

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MONOLITHIC POWER SYSTEMS, INC.,

Petitioner,

v.

REED SEMICONDUCTOR CORP.,

Patent Owner.

IPR2025-_____

U.S. Patent No. 7,960,955

PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 7,960,955
UNDER 35 U.S.C. §312 AND 37 C.F.R. §42.104

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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 7,960,955 (the “’955 Patent”)
1002	File History of the ’955 Patent
1003	Declaration of Joseph McAlexander
1004	U.S. Pat. No. 7,015,544 (“Lotfi”)
1005	U.S. Pat. No. 5,528,132 (“Doluca”)
1006	U.S. Pat. No. 6,271,652 (“Burststein”)
1007	U.S. Patent No. 5,428,286 (“Kha”)
1008	U.S. Patent No. 4,675,797 (“Vinciarelli”)
1009	CV of Joseph McAlexander

LIST OF CHALLENGED CLAIMS

Claim Element	Claim Language
1[PRE]	“A power supply apparatus for use with an input voltage provided from outside, the power supply apparatus comprising:”
1[A]	“a switching power supply which stabilizes the input voltage;”
1[B]	“a reference voltage source which generates a predetermined reference voltage;”
1[C]	“a linear regulator which stabilizes the input voltage, based on the reference voltage generated by the reference voltage source;”
1[D1]	“wherein an output voltage of the linear regulator is supplied as a power supply voltage of a controller of the switching power supply and the reference voltage source”
1[D2]	“wherein ... and the input voltage is not directly supplied to the controller as a power supply voltage.”
7	“A power supply apparatus according to claim 1, wherein the reference voltage source, the linear regulator, and the controller of the switching power supply are integrated on one semiconductor substrate.”
8	“A power supply apparatus according to claim 1, wherein the switching power supply is a step-up switching regulator which steps up the input voltage.”
9	“An electronic device comprising: a battery; a load circuit; and the power supply apparatus according to claim 8, which has voltage of the battery as an input voltage, and steps up the voltage to supply the load circuit.”

Monolithic Power Systems, Inc. (“Petitioner” or “MPS”) requests *Inter Partes* Review of claims 1, 7, 8, and 9 (the “Challenged Claims”) of U.S. Patent No. 7,960,955 (Ex. 1001, the “’955 Patent”).

The ’955 Patent was acquired by Patent Owner in August 2025 for the sole purpose of asserting it against MPS in response to MPS’s enforcement of its own patents against Patent Owner’s widespread infringement. The ’955 Patent had never been asserted by its original assignee, Rohm Co., Ltd., which has no history of offensive patent assertion. Now that Patent Owner has chosen to wield the ’955 Patent against MPS, MPS promptly submits this narrowly focused petition for *inter partes* review of four claims: 1, 7, 8, and 9.

The ’955 Patent claims a power-supply apparatus that receives an input voltage and produces a regulated output. It recites a familiar collection of components—a switching power supply, a reference-voltage source, a controller, and a linear regulator—and seeks to claim a purportedly novel arrangement. In the claimed arrangement, the linear regulator stabilizes an input voltage based on a reference voltage. An output voltage of the linear regulator is provided as a regulated “power supply voltage” to both the reference voltage source and a controller of the switching power supply.

But this arrangement of well-known components was already known or obvious as demonstrated by both grounds presented here: Lotfi discloses the same

configuration recited in the '955 Patent. Its linear regulator generates a regulated power supply voltage based on a reference voltage, and that power supply voltage powers both a switching controller and a reference voltage generator. Doluca also discloses a linear regulator that powers a controller of a switching power supply, but provides no implementation details of the regulator. Burstein, however, supplies those details. It teaches a linear regulator that supplies power to a bandgap reference circuit (the claimed “reference voltage source”) that, in turn, generates a reference voltage for the linear regulator—the purportedly novel architecture claimed by the '955 Patent.

This Petition, therefore, requests inter partes review of challenged claims 1, 7, 8, and 9 and demonstrates their unpatentability.

I. Identification Of Challenges (37 C.F.R. § 42.104(b))

A. Prior Art Printed Publications Relied Upon

The '955 Patent claims priority to a December 9, 2005 foreign (Japanese) application, but the effective filing date of the '955 patent is November 30, 2006, which is the international filing date of the corresponding PCT application. MPEP § 2139.01. The review of the Challenged Claims is governed by Pre-AIA 35 U.S.C. §§ 102 and 103 and AIA 35 U.S.C. §§ 311 to 319 and 325(d). Petitioner's challenge is based on the following prior-art references, none of which were before the Patent Office during prosecution of the '955 Patent:

- U.S. Pat. No. 7,015,544 (“Lotfi,” Ex. 1004);
- U.S. Pat. No. 5,528,132 (“Doluca,” Ex. 1005);
- U.S. Pat. No. 6,271,652 (“Burstein,” Ex. 1006); and
- U.S. Patent No. 5,428,286 (“Kha,” Ex. 1007).

Lotfi is prior art under at least 35 U.S.C. §§ 102(a) and (e) because it was filed August 23, 2004 and issued Mar. 21, 2006. Doluca, Burstein, and Kha are prior art under at least §§ 102(a), (b), and (e) because they were filed in 1994, 2000, and 1994 respectively, and issued in 1996, 2001, and 1995, respectively.

B. Grounds For Challenge

This Petition, supported by the declaration of Joseph McAlexander (Ex. 1003), presents the following grounds of unpatentability:

Ground 1: Claims 1 and 7 are obvious under 35 U.S.C. § 103 over Lotfi.

Ground 1B: Claims 8 and 9 are obvious under 35 U.S.C. § 103 over Lotfi in view of Kha.

Ground 2: Claims 1 and 7 are obvious under 35 U.S.C. § 103 over Doluca in view of Burstein.

Ground 2B: Claims 8 and 9 are obvious under 35 U.S.C. § 103 over Doluca in view of Burstein and Kha.

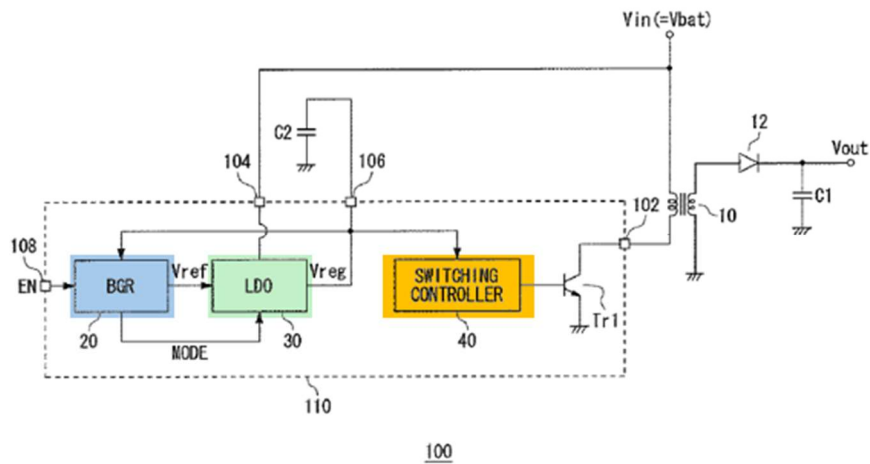
II. Background

A. Technology Background

The '955 Patent relates to power supply apparatuses. Ex. 1001 at Abst., 1:17-19; Ex. 1003 ¶ 32. As the '955 patent recognizes, “switching power supplies” were known in the art and used “to supply a voltage higher or a voltage lower than a power supply voltage supplied from a battery or the like, to a load circuit.” Ex. 1001 at 1:21-26; Ex. 1003 ¶ 32. Such power supplies commonly included a “control circuit which controls ON and OFF states of a switching element” based on a “reference voltage.” Ex. 1001 at 1:35-40; Ex. 1003 ¶ 32. One drawback, however, is that “switching noise generated by the switching element” may impact the “reference voltage source” which results in a risk that “a stepping up or stepping down operation will be hindered.” Ex. 1001 at 1:41-46; Ex. 1003 ¶ 33.

B. The '955 Patent (Ex. 1001)

The '955 Patent sought to overcome the problems with the prior art by disclosing a “power supply apparatus” comprising a “reference voltage source 20” (blue), “linear regulator 30” (green), and “switching controller 40” (orange) as shown below. Ex. 1001 at 4:41-43, 5:1-3, 5:9-10, 5:18-23; Ex. 1003 ¶ 34.



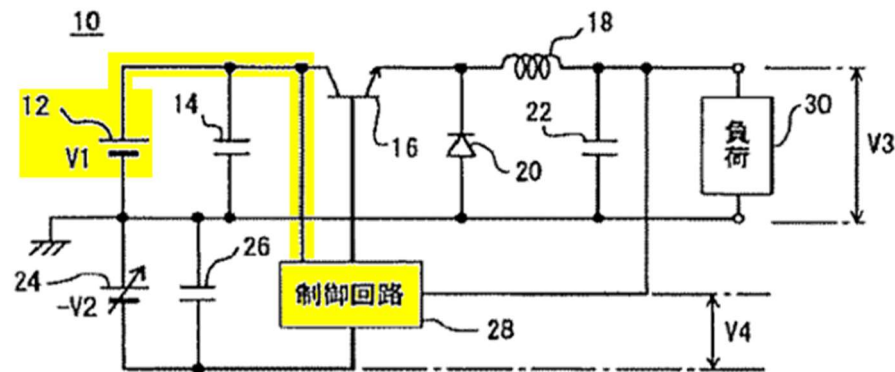
The '955 Patent teaches that the linear regulator “stabilizes the input voltage, based on the reference voltage generated by the reference voltage source.” Ex. 1001 at 1:59-61. Further, “an output voltage of the linear regulator is supplied as a power supply voltage of a control circuit of the switching power supply and the reference voltage source.” Ex. 1001 at 1:61-64; Ex. 1003 ¶¶ 35. According to the '955 Patent, “since the reference voltage source generates the reference voltage, with the output voltage of the linear regulator as the power supply voltage, an impact of noise generated in the switching element can be reduced, and it is possible to generate the reference voltage with a small noise component.” Ex. 1001 at 1:65-2:3; Ex. 1003 ¶¶ 35.

C. The '955 Patent Prosecution History (Ex. 1002)

The '955 Patent was subject to a single rejection. *See, e.g.*, Ex. 1002 at 252-258 (Aug. 27, 2010 Non-Final Rejection). The Examiner rejected the then-pending

claim 1 and 7 as obvious in view of JP2004-32899 and JP05-35344. To overcome rejection, the Applicant amended claim 1 to include the limitation “and the input voltage is not directly supplied to the controller as a power supply voltage.” *Id.* at 273 (Nov. 29, 2010 Amendment). The Applicant argued that “the output voltage of the voltage supply 12 of ‘899 (i.e., the purported input voltage) is input to a positive power supply terminal of structure 28”—corresponding to the claimed “the controller”—as shown below. *Id.* (Nov. 29, 2010 Amendment); Ex. 1003 ¶ 36. The claims were subsequently allowed. *Id.* at 284.

【 図 1 】



III. PERSON OF ORDINARY SKILL IN THE ART

A POSITA would have had at least a bachelor’s degree in electrical engineering or equivalent, and approximately two years of experience working in the field of power converters, circuit design, device physics, or related technologies. Ex. 1003 ¶¶ 28-31. Lack of work experience can be remedied by additional education and vice versa. *Id.*

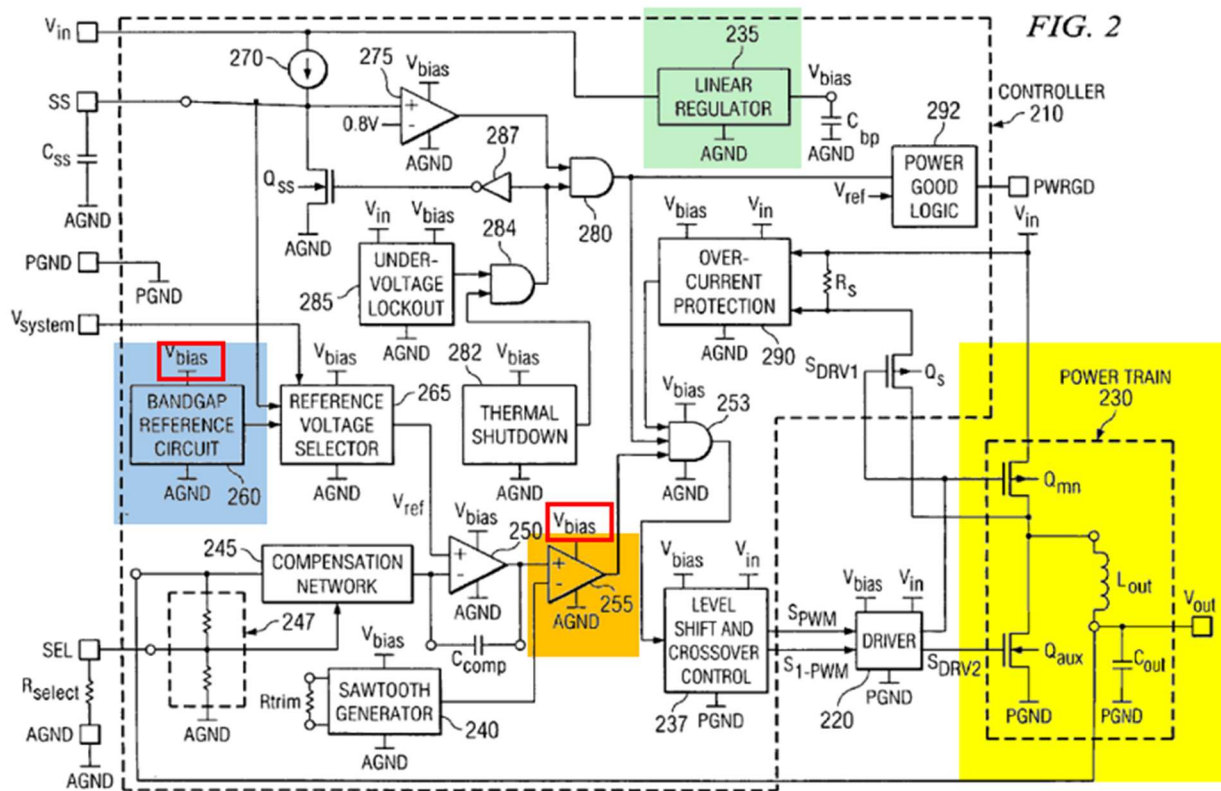
IV. CLAIM CONSTRUCTION

No express constructions are necessary in this IPR; Petitioner has applied the claim terms' ordinary meanings as understood by POSITAs. 37 C.F.R. §42.100(b); Ex. 1003 ¶¶ 26-27.

V. Ground 1: Claims 1 And 7 Are Obvious Over Lotfi

A. Overview of Lotfi (Ex. 1004)

Lotfi teaches a “power converter” that includes the same basic components of the '955 Patent: a “reference circuit 260” (blue), “linear regulator 235” (green), and a “PWM comparator 255” (orange) to control the switches of “power train 230” (yellow). Ex. 1004 at Fig. 2; Ex. 1003 ¶ 37. The “power train 230” is “a buck converter technology,” which is a switching power supply comprising “main and auxiliary switches Q_{mn} , Q_{aux} .” Ex. 1004 at 8:37-44; Ex. 1003 ¶ 38.

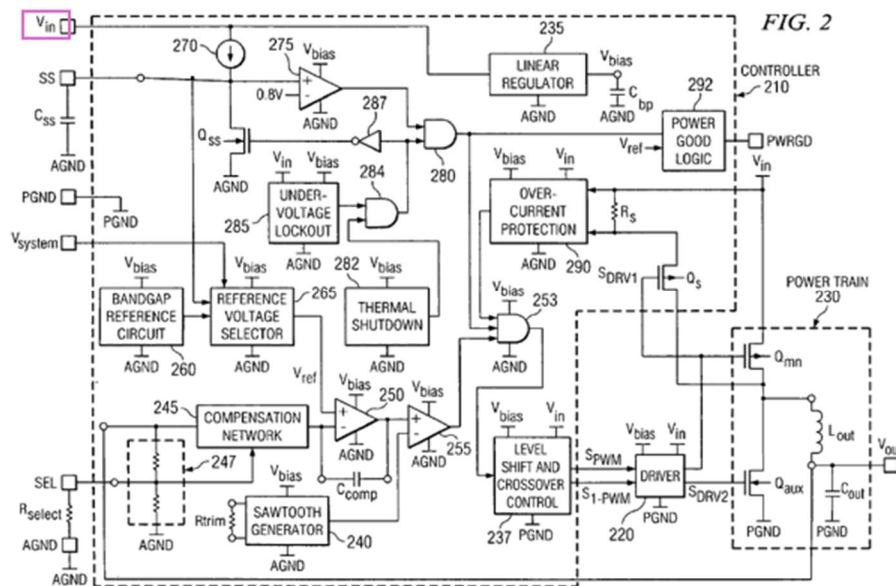


Like the '955 Patent, Lotfi discloses that the “linear regulator 235 provides a well regulated, low voltage bias voltage V_{bias} ” by “sens[ing] ... a reference voltage such as provided by the bandgap reference circuit 260.” Ex. 1004 at 11:45-51; Ex. 1003 ¶ 39. Further, as with the '955 Patent, the output of the linear regulator V_{bias} (red) is supplied as the power supply voltage to both a controller of the switching power supply—the “PWM comparator 255” (orange) whose “output” controls switches Q_{mn} and Q_{aux} (Ex. 1004 at 10:19-25)—and the “reference circuit 260” (blue) as shown above in Figure 2 above. Ex. 1004 at Fig. 2; Ex. 1003 ¶ 39.

1. Independent Claim 1

- (a) 1[PRE] “A power supply apparatus for use with an input voltage provided from outside, the power supply apparatus comprising:”

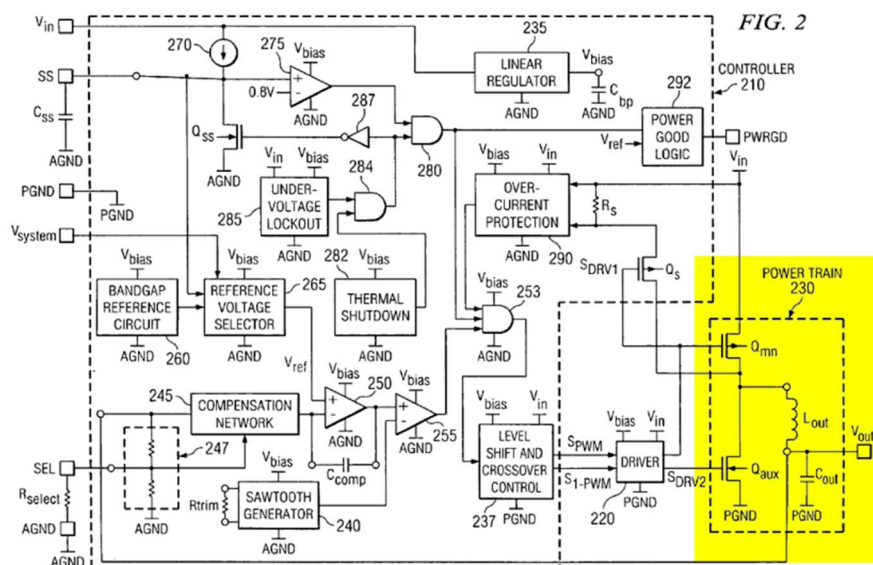
Lotfi discloses and renders obvious 1[PRE]. Ex. 1003 ¶¶ 40-41. FIG. 2 depicts a “power converter” (the claimed “power supply apparatus”) that is used with “the input voltage V_{in} ” (purple), which is “unregulated” and “from a source of electrical power” represented by “a battery” (the claimed “input voltage provided from the outside.”). Ex. 1004 at 6:15-19, 8:19-23, 8:64-9:1; *see also* Fig. 2.



- (b) 1[A] “a switching power supply which stabilizes the input voltage;”

Lotfi discloses and renders obvious 1[A]. Ex. 1003 ¶¶ 42-43. Figure 2 discloses a “power train 230” (the claimed “switching power supply,” in yellow) that stabilizes V_{in} (the claimed “input voltage”). Ex. 1004 at 8:24-36, 8:66-9:1.

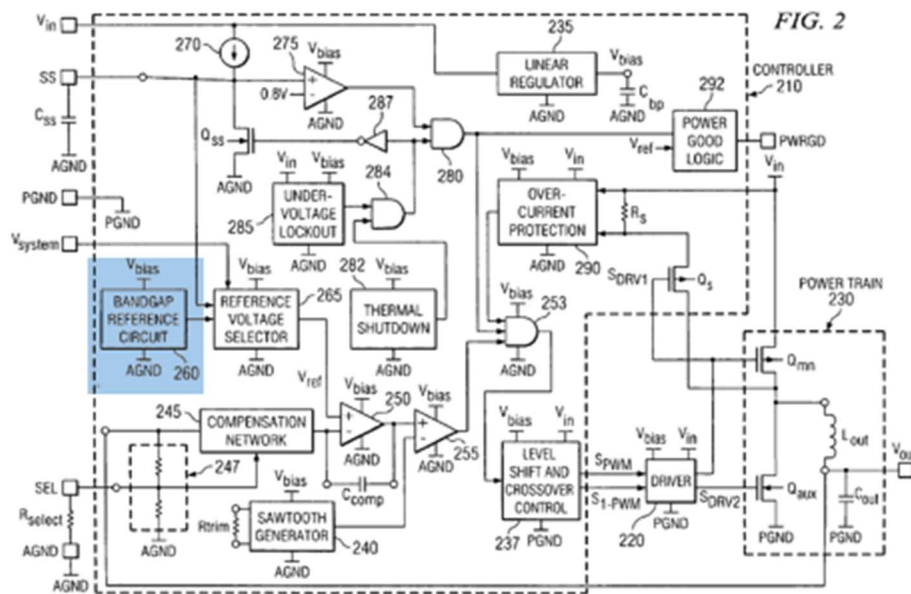
Specifically, Lotfi states that the disclosed “power train 230” includes switches Q_{mn} and Q_{aux} “to regulate an output characteristic (e.g., an output voltage V_{out}) thereof.” Ex. 1004 at 8:24-38; *see also id.* at 6:9-14, 6:15-23 (“The power train 110 of the power converter receives an input voltage V_{in} from a source of electrical power ... and provides a regulated output voltage V_{out} ”). According to Lotfi, “a switching operation of the power converter can regulate the output voltage V_{out} ,” thereby stabilizing the input voltage with a switching power supply. *Id.* at 6:19-23; Ex. 1003 ¶ 43.



(c) 1[B] “a reference voltage source which generates a predetermined reference voltage;”

Lotfi discloses and renders obvious 1[B]. Ex. 1003 ¶¶ 44-45. Lotfi teaches a “bandgap reference circuit 260” (the claimed “reference voltage source,” in blue). Ex. 1004 at 10:33-35. Lotfi expressly refers to the output of the “bandgap reference

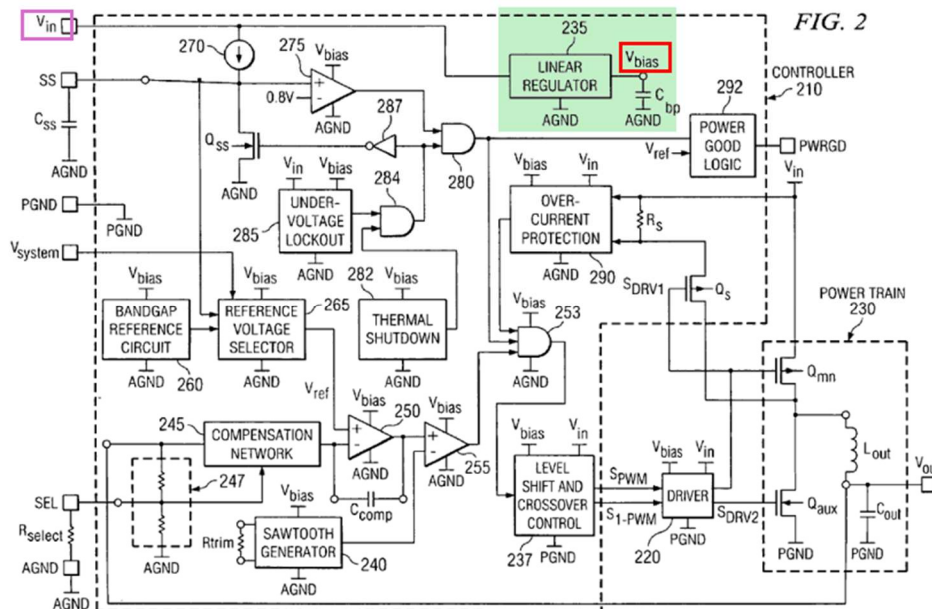
circuit 260” as “a reference voltage,” which is “predetermined” to provide “negative feedback to a control terminal of the series-pass, regulating switch,” resulting in “voltage regulation for the bias voltage.” *Id.* at 11:45-51 (“...a reference voltage such as provided by the bandgap reference circuit 260...”); Ex. 1003 ¶ 45.



(d) 1[C] “a linear regulator which stabilizes the input voltage, based on the reference voltage generated by the reference voltage source,”

Lotfi discloses and renders obvious 1[C]. Ex. 1003 ¶¶ 46-47. Lotfi discloses a “linear regulator 235” (the claimed “linear regulator,” in green) that “is powered from the input voltage V_{in} ” (the claimed “input voltage,” in purple) and “provides a well regulated, low voltage bias voltage V_{bias} ” (a stabilized voltage, in red). Ex. 1004 at 11:32-37. Specifically, “linear regulator 235” provides “voltage regulation for the bias voltage V_{bias} ” based on “sens[ing]” a “reference voltage such as provided

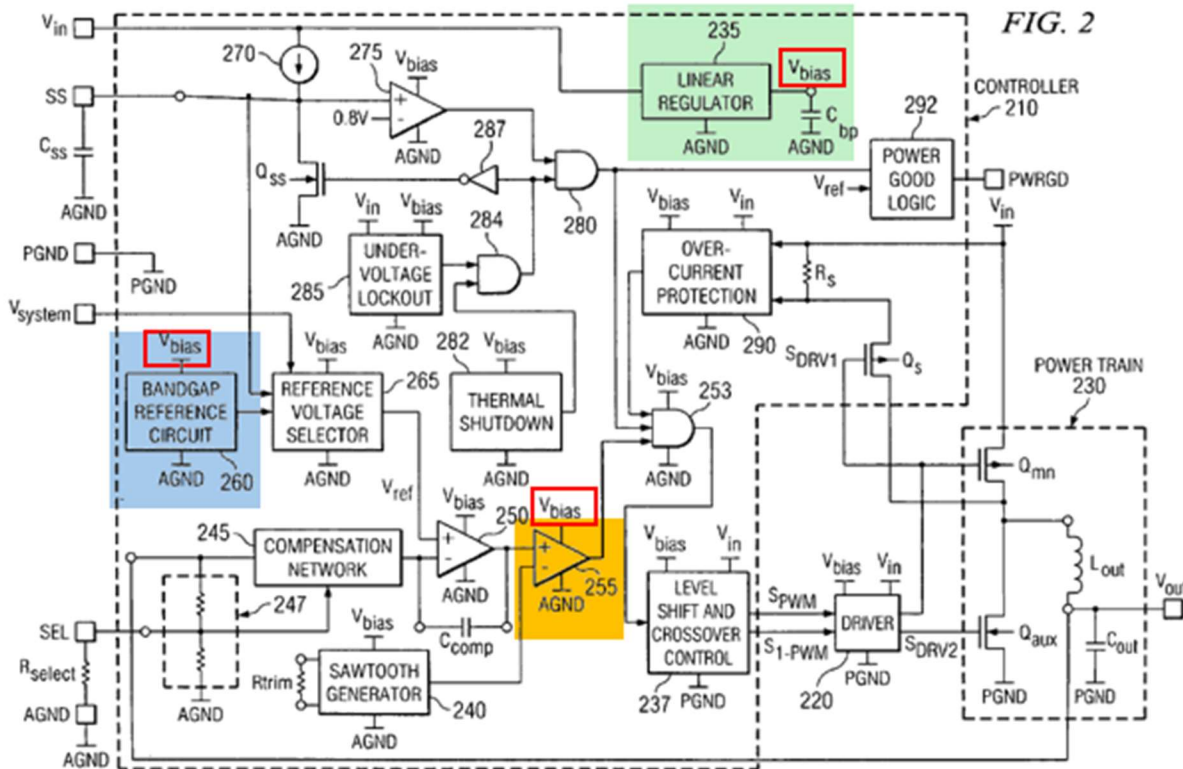
by the bandgap reference circuit 260 ... thereby providing voltage regulation for the bias voltage V_{bias} .” *Id.* at 11:45-51. Thus, linear regulator 235 stabilizes V_{in} based on the reference voltage generated by the claimed reference voltage source, bandgap reference circuit 260. *Id.*



- (e) 1[D1] “wherein an output voltage of the linear regulator is supplied as a power supply voltage of a controller of the switching power supply and the reference voltage source”

Lotfi discloses and renders obvious 1[D1]. Ex. 1003 ¶¶ 48-53. The output voltage of linear regulator 235 (green) is V_{bias} (red). *Id.* ¶ 49; Ex. 1004 at Fig. 2. V_{bias} is supplied as a power supply voltage to a “PWM comparator 255” (the claimed “controller of the switching power supply,” in orange) and “bandgap reference

circuit 260” (the claimed “reference voltage source,” in blue) as shown below. Ex. 1004 at Fig. 2.



As discussed, the “bandgap reference voltage circuit 260” is the “reference voltage source 260.” See *supra* § V.A.1(c); Ex. 1003 ¶ 50.

The “PWM comparator 255” is a “controller of the switching power supply.” Ex. 1003 ¶ 51. As discussed, “power train 230” is the claimed “switching power supply” comprising “main and auxiliary switches Q_{mn} , Q_{aux} .” Ex. 1004 at 8:37-44. According to Lotfi, “[a]n output of the PWM comparator 255 is high during a primary interval when the main switch Q_{mn} of the power train is configured to conduct” and “[t]he output of the PWM comparator 255 is low during a

complementary interval when the main switch Q_{mn} of the power train is transitioned to a non-conducting state and the auxiliary switch Q_{aux} is configured to conduct.” *Id.* at 10:19-25. That is consistent with the ’955 Patent’s disclosure that “switching controller 40 controls the base voltage of the switching transistor Tr1, and controls ON and OFF states thereof.” Ex. 1001 at 5:1-3; Ex. 1003 ¶ 51.

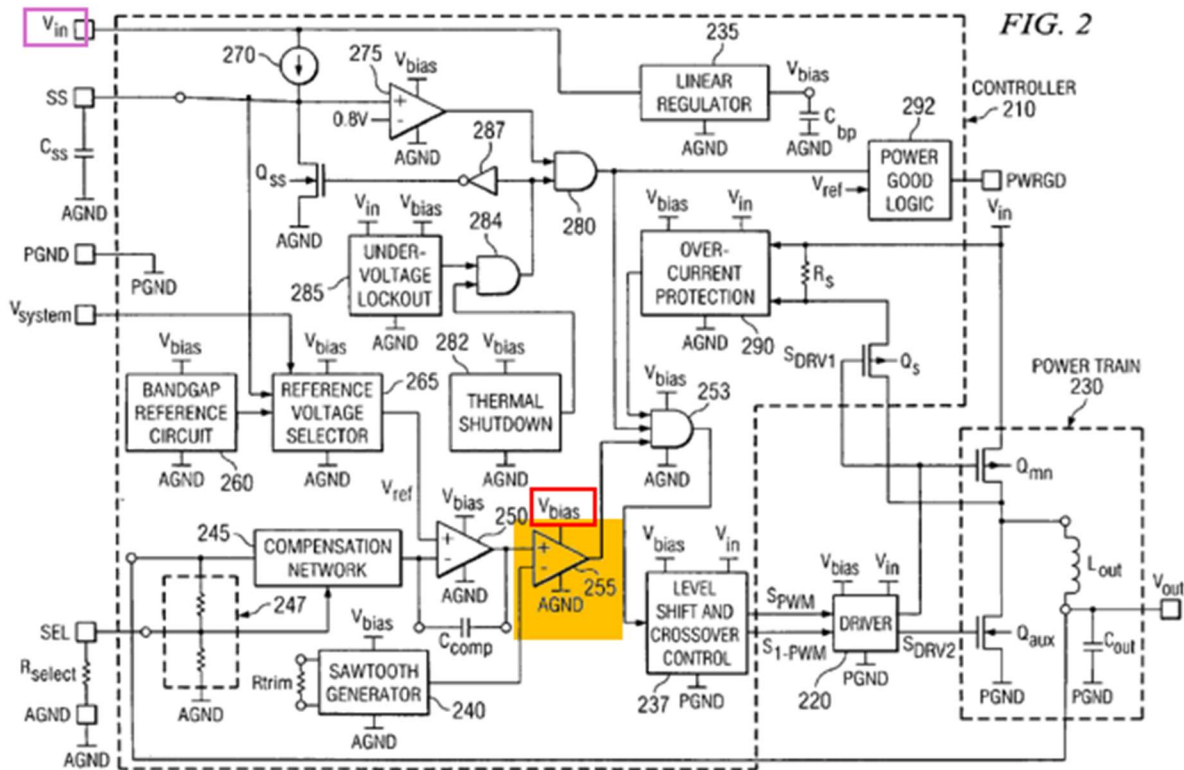
To the extent Patent Owner contends that the claimed “controller of the switching power supply” must also include additional components such as “error amplifier 250” and/or “sawtooth generator 240,” each of those components are also powered by V_{bias} as shown in Figure 2. Ex. 1004 at Fig. 2; Ex. 1003 ¶ 52.

To the extent Patent Owner contends that the claimed “controller of the switching power supply” encompasses the entirety of Lotfi’s “controller 210,” that argument fails. *Id.* ¶ 53. For example, the ’955 Patent identifies its “switching controller 40”—which embodies the claimed “controller of the switching power supply”—as one component of “control circuit 110.” Ex. 1001 at Fig. 1. That control circuit also “includes a reference voltage source 20 and a linear regulator 30.” *Id.* at 4:57-62, Fig. 1. Lotfi’s disclosure mirrors this structure: Lotfi’s “controller 210” likewise incorporates additional circuitry, including “linear regulator 235” and “bandgap reference circuit 260.” Ex. 1004 at Fig. 2; Ex. 1003 ¶ 53. These components correspond to the ’955 Patent’s “reference voltage source 20” and “linear regulator 30” as discussed, confirming that Lotfi’s “controller 210”

maps to the broader “control circuit 110,” not to the claimed “controller of the switching power supply.” Ex. 1003 ¶ 53.

(f) 1[D2] “wherein ... and the input voltage is not directly supplied to the controller as a power supply voltage.”

Lotfi discloses and renders obvious 1[D2]. Ex. 1003 ¶¶ 54-58. The input voltage V_{in} (purple) is not directly supplied to the “PWM comparator 255” as a “power supply voltage” as shown in Figure 2. Ex. 1004 at Fig. 2. As discussed, PWM comparator 255 is powered by V_{bias} , an output voltage of the linear regulator 235. *See supra* § V.A.1(e); Ex. 1003 ¶ 55. V_{in} also is not directly supplied to the “error amplifier 250” and “sawtooth generator 240” as a “power supply voltage” to the extent Patent Owner argues those components also comprise the “controller.” Ex. 1004 at Fig. 2; Ex. 1003 ¶ 55.



To the extent Patent Owner points to components of Lotfi that are coupled to V_{in} to argue that Lotfi does not disclose or render obvious this limitation, that argument would be incorrect and mischaracterizes Lotfi. Ex. 1003 ¶¶ 56-57. Lotfi expressly teaches that “[l]ower voltages (e.g., 2.5 volts) are employed with the *control* and signal processing devices.”¹ Ex. 1004 at 7:40-49; *see also id.* at 1:34-37 (“More specifically, lower voltages (e.g., 2.5 volts) are employed with the control and signal processing devices”); *see also* Ex. 1003 ¶¶ 56. Lotfi further describes “*control* and signal processing devices” as “low voltages devices” (Ex. 1004. at

¹ All emphasis added unless otherwise stated.

7:46-49) and explains that “the low voltage devices operate from a low voltage source which is usually well regulated such as the bias voltages V_{bias} ,” in contrast to higher voltage devices that are supplied by V_{in} (*id.* at 9:40-44). *See also id.* at 14:37-41 (referring to V_{in} as “an unregulated input voltage at a nominal five volts”). In other words, Lotfi explicitly identifies V_{bias} —the output of the linear regulator—as the “power supply voltage” for any “control ... devices” of Lotfi’s 210, refuting any argument by Patent Owner that components whose power supply voltage is purportedly V_{in} comprise the claimed “controller.” *Id.* at 9:37-48; Ex. 1003 ¶ 56.

Moreover, “the controller” of limitation 1[D2] refers to “a controller of the switching power supply.” Ex. 1001 at cl. 1. There can be no reasonable dispute that the “PWM comparator 255” is “a controller of the switching power supply” because Lotfi describes it as governing the ON (high) and OFF (low) states of Q_{mn} and Q_{aux} , the switches of “power train 230” (the claimed “switching power supply”). Ex. 1004 at 10:19-25 (“An output of the PWM comparator 255 is high during a primary interval when the main switch Q_{mn} , of the power train is configured to conduct. The output of the PWM comparator 255 is low during a complementary interval when the main switch Q_{mn} of the power train is transitioned to a non-conducting State and the auxiliary switch Q_{aux} is configured to conduct.”). Because the input voltage V_{in} is not directly supplied to PWM comparator 255 as a power supply voltage, Lotfi discloses this limitation—even if Patent Owner attempts to argue that *other*,

additional components of 210 are coupled to V_{in} , which Lotfi teaches is used for “higher voltage devices,” not control devices.² Ex. 1003 ¶ 57; Ex. 1004 at 9:40-42.

² For example, even if Patent Owner were to contend that this limitation is not met by pointing to Lotfi’s “level shift and crossover control circuit 237,” that does not change Lotfi’s disclosure of PWM comparator 255 as “a controller of the switching power supply” to which the “input voltage is not directly supplied” as “a power supply voltage.” Ex. 1003 ¶ 58. Regardless, Lotfi states that 237 “may” provide a signal to “prevent a cross conduction and enhance the switching transitions therebetween.” Ex. 1004 at 8:29-36. In other words, 237 is an optional component that “may” be used to *improve* the “switching transitions.” Ex. 1003 ¶ 58. Further, as the Federal Circuit has recognized, the prior art’s “optional inclusion” of an element teaches embodiments that “both do and do not contain” that element. *Upsher-Smith Labs., v. Pamlab*, 412 F.3d 1319, 1322 (Fed. Cir. 2005) (finding prior art’s “optional inclusion” of “antioxidants teaches vitamin compositions that both do and do not contain antioxidants.”).

2. Dependent Claim 7

- (a) **“A power supply apparatus according to claim 1, wherein the reference voltage source, the linear regulator, and the controller of the switching power supply are integrated on one semiconductor substrate.”**

As discussed above, Lotfi discloses and renders obvious the power supply apparatus according to claim 1. Ex. 1003 ¶¶ 59-61. Lotfi further discloses and renders obvious the additional limitation of claim 7. *Id.*

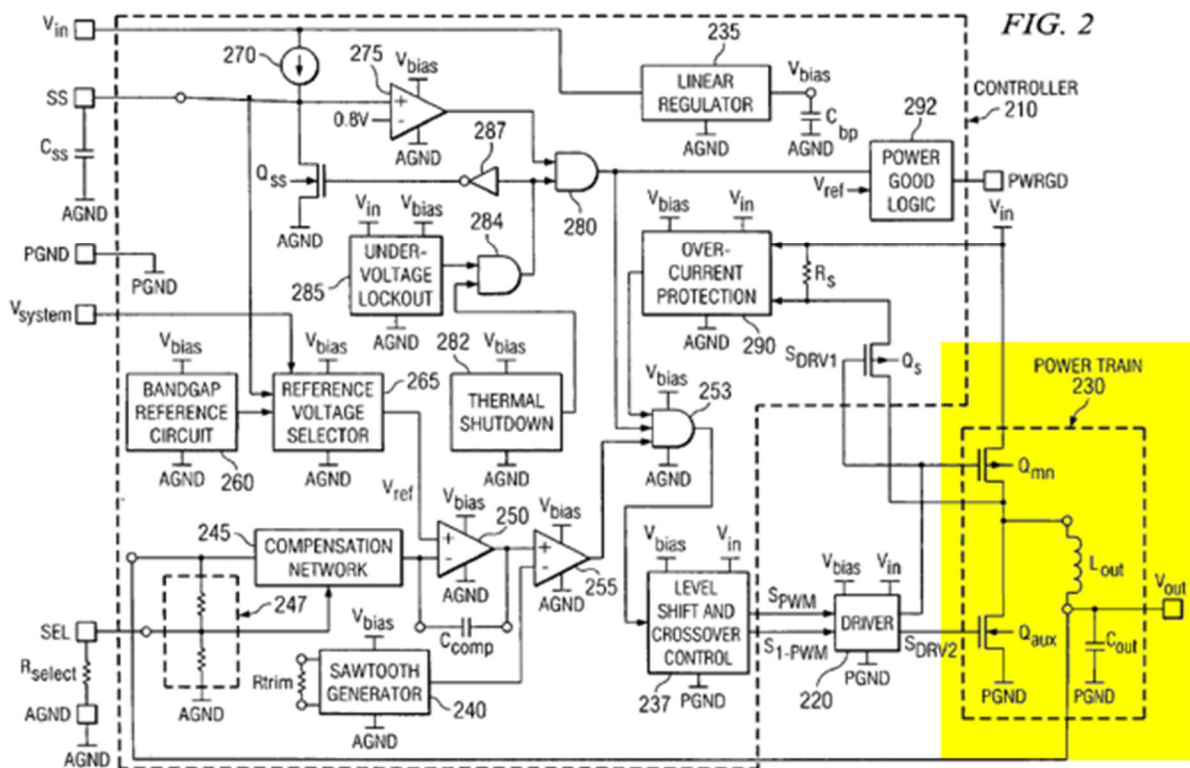
According to Lotfi, its invention is directed to “incorporating the low voltage devices and the higher voltage devices on *the* semiconductor substrate” to “accommodate higher switching frequencies in the design of power processing circuit due to a reduction of parasitic capacitances and inductances in the integrated circuit.” Ex. 1004 at 2:59-3:5. Figure 2—which includes the devices comprising the claimed “reference voltage source,” “linear regulator,” and “controller of the switching power supply” as discussed with claim 1—is a “schematic diagram of an embodiment of a controller in an environment of a power converter embodied in, or portions thereof, an integrated circuit constructed according to the principles of the present invention.” *Id.* at 8:19-23, 13:29-39. Because Lotfi is directed to an “integrated circuit” that “incorporates higher voltage devices and low voltage devices on a semiconductor substrate,” Lotfi discloses and renders obvious this limitation. *Id.* at 4:1-10; Ex. 1003 ¶¶ 59-61.

VI. Ground 1B: Claims 8 and 9 Are Obvious Over Lotfi In View Of Kha

1. Dependent Claim 8

- (a) “A power supply apparatus according to claim 1, wherein the switching power supply is a step-up switching regulator which steps up the input voltage.”

Lotfi alone and in view of Kha discloses and renders obvious claim 8. Ex. 1003 ¶¶ 62-67. Lotfi depicts a “buck converter topology” as the “power train 230” (yellow). Ex. 1004 at 8:37-38.



Lotfi, however, recognizes that “those skilled in the art should understand that other converter topologies such as a forward converter topology are well within the broad scope of the present invention.” Ex. 1004 at 6:9-14. It was well known by

2005 that a “forward converter topology” could be configured as a step-up switching regulator that steps up the input voltage. Ex. 1003 ¶ 63. For example, a patent from 1985—twenty years before the alleged invention of the ’955 Patent—discloses that a “forward converter” is capable of “voltage step-up or step-down, and voltage regulation.” Ex. 1008 at 1:30-2:28. Thus, a POSITA reading Lotfi’s disclosures would recognize that a “forward converter topology” could be used as “power train 230,” which steps up the input voltage if the output voltage is required to be greater than the input voltage for a particular application. Ex. 1003 ¶ 63.

Moreover, by the 2005 priority date of the ’955 Patent, the fundamental “switching mode power supplies” were “very well known and examples of basic topologies are boost convertors, buck convertors and buck boost convertors.” Ex. 1007 at 1:12-19. Ex. 1003 ¶ 64. A POSITA would have recognized that selection among these well-known topologies was a routine design choice driven primarily by the requirements of the intended application, such as the relative input and output voltage levels. Ex. 1003 ¶ 64. Consequently, a POSITA would have been motivated to consider alternative topologies for use in Lotfi rather than limiting the design to the particular buck converter topology illustrated in Lotfi for applications where the output voltage was required to be greater than the input voltage; Lotfi itself motivates this, as discussed above. Ex. 1004 at 6:9-14; Ex. 1003 ¶¶ 64-65.

The boost topology, in particular, was among the most common and “well-known” technologies well before 2005. Ex. 1003 ¶ 65. As explained in a patent filed in 1994, the “boost convertor” was already then a “very well known” and “basic topolog[y].” Ex. 1007 at 1:16-19. A POSITA would have understood that a “boost convertor” supply is a step-up switching regulator which steps up the input voltage and is therefore suitable for use when the load required an output voltage greater than the input voltage. *Id.* at 3:26-38; Ex. 1003 ¶ 65. Indeed, a POSITA would have readily appreciated that, for applications in which the required output voltage exceeds the available input voltage, substituting a boost converter for the buck converter in the Lotfi “power train 230” would be an obvious solution. Ex. 1003 ¶ 65.

Implementing a boost converter, for example, as shown in Figure 1A of Kha, in place of a buck converter involves only a straightforward and well-understood modification. *Id.* ¶ 66; Ex. 1007 at 1:16-19, 3:39-48. Like the “buck convertor,” the “boost convertor” includes “an inductance L through which current is switched by means of a switch S and a diode D rectifies the output.” Ex. 1007 at 3:20-22. For a “buck convertor topology,” the “positioning of the switch S, the diode D and the inductor L differs from the arrangement in the boost convertor,” as shown in Figures 1B (buck) and 1A (boost) of Kha. *Id.* at 3:39-48. Because each topology’s behavior was predictable and extensively documented, a POSITA would have expected that

replacing Lotfi's buck converter with a boost converter, such as shown in Figure 1A of Kha, would yield the predictable result of generating an output voltage higher than the input voltage. Ex. 1003 ¶ 66.

A POSITA would further have understood that such a substitution would not alter the operation or configuration of the other functional blocks of the Lotfi—namely, the linear regulator, the bandgap reference, and the PWM comparator. Ex. 1003 ¶ 67. The combination of those components operate independently of whether the downstream switching power supply employs a buck or boost topology, and their functions would continue to be performed in the same manner. *Id.*; *see also* Ex. 1007 at 3:59-61 (“In order to control the switching of the switch S, a suitable control circuit is provided which is not shown in the diagrams of FIGS. 1A-1C”). Thus, selecting a boost converter in place of a buck converter represents nothing more than a routine design choice yielding predictable benefits well understood in the art. Ex. 1003 ¶ 67.

2. Dependent Claim 9

- (a) **“An electronic device comprising: a battery; a load circuit; and the power supply apparatus according to claim 8, which has voltage of the battery as an input voltage, and steps up the voltage to supply the load circuit.”**

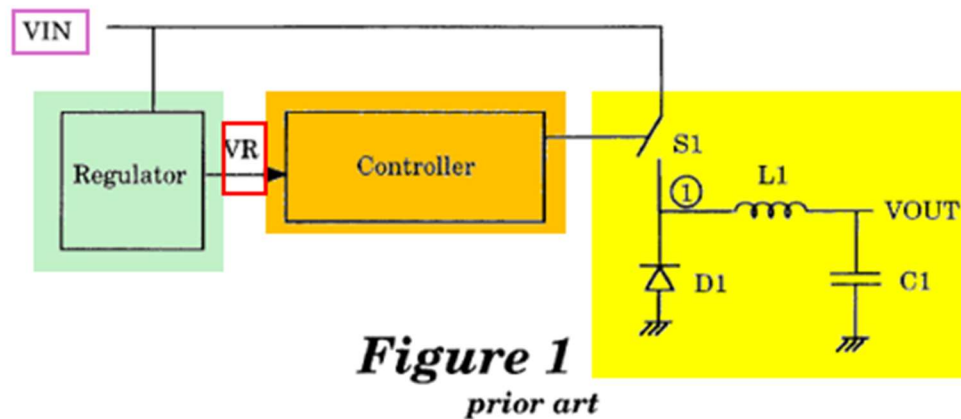
Lotfi alone and in view of Kha discloses and renders obvious claim 9. Ex. 1003 ¶¶ 68-69. As discussed, Lotfi alone and in view of Kha discloses the apparatus

of claim 8. Lotfi further teaches that the input voltage V_{in} may be received from a source of electrical power “represented by a battery.” Ex. 1004 at 6:15-19. Also as discussed, when the “power train” is a boost converter, the input voltage is stepped up, which results in the apparatus of claim 8 providing a “regulated output voltage V_{out} to power, for instance, a microprocessor at an output of the power converter” that requires a greater voltage than the input voltage. *Id.* at 6:15-19; Ex. 1003 ¶ 69. A POSITA would understand that a microprocessor is a “load circuit” as claimed. Ex. 1003 ¶ 69.

VII. Ground 2: Claims 1 and 7 Are Obvious Over Doluca In View Of Burstein

A. Overview of Doluca (Ex. 1005)

Dolucas discloses a “very common DC-DC converter topology known as the step-down, or buck, topology.” Ex. 1005 at 1:31-32; Ex. 1003 ¶ 70. As shown in Figure 1, the converter converts a “high input voltage V_{IN} ” to a “low input voltage V_{OUT} ” and comprises a “linear regulator” (green), where the “linear regulator output voltage V_R ” (red) is “derived from the input power source voltage” (purple). Ex. 1005 at 1:32-35. The “linear regulator output voltage V_R ” powers a “controller” (orange) for switch S1 of a switching converter (yellow). *Id.* The “controller runs at a substantially lower voltage than the input” and V_{IN} is not directly supplied to the controller as a power supply voltage. *Id.* at 2:26-28.



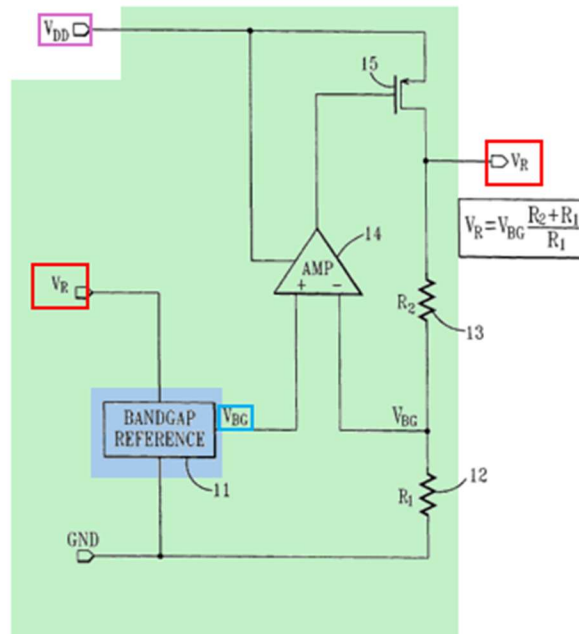
Doluca discloses all elements of claim 1 except for the linear regulator's reference voltage being from a reference voltage source. Ex. 1003 ¶ 71. In fact, Doluca does not disclose any details about the “linear regulator” used in the converter of Figure 1. *Id.* Thus, a POSITA would have turned to other references when implementing the converter taught by Doluca to implement the linear regulator. *Id.* One such reference is Burstein.

B. Overview of Burstein (Ex. 1006)

Burstein teaches “[a] direct current (DC), voltage regulator” that “regulates the supply voltage to a preferred, accurate, and stable amplitude.” Ex. 1006 1:12-15; Ex. 1003 ¶ 72. Burstein recognizes that “[v]oltage regulation is essential in many applications.” Ex. 1006 at 1:18.

Figure 1 of Burstein shows a “prior art design for a voltage regulator” that was well-known by Burstein's 2000 filing date—years before the '955 Patent. Ex.

1003 ¶ 72. As shown in Figure 1, Burstein's "prior art" "voltage regulator" (green) converts an input V_{DD} (purple) into a regulated output voltage V_R (red). The "voltage regulator" includes a "bandgap reference circuit 11" (blue). Ex. 1006 at 1:45-48; Ex. 1003 ¶ 72. According to Burstein, "[t]he regulated voltage provided by this design is given by the equation: $V_R = (V_{BG} * (R1 + R2)) / R1$, where V_{BG} is the bandgap voltage." Ex. 1006 at 1:51-55; Ex. 1003 ¶ 73. In other words, the output of the regulator is based on the "bandgap voltage" (aqua), a reference voltage generated by the bandgap reference circuit (*id.* at Fig. 1). *See also* Ex. 1006 at 1:36-39 ("A bandgap reference is useful in many applications because it provides a substantially invariant voltage when subjected to variations of temperatures and power supply voltage."); Ex. 1003 ¶ 73. The "regulated voltage" (red) is also "used as a power source for the bandgap reference circuitry" (blue). Ex. 1006 at 1:61-64; Ex. 1003 ¶ 73.



Moreover, a POSITA would understand that Burstein's "voltage regulator" is a "linear regulator" that converts a higher input voltage V_{DD} to a lower, regulated voltage V_R . Ex. 1003 ¶¶ 74-75.³ Burstein teaches that the regulated voltage V_{reg} is lower than the input voltage V_{DD} , consistent with the functionality of a linear

³ Burstein's reference to "gain boosting" refers to the gain of the feedback amplifier, which helps "achieve a highly accurate voltage potential ... at the output of the regulator." Ex. 1006 at 2:9-25; 2:33-36 ("The additional gain stage increases the overall gain of the feedback amplifier..."). A POSITA would understand that it does not refer to a voltage gain as between the input voltage and regulated output voltage. Ex. 1003 ¶ 74.

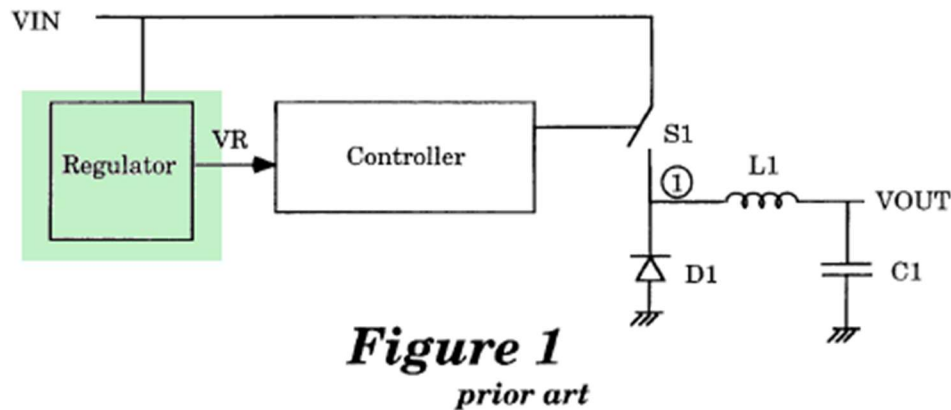
regulator. Ex. 1006 at 4:26-30 (“ $V_{reg}=V_{DD}-V_{DS,26}$ ”)⁴; Ex. 1003 ¶ 75. Further, Burstein explains—with reference to Figure 2, the “circuit configuration” for implementing Figure 1 (Ex. 1006 at 1:56-57)—that “[t]he regulated voltage is generated by the resistive chain of resistors 23 and 24 in conjunction with P-MOS transistor 26” (*id.* at 1:61-64) where “transistor 26” operates in “an active mode of linear operation” (*id.* at 4:19-21). That is precisely how linear regulators operate to regulate an input voltage: by operating a transistor in its linear region to regulate the output voltage. Ex. 1003 ¶ 76.

C. A POSITA Would Have Been Motivated To Combine Doluca With Burstein

A POSITA would have been motivated to combine Doluca and Burstein. Ex. 1003 ¶¶ 77-81. Specifically, a POSITA would have been motivated to implement Burstein’s “prior art” linear regulator of Figure 1 with Doluca’s “very common DC-

⁴ Although Burstein provides this equation with respect to Figure 3, Burstein states that Figure 3 simply adds a “a second gain-boosting stage in the voltage regulator design of Figure 2,” which improves the feedback loop. Ex. 1006 at 3:1-4. Burstein’s disclosures about the general operation of Figure 3 to convert V_{DD} to V_{reg} , therefore, are equally applicable to Figure 2. Ex. 1003 ¶ 75.

DC converter topology,” which uses such a linear regulator (green) to power a “controller” (Ex. 1005 at 1:33-36; Fig. 1). Ex. 1003 ¶ 77.

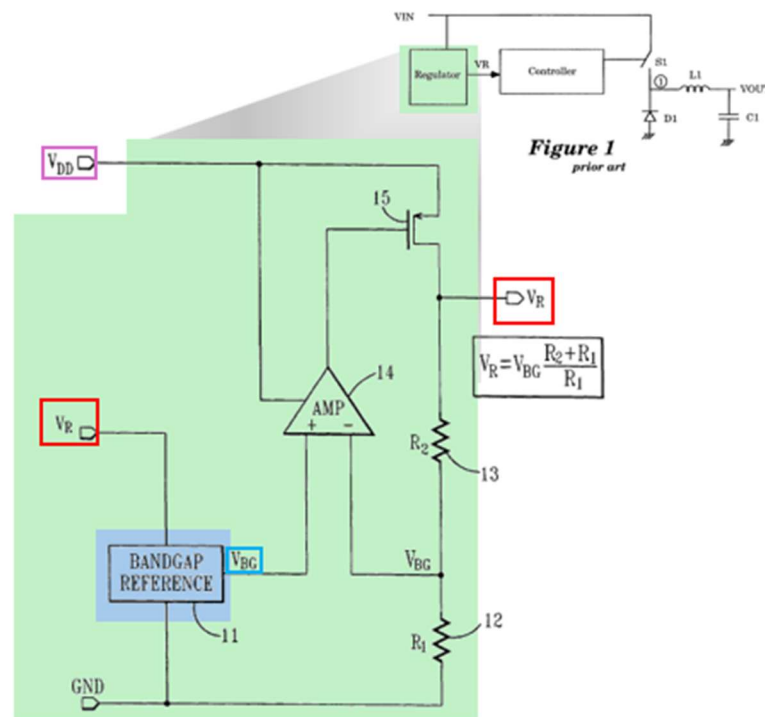


Dolucca provides no implementation details for the regulator it identifies as powering the “controller.” Ex. 1003 ¶ 78. The “Regulator” shown in Figure 1 is a black-box, motivating a POSITA to look to other references like Burstein for implementation details. *Id.* Burstein provides details of a “voltage regulator” that “regulates the supply voltage to a preferred, accurate, and stable amplitude” (Ex. 1006 at 1:12-15)—exactly what Dolucca’s black-box regulator needs to do in converting VIN to VR (Ex. 1005 at 1:32-34). Ex. 1003 ¶ 78. Incorporating Burstein’s regulator into Dolucca’s DC–DC converter to supply power to the controller is therefore the very use Burstein contemplates for voltage regulators—to provide a “highly stable and accurate” voltage that Burstein recognizes is “essential in many applications.” Ex. 1006 at 1:15-18. Ex. 1003 ¶ 78.

Moreover, Doluca discloses that its disclosed power converters are used “in battery operated systems” (Ex. 1005 at 1:15-18) and Burstein similarly recognizes that its “voltage regulator” is “essential in many applications,” in particular, systems where a “battery supplies power” (Ex. 1006 at 1:18-22). Ex. 1003 ¶ 79. Burstein further teaches by selecting the appropriate bandgap voltage and/or resistor values for R1 and R2, a “preferred, accurate, and stable” output voltage VR can be generated from the input voltage VDD. Ex. 1006 at 1:12-15. Specifically, Burstein teaches that “[t]he regulated voltage provided by this design is given by the equation: $V_R = (V_{BG} * (R1 + R2)) / R1$, where V_{BG} is the bandgap voltage.” *Id.* at 1:51-55. A POSITA would thus recognize that the Burstein regulator can be used with the Doluca converter to convert an input voltage to an appropriate voltage, such that “the controller is powered from a linear regulator output voltage VR that is derived from the input voltage power source.” Ex. 1005 at 1:32-35; Ex. 1003 ¶¶ 79-80.

In short, the use of the Burstein “regulator” with the Doluca converter is a straight-forward application of a known technique (a linear regulator) to improve known devices (the “very common” power converter described by Doluca). Ex. 1003 ¶ 81. And the result is entirely predictable: the Burstein regulator will perform its known function of “regulat[ing] the supply voltage to a preferred, accurate, and stable amplitude” (Ex. 1006 at 1:12-15) to power the controller in Doluca’s converter (Ex. 1005 at 1:12-18, 31-35). Ex. 1003 ¶ 81.

A POSITA would have accordingly been motivated to combine Doluca and Burstein to use Burstein's linear regulator in Doluca's architecture. Ex. ¶ 81. This combination is annotated below, showing how the Burstein regulator is implemented with the Doluca power converter device. *Id.*



1. Independent Claim 1

- (a) 1[PRE] “A power supply apparatus for use with an input voltage provided from outside, the power supply apparatus comprising:”

The Doluca-Burstein combination discloses and renders obvious [PRE]. Ex. 1003 ¶¶ 82-83. Doluca discloses a “high frequency switching DC-DC converter.” Ex. 1005 at 1:9-11. In particular, Doluca teaches a “very common DC-DC converter topology known as the step-down, or buck, topology” (the claimed “power supply

apparatus”) used with VIN (the claimed “input voltage provided from outside,” in purple). Ex. 1005 at 1:31-37.

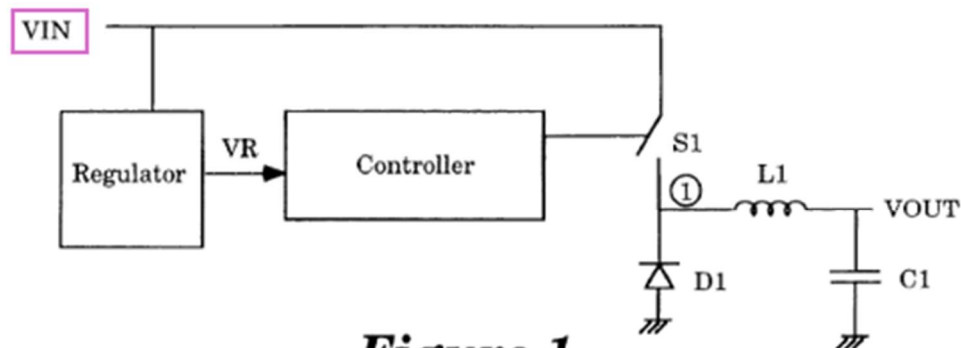


Figure 1
prior art

(b) 1[A] “a switching power supply which stabilizes the input voltage;”

The Doluca-Burstein combination discloses and renders obvious 1[A]. Ex. 1003 ¶¶ 84-86. Doluca teaches a “high frequency switching DC-DC converter” (the claimed “switching power supply”). Ex. 1005 at 1:9-11. According to Doluca, Figure 1 shows “a high input voltage VIN, say 20V” (purple) that “is converted to a low input voltage VOUT, say 5V” by using switch S1 (yellow). *Id.* at 1:31-37. A POSITA would understand that this conversion “stabilizes the input voltage,” VIN as an output voltage VOUT. Ex. 1003 ¶ 84.

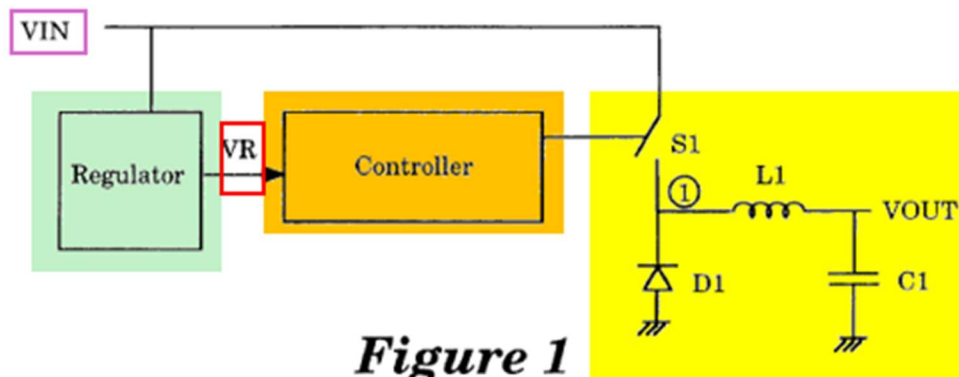


Figure 1
prior art

(c) 1[B] “a reference voltage source which generates a predetermined reference voltage;”

The Doluca-Burstein combination teaches and renders obvious 1[B]. Ex. 1003 ¶¶ 87-88. Doluca alone does not teach 1[B] because it does not provide detail regarding the linear regulator and its reference voltage source. *Id.*

Burstein, however, teaches and renders obvious 1[B]. *Id.* Specifically, Burstein teaches a “bandgap reference circuit 11” that generates “ V_{BG} ,” a “bandgap voltage.” Ex. 1006 at 1:46-55, Fig. 1. The “bandgap voltage” is a predetermined reference voltage because, according to Burstein it is a “substantially invariant voltage” and “[v]oltage regulation is typically achieved by generating a bandgap voltage and applying this voltage to a resistive chain.” *Id.* at 1:36-40; *see also id.* at 1:51-55, Fig. 1; Ex. 1003 ¶ 88.

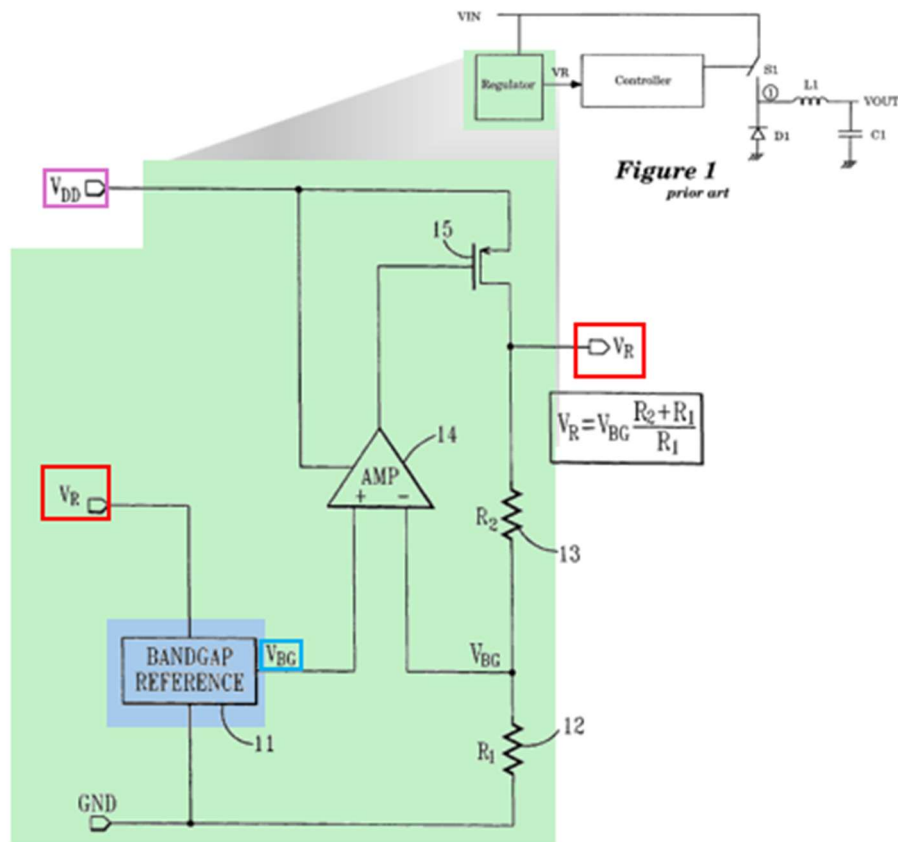


Figure 1
 prior art

- (d) 1[C] “a linear regulator which stabilizes the input voltage, based on the reference voltage generated by the reference voltage source;”

The Doluca-Burstein combination discloses and renders obvious 1[C]. Ex. 1003 ¶¶ 89-92. Doluca teaches a “linear regulator” (green) that outputs a regulated voltage “VR” (red) that is “derived from the input power source voltage” VIN (purple). Ex. 1005 at 1:33-36. Doluca’s linear regulator therefore “stabilizes the input voltage” VIN. Ex. 1003 ¶90.

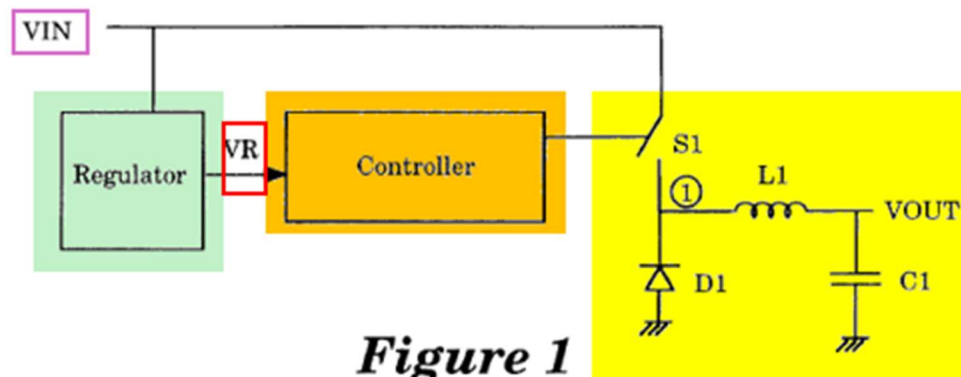
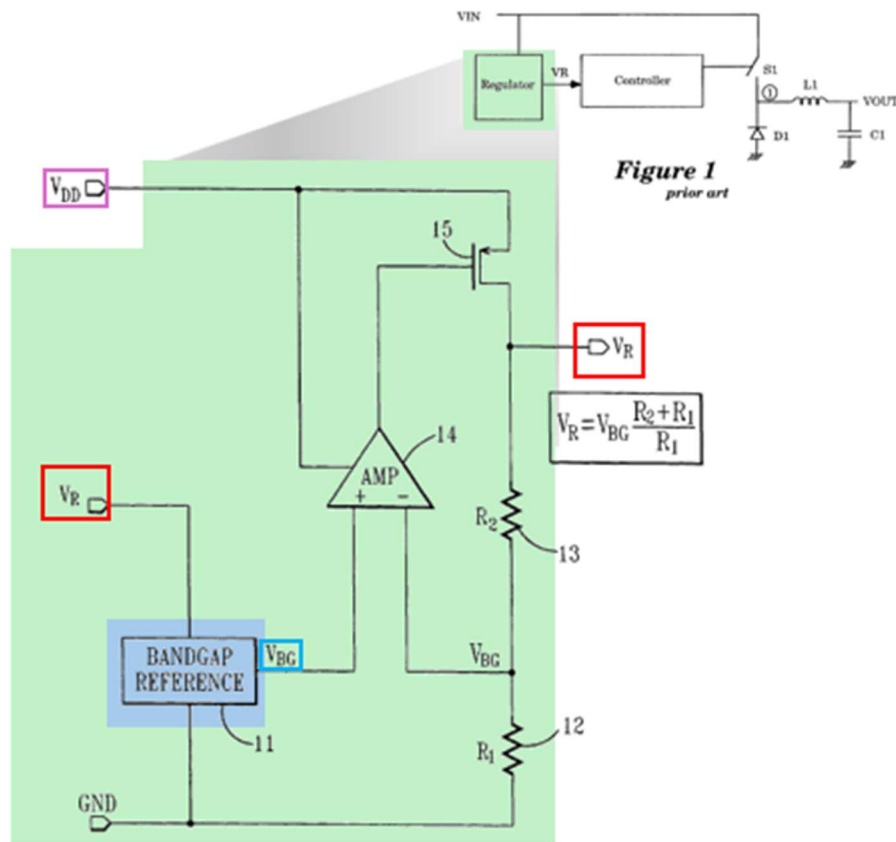


Figure 1
prior art

Dolucca does not provide detail of the internal circuitry of its linear regulator and therefore is silent on whether its output is “based on the reference voltage generated by the reference voltage generator.” Ex. 1003 ¶ 91. The Burstein regulator (green) used in the Dolucca-Burstein combination, however, “regulates the supply voltage” V_{DD} (purple) to generate a “preferred, accurate, and stable” voltage, V_R (red). Ex. 1006 at 1:12-15. The stabilized input voltage of Burstein V_R is “based on” V_{BG} (aqua), the claimed “reference voltage generated by the reference voltage source,” bandgap reference circuit 11 (blue). *Id.* at Fig. 1, 1:51-55 (“ $V_R = (V_{BG} * (R1 + R2)) / R1$, where V_{BG} is the bandgap voltage”); Ex. 1003 ¶ 91. Burstein further discloses that “[v]oltage regulation is typically achieved by generating a bandgap voltage and applying this voltage to a resistive chain,” further confirming that the regulated (or stabilized) input voltage is “based on” the reference voltage of the reference voltage source. Ex. 1006 at 1:38-40; Ex. 1003 ¶ 91.



Thus, when the Burststein linear regulator is combined with Doluca’s converter, the Doluca-Burstein combination includes a linear regulator (green in the figure above) which stabilizes the input voltage (Doluca’s VIN/Burstein’s V_{DD}) based on the reference voltage generated by the reference voltage source (V_{BG} of Burstein).
 Ex. 1003 ¶ 92.

- (e) 1[D1] “wherein an output voltage of the linear regulator is supplied as a power supply voltage of a controller of the switching power supply and the reference voltage source”

The Doluca-Burstein combination discloses and renders obvious 1[D1]. Ex. 1003 ¶¶ 93-96. Doluca teaches that “the controller is powered from a linear regulator

output voltage VR” (red), as shown in Figure 1 of Doluca below. Ex. 1005 at 1:34-36. As Doluca teaches, its “controller is powered from a linear regulator output voltage VR that is derived from the input power voltage source” and “substantially lower voltage than the input.” *Id.* at 1:33-35, 2:26-30. That is true for the Doluca-Burstein combination as well: the output of Burstein’s linear regulator V_R is a voltage derived from and substantially lower than the input power voltage source to power the Doluca controller. See § I.C.1(d); Ex. 1003 ¶ 96.

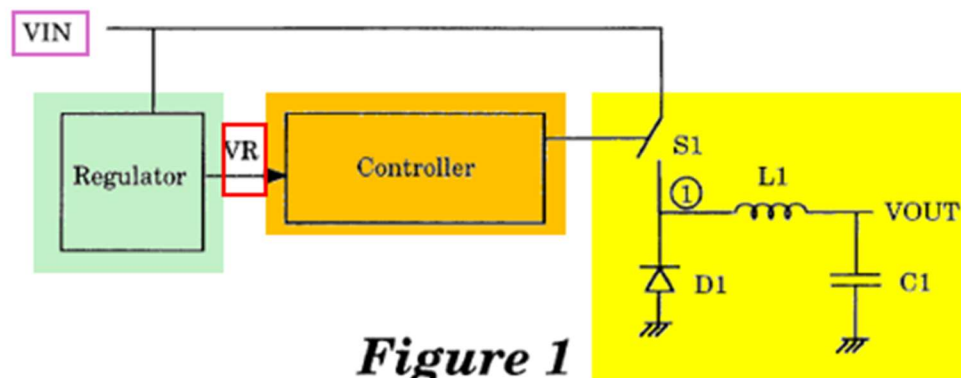
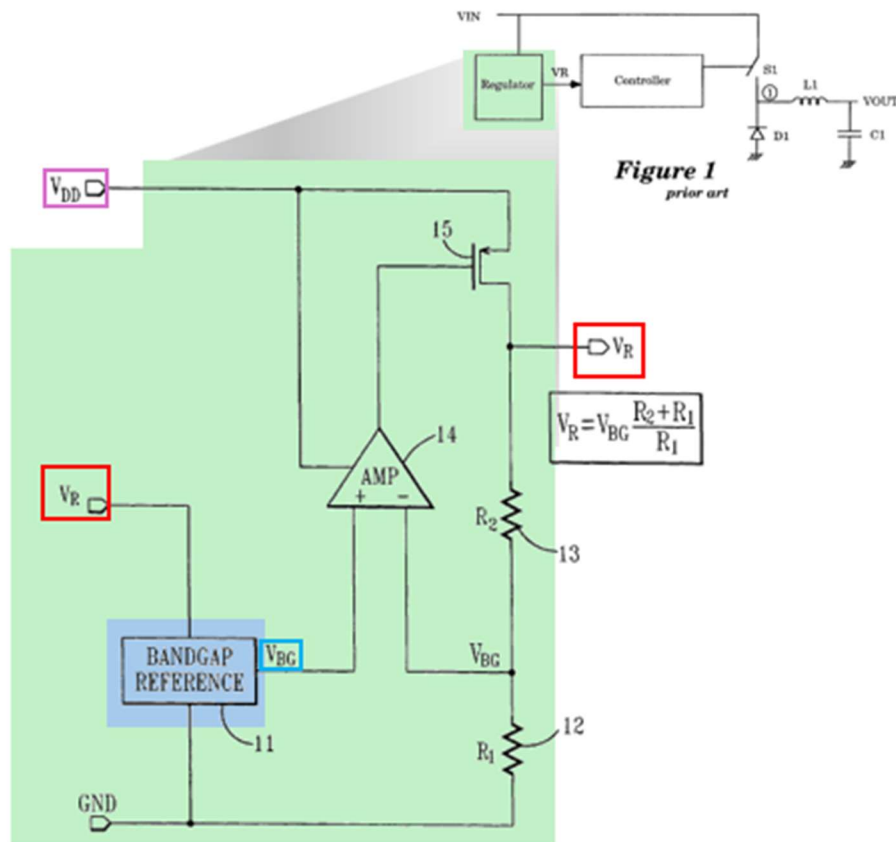


Figure 1
prior art

Dolucas does not teach “wherein an output voltage of the linear regulator is supplied as a power supply voltage of ... the reference voltage source.” Ex. 1003 ¶ 95. Burstein, however, does. *Id.* According to Burstein, the “regulated voltage” or “ V_R ” (red) is “used as a power source for the bandgap reference circuitry” (blue), “as well as an external load,” such as the “Controller” of Doluca. Ex. 1006 at 1:61-64, Fig. 1; Ex. 1003 ¶¶ 95-96.



Thus, in the Doluca-Burstein combination, the output of the Burstein linear regulator, V_R , is supplied as a power supply voltage of both the Doluca “controller” as well as to the reference voltage source “bandgap reference circuit 11.” Ex. 1003 ¶¶ 93-96.

(f) 1[D2] “wherein ... and the input voltage is not directly supplied to the controller as a power supply voltage.”

The Doluca-Burstein combination discloses and renders obvious 1[D2]. Ex. 1003 ¶¶ 97-99. As seen in Figure 1 of Doluca, the linear regulator’s (green) output voltage V_R (red) is supplied to the controller (orange) as a power supply voltage, and the input voltage V_{IN} (purple) “is not directly supplied to the controller as a

power supply voltage.” Ex. 1005 at 1:31-38 and 2:27-30; *see also* Figs. 2-3 (showing that VR provides power supply to the controller, and not VIN). Instead, Doluca teaches that “the controller is powered from a linear regulator output voltage VR” (red) and that “the controller runs at a substantially lower voltage than the input.” *Id.* at 1:34-36, 2:26-28; Ex. 1003 ¶¶ 98-99.

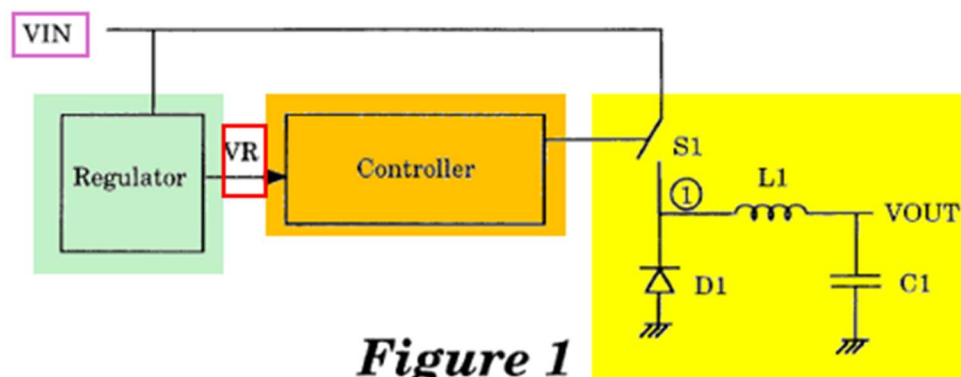
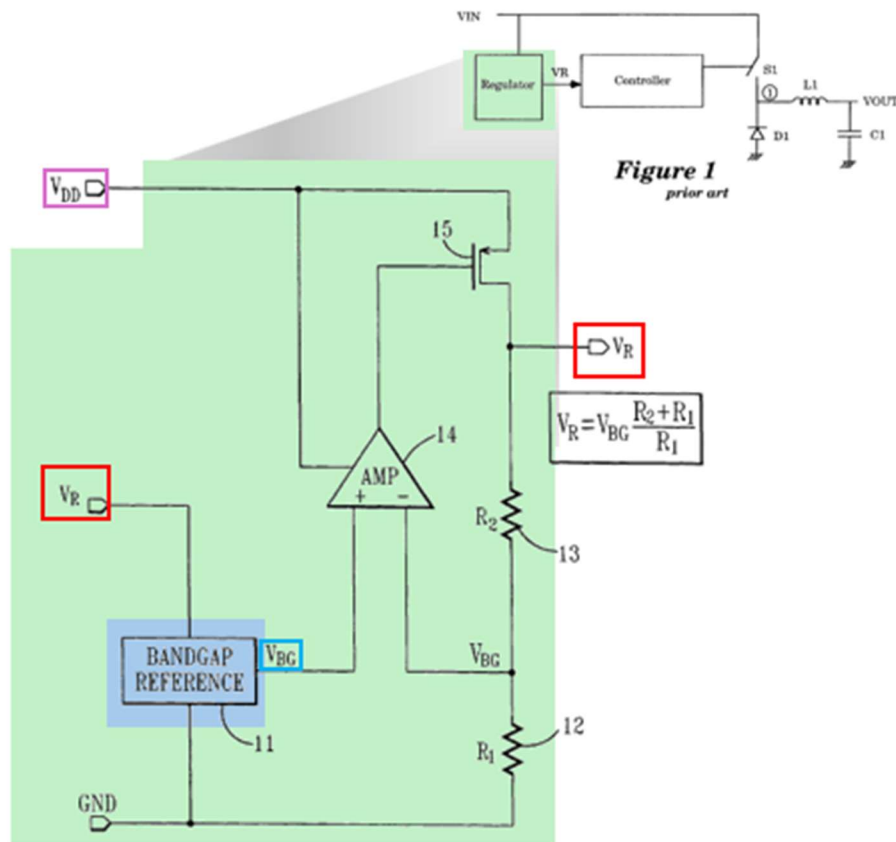


Figure 1
prior art

When Doluca is used in combination with Burstein, the output voltage of the Burstein regulator V_R is supplied to the controller as discussed above (§ I.C.1(e))—not the input voltage V_{IN} , confirming this limitation is disclosed and rendered obvious by the Doluca-Burstein combination. Ex. 1003 ¶¶ 98-99.



2. Dependent Claim 7

- (a) “A power supply apparatus according to claim 1, wherein the reference voltage source, the linear regulator, and the controller of the switching power supply are integrated on one semiconductor substrate.”

The Doluca-Burstein combination discloses and renders obvious claim 7. Ex. 1003 ¶¶ 100-102. Doluca describes providing its features in an integrated circuit. Ex. 1005 at cls. 10-13. A POSITA would have readily understood that an “integrated circuit” is, by definition, fabricated on a single semiconductor substrate. Ex. 1003 ¶ 101. Doluca reinforces this understanding by explaining that power converter

topologies may be implemented with “a p-channel MOSFET, though an n-channel instead of p-channel device could be used, or even a bipolar device of either conductivity type could be used.” Ex. 1005 at 3:16-26. All of these are conventional transistor structures that a POSITA in 2005 would have recognized as being formed using standard semiconductor processes on a common substrate such as silicon. Ex. 1003 ¶¶ 101-102.

Burstein likewise teaches implementing its circuitry using standard and well-known transistor devices, including a “P-MOS transistor” and a “MOSFET.” Ex. 1006 at 1:45–64. The use of standard transistor elements further confirms that Burstein’s circuitry, like Doluca’s, would be implemented on a semiconductor substrate. Ex. 1003 ¶¶ 101-102. A POSITA would therefore have understood that combining Doluca’s and Burstein’s teachings yields a system in which the reference voltage source, linear regulator, and controller of the switching power supply are integrated onto a single semiconductor substrate using routine semiconductor fabrication techniques. *Id.*

VIII. Ground 2B: Claim 8 Is Obvious Over Doluca In View Of Burstein And Kha.

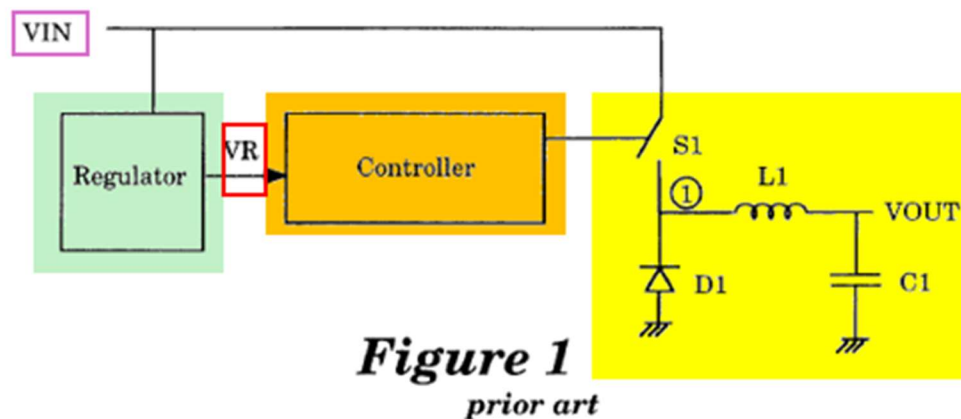
1. Dependent Claim 8

- (a) “A power supply apparatus according to claim 1, wherein the switching power supply is a step-up switching regulator which steps up the input voltage.”

Dolucas in view of Burstein and Kha discloses and renders obvious claim 8.

Ex. 1003 ¶¶ 103-108. Doluca depicts a “buck” topology switching power supply in Figure 1 (yellow) that is implemented with its regulator and controller configuration.

Ex. 1005 at 1:31-32.



Dolucas, however, recognizes that “one skilled in the art can also implement a similar scheme” of its disclosures “for other topologies, like inverting DC-DC conversion.” Ex. 1005 at 3:16-18; Ex. 1003 ¶ 104. A POSITA would recognize that an “inverting DC-DC conversion scheme” could be a step-up switching regulator

which steps up the input voltage and suitable for use in applications that require a higher output voltage than the input voltage. *Id.*

Moreover, by the 2005 priority date of the '955 Patent, the fundamental “switching mode power supplies” were “very well known and examples of basic topologies are boost convertors, buck convertors and buck boost convertors.” Ex. 1007 at 1:12-19. Ex. 1003 ¶ 105-106. A POSITA would have recognized that selection among these well-known topologies was a routine design choice driven primarily by the requirements of the intended application, such as the relative input and output voltage levels. *Id.* Consequently, a POSITA would have been motivated to consider alternative topologies for use in the Doluca-Burstein combination rather than limiting the design to the particular buck converter topology illustrated in Doluca when the output voltage requirements exceed the input voltage; Doluca itself motivates this, as discussed above. Ex. 1005 at 3:16-18; Ex. 1003 ¶¶ 103-104.

The boost topology, in particular, was among the most common and “well-known” technologies well before 2005. Ex. 1003 ¶ 106. As explained in Kha, a patent filed in 1994, the “boost convertor” was already then a “very well known” and “basic topolog[y].” Ex. 1007 at 1:16-19. A POSITA would have understood that a “boost convertor” supply is a step-up switching regulator which steps up the input voltage. *Id.* at 3:26-38; Ex. 1003 ¶ 104. A POSITA would have readily appreciated that, for applications in which the required output voltage exceeds the

available input voltage, substituting a boost converter for the buck converter in the Doluca-Burstein system would be an obvious solution. Ex. 1003 ¶¶ 106-107. Doluca explicitly recognizes that “[s]witch-mode topologies are widely used to convert power supply voltages from one value to another,” without restriction on whether the conversion steps down voltages (as in the exemplary buck topology) or steps up voltages. Ex. 1005 at 1:13-15.

Implementing a boost converter, for example as shown in Figure 1A of Kha, in place of a buck converter with the Doluca-Burstein combination involves only a straightforward and well-understood modification. Ex. 1003 ¶ 107. Like the “buck convertor,” the “boost convertor” includes “an inductance L through which current is switched by means of a switch S and a diode D rectifies the output.” Ex. 1007 at 3:20-22. For a “buck convertor topology,” the “positioning of the switch S, the diode D and the inductor L differs from the arrangement in the boost convertor,” as shown in Figures 1B (buck) and 1A (boost) of Kha. *Id.* at 3:39-48. Because each topology’s behavior was predictable and extensively documented, a POSITA would have expected that replacing Doluca’s buck converter with a boost converter, such as shown in Figure 1A of Kha, would yield the predictable result of generating an output voltage higher than the input voltage. Ex. 1003 ¶ 107.

A POSITA would further have understood that such a substitution would not alter the operation or configuration of the other functional blocks of the Doluca and

Burstein combination—namely, the linear regulator, the bandgap reference, and the controller. Ex. 1003 ¶ 108. The combination of those components operate independently of whether the downstream switching power supply employs a buck or boost topology, and their functions would continue to be performed in the same manner. *Id.*; *see also* Ex. 1007 at 3:59-61 (“In order to control the switching of the switch S, a suitable control circuit is provided which is not shown in the diagrams of FIGS. 1A-1C”). Thus, selecting a boost converter in place of a buck converter represents nothing more than a routine design choice yielding predictable benefits well understood in the art. Ex. 1003 ¶ 108.

2. Dependent Claim 9

- (a) **“An electronic device comprising: a battery; a load circuit; and the power supply apparatus according to claim 8, which has voltage of the battery as an input voltage, and steps up the voltage to supply the load circuit.”**

Doluca in view of Burstein and Kha discloses and renders obvious claim 9. Ex. 1003 ¶¶ 109-112. As discussed, Doluca in view of Burstein and Kha discloses the apparatus of claim 8.

Doluca further teaches that its converter may be used “in battery operated systems” that a POSITA would understand would have the voltage of the battery as an input voltage. Ex. 1005 at 1:15-18. Doluca further contemplates a load circuit connected at the output of its converter, given that its claimed invention is to improve

“light load efficiency.” *Id.* at Abst., 3:28, 3:50 (referring to “improving the efficiency of the regulator, particularly when subject to light loads.”). Indeed, the title of Doluca is “Method and Apparatus for Increasing Switching Regulator Light Load Efficiency,” which a POSITA would understand means that a load circuit is to be connected to the output of Doluca. Ex. 1003 ¶ 111. As discussed, when Doluca uses a boost topology, the input voltage is stepped up, which results in the apparatus of claim 8 providing an output voltage V_{OUT} to supply a load requiring a higher voltage than the input voltage, which a POSITA would understand would comprise a load circuit. Ex. 1003 ¶¶ 111-112.

IX. MANDATORY NOTICES AND FEES

A. Real Party-In-Interest

Monolithic Power Systems, Inc. is the real party-in-interest.

B. Related Matters

The '955 Patent is the subject of the following active proceedings:

Reed Semiconductor Corp. v. Monolithic Power Systems, Inc.; Civil Action No. 6:25-cv-00449, in the U.S. District Court for the Western District of Texas, Waco Division, filed on September 30, 2025.

C. Counsel and Service Information

Pursuant to 37 C.F.R. §42.8(b)(3) and 42.10(a), Petitioner provides the following counsel and service information. Pursuant to 37 C.F.R. § 42.10(b), a Power of Attorney accompanies this Petition.

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Petitioner consents to electronic service directed to the following email addresses: cnaples@cgsh.com, tyeh@cgsh.com, speters@cgsh.com, john.schnurer@foley.com, miguel.bombach@foley.com.

D. Payment of Fees Under 37 C.F.R. §42.103

The Office is authorized to charge fees for this Petition to Deposit Account No. 19-0741. Any additional fees that might be due are also authorized.

X. CERTIFICATION OF GROUNDS FOR STANDING

Petitioner certifies under Rule 42.104(a) that the '955 Patent is available for IPR and Petitioner is not barred or estopped from requesting IPR of the Challenged Claims on the grounds identified in this Petition.

Dated: December 1, 2025

Respectfully submitted,

/s/ Clement Naples
Lead Counsel

Attorney for Petitioner

CERTIFICATION OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. §42.24 that the foregoing Petition for *Inter Partes* Review, excluding any table of contents, mandatory notices under 37 C.F.R. §42.8, certificates of service or word count, or appendix of exhibits, contains 7,653 words according to the word-processing program used to prepare this document (Microsoft Word).

Dated: December 1, 2025

Respectfully submitted,

/s/ Clement Naples

Clement Naples, Reg. No. 50,663

Attorney for Petitioner

**CERTIFICATE OF SERVICE ON PATENT OWNER
UNDER 37 C.F.R. §42.105(a)**

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b), the undersigned certifies that on December 1, 2025, a complete and entire copy of this Petition for *Inter Partes* Review and Exhibits were provided via Federal Express to the Patent Owner by serving the correspondence address of record for the '955 patent:

Cantor Colburn LLP
20 Church Street
22nd Floor
Hartford, CT 06103

A complete and entire copy of this Petition for *Inter Partes* Review and Exhibits were also mailed to counsel of record in the parallel litigation:

Rick Rambo (rick.rambo@morganlewis.com)
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Respectfully submitted,

By: /s/ Clement Naples
Clement Naples, Reg. No. 50,663

Attorney for Petitioner