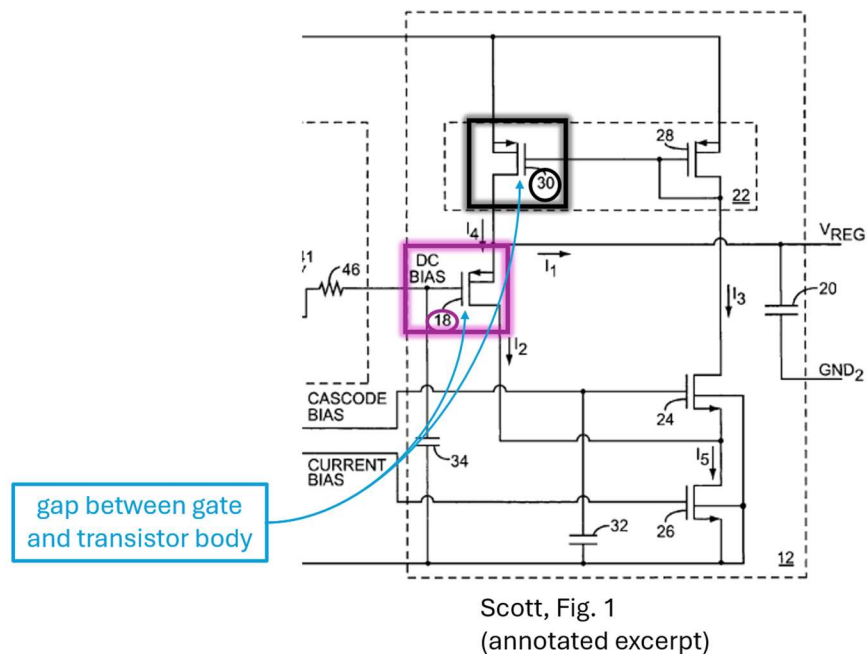
Thus, Scott renders Claim 10 obvious.

6. Claim 11: The voltage regulator of claim 1, wherein said signal received at said pass device gate is a voltage.

Claim 11 requires the signal received at the pass device to be a voltage. As discussed above, Scott's transistor 30 is the claimed pass device. *Supra*, § VII.A.1.g. Scott's transistor 30 receives a voltage at its gate, so it meets this requirement. Ex-1005, Fig. 1; *see also* Ex-1002 ¶¶149-152.

A MOSFET is a type of transistor that receives a voltage at its gate. Ex-1002 ¶150. In circuit diagrams, a transistor that is a MOSFET is drawn with a physical gap between its gate and body. *Id.*

Scott's transistor 30 is a MOSFET. Ex-1002 ¶151. Figure 1 (annotated below) shows that transistor 30 (black) has a gate physically separated from the body.



This physical separation means the transistor is a MOSFET. *See* Ex-1002 ¶151.

Because MOSFETs receive a voltage at their gates, and the transistor 30 is a MOSFET, the transistor 30 receives a voltage at its gate. *See* Ex-1002 ¶152. Thus, Scott renders Claim 11 obvious.

7. **Claim 14**

- a. **Element 14[pre]: A voltage regulator circuit integrated in an integrated circuit (IC) and adapted to provide a voltage from a power supply to a load integrated in the IC under selectively variable load conditions, comprising:**

To the extent the preamble is limiting, Scott discloses most of the preamble for the same reasons as Element 1[pre]. *Supra*, § VII.A.1.a; *see also* Ex-1002 ¶¶153-155; Ex-1020.

Scott also discloses the remainder of the preamble, which requires that the load is “integrated in the IC” and operates under “selectively variable load conditions.” Scott discloses that the load is integrated in the IC because every element of Scott’s voltage regulator, including the load, is integrated in one integrated circuit. *Supra*, § VII.A.1.a. Scott discloses selectively variable load conditions because it discloses that a voltage regulator provides a regulated voltage “as **load current** and supply voltage change.” *Id.*, 1:14-16 (emphasis added). A POSITA would have understood that one reason a load current varies is because the load circuitry is selectively variable. Ex-1002 ¶154.

Thus, Scott discloses or teaches Element 14[pre].

- b. **Element 14[a]: an input adapted to receive a voltage from said power supply;**

Scott discloses Element 14[a] for the same reasons as Element 1[a], which is identical. *Supra*, § VII.A.1.b; *see also* Ex-1002 ¶156; Ex-1020.

c. Element 14[b]: an output adapted to be coupled to said load;

Scott discloses Element 14[b] for the same reasons as Element 1[b], which is identical. *Supra*, § VII.A.1.c; *see also* Ex-1002 ¶157; Ex-1020.

d. Element 14[c]: a first current path referenced to said input;

Scott discloses Element 14[c] for the same reasons as Element 1[c], which explains how the “first current path” is coupled to the input. *Supra*, § VII.A.1.d; *see also* Ex-1002 ¶158; Ex-1020.

e. Element 14[d]: feedback means for maintaining a voltage at a gate of a feedback transistor substantially constant;

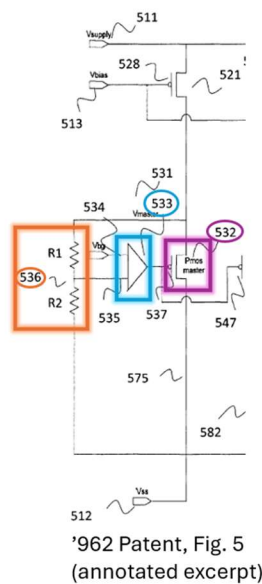
In the related district court litigation, the parties agreed that 35 U.S.C. § 112, ¶6 applies to Element 14[d], and agreed on the function. *See* Ex-1008, 4. The Court has construed the term’s structure in its claim construction order. The District Court’s construction including a representative structure disclosed in the prior art, applied herein, is provided below. Ex-1009, 64; Ex-1002 ¶¶159-165.

District Court’s Construction
Function: maintaining a voltage at a gate of a feedback transistor substantially constant
Representative Structure: feedback circuit arranged as shown in Figure 5, element 531 including differential amplifier 533, voltage divider 536, and feedback transistor 532

Scott discloses the identified function for the reasons discussed in Element 1[c], which shows how Scott discloses “a feedback circuit... constructed to maintain

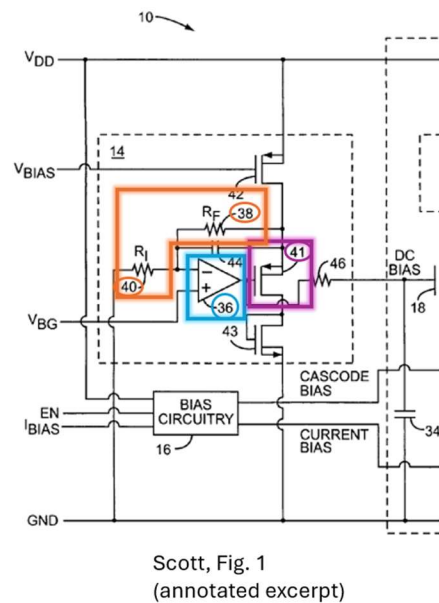
a voltage at a gate of a feedback transistor substantially constant.” *Supra*,
 § VII.A.1.d; *see also* Ex-1020.

The structure requires a feedback circuit including three elements: (1) a differential amplifier; (2) a voltage divider; and (3) a “feedback transistor.” Scott’s “voltage bias circuitry” has each of these elements arranged in the same way as in the ’962 Patent, as shown by the comparison of the ’962 Patent’s Figure 5 and Scott’s Figure 1, both annotated below.



Feedback Circuit including:

- 1) **Differential Amplifier**
- 2) **Voltage Divider**
- 3) **Feedback Transistor**



See also Ex-1005, 5:2-5.

First, Scott discloses the required differential amplifier. *See* Ex-1002 ¶162. Scott's voltage bias circuitry includes an operational amplifier (blue). Ex-1005, 5:2-5, Fig. 1. A POSITA would have understood that an operational amplifier includes a differential amplifier as its input stage. Ex-1002 ¶162. Scott's operational amplifier

is arranged in the same way as the '962 Patent's differential amplifier. *Compare* Ex-1001, Fig. 5; *with* Ex-1005, Fig. 1. Both include two identical inputs—a bandgap voltage and a “feedback” voltage—and output a substantially constant voltage at a gate of a transistor. *Compare* Ex-1001, 8:48-56, Fig. 5; *with* Ex-1005, 5:2-21, Fig. 1.

Second, Scott discloses the required voltage divider. Scott discloses a “feedback resistor” and an “input resistor” (orange), that operate in conjunction to provide one of the inputs to the operational amplifier (blue). Ex-1005, 5:2-14, Fig. 1. A POSITA would have understood that these resistors act together as a voltage divider. Ex-1002 ¶163. The '962 Patent's voltage divider has the same arrangement. Ex-1001, 8:50-56, Fig. 5.

Third, Scott discloses the required “feedback transistor.” Scott discloses a “matching output transistor” (purple) which is the required “feedback transistor.” Ex-1005, 5:2-5, Fig. 1. The output of the operational amplifier (blue) is coupled to the gate of the matching output transistor (purple), and that gate voltage is also coupled to an “output transistor.” Ex-1005, 5:14-18, Fig. 1. The '962 Patent's “feedback transistor” is arranged in the same way. Ex-1001, 8:57-60, 9:13-15, Fig. 5.

Thus, Scott discloses the same structure as the '962 Patent, or equivalents thereof, and therefore discloses or teaches Element 14[d].

f. Element 14[e]: first current supply means for supplying to a second current path referenced to said input a first current that is substantially constant;

In the related district court litigation, the parties agreed that 35 U.S.C. § 112, ¶6 applies to Element 14[e], and agreed on the function. *See* Ex-1008, 5-6. The District Court’s construction including a representative structure disclosed in the prior art, applied herein, is provided below. Ex-1009, 65; Ex-1002 ¶¶170-174.

District Court’s Construction
Function: supplying to a second current path referenced to said input a first current that is substantially constant
Representative Structure: first current source 622 of Fig. 6, and equivalents, as described and shown at 10:63-11:3, Fig. 6

Scott discloses the identified function for the reasons discussed in Element 1[d], which shows how Scott discloses “a first current supply circuit constructed to supply to a second current path a first current that is substantially constant.” *Supra*, § VII.A.1.e; *see also* Ex-1020.

The representative structure is the first current source 622, which is a transistor that (1) has a bias voltage applied at its gate; and (2) supplies a constant current to the second current path. *See* Ex-1001, 10:63-67 (“In the embodiment shown, a bias voltage is applied to gate 671 of transistor 672, which functions to supply a constant current dependent on the bias voltage.”). Scott’s current source (26) is the claimed first current source. The current source is a transistor with a bias

voltage applied at its gate, and it supplies a constant current to the second current path. *See* Ex-1005, 3:66-4:1 (“The current sources [sic] 26 is biased to produce a current I5, where the current I5 is a constant current.”); *see also* Fig. 1.

Thus, Scott discloses the same structure as the ’962 Patent, or equivalents thereof, and therefore discloses or teaches Element 14[e].

- g. **Element 14[f]: second current supply means coupled to said first current supply means, said gate of said feedback transistor, and said output of said voltage regulator circuit for receiving a first voltage reference and a second voltage reference and for supplying a second current to said second current path with a magnitude based on said first voltage reference and said second voltage reference;**

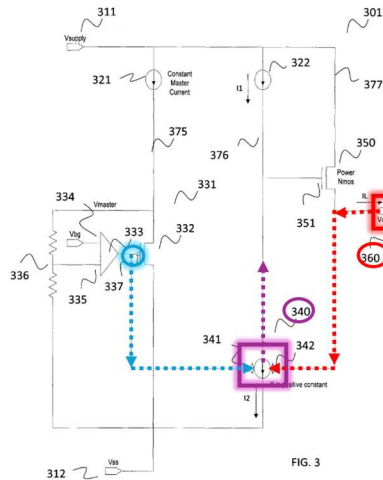
In the related district court litigation, the parties agreed that 35 U.S.C. § 112, ¶6 applies to Element 14[f], and agreed on the function. *See* Ex-1008, 6. The District Court’s construction including a representative structure disclosed in the prior art, applied herein, is provided below. Ex-1009, 66; Ex-1002 ¶¶170-174.

District Court’s Construction
Function: receiving a first voltage reference and a second voltage reference and for supplying a second current to said second current path with a magnitude based on said first voltage reference and said second voltage reference
Representative Structure: second current source 340 of Fig. 3, and equivalents, as described and shown at 6:42-62, Fig. 3

Scott discloses the identified function and the required couplings for the reasons discussed in Element 1[e], which explains how Scott discloses “a second

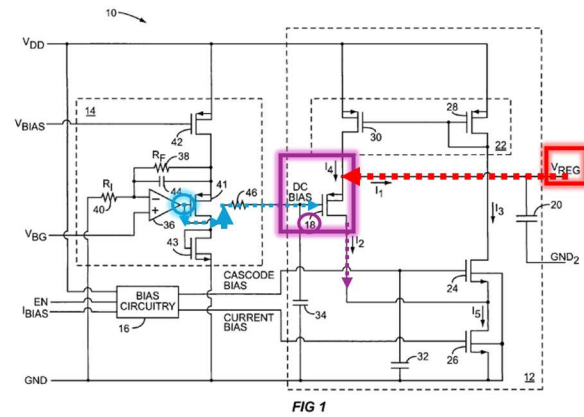
current supply circuit coupled to said first current supply circuit, said gate of said feedback transistor, and said output of said voltage regulator circuit and constructed to supply a second current to said second current path with a magnitude based on said voltage at said gate of said feedback transistor and a voltage at said output of said voltage regulator circuit.” *Supra*, § VII.A.1.f; *see also* Ex-1020. The required voltage references in the agreed function are supplied by the gate of the feedback transistor and the output of the voltage regulator. *Id.*

The representative structure is the second current source 340, which is “a variable current source adapted to supply a current to second current path” based on two reference signals. Ex-1001, 6:42-48. The first reference signal is based on a voltage at the gate of the feedback transistor, and the second is based on the voltage at the output node. *Id.* A comparison of the ’962 Patent’s Figure 3 and Scott’s Figure 1 (both annotated below) shows that Scott’s voltage regulator has all of these elements, arranged in the same way as the ’962 Patent.



'962 Patent, Fig. 3
(annotated)

Variable Current Source with 2 reference signals:
1) **Gate** of the feedback transistor
2) **Output** of voltage regulator



Scott, Fig. 1
(annotated)

As illustrated above, Scott's output transistor (purple) is the claimed second current source. Ex-1005, 3:47-51, 5:18-21, Fig. 1. It is a variable current source because it "draws a current I_2 ." *Id.*, 3:49-51. As discussed with reference to Element 1[e], the current I_2 is a variable current that is supplied to the second current path. *Supra*, § VII.A.1.f; Ex-1020. Moreover, the current supplied by Scott's output transistor is based on the two required reference signals. Ex-1005, 3:47-51 ("[T]he output transistor 18 draws a current I_2 based on a DC bias and the charge stored across the reservoir capacitor 20, which corresponds to the regulated voltage (V_{REG})."). First, the DC BIAS voltage is based on the voltage at the gate of the "feedback transistor" (blue), to which it is coupled. Ex-1005, 5:18-21, Fig. 1. Second, the output transistor is also coupled to the output of the voltage regulator (red), and its current is based on that voltage as well. *Id.*, 3:47-51, Fig. 1. The '962

Patent's "second current supply means" is arranged in the same way. *See* Ex-1001, 9:13-17, Fig. 5.

Thus, Scott discloses or teaches Element 14[f].

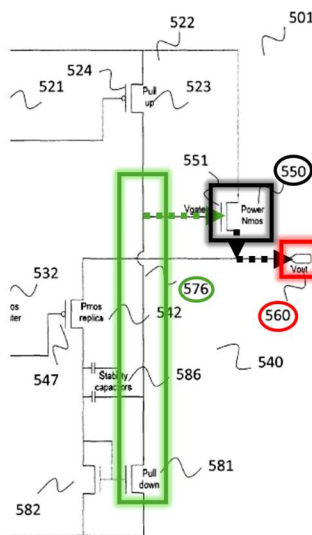
- h. Element 14[g]: means for supplying current to said load for receiving a signal based on a magnitude of said first current and a magnitude of said second current and for supplying a load current to said load via said output of said voltage regulator circuit with a magnitude based on a magnitude of said signal;**

The parties agree that 35 U.S.C. § 112, ¶6 applies to Element 14[g], and further agree on the function and structure for the claim term. *See* Ex-1008, 2-3. The agreed function and a representative identification of the agreed structure disclosed in the prior art is provided below. *Id.*; Ex-1002 ¶¶175-179.

Agreed Construction
<p>Function: supplying current to said load for receiving a signal based on a magnitude of said first current and a magnitude of said second current and for supplying a load current to said load via said output of said voltage regulator circuit with a magnitude based on a magnitude of said signal</p> <p>Representative Structure: pass transistor 550 of Fig. 5, as described and shown at 7:27-51</p>

Scott discloses the agreed function for the same reasons as Element 1[f], which shows how Scott discloses "a pass device... adapted to receive a signal based on said current of said second current path and supply a load current to said load via said output of said voltage regulator circuit with a magnitude based on said signal." *Supra*, § VII.A.1.g; Ex-1020.

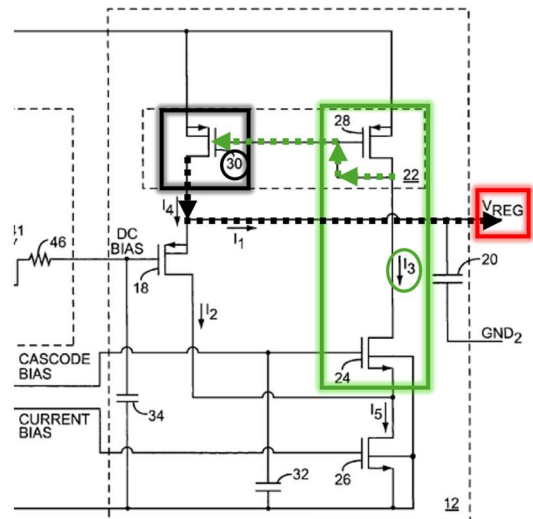
The agreed structure requires a “pass transistor” that receives a signal at its gate based on the magnitude of the second current path. *See* Ex-1001, 7:27-30. Further, the transistor “may be adapted to supply, to a load coupled to output 460, a load current with a magnitude based on the signal received at pass transistor gate.” *Id.*, 7:32-35. A comparison of the ’962 Patent’s Figure 5 and Scott’s Figure 1 (both annotated below) shows that Scott discloses these elements with the same arrangement as the ’962 Patent.



'962 Patent, Fig. 5
(annotated excerpt)

Pass Device :

- 1) Includes a **Gate** that receives a signal from **Second Current Path**
- 2) Supplies a **Load Current** to the load via the **Voltage Regulator Output**



Scott, Fig. 1
(annotated excerpt)

Scott discloses a transistor (black) that receives a signal at its gate from the current I3 (green), which is part of Scott's "second current path." Ex-1005, 3:52-58, Fig. 1. The transistor (black) supplies a current I4 (black arrow), which is derived from the current I3 (green) received at the transistor's gate. *Id.* Thus, the transistor receives a signal at its gate based on the magnitude of the second current path. *Id.*

Further, increases in the current I4 supplied by Scott's transistor (black) are reflected in the current I1 (black arrow), which is supplied to the regulated voltage output via the reservoir capacitor. *Id.*, 4:8-11. Thus, Scott's transistor supplies a load current with a magnitude based on the signal received at its gate. *Id.* The structure of the '962 Patent's supply means is arranged in the same way. *See* Ex-1001, 7:27-35, Fig. 5. Therefore, Scott discloses the same structure as the '962 Patent. Alternatively, to the extent Patent Owner points to any alleged difference in Scott's structure, Scott's transistor 30 performs the identical function in substantially the same way to achieve substantially the same result as the disclosed structure. Ex-1002, ¶178.

Thus, Scott discloses or teaches Element 14[g].

- i. **Element 14[h]: wherein said first current supply means, said second current supply means and said means for supplying current to said load are arranged such that, if a voltage at said load decreases, a magnitude of said load current is increased and, if a voltage said load increases, a magnitude of said load current is decreased; and**

Scott discloses Element 14[h] for the same reasons as Element 1[g]. *Supra*, § VII.A.1.h; *see also* Ex-1002 ¶180; Ex-1020.

- j. **Element 14[i]: wherein said feedback means, said first current supply means, said second current supply means, and said means for supplying current to said load are integrated in an integrated circuit.**

Scott discloses Element 14[i] for the same reasons as Elements 1[pre] and 1[h]. *Supra*, §§ VII.A.1.a, i; *see also* Ex-1002 ¶181-182; Ex-1020.

Thus, Scott renders Claim 14 obvious.

8. Claim 16

- a. Element 16[pre]: A method of regulating a supply voltage for selectively operable load circuitry of an integrated circuit, comprising:**

To the extent the preamble is limiting, Scott discloses the preamble. *See* Ex-1020 ¶¶183-185. Scott discloses an integrated circuit for the same reasons discussed above. *Supra*, §§ VII.A.1.a, h; Ex-1020.

Scott also discloses the remainder of the preamble, which requires a method of regulating a supply voltage for selectively operable circuitry. Scott discloses a method of regulating a supply voltage because it claims, in part “[a] method for regulating an output voltage of a voltage regulator.” Ex-1005, Cl. 16. Scott discloses selectively operable load circuitry because it discloses that a voltage regulator provides a regulated voltage “as **load current** and supply voltage change.” *Id.*, 1:14-16 (emphasis added). A POSITA would have understood that one reason a load current varies is because the load circuitry is selectively operable. Ex-1002 ¶184.

Thus, Scott discloses or teaches every limitation of Element 16[pre].

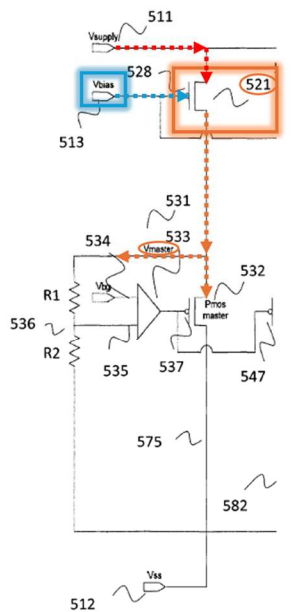
- b. Element 16[a]: receiving, from a power supply, a power supply voltage;**

Scott discloses Element 16[a] for the same reasons as Element 1[a], which explains how Scott discloses the structure for receiving a power supply from a power supply voltage. *Supra*, § VII.A.1.b; *see also* Ex-1002 ¶186; Ex-1020. A POSITA

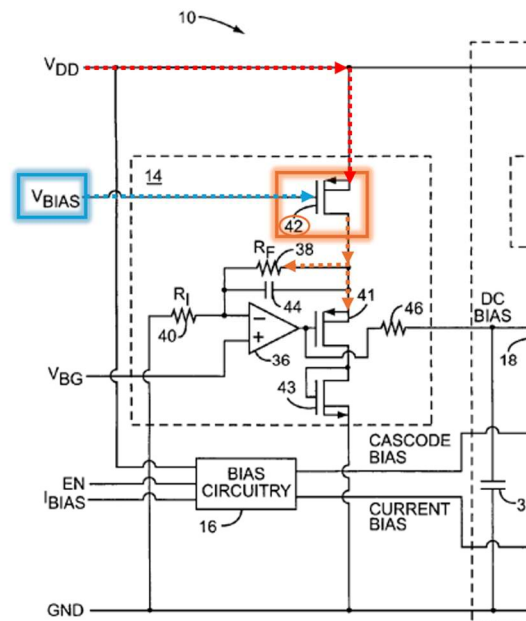
would have understood that the structure disclosed in Scott inherently determines how Scott's voltage regulator operates. Ex-1002 ¶186.

c. Element 16[b]: supplying, to a first current path integrated in said integrated circuit and referenced to said power supply voltage, a master current;

Element 16[b] requires supplying a master current to a first current path integrated in the integrated circuit and referenced to the power supply voltage. A comparison of the '962 Patent's Figure 5 and Scott's Figure 1 (both annotated below) shows that Scott's current source transistor (42) discloses this requirement in the same way as the '962 Patent. Ex-1002 ¶¶187-190.



'962 Patent, Fig. 5
(annotated excerpt)



Scott, Fig. 1
(annotated excerpt)

Scott's current source transistor (orange) supplies the claimed "master current" (orange arrow) from its drain. Ex-1005, 5:2-7. As discussed with reference

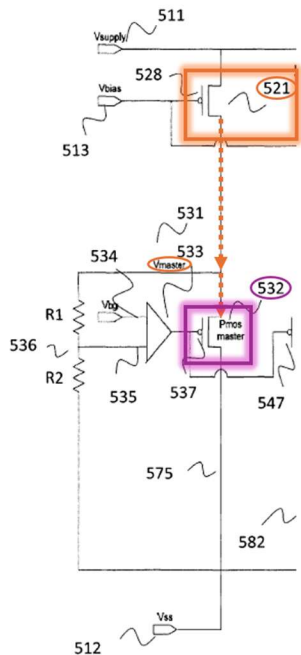
to Element 1[b], the current path it is supplied to is part of the claimed “first current path.” *Supra*, § VII.A.1.c. The current source, also part of the claimed “first current path,” is referenced to the power supply voltage (red arrow), as claimed. Ex-1005, Fig. 1. The master current supplied is based on a voltage bias (blue) supplied at its gate. *Id.* Moreover, every element of Scott’s voltage regulator, including the first current path, is integrated in one integrated circuit. *Supra*, § VII.A.1.a.

The ’962 Patent’s “master transistor 521” (orange), described by this claim limitation, operates in the same way. Ex-1001, Fig. 5. It receives a input from the voltage supply (red arrow) at its source, and supplies a current (orange arrow) from its drain based on a bias voltage (blue) received at its gate. *Id.*, Fig. 5, 8:67-9:4.

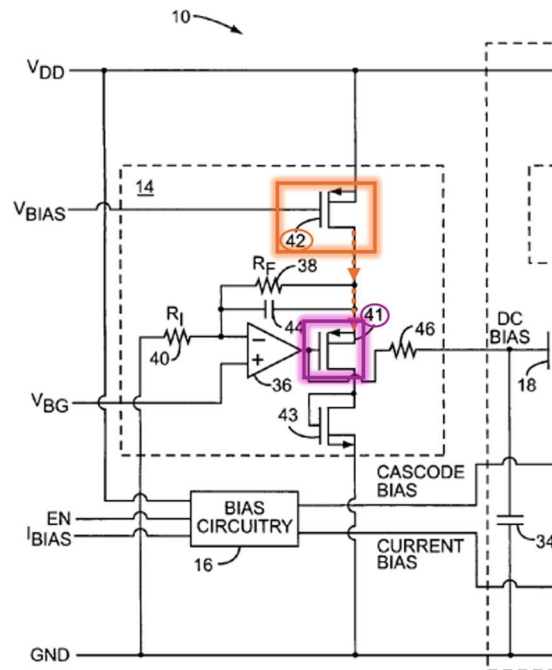
Thus, Scott discloses or teaches Element 16[b].

d. Element 16[c]: receiving, at a feedback transistor integrated in said integrated circuit, said master current;

Scott discloses receiving the master current at a feedback transistor. Ex-1002 ¶¶191-193. As described in reference to Element 1[c], Scott’s output matching transistor (18) is the claimed “feedback transistor.” *Supra*, § VII.A.1.d. A comparison of the ’962 Patent’s Figure 5 and Scott’s Figure 1 (both annotated below) shows that Scott discloses receiving the master current at its feedback transistor in the same way as the ’962 Patent.



'962 Patent, Fig. 5
(annotated excerpt)



Scott, Fig. 1
(annotated excerpt)

As shown, Scott’s current source (orange) supplies the master current (orange arrow) to its matching output transistor (purple), which is the claimed “feedback transistor.” Ex-1005, Fig. 1; *see also* 5:14-16. Moreover, as the comparison above shows, the master current is supplied in the same way in the ’962 Patent. Ex-1001, Fig. 1. Thus, Scott discloses the feedback transistor receiving the master current. Additionally, every element of Scott’s voltage regulator, including the matching output transistor (the claimed “feedback transistor”), is integrated in one integrated circuit. *Supra*, § VII.A.1.a.

Thus, Scott discloses or teaches Element 16[c].

- e. **Element 16[d]: maintaining, via a feedback circuit integrated in said integrated circuit and coupled to said feedback transistor, a voltage at a gate of said feedback transistor substantially constant;**

Scott discloses Element 16[d] for the same reasons as Element 1[c], which explains how Scott discloses how the structure of the feedback circuit is constructed to maintain a substantially constant voltage at the gate of the feedback transistor. *Supra*, § VII.A.1.b; *see also* Ex-1002 ¶¶194-195; Ex-1020. A POSITA would have understood that the structure disclosed in Scott inherently determines how Scott's voltage regulator operates. Ex-1002 ¶194. Moreover, every element of Scott's voltage regulator, including the voltage bias circuitry (the claimed "feedback circuit"), is integrated in one integrated circuit. *Supra*, § VII.A.1.a.

Thus, Scott discloses or teaches Element 16[d].

- f. **Element 16[e]: supplying, to a second current path integrated in said integrated circuit and coupled to a pass transistor, a first current with a substantially constant magnitude;**

Scott discloses most of Element 16[e] for the same reasons as Element 1[d], which explains how Scott discloses the "first current supply circuit" constructed to supply a constant current to a second current path. § VII.A.1.e; *see also* Ex-1002 ¶¶196-198; Ex-1020. A POSITA would have understood that the structure disclosed in Scott inherently determines how Scott's voltage regulator operates. Ex-1002 ¶196.

Moreover, every element of Scott's voltage regulator, including the identified "second current path," is integrated in one integrated circuit. *Supra*, § VII.A.1.a. The second current path is also coupled to a pass transistor, as described with reference to Element 1[f]. *Supra*, § VII.A.1.g; *see also* Ex-1020.

Thus, Scott discloses or teaches Element 16[e].

- g. Element 16[f]: supplying, to said second current path, a second current that is a variable current with a magnitude based on said voltage at said gate of said feedback transistor and a voltage at said variable load;**

Scott discloses Element 16[f] for the same reasons as Element 1[e], which explains how Scott discloses the "second current supply circuit" constructed to supply a variable current based on the voltage at the gate of the feedback transistor and the output of the voltage regulator to the second current path. *Supra*, § VII.A.1.f; *see also* Ex-1002 ¶¶199-200; Ex-1020. A POSITA would have understood that the structure disclosed in Scott inherently determines how Scott's voltage regulator operates. Ex-1002 ¶199.

Thus, Scott discloses or teaches Element 16[f].

- h. Element 16[g]: receiving, at a gate of said pass transistor integrated in said integrated circuit, a control signal based on a magnitude of a current of the second current path; and**

Scott discloses Element 16[g] for the same reasons as Element 1[f], which explains how Scott discloses its "pass device" is constructed to receive a control

signal based on the magnitude of a current of the second current path. *Supra*, § VII.A.1.g; *see also* Ex-1002 ¶¶201-202; Ex-1020. A POSITA would have understood that the structure disclosed in Scott inherently determines how Scott's voltage regulator operates. Ex-1002 ¶201. Moreover, every element of Scott's voltage regulator, including the transistor 30 (the claimed "pass device") is integrated in one integrated circuit. *Supra*, § VII.A.1.a.

Thus, Scott discloses or teaches Element 16[g].

- i. **Element 16[h]: supplying, to said load via said pass transistor, a load current based on the control signal such that when a voltage across said variable load increases, a magnitude of said load current is reduced, and when a voltage across said variable load decreases, a magnitude of said load current is increased.**

Scott discloses Element 16[h] for the same reasons as Elements 1[f]-[g]. *Supra*, §§ VII.A.1.g-h; *see also* Ex-1002 ¶¶203-205; Ex-1020. Element 1[f] explains how Scott discloses its "pass device" is constructed to supply a load current to the load based on the control signal received from the second current path. *Supra*, § VII.A.1.g. Element 1[g] explains how Scott voltage regulator is constructed to increase the load current when a voltage at the load decreases and vice versa. *Supra*, § VII.A.1.h. A POSITA would have understood that the structure disclosed in Scott inherently determines how Scott's voltage regulator operates. Ex-1002 ¶203.

Thus, Scott discloses or teaches Element 16[h].

Therefore, Scott renders Claim 16 obvious.

9. Claim 17

- a. Element 17[pre]: A method of regulating a supply voltage for selectively operable load circuitry of an integrated circuit, comprising:**

To the extent the preamble is limiting, Scott discloses the preamble for the same reasons as Element 16[pre], which is identical. *Supra*, § VII.A.8.a; *see also* Ex-1002 ¶206; Ex-1020.

- b. Element 17[a]: generating, at a first current path integrated in said integrated circuit, a substantially constant master current;**

Scott discloses Element 17[a] for the same reasons as Element 16[b]. *Supra*, § VIII.A.6.c; *see also* Ex-1002 ¶¶207-208; Ex-1020. Element 16[b] requires “supplying” the master current to the first current path. *Id.* Scott’s current source transistor, which “supplies” the master current to the first current path, necessarily also “generates” the master current at the first current path, as described above. *Id.*

Thus, Scott discloses or teaches Element 17[a].

- c. Element 17[b]: supplying, via a first current source integrated in said integrated circuit and coupled to a second current path, a first current;**

Scott discloses Element 17[b] for the same reasons as Elements 1[d] and 16[e]. *Supra*, §§ VII.A.1.e, VII.A.8.f; *see also* Ex-1002 ¶209; Ex-1020.

- d. Element 17[c]: supplying, via a second current source integrated in said integrated circuit and coupled to said second current path, a second current with a magnitude based in part on a voltage at said variable load;**

Scott discloses most of Element 17[c] for the same reasons as Elements 1[e] and 16[f]. *Supra*, §§ VII.A.1.f, VII.A.8.g; *see also* Ex-1002 ¶¶210-211; Ex-1020. Element 17[c] additionally requires that the second current source is integrated in the integrated circuit. Every element of Scott's voltage regulator, including the output transistor (the claimed "second current source") is integrated in one integrated circuit. *Supra*, § VII.A.1.a.

Thus, Scott discloses or teaches Element 17[c].

- e. Element 17[d]: receiving, from said second current path, a control signal at a pass transistor integrated in said integrated circuit, wherein said control signal has a magnitude based a current of said second current path;**

Scott discloses Element 17[d] for the same reasons as Elements 1[f] and 16[g]. *Supra*, §§ VII.A.1.g, VII.A.8.h; *see also* Ex-1002 ¶212; Ex-1020.

- f. Element 17[e]: supplying, to said load circuitry via said pass transistor, a load current in response to said control signal; and**

Scott discloses Element 17[e] for the same reasons as Elements 1[f] and 16[h]. *Supra*, §§ VII.A.1.g, VII.A.8.i; *see also* Ex-1002 ¶213; Ex-1020.

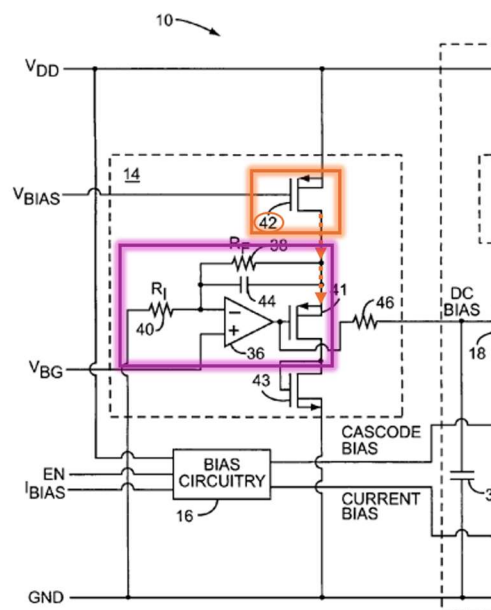
- g. Element 17[f]: wherein a magnitude of said first current and a magnitude of said second current are at least in part dependent on a magnitude of said master current.**

Element 17[f] requires the magnitude of two currents, the first current and the second current, to be dependent “at least in part” on the magnitude of the claimed master current. As discussed with reference to Element 17[a], Scott’s voltage bias circuitry produces the claimed “master current” via its operational amplifier 36. *Supra*, § VII.A.9.b; *see also* Ex-1002 ¶¶214-218.

First, the magnitude of the first current is dependent on the magnitude of the master current. As discussed with reference to Element 1[d], the constant current I5 is the claimed first current. *Supra*, §§ VII.A.1.e. The second current I2, which reflects changes in the regulated output voltage, is compared to the first current I5 to supply a current I3, which is a proportion of the current that is ultimately supplied to restore the regulated output voltage. *Supra*, §§ VII.A.1.e-g; *see also* Ex-1005, 3:47-4:56. While the first current I5 does not directly take the master current as one of its inputs, it is “at least in part dependent” on the magnitude of that current because it must be set at a level where its comparison with I2 produces a voltage I3 that can restore the regulated output voltage V_{REG} , which the master current also reflects. *See id.* 3:47-4:56, 5:8-11; *see also* Ex-1002 ¶215. To the extent Patent Owner argues that the first current must be directly set by the master current, that is not supported in the ’962 Patent. The first current source in the ’962 Patent supplies its current “based

on a magnitude of the bias voltage at gate 528”—not the master current. Ex-1001,
8:61-9:8.

Second, the magnitude of the second current is based on the magnitude of the master current. As discussed with reference to Element 1[e], the magnitude of the second current is based in part on the magnitude of the DC BIAS voltage at the gate of the output transistor 18. *Supra*, § VII.A.1.f.(2); *see also* Ex-1005, 3:62-66, 5:18-21. As shown in Figure 1 (annotated below), the master current (orange arrow) is supplied to voltage bias circuitry (purple box) where the DC BIAS is generated.



Scott, Fig. 1
(annotated excerpt)

Thus, the master current helps determine the magnitude of the DC BIAS voltage.

Ex-1005, Fig. 1. Since the DC BIAS voltage helps determine the magnitude of the

claimed “second current” (*Supra*, § VII.A.1.f.(2)), the magnitude of the second current is based, in part, on the magnitude of the master current.

Both Scott’s first and second current are dependent, at least in part, on the magnitude of the master current. Thus, Scott discloses or teaches Element 17[f].

Therefore, Scott renders Claim 17 obvious.

10. Claim 18: The method of claim 17, wherein supplying said second current includes supplying a current based on a difference between a voltage at a gate of a feedback transistor of a feedback circuit and a voltage at said load circuitry.

Claim 18 requires the second current to be based on a difference between the voltage at the gate of a feedback transistor and the voltage at the load circuitry. As discussed with reference to Element 1[e], Scott’s output transistor, which supplies the second current, has its source coupled to the load circuitry and its gate coupled to the gate of the feedback transistor. *Supra*, § VII.A.1.f; Ex-1020 The discussion of Element 1[e] also shows that the second current, supplied by the output transistor, is dependent on those voltages at its source and gate. *Id.*

The second current is further dependent on a *difference* between those voltages, as required by Claim 18. Ex-1002 ¶¶219-221. As discussed in reference to Claim 11, the output transistor is a MOSFET transistor, because it is drawn with a gap between the gate and body. *Supra*, § VII.A.6; *see also* Ex-1002 ¶220. A POSITA would have understood that in a MOSFET transistor, current flow is controlled in part the difference between the gate and source voltages. Ex-1002 ¶220. Therefore,

the second current supplied by the output transistor is based on the difference between its gate voltage (voltage at gate of feedback transistor) and source voltage (voltage at load circuitry).

Thus, Scott renders Claim 18 obvious.

11. **Claim 19: The method of claim 17, wherein supplying, to said load circuitry via said pass transistor, a load current includes increasing a magnitude of said load current if a voltage at said output decreases, and decreasing a magnitude of said load current if a voltage at said output increases.**

Scott discloses Claim 19 for the same reasons as Elements 1[g] and 16[h].

Supra, §§ VII.A.1.h, VII.A.8.i; *see also* Ex-1002 ¶222; Ex-1002. Thus, Scott renders Claim 19 obvious.

12. **Claim 20: The method of claim 17, wherein supplying said load current includes supplying a current with a magnitude of less than one amp, and wherein supplying first current and supplying said second current includes supplying a current with a magnitude of less than one milli-amp.**

Claim 20 requires the load current to be less than one amp, and the first and second current to be less than one milli-amp. As discussed in reference to Claim 1, Scott's load current is I_4 , the first current is I_5 , and the second current is I_2 . *Supra*, §§ VII.A.1.e-g. Scott's detailed description discloses an example where all the currents meet Claim 20's requirements. Ex-1005, 4:34-56; *see also* Ex-1002 ¶¶223-224. In this example, I_4 (the claimed "load current") ranges from 300 μA to 450 μA , so it is less than one amp. *Id.* I_5 (the claimed "first current") is a constant 500 μA ,

so it is less than one milli-amp. *Id.* And I2 (the claimed “second current”) ranges from 200 μ A to 300 μ A, so it is less than one milli-amp. *Id.*

Thus, Scott renders Claim 20 obvious.

B. Ground 2: Claims 1, 7-11, 14, and 16-20 Are Obvious Over Scott in view of Gradinariu

Claims 1, 7-11, 14, and 16-20 are obvious in light of Scott alone. *Supra*, § VII.A. Claims 1, 14, 16, and 19 are further obvious over Scott in view of Gradinariu. *See* Ex-1002 ¶225.

1. Motivation to Combine Scott and Gradinariu

A POSITA would have been motivated to combine Scott and Gradinariu because both are directed to voltage regulators. *See* Ex-1005, 1:6 (“The present invention relates to a voltage regulator); Ex-1006, 1:7-8 (“The present invention relates generally to voltage regulator circuits.”); *see also* Ex-1002 ¶¶226-228. Moreover, both inventions operate on the same principle—monitoring an output voltage and adjusting the load current accordingly to maintain a regulated output voltage. *See* Ex-1005, 1:57-60; Ex-1006, 2:49-53.

In particular, a POSITA would have been motivated to combine Scott with Gradinariu’s teaching that voltage regulators correct for output changes in either direction. *See* Ex-1002 ¶227. It was known well before the application date here that voltage regulators correct for changes in output voltage in either direction. *See id.* For example, Gradinariu discusses multiple prior art references that describe

corrections based on increases and decreases in output voltage. Ex-1006, 1:44-2:5. The alleged differences in these inventions relate to how that correction is achieved, not the type of correction applied. *Id.*, 2:6-36. While Scott's disclosure focuses mainly on increasing a load current when the output voltage decreases (Ex-1005, 3:62-4:13), a POSITA would have understood that a voltage regulator needs to provide corrections in both directions in order to operate properly. *See* Ex-1002 ¶227. Thus, to the extent Scott does not disclose decreasing a load current when the output voltage increases, a POSITA would have been motivated to combine Scott with Gradinariu's teaching of providing corrections in both directions. *Id.*

A POSITA would have had an expectation of success when modifying Scott with Gradinariu's teaching about making voltage adjustments in both directions based on feedback from the output related to changes to the load. Ex-1002 ¶228. While Scott focuses on increasing load current when output voltage drops, it also discloses that it can respond to increases in output voltage by decreasing load current. *See* Ex-1005, 4:11-13. In other words, Scott is already capable of reacting to output voltage changes in both directions. *Id.*, 3:62-4:13. Thus, a POSITA designing a voltage regulator according to Scott would have expected to be able to implement Gradinariu's teaching of reacting to changes in both directions with at most minor, easily implemented modifications. *See* Ex-1002 ¶228.

2. Claim 1

As discussed in section VII.A.1, *supra*, all elements of Claim 1 are obvious over Scott alone. Ex-1002 ¶229.

- a. **Element 1[g]: wherein said second current supply circuit is adapted to, via said pass device, cause an increase in magnitude of said load current supplied to said output if a voltage at said output decreases and cause a decrease in magnitude of said load current supplied to said output if a voltage at said output increases; and**

To the extent Element 1[g] is not obvious over Scott alone, it is obvious over Scott in light of Gradinariu. Ex-1002 ¶¶230-233. Element 1[g] requires the second current supply circuit to operate via the pass device to cause an increase in the magnitude of the load current supplied to the output when the output voltage decreases, and vice versa. Scott in view of Gradinariu discloses or teaches these requirements.

As discussed with reference to Ground 1, Scott's output transistor is the claimed second current supply circuit, and operates in conjunction with the pass device to provide an output current to the load. *Supra*, §§ VII.A.1.f-g. Gradinariu similarly includes what it calls a "output leg," which supplies an output current to a load through its terminal transistor N5. Ex-1006, 3:56-58, 4:29-33, Fig. 1.

As discussed with reference to Ground 1, Scott's output transistor causes an increase in magnitude of the load current when the output voltage decreases and vice

versa. *Supra*, § VII.A.1.h. To the extent the Board finds that Scott alone does not disclose this limitation, Scott in view of Gradinariu does. For example, Gradinariu discloses that its amplifier provides negative feedback with respect to the replica voltage. Ex-1006, 4:38-39. The replica voltage tracks the output voltage. *Id.*, 4:3-6. When the replica voltage drops below a reference voltage, the amplifier increases its output, and vice versa. *Id.*, 4:38-47. These changes in the amplifier's output are provided to the transistor N2, which provides current to the load through the output leg. *Id.*, 5:14-25. Thus, the output leg causes an increase in magnitude of the load current supplied to the output when the output voltage drops, and vice versa, as required by Element 1[g]. *Id.*

Thus, Scott in view of Gradinariu renders Claim 1 obvious.

3. Claim 14

As discussed in section VII.A.7, *supra*, all elements of Claim 14 are obvious over Scott alone. Ex-1002 ¶234.

- a. **Element 14[h]: wherein said first current supply means, said second current supply means and said means for supplying current to said load are arranged such that, if a voltage at said load decreases, a magnitude of said load current is increased and, if a voltage said load increases, a magnitude of said load current is decreased; and**

To the extent Element 14[h] is not obvious over Scott alone, it is obvious over Scott in light of Gradinariu, for the same reasons as Element 1[g]. *Supra*, § VII.B.2.a; *see also* Ex-1002 ¶¶235-236; Ex-1020.

Thus, Scott in view of Gradinariu renders Claim 14 obvious.

4. Claim 16

As discussed in section VII.A.6, all elements of Claim 16 are obvious over Scott alone. Ex-1002 ¶237.

- a. **Element 16[h]: supplying, to said load via said pass transistor, a load current based on the control signal such that when a voltage across said variable load increases, a magnitude of said load current is reduced, and when a voltage across said variable load decreases, a magnitude of said load current is increased.**

To the extent Element 16[h] is not obvious over Scott alone, it is obvious over Scott in light of Gradinariu, for the same reasons as Element 1[g]. *Supra*, § VII.B.2.a; *see also* Ex-1002 ¶¶238-239; Ex-1020.

Thus, Scott in view of Gradinariu renders Claim 16 obvious.

5. **Claim 19: The method of claim 17, wherein supplying, to said load circuitry via said pass transistor, a load current includes increasing a magnitude of said load current if a voltage at said output decreases, and decreasing a magnitude of said load current if a voltage at said output increases.**

As discussed in section VII.A.11, *supra*, Claim 19 is obvious over Scott alone.

To the extent Claim 19 is not obvious over Scott alone, it is obvious over Scott in light of Gradinariu, for the same reasons as Element 1[g]. *Supra*, § VII.B.2.a; *see also* Ex-1002 ¶¶240-241; Ex-1020.

Thus, Scott in view of Gradinariu renders Claim 19 obvious.

VIII. CONCLUSION

The unpatentability grounds presented above are reasonably likely to prevail, and IPR should be instituted for Claims 1, 7-11, 14, and 16-20 of the '962 Patent based on each of the grounds specified in this Petition.

Respectfully submitted,

/s/ John Kappos

John Kappos (Reg. No. 37,861)
O'Melveny & Myers LLP
2801 North Harwood Street, Suite 1600
Dallas, TX 75201
Telephone: (972) 360-1900
Fax: (972) 360-1901
E-Mail: jkappos@omm.com
Attorney for Petitioner

CERTIFICATE OF WORD COUNT

Under 37 C.F.R. § 42.24(d), Petitioner certifies that this petition includes 13,772 words, as measured by Microsoft Word, exclusive of the table of contents, mandatory notices under § 42.8, certificates of service, word count, and exhibits.

CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e)(1))

The undersigned hereby certifies that the above document was served on October 16, 2025, by filing this document through the Patent Trial and Appeal Board P-TACTS System, as well as delivering a copy via express mail upon the following attorneys of record for the Patent Owner:

The Law Offices of David A. Gerasimow, P.C.
211 W. Wacker Dr.
Ste. 1717
Chicago, IL 60606

A courtesy copy was sent to the below counsel via electronic mail:

David T. DeZern
Jonathan H. Rastegar
Patrick J. Conroy
Ryan Griffin
T. William Kennedy, Jr.
Nelson Bumgardner Conroy P.C.
2727 N. Harwood Street, Suite 250
Dallas, TX 75201
Email: david@nelbum.com
Email: JON@nelbum.com
Email: pat@nelbum.com
Email: ryan@nelbum.com
Email: bill@nelbum.com

William D. Ellerman
Cherry Johnson Siegmund James PLLC
One Glen Lakes Tower
8140 Walnut Hill Lane, Suite 105
Dallas, TX 75231
Email: wellerman@cjsjlaw.com

Mark D. Siegmund
Cherry Johnson Siegmund James PLLC

7901 Fish Pond Road, Ste 2nd Floor
Waco, TX 76710
Email: msiegmund@cjsjlaw.com

Dated: October 16, 2025

Respectfully submitted,

/s/ John Kappos

John Kappos (Reg. No. 37,861)
O'Melveny & Myers LLP
2801 North Harwood Street, Suite 1600
Dallas, TX 75201
Telephone: (972) 360-1900
Fax: (972) 360-1901
E-Mail: jkappos@omm.com
Attorney for Petitioner