IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio VINCIARELLI
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	Unknown
Filing Date:	Herewith
Examiner:	Unknown
Art Unit:	Unknown

UTILITY PATENT APPLICATION TRANSMITTAL

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Alexandria, VA 22313-1450

Commissioner:

Transmitted herewith for filing under 37 C.F.R. § 1.53(b) is the nonprovisional utility patent application of:

Patrizio VINCIARELLI
294 Beacon Street
Boston, MA 02116

Andrew D'AMICO
c/o Vicor Corp.
25 Frontage Road
Andover, Massachusetts 01810

Enclosed are:

[**X**] Description, Claim(s), and Abstract (24 pages).

[**X**] Formal drawings (7 sheets, Figures 1-7).

[**X**] Power of Attorney (1 pages).

[**X**] Request for application not to be published with certification under 35 USC 122(b)(2)(B)(i).

[**X**] Information Disclosure Statement.

[**X**] Form PTO/SB/08

[**X**] Application Data Sheet (37 CFR 1.76).

The adjustment to the number of sheets for EFS-Web filing follows:

Number of Sheets		**EFS-Web Adjustment**	**Number of Sheets for EFS-Web**
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Size Fee	26	-	100	= 0		x	$400.00		$0.00
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Respectfully submitted,

Date 2013-08-02 By

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

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Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
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Inventor 2 Remove

Legal Name

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All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

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Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

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Title of the Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER		
Attorney Docket Number	092377-0123	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
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	Application Number	
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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

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If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :	
If the Applicant is an Organization check here. ☒	
Organization Name	VLT, INC.

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Country		Postal Code	94086
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
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Signature				Date (YYYY-MM-DD)	2013-07-02
First Name	Matthew A.	Last Name	Smith	Registration Number	49003

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	VLT, Inc.
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	Unassigned
Filing Date:	Herewith
Examiner:	Unassigned
Art Unit:	Unassigned
Confirmation Number:	Unassigned

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Respectfully submitted,

Date 2013-07-02

By _____

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Registration No. 49,003

4816-0398-9524.1

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	Telephone		Email

Assignee Name and Address: VLT, INC.
560 OAKMEAD PARKWAY
SUNNYVALE, CALIFORNIA 94086

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Signature		Date 4-03-2013
Name	Andrew D'Amico	Telephone 978-749-3230
Title	V.P. Intellectual Property	

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U.S. PATENT APPLICATION

for

POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

Inventors: Patrizio Vinciarelli
Andrew D'Amico

POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

TECHNICAL FIELD

[0001] This invention relates to apparatus and methods of converting and distributing power in electrical systems such as computer and telecommunication systems and servers.

BACKGROUND

[0002] Referring to Fig. 1, a prior art power distribution system 1 such as an Intermediate Bus Architecture ("IBA") is shown having a DC power source 5, supplying power at a source voltage, V_S, to the input of a bus converter 10. The output of the bus converter 10 supplies power to one or more down-stream regulators, e.g. regulators 6, 7 which in turn provide regulated power, e.g. regulated voltage, to respective loads 8, 9. The bus converter 10 may include a DC Transformer which is a switching power converter that may provide voltage transformation from its input to output at an essentially fixed voltage gain and also provide galvanic isolation between its input and output. The bus converter 10 may adjust its output slightly during predetermined operating conditions to provide in-rush current limiting, e.g. during start up and may provide partial regulation over selected portions of the source voltage range. Although a single bus converter is shown in Fig. 1, a plurality of bus converters may be connected to receive power from a single source 5 and provide power at one or more voltages to a plurality of down-stream regulators, such as regulators 6 and 7. Additionally, two or more bus converters or two or more DC Transformers may be connected in parallel to increase power throughput or to provide a measure of fault tolerance.

SUMMARY

[0003] One embodiment of the disclosure relates to an apparatus that includes a power distribution system comprising a source for providing power at a DC source voltage V_S. The apparatus further includes a bus converter that includes an input circuit and an output circuit. The bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio K_{DC} at an output current. An input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$. The apparatus further includes a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}. The apparatus further includes a plurality of regulators. Each regulator includes a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load. The plurality of regulators each are separated by a distance from the bus converter. The input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

[0004] Another embodiment relates to an apparatus that includes a power converter including an input circuit and an output circuit. The power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S. The power converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio K_{DC} at an output current. An input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter. The substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$. The power converter further includes a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is

approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

[0005] Yet another embodiment relates to an apparatus that includes a bus converter including an input circuit and an output circuit. The bus converter is configured to receive power from a power distribution system including a source for providing power at a DC source voltage V_S. The bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio K_{DC} at an output current. An input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$. The apparatus further includes a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}. The apparatus further includes a plurality of regulators. Each regulator includes a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load. The plurality of regulators each are separated by a distance from the bus converter. The input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

[0006] Another embodiment relates to an apparatus comprising an intermediate bus architecture power distribution system for a telecommunications system comprising a source for providing power at a DC source voltage; a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series, and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus

converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 shows a schematic block diagram of a prior art IBA power distribution system according to an illustrative embodiment.

[0008] FIG. 2 shows a functional block diagram of a series-connected DC Transformer according to an illustrative embodiment.

[0009] FIG. 3 shows a schematic diagram of a new power distribution architecture according to an illustrative embodiment.

[0010] FIG. 4 shows a schematic diagram of an isolated SAC-based DC Transformer according to an illustrative embodiment.

[0011] FIG. 5 shows a schematic diagram of a series-connected SAC-based DC Transformer according to an illustrative embodiment.

[0012] FIG. 6 shows a schematic diagram of a series-connected SAC-based DC Transformer having a center-tapped winding in the output circuit according to an illustrative embodiment.

[0013] FIG. 7 shows a schematic diagram of a series-connected DC Transformer for receiving power from a negative input source and delivering power at a positive output voltage according to an illustrative embodiment.

DETAILED DESCRIPTION

Power Distribution Architecture

[0014] A power distribution system 50 is shown in Fig. 3 having a primary power source 51 delivering power via a connection 52 to a front-end power-processing unit 53. The primary power source 51 may be an AC utility line, and the front end unit 53 may be a power conversion stage that converts power from the power source 51 delivering power at a relatively high but safe DC voltage to a power distribution bus 55, e.g. the DC voltage may vary from a minimum, e.g. 38 Volts, to a maximum, e.g. 55 Volts. Preferably, the front-end unit 53 provides voltage step

down and isolation and may optionally provide power factor correction, regulation, or both. An optional backup power system 54 is shown connected to the power distribution bus 55 to provide power in the event of a loss of power from the primary power source 52. The backup power system may include batteries, a charger for maintaining the batteries, and a switchover mechanism that connects the batteries to the bus in response to predetermined events, such as a decline in voltage or loss of power from the output of the front end 53 or the primary power source 51.

[0015] One or more bus converters, e.g. bus converters 56, 57, may be connected to the power distribution bus 55 downstream from the front end 53 as shown in the example of Fig. 3 to convert power received from the relatively high voltage power distribution bus 55 for delivery to a respective lower voltage bus. As shown, bus converters 56 and 57 respectively supply power to buses 58 and 59 at voltages, e.g. at or near the requisite load voltages, that are lower than the voltage of the power distribution bus 55, providing step-down voltage transformation. The bus converters 56, 57 are generally separated by a distance from their respective regulators 60, 61. For example, in a typical system, one or more system circuit boards housed in a common enclosure may each include one or more bus converters, preferably located near the edge of, or other location on, the board where power connections are made to the board. A down-stream regulator receiving power from the bus converter(s) may be preferably located adjacent to the circuitry, e.g. a processor, ASIC, or other circuitry, to which it or they supply power. The physical distance separating the bus converter and a respective down-stream regulator in such an example may range from as much as a dimension of the system circuit board, i.e. a diagonal dimension where the bus converter and regulator located at opposite corners, a length or width dimension where they are located at opposite edges, a half-length or width where one is situated closer to the middle and the other is at an edge, etc. In another example, a bus converter may be located off of the system board in which case the electrical distance could be greater than a dimension of the system board. Naturally, the distance separating the bus converter and a respective down-stream regulator will depend on the system layout. However, a bus converter housed in a self-contained assembly adapted to be installed as a unit at a location remote from

the down-stream regulator(s) may be separated by a distance from a down-stream regulator regardless of their respective mounting locations at the system level.

[0016] The output of each bus converter 56, 57 may, in turn, provide power via its respective bus 58, 59 to a respective plurality of regulators, preferably at or near the point of load, such as point-of-load switching voltage regulators 60, 61. It should be understood that although two bus converters 56, 57 are shown in the example of Fig. 3, any number of bus converters, e.g. one, may be used. Similarly, although regulators 60 and 61 are shown in Fig. 3 as comprising a plurality of individual regulators, any suitable number of regulators, e.g. one, may be connected to a particular bus converter within the constraints of the physical devices used. The regulators 60, 61 may supply power to respective loads (not shown). The loads can be a variety of devices, including integrated circuits and electromechanical devices (such as storage and cooling devices).

[0017] The bus converters 56, 57 shown in the system of Fig. 3, however, preferably do not provide galvanic isolation between their respective output busses 58, 59 and the power distribution bus 55 as described in additional detail below.

Series-Connected DC Transformer

[0018] Referring to Fig. 2, a functional block diagram of a series-connected power conversion system 20 suitable for use as a bus converter in the power distribution system 50 of Fig. 3 is shown. The power conversion system 20 includes an input 21 for receiving power from a source at a source voltage, V_S, and an output 22 for delivering power to a load at an output voltage, V_O, that is less than V_S, and a DC Transformer 25. The DC Transformer 25 may be implemented preferably using the Sine-Amplitude Converter ("SAC") topologies and timing architectures described in Vinciarelli, *Factorized Power Architecture and Point of Load Sine Amplitude Converters*, U.S. Patent No 6,930,893 and in Vinciarelli, *Point of Load Sine Amplitude Converters and Methods*, U.S. Patent No. 7,145,786 both assigned to VLT., Inc. and incorporated here in their entirety by reference (hereinafter the "SAC Patents"). Alternatively, other converter topologies, such as hard-switching, fixed ratio DC-DC converters, may be used. The DC Transformer 25 converts power received from its input 23 (distinguished from the input

21 of the bus converter 20) at an input voltage, V_{IN}, for delivery to its output 24 at an output voltage, V_{OUT}, using an essentially fixed voltage gain or voltage transformation ratio.

[0019] The voltage gain or voltage transformation ratio of a system as defined generally herein is the ratio of its output voltage to its input voltage at a specified current such as an output current. For the system 20 in Fig. 2, the voltage transformation ratio may be expressed as $K_{SYS} = V_O / V_S @ I_L$. Similarly, the voltage transformation ratio of the DC Transformer 25 may be stated as $K_{DC} = V_{OUT} / V_{IN} @ I_O$. Note that the system output voltage, V_O, and the DC Transformer output voltage, V_{OUT}, are the same in the configuration shown. However, the input 23 and output 24 of the DC Transformer 25 are shown in a series-connected configuration across the system input 21. As a result, the input voltage, V_{IN}, to the DC Transformer input 23 is less than the input voltage, V_S, to the system input 21 by an amount equal to the output voltage:

$$V_{IN} = V_S - V_O. \quad (1)$$

[0020] Similarly as shown in Fig. 2, the current, I_L, drawn by the load from the system output 22 is greater than the current produced at the output 24 of the DC Transformer 25 by an amount equal to the input current:

$$I_O = I_L - I_{IN}. \quad (2)$$

[0021] The system voltage transformation ratio, K_{SYS}, using the series-connected DC Transformer 25, may be expressed as a function of the DC Transformer voltage transformation ratio, K_{DC}:

$$K_{SYS} = K_{DC} /(K_{DC} + 1) \quad (3)$$

[0022] The above equation (3) may be rearranged to express the DC Transformer 25 voltage transformation ratio, KDC, required in a series-connected system as a function of the system voltage transformation ratio, K_{SYS}:

$$K_{DC} = K_{SYS} /(1 - K_{SYS}) \quad (4)$$

[0023] Referring to Fig. 4, an isolated SAC that may be utilized for DC Transformer 25, according to one embodiment, is shown having a full-bridge input circuit, including switches S1, S2, S3, and S4, connected to drive the resonant circuit including capacitor C and the input winding, having N1 turns, with the input voltage V_{IN}. The isolated SAC is shown having a full-bridge output circuit, including switches S5, S6, S7, and S8, connected to rectify the voltage

impressed across the output winding, having N2 turns, and delivering the output voltage, V_o. The voltage transformation ratio of the SAC will be essentially a function of the turns ratio: $K_{DC} = V_O/V_{IN} = N2/N1$.

[0024] A series-connected SAC 200 is shown in Fig. 5. By way of comparison, the series-connected SAC 200 uses the same full-bridge input circuit topology, including switches S1, S2, S3, and S4, driving the resonant circuit including capacitor C and the input winding, having N1 turns, with the input voltage V_{IN}. SAC 200 also uses the same full-bridge output topology, including switches S5, S6, S7, and S8, connected to rectify the voltage impressed across the output winding, having N2 turns, and delivering the output voltage, V_O. The voltage transformation ratio of the series-connected SAC 200 from the input circuit to output circuit is also essentially a function of the transformer turns ratio N2/N1 and the same as the isolated SAC 25 in Fig. 4: $K_{DC} = V_O/V_{IN} = N2/N1$. However, when evaluated in terms of the system, i.e. using V_S applied across the series-connected input and output, the voltage transformation ratio becomes: $K_{SYS} = V_O/V_S = N2/(N2 + N1)$.

[0025] Many contemporary applications use a voltage transformation ratio equal to 1/5 requiring an odd transformer turns ratio (N2 / N1 = 1/5) which is generally not optimal. Referring to equation (4) above, the $K_{SYS} = 1/5$ bus converter may be implemented using a $K_{DC} = 1/4$ series-connected topology (e.g. as shown in Figs. 2, 4, and 5), allowing the use of an even, i.e. 1:4, turns ratio in the transformer. An even transformer turns ratio may provide greater transformer layout flexibility and efficiency.

[0026] Note that the series-connected converter 200 may be implemented by connecting an off-the-shelf isolated DC Transformer, such as the isolated converter shown in Fig. 4, as shown in Fig. 2. Alternatively, the converter 200 may be implemented as series-connected input and output circuits, e.g. as shown in Figs. 5, 6, and 7 discussed below, in an integrated converter, optionally providing greater power density eliminating the isolation imposed design constraints, eliminating control circuit bias currents from flowing through to the output and the potential need for an output clamp, and providing system-ground referenced control circuitry (not shown) for interface signals that are referenced to ground rather than the output for the reconfigured off-the-shelf isolated converter.

[0027] Connecting the input and output of the DC Transformer 25 in series eliminates galvanic isolation between the input and output of the series-connected bus converter 20, which is counterintuitive. However, when used in the architecture of Fig. 3, isolation is deployed at an intermediate stage where the isolation may be superfluous. The architecture of Fig. 3, therefore, trades isolation at this stage for efficiency gain and reduced component stress. If isolation is required, e.g. for safety reasons, in the architecture of Fig. 3, it may preferably be provided by an upstream power conversion stage such as the front-end converter 53.

Efficiency

[0028] The power processed by the isolated SAC shown in Fig. 4 may be compared with that of the series-connected SAC 200 (Fig. 5) by summing the product of maximum voltage across (V_n) and average current (I_n) through each switch (n=1 through 8).

$$P_{Processed} = \sum_{n=1}^{8} (V_n * I_n) \quad (5)$$

[0029] Each input switch (S1, S2, S3 and S4) in the full bridge input circuits (Figs. 4, 5) is subjected to the input voltage, V_{IN}, (distinguished from the source voltage V_S) and an average of one half of the input current, I_{IN}. The sinusoidal nature of the current in the SAC topology represents a difference between the RMS and average currents, which is unimportant for the following comparison between two converters using the same topology. The power processed by the input circuits is:

$$P_{IN} = 2 * V_{IN} * I_{IN} \quad (6)$$

[0030] Similarly, each output switch (S5, S6, S7 and S8) in the full bridge output circuit of Fig. 4 will be subjected to the full output voltage, V_O, and will carry an average of one half of the output current, I_O. Note that the output current in the case of the isolated converter is equal to the load current, I_L and in the case of the series-connected converter (discussed below) is not. The power processed by the output circuits may therefore be reduced to:

$$P_{OUT} = 2 * V_O * I_O \quad (7)$$

[0031] Combining equations (6) and (7) and making the appropriate substitutions using $K_{DC} = V_O/V_{IN}$ and the corollary $I_{IN} = K_{DC} * I_O$, the total power processed by the converters reduces to:

$$P = 4 * V_O * I_O \quad (8)$$

[0032] In the isolated converter of Fig. 4, the output current equals the load current ($I_O = I_L$), therefore, the power processed by the isolated converter, P_{ISO}, may be reduced to the following function of load power, $P_{Load} = V_O * I_L$,:

$$P_{ISO} = 4 * P_{Load} \quad (9)$$

[0033] Neglecting fixed losses in the converter, the input current may be expressed as a function of the output current and voltage transformation ratio as follows:

$$I_{IN} = I_O * K_{DC} \quad (10)$$

[0034] Combining equations (2), (4), and (10), the output current of the series-connected converter may be expressed as a function of load current and voltage transformation ratio as follows:

$$I_{O\text{-}Series} = I_L * (1 - K_{SYS}) \quad (11)$$

[0035] Substituting equation (11) into equation (8) produces the total power processed by the series-connected converter as a function of load power ($P_{Load} = V_O * I_L$) and system voltage transformation ratio:

$$P_{SERIES} = 4 * P_{Load} * (1 - K_{SYS}) \quad (12)$$

[0036] Accordingly, the efficiency advantage of the series-connected converter over the isolated converter--the ratio of equations (12) and (9)--reduces to:

$$P_{SERIES} / P_{ISO} = (1 - K_{SYS}) \quad (13)$$

[0037] From equation (13) it can be seen that the series-connected converter offers a significant efficiency advantage. Consider a typical example for comparison, using a bus converter to convert power from a nominal 50 Volt power distribution bus for delivery to a 10 volt load ($K_{SYS} = 1/5$) at 100 amps: the series-connected converter processes only 80% of the power, offering a 20% efficiency savings compared to the isolated converter.

[0038] In a typical isolated DC Transformer, like most DC-DC converters, the control circuitry is configured to operate from power drawn from the input producing a quiescent component of the input current. Use of such a converter, e.g. an off-the-shelf DC Transformer, in a series-

connected configuration could, therefore, allow the quiescent input current to flow unregulated into a load connected to the output, which would be problematic while the power train is not operating and, therefore, incapable of regulating the output voltage. It may, for that reason, be desirable to clamp the output voltage using a zener diode, such as zener diode 26 in Fig. 2, or other clamp circuit or device appropriately scaled in breakdown voltage and power dissipation to carry the quiescent input current, protecting the load and perhaps the output circuitry of the converter. Integrating the series-connected input and output circuitry into a non-isolated converter topology such as shown in Figs. 5, 6, and 7 affords the opportunity to configure the control circuitry to draw power from the input to ground preventing that component of the input current from flowing out to the load. Additionally, a DC blocking capacitor may be used in the power train to avoid leakage current from flowing from the input to the output. One or both of the above measures may be used to avoid the need to clamp the output.

[0039] Configuring the control circuitry to reference the system ground in the integrated converter (rather than the input return in the off-the-shelf isolated converter) easily allows any interface signals to be ground-referenced (rather than output referenced) which is advantageous from the perspective of the system integrator.

Center-Tap Secondary

[0040] Another series-connected SAC 210 is shown in Fig. 6. By way of comparison, the series-connected SAC 210 uses the same full-bridge input circuit topology, including switches S1, S2, S3, and S4, driving the resonant circuit including capacitor C and the input winding, having N1 turns, with the input voltage V_{IN}, as shown in Fig. 5. However, a center-tap output winding, having 2 * N2 turns, is used in the output circuit, which includes switches S5, S6, S7, and S8, connected to rectify the voltage impressed across the output windings and delivering the output voltage, V_O. The system voltage transformation ratio of the series-connected SAC 210 (Fig. 6) is essentially a function of the transformer turns ratio: $K_{SYS} = V_O/V_{SYS} = N2/(N1 + 2 * N2)$; as is the voltage transformation ratio from input circuit to output circuit: $K_{DC} = V_O/V_{IN} = N2/N1$.

[0041] The converter 210 of Fig. 6 differs from the series-connected converter 200 (Fig. 5) in that the input voltage, V_{IN}, presented to the input circuit is equal to the source voltage, V_S, reduced by twice the output voltage, V_O:

$$V_{IN\text{-}210} = V_S - 2V_O \qquad (14)$$

[0042] as suggested by the addition of N2 turns in the output winding of the transformer. Also, each output switch (S5, S6, S7 and S8) in the converter 210 is subjected to twice the output voltage, V_O, with the upper output switches (S5 and S7) each carrying an average of half of the input current, I_{IN}, and the lower output switches (S6 and S8) each carrying an average of half of the difference between the load current, I_L, and the input current, I_{IN}. Using the same analysis as described above, summing the product of maximum voltage across (V_n) and average current (I_n) through each switch (N=1 through 8), the total power processed by the converter 210 of Fig. 6 is:

$$P_{210} = 2 * V_{IN} * I_{IN} + 2 * V_O * I_{IN} + 2 * V_O * (I_L - I_{IN}) \qquad (15)$$

[0043] Using the system voltage transformation ratio, $K_{SYS} = V_O/V_S$ in equation (14), the input voltage may be expressed as:

$$V_{IN\text{-}210} = V_O * ((1/K_{SYS}) - 2) \qquad (16)$$

[0044] Recognizing that in an ideal converter the input power equals the output power $V_S * I_{IN} = V_O * I_L$ the input current may be expressed as:

$$I_{IN} = K_{SYS} * I_L \qquad (17)$$

[0045] Making the appropriate substitutions into equation (15), the total power processed by series-connected converter 210 (Fig. 6) reduces to:

$$P_{210} = 4 * V_O * I_L * (1 - K_{SYS}) \qquad (18)$$

[0046] which may be further reduced to express the total power processed by the series-connected converter 210 using a center-tap output winding as shown in Fig. 6 as a function of load power ($P_{Load} = V_O * I_L$) and system voltage transformation ratio:

$$P_{210} = 4 * P_{Load} * (1 - K_{SYS}) \qquad (19)$$

[0047] Which is the same result obtained in equation (12) above for the series-connected converter 200 in Fig. 5.

[0048] There may be certain advantages of one series-connected topology over the other depending upon the application. For example, the transformer in the converter 200 (Fig. 5) has

N2 fewer turns than in the transformer of the converter 210 (Fig. 6) offering reduced winding losses. However, the input switches (S1, S2, S3 and S4) in the converter 210 (Fig. 6) are exposed to lower voltages than in the converter 200 (Fig. 5) which may afford lower switch conduction losses. Also, two of the output switches (S5 and S7) in converter 210 (Fig. 6) carry much less current and may be implemented with smaller and more cost effective devices than in converter 200 (Fig. 5).

Negative Input-Positive Output

[0049] Referring to Fig. 7, another series-connected SAC-based converter 215 is shown configured to receive a negative source voltage, V_S, and deliver a positive output voltage. (The topology shown in Fig. 7 may alternatively be adapted to receive a positive source voltage and deliver a negative output voltage.) Converter 215 may be viewed as a variation of the converter 210 (Fig. 6) in which the input and output circuit positions have been rearranged with the output terminal serving as the common terminal. The converter 215 of Fig. 7 differs from the converter 210 (Fig. 6) in that the absolute value of the input voltage, V_{IN}, presented to the input circuit is equal to the absolute value of the source voltage, V_S, reduced by the absolute value of the output voltage, V_O (compared to twice the output voltage in Fig. 6) because of the polarity change from input to output:

$$|V_{IN\text{-}215}| = |V_S| - |V_O| \qquad (20)$$

as also suggested by the transformer configuration. Also, the upper output switches (S5 and S7) each carry an average of half of the output current, I_O, which equals the load current, I_L in Fig. 7, compared to the difference between the load current, I_L, and the input current, I_{IN}, in Fig. 6. Once again, summing the product of maximum voltage across (V_n) and average current (I_n) through each switch (N=1 through 8) as described above, the total power processed by the converter 215 of Fig. 7 is:

$$P_{215} = 2 * V_{IN} * I_{IN} + 2 * V_O * I_{IN} + 2 * V_O * I_L \qquad (21)$$

[0050] which, when reduced using equations (17) and (20), becomes:

$$P_{215} = 4 * P_{Load} \qquad (22)$$

[0051] A comparison of the power processed by the converter 215 (equation (22); Fig. 7) with the power processed by the isolated converter 25 (equation (9); Fig. 4) may indicate no efficiency advantage, however, the input switches (S1, S2, S3 and S4) in the series-connected converter 215 of Fig. 7 are subjected to lower voltages potentially affording use of better figure of merit switches leading to potential efficiency improvements. Furthermore, the absence of isolation-related design constraints in such an integrated converter may be used to increase power density.

[0052] The converters 20 (Fig. 2), 200 (Fig. 5), 210 (Fig. 6), and 215 (Fig. 7) are examples of a class of series-connected converters in which at least a portion of the output circuit is connected in series with the input circuit such that the absolute value of the voltage, V_{IN}, presented to the input circuit is equal to the absolute value of the source voltage V_S, minus N times the absolute value of the output voltage, V_O, where the value of N is at least 1:

$$|V_{IN}| = |V_S| - N * |V_O| \qquad (23)$$

[0053] The value of N will vary depending upon the converter topology used, e.g. a center-tap secondary or not, polarity reversing or not, etc. In the examples described above: N=1 for converters 20 (Fig. 2), 200 (Fig. 5), and 215 (Fig. 7) and N=2 for converter 210 (Fig. 6) as shown in equation 14. Although a full bridge switch configuration is preferred for its superior noise performance, half-bridge switch configurations may also be deployed in the input circuitry, the output circuitry, or both.

[0054] The disclosure is described above with reference to drawings. These drawings illustrate certain details of specific embodiments that implement the systems, apparatus, and/or methods of the present disclosure. However, describing the disclosure with drawings should not be construed as imposing on the disclosure any limitations that may be present in the drawings. No claim element herein is to be construed under the provisions of 35 U.S.C. § 112, sixth paragraph, unless the element is expressly recited using the phrase "means for." Furthermore, no element, component or method step in the present disclosure is intended to be dedicated to the public, regardless of whether the element, component or method step is explicitly recited in the claims.

[0055] It should be noted that although the disclosure provided herein may describe a specific order of method steps, it is understood that the order of these steps may differ from what is described. Also, two or more steps may be performed concurrently or with partial concurrence. It is understood that all such variations are within the scope of the disclosure.

[0056] The foregoing description of embodiments of the disclosure have been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the disclosure to the precise form disclosed, and modifications and variations are possible in light of the above teachings or may be acquired from practice of the disclosure. The embodiments were chosen and described in order to explain the principals of the disclosure and its practical application to enable one skilled in the art to utilize the disclosure in various embodiments and with various modifications as are suited to the particular use contemplated.

WHAT IS CLAIMED IS:

1. An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

2. The apparatus of claim 1, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

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3. The apparatus of claim 1, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to approximately 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

4. The apparatus of claim 1, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

5. The apparatus of claim 1, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

6. The apparatus of claim 1, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

7. The apparatus of claim 1, further comprising a circuit board, wherein the bus converter and at least one regulator are assembled to the circuit board, and the regulator is configured to supply power to an integrated circuit in a telecommunications application.

8. The apparatus of claim 1, further comprising a clamp circuit connected to prevent the output voltage, $V_{OUT,}$ from exceeding a predetermined level.

9. An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$, wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

10. The apparatus of claim 9, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

11. The apparatus of claim 9, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is approximately equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

12. The apparatus of claim 9, wherein the power converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

13. The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

15. The apparatus of claim 9, further comprising a circuit board, and wherein the power converter is configured to supply power to a plurality of regulators over a power distribution bus, the regulators disposed at a distance to the power converter, and wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit in a telecommunications application.

16. An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

17. The apparatus of claim 16, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

18. The apparatus of claim 16, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

19. The apparatus of claim 16, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

20. The apparatus of claim 16, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, wherein the first polarity is opposite the second polarity.

21. The apparatus of claim 16, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

22. An apparatus comprising:

an intermediate bus architecture power distribution system for a telecommunications system comprising a source for providing power at a DC source voltage;

a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series, and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and

the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

23. The apparatus of claim 22, wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an

output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

24. The apparatus of claim 22, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

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ABSTRACT

Apparatus for power conversion are provided. One apparatus includes a power converter including an input circuit and an output circuit. The power converter is configured to receive power from a source for providing power at a DC source voltage V_S. The power converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio $K_{DC} = V_{OUT} / V_{IN}$ at an output current, wherein V_{IN} is an input voltage and V_{OUT} is an output voltage. The input circuit and at least a portion of the output circuit are connected in series across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

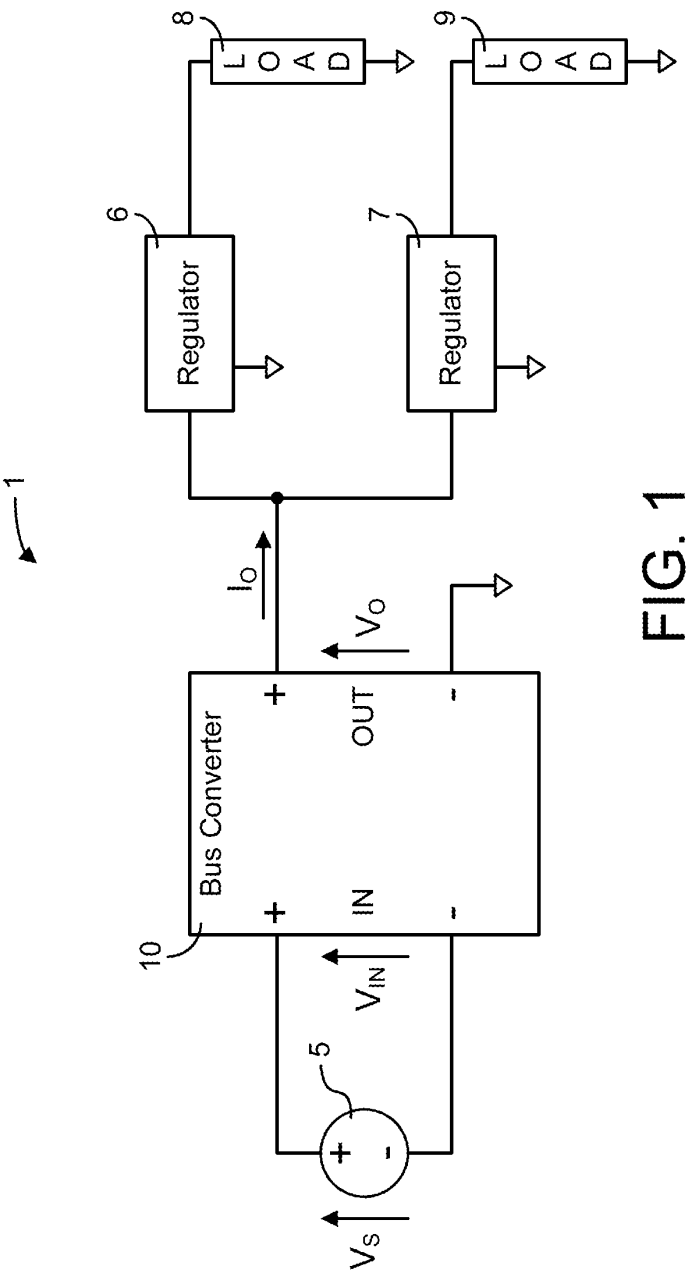


FIG. 1

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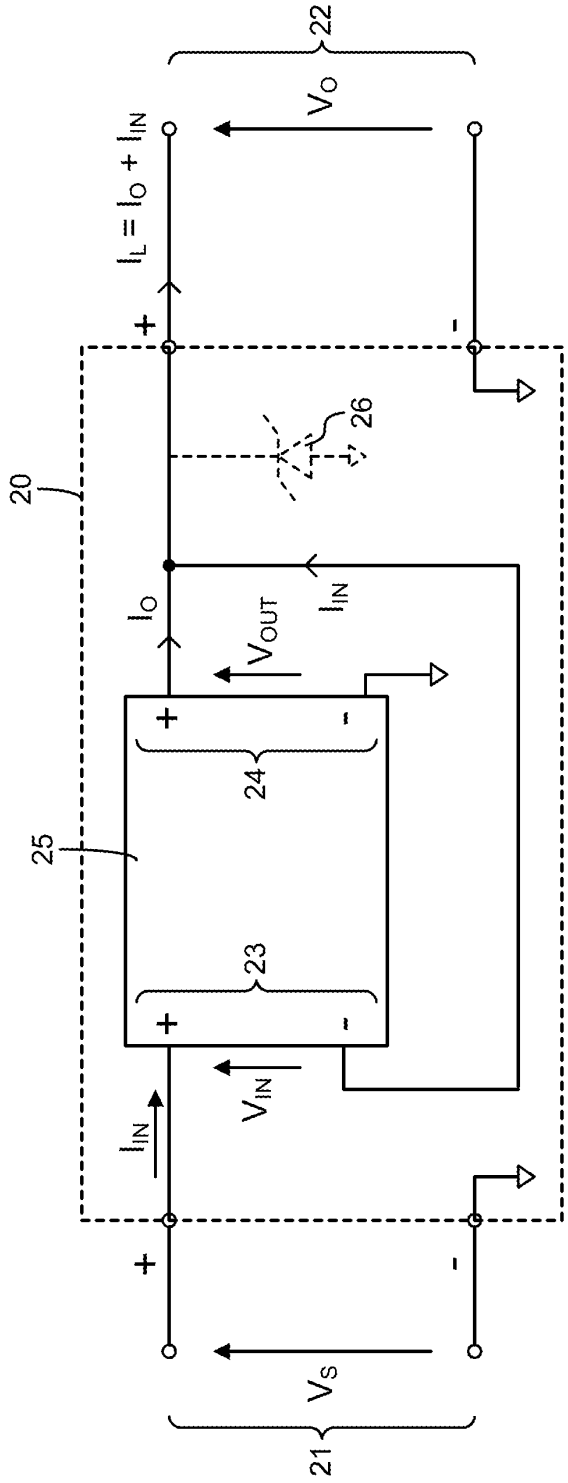


FIG. 2

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Page 36

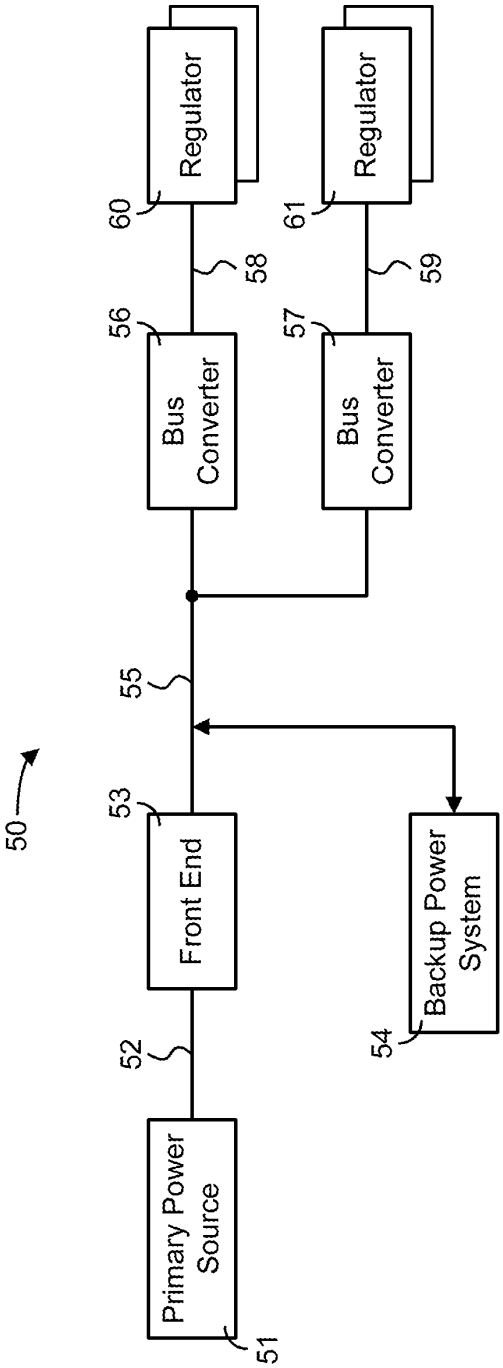


FIG. 3

DELTA ELECTRONICS EX. 1002
Page 37

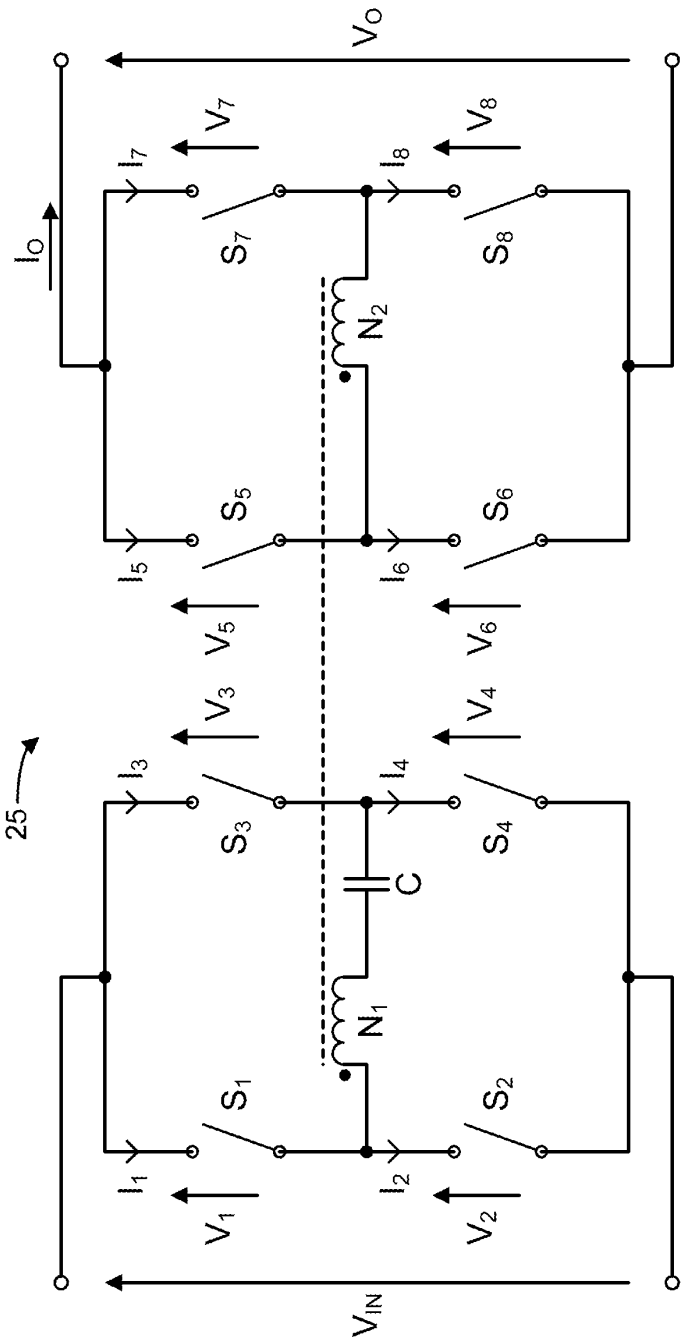


FIG. 4

DELTA ELECTRONICS EX. 1002
Page 38

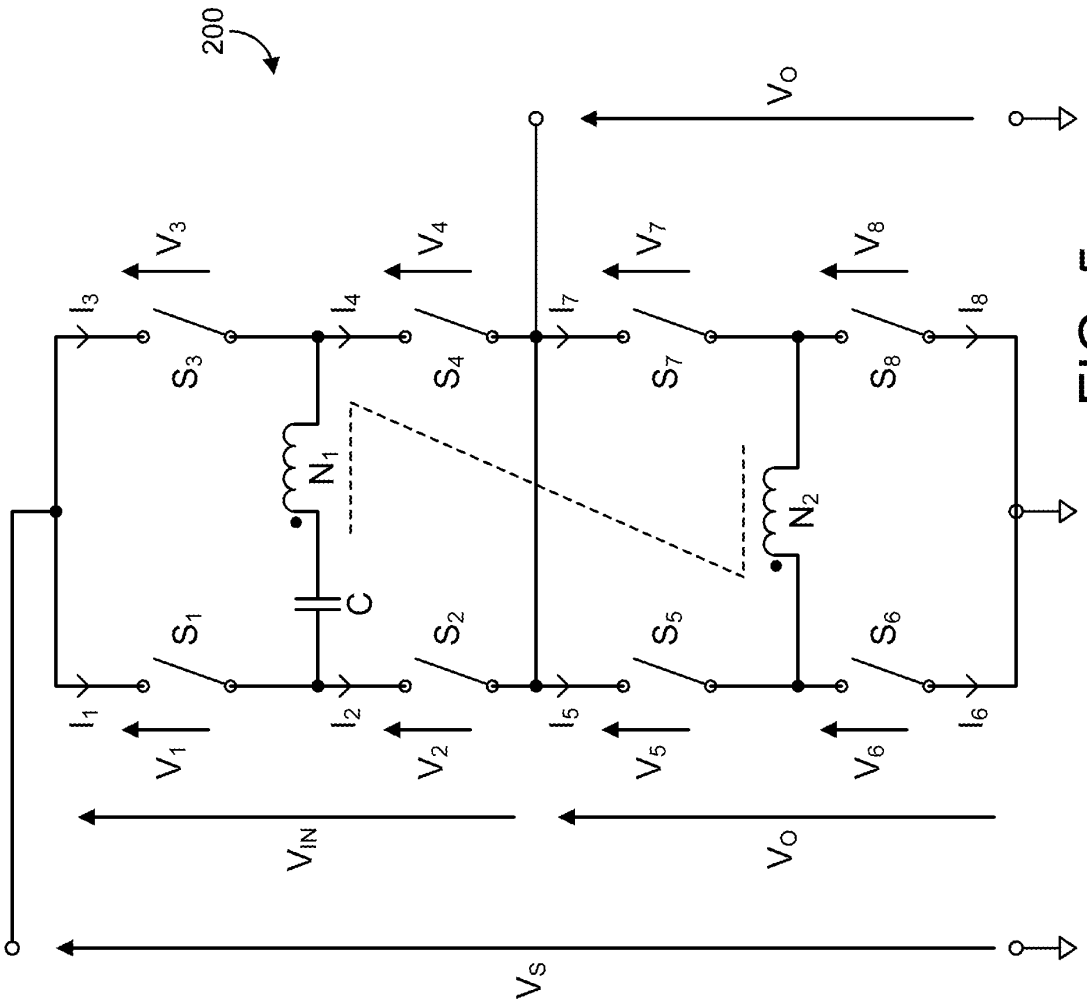


FIG. 5

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Page 39

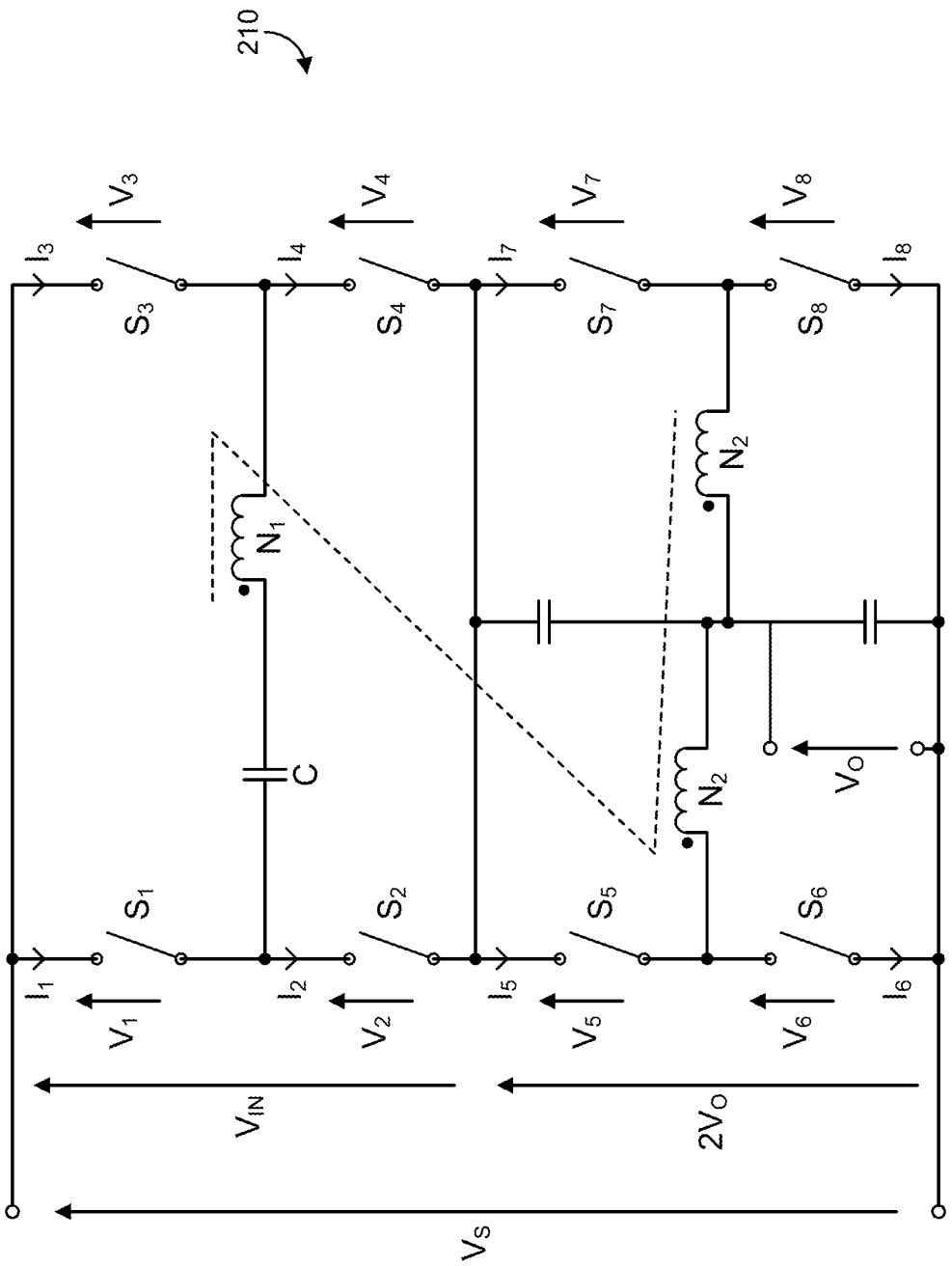


FIG. 6

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Page 40

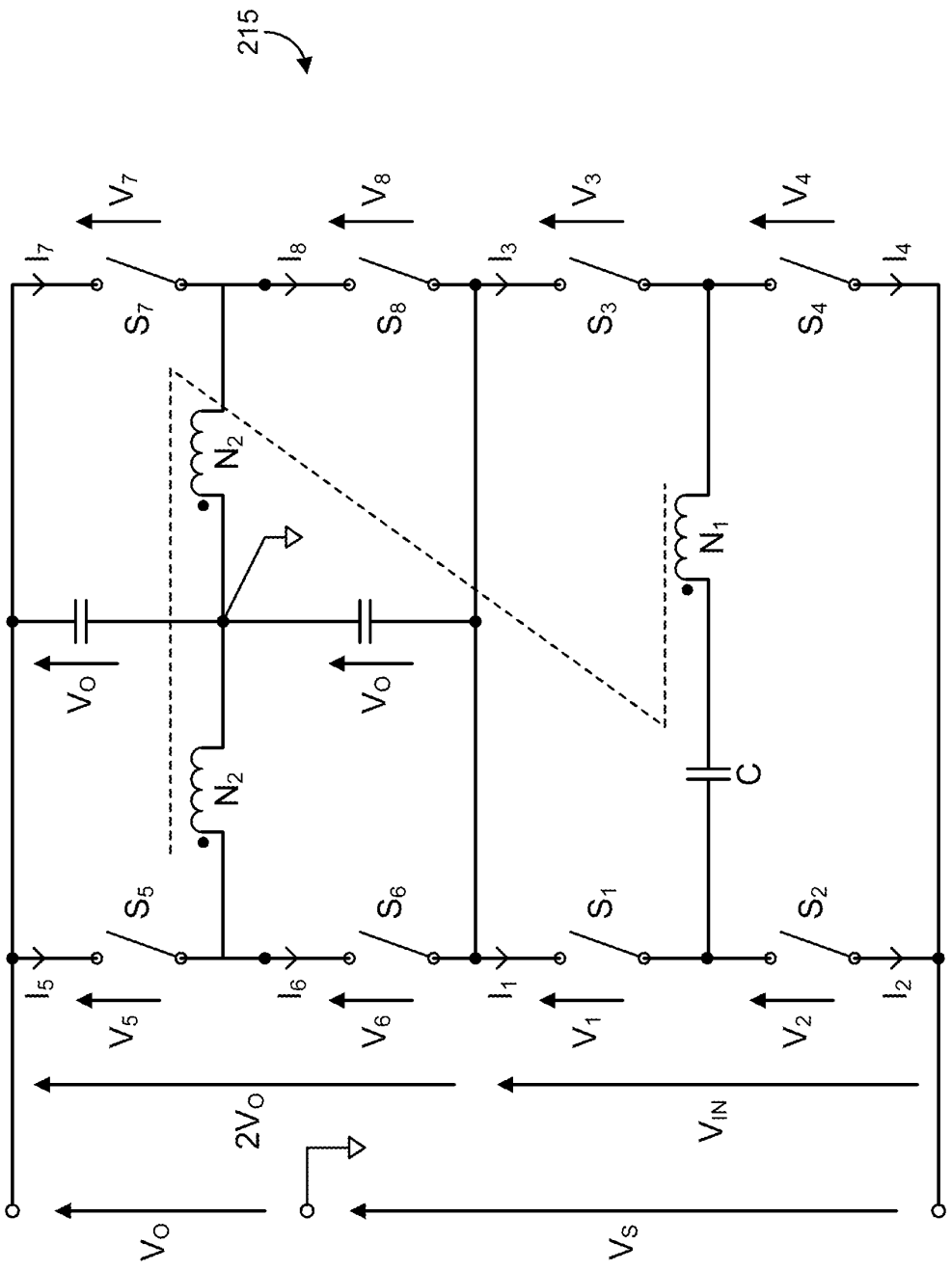


FIG. 7

DELTA ELECTRONICS EX. 1002
Page 41

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	VLT, Inc.
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	Unassigned
Filing Date:	Herewith
Examiner:	Unassigned
Art Unit:	Unassigned
Confirmation Number:	Unassigned

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicants respectfully request that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any

rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

CONCISE EXPLANATION OF RELEVANCE

The relevance of the listed documents is explained in the present specification.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), within three (3) months of the filing date of the application.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account No. 19-0741.

Respectfully submitted,

Date 2013-07-02 By _____

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (202) 295-4618
Facsimile: (202) 672-5399

Matthew A. Smith
Attorney for Applicant
Registration No. 49,003

PTO/SB/08 (09-06)
Approved for use through 03/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: July 2, 2013				**First Named Inventor**	Patrizio VINCIARELLI
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	1	of	1	Attorney Docket Number	092377-0123

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	6,930,893 B2	08-16-2005	Vinciarelli	
	A2	7,145,786 B2	12-05-2006	Vinciarelli	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] *(if known)*	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Matthew A. Smith
Attorney Docket Number:	092377-0123
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Claims in Excess of 20	1202	4	80	320
Independent claims in excess of 3	1201	1	420	420
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Late Filing Fee for Oath or Declaration	1051	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2480**

Electronic Acknowledgement Receipt	
EFS ID:	16213791
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Matthew A. Smith/Katie Newcomb
Filer Authorized By:	Matthew A. Smith
Attorney Docket Number:	092377-0123
Receipt Date:	02-JUL-2013
Filing Date:	
Time Stamp:	11:43:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$2480
RAM confirmation Number	10639
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		0123_transmittals.pdf	378928 225f3ebbc6ca4f33005187517f6e7c9439e77a8f	yes	10

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal of New Application	1	3
	Application Data Sheet	4	8
	Nonpublication request from applicant.	9	9
	Power of Attorney	10	10

Warnings:

Information:

2		0123_Spec.pdf	165635 ca6f0e7b5fa87d87eaac4c52438d0259fe39bd52	yes	24

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	16
	Claims	17	23
	Abstract	24	24

Warnings:

Information:

3	Drawings-only black and white line drawings	0123_Figures.pdf	400077 d597c6bee479b3efd7ba4cc874e9d4efdb6bf87c	no	7

Warnings:

Information:

4		0123_IDS.pdf	105286 095119bb1191722934cfdefceefb981ca8804654	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	40024 1bce862c36760e1747c714f1aa030c06a71791c9	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	1089950	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/933,252	07/02/2013	Patrizio VINCIARELLI	092377-0123

CONFIRMATION NO. 5889

112754
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

NOTICE

OC000000062782758

Date Mailed: 07/29/2013

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Patrizio VINCIARELLI
  Andrew D'Amico

  Applicant may submit the inventor's oath or declaration at any time before the Notice of Allowance and Fee(s) Due, PTOL-85, is mailed.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/933,252

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	24 minus 20 =	* 4			OR	x 80 =	320
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1				x 420 =	420
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2340

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/933,252	07/02/2013	2836	2480	092377-0123	24	4

CONFIRMATION NO. 5889

112754
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

FILING RECEIPT

OC000000062782757

Date Mailed: 07/29/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Patrizio VINCIARELLI, Boston, MA;
Andrew D'Amico, Andover, MA;

Applicant(s)

VLT, INC., Sunnyvale, CA

Power of Attorney: The patent practitioners associated with Customer Number 112754

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 07/24/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/933,252**
Projected Publication Date: Request for Non-Publication Acknowledged
Non-Publication Request: Yes
Early Publication Request: No

Title

POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

Preliminary Class

307

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/933,252	07/02/2013	Patrizio VINCIARELLI	092377-0123

CONFIRMATION NO. 5889

112754
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

POA ACCEPTANCE LETTER

OC000000062782873

Date Mailed: 07/29/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/02/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/bpham/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Atty. Dkt. No. 092377-0123

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: VLT, Inc.

Title: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

Appl. No.: 13/933,252

Filing Date: 7/2/2013

Examiner: Unassigned

Art Unit: 2836

Confirmation Number: 5889

TRANSMITTAL LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Attached are the following items in connection with the above-identified application:

1. Executed Inventor Declaration; and
2. Updated Application Data Sheet. The ADS has been marked up to include the application number, and an updated address for the inventor Andrew D'Amico.

Respectfully submitted,

Date July 31, 2013

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
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Brett P. Belden
Attorney for Applicant
Registration No. 57,705

PTO/AIA/08 (modified)

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

__ Declaration Submitted With Initial Filing

OR

_X_ Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f)) required)

Attorney Docket Number	092377-0123
First Named Inventor	Patrizio VINCIARELLI
COMPLETE IF KNOWN	
Application Number	13/933,252
Filing Date	July 2, 2013
Art Unit	
Examiner Name	

POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

(Title of the Invention)

As a below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application,

OR

☒ United States Application Number or PCT International application number 13/933,252 filed on July 2, 2013.

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

Authorization To Permit Access To Application by Participating Office

☒ If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the above-identified patent application is filed access to the above-identified patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the above-identified patent application is filed to have access to the above-identified patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the above-identified patent application with respect to: 1) the above-identified patent application-as-filed; 2) any foreign application to which the above-identified patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the above-identified patent application; and 3) any U.S. application-as-filed from which benefit is sought in the above-identified patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing the Authorization to Permit Access to Application by Participating Offices.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

DECLARATION — Utility or Design Patent Application

Docket Number: 092377-0123 Application No: 13/933,252

Direct all correspondence to:	☒ The address associated with Customer Number:	112754	OR ☐ Correspondence address below
Name			
Address			
City	State	Zip	
Country	Telephone	Email	

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. Petitioner/applicant is advised that documents which form the record of a patent application (such as the PTO/SB/01) are placed into the Privacy Act system of records DEPARTMENT OF COMMERCE, COMMERCE-PAT-7, System name: *Patent Application Files* . Documents not retained in an application file (such as the PTO-2038) are placed into the Privacy Act system of COMMERCE/PAT-TM-10, System name: *Deposit Accounts and Electronic Funds Transfer Profiles* .

LEGAL NAME OF SOLE OR FIRST INVENTOR:

(*E.g.*,Given Name (first and middle (if any)) and Family Name or Surname)

Patrizio VINCIARELLI

Inventor's Signature	Date (optional) July 11, 2013	
Residence: Boston	State: Massachusetts	Country: United States of America

Mailing Address

294 Beacon Street

City Boston	State MA	Zip 02116	Country United States of America

☒ Additional inventors are being named on the __1___ supplemental sheet(s) PTO/AIA/10 attached hereto

I51-3604-5332.1

PTO/AIA/10 (modified)

SUPPLEMENTAL SHEET FOR DECLARATION	ADDITIONAL INVENTOR(S) Supplemental Sheet (for PTO/AIA/08,09) Page __of__

Legal Name of Additional Joint Inventor, if any:			
(*E.g.*, Given Name (first and middle (if any)) and Family Name or Surname)			
Andrew D'AMICO			
Inventor's Signature		Date (optional) 7-11-2013	
Residence: City Marina del Rey	State: California	Country: United States of America	
Mailing Address 14004 Palawan Way, No. 211			
City Marina del Rey	State California	Zip 90292	Country United States of America

Legal Name of Additional Joint Inventor, if any:			
(*E.g.*, Given Name (first and middle (if any)) and Family Name or Surname)			
Inventor's Signature		Date (optional)	
Residence: City	State	Country	
Mailing Address			
City	State	Zip	Country

Legal Name of Additional Joint Inventor, if any:			
(*E.g.*, Given Name (first and middle (if any)) and Family Name or Surname)			
Inventor's Signature		Date (optional)	
Residence: City	State	Country	
Mailing Address			
City	State	Zip	Country

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Patrizio		VINCIARELLI	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Boston	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	294 Beacon Street		
Address 2			
City	Boston	State/Province	MA
Postal Code	02116	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Andrew		D'AMICO	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Marina Del Rey	Country of Residence	California

Mailing Address of Inventor:

Address 1	~~c/o Vicor Corp.~~ 14004 Palawan Way, No. 211		
Address 2	~~25 Frontage Road~~		
City	~~Andover~~ Marina Del Rey	State/Province	~~MA~~ CA
Postal Code	~~01810~~ 90292	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	112754		
Email Address	IPDocketing@foley.com	Add Email	Remove Email

Application Information:

Title of the Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER		
Attorney Docket Number	092377-0123	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☒ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	112754		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

○ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
◉ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	VLT, INC.

Mailing Address Information For Applicant:

Address 1	560 OAKMEAD PARKWAY		
Address 2			
City	SUNNYVALE	**State/Province**	CA
Country		Postal Code	94086
Phone Number		Fax Number	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

Email Address	

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/Brett P. Belden/			Date (YYYY-MM-DD)	2013-07-31
First Name	Brett	Last Name	Belden	Registration Number	57,705

Additional Signature may be generated within this form by selecting the Add button.

Electronic Acknowledgement Receipt

EFS ID:	16468046
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Katie Newcomb
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	092377-0123
Receipt Date:	31-JUL-2013
Filing Date:	02-JUL-2013
Time Stamp:	16:23:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	0123_transmittal_letter.pdf	81263 c3a3cdaa429ec753015ed648225739a71971a2a1	no	1

Warnings:	
Information:	

2	Oath or Declaration filed	0123_Declaration.pdf	330788 36dfab27da110a18eb7ffbb6b4f1fc23a39441da	no	3
Warnings:					
Information:					
3	Application Data Sheet	0123_updated_ADS.pdf	55340 cbc9e512d525758e7f0e1960029b0499b8501bbc	no	5
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
			Total Files Size (in bytes):	467391	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08 (09-06)
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Substitute for form 1449/PTO				*Complete if Known*	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: January 13, 2014				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio VINCIARELLI
(use as many sheets as necessary)				Art Unit	2836
				Examiner Name	Unassigned
Sheet	1	of	2	Attorney Docket Number	092377-0123

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	5,377,090	12-27-1994	Steigerwald	
	A2	5,274,539	12-28-1993	Steigerwald	
	A3	5,999,417	12-07-1999	Schlecht	
	A4	4,586,119	04-29-1986	Sutton	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A5	JP 2004-254393	09-09-2004	TDK Corporation		✓
	A6	JP H5-64446	03-12-1993	Yamaha Corporation		✓

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A7	COBOS, J.A. et al. "Low Output Voltage DC/DC Conversion". 1994 IEEE, pp. 1676-1681.	
	A8	PRESSMAN, A. "Switching and Linear Power Supply, Power Converter Design". Hayden Book Company: Rochelle Park, New Jersey, 1977.	
	A9	JOVANOVIC, M. et al. "Distributed Power Systems – Benefits and Challenges". Int. J. Electronics, Vol 77 No. 5, 1994, pp. 601-612.	
	A10	KASSAKIAN, J.G. et al. "Principles of Power Electronics". Addison-Wesley Publishing Company: Reading, MA, 1991.	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP . if possible. and . The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by . This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**.

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4849-4640-3095.1

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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: January 13, 2014				**First Named Inventor**	Patrizio VINCIARELLI
				Art Unit	2836
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	2	of	2	Attorney Docket Number	092377-0123

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A11	COBOS, J.A. et al. "Study of the Applicability of Self-Driven Synchronous Rectification to Resonant Topologies". 1992 IEEE, pp. 933-940.	
	A12	KASSAKIAN, J.G. et al. "High-Frequency High-Density Converters for Distributed Power Supply Systems". Proceedings of the IEEE, Vol. 76 No. 4, April 1988, pp. 362-376.	
	A13	UCEDA, J. et al. "Supplying Power at Low Voltage (3.3V)". 1995 IEEE, pp. 244-251.	
	A14	JI, H.K. et al. "Active Clamp Forward Converter with MOSFET Synchronous Rectification". 1994 IEEE, pp. 895-901.	
	A15	de la CRUZ, E. et al. "Analysis of Suitable PWM Topologies to Meet Very High Efficienty Requirements for On Board DC/DC Converters in Future Telecom Systems". DC/DC Converters: Distributed Power, pp. 207-214.	
	A16	Trial Testimony Transcript of December 14, 2010, AM Session, *SynQor, Inc. v. Artesyn Technologies, et al.*, Case No. 2:07-CV-479 (51 pages).	
	A17	NARVESON, B. "What is the Right Bus Voltage?" IEEE, 1988, pp. 883-888.	
	A18	"BusQor Series". SynQor website, 14 August 2002, retrieved from http://web.archive.org/web/20020814221649/ http://www.synqor.com/products/busqor_qb.html (2 pages).	
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Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP . if possible. and . The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by . This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

4849-4640-3095.1

Electronic Acknowledgement Receipt

EFS ID:	17892635
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	John D. Lanza/Katie Newcomb
Filer Authorized By:	John D. Lanza
Attorney Docket Number:	092377-0123
Receipt Date:	13-JAN-2014
Filing Date:	02-JUL-2013
Time Stamp:	13:18:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	0123_IDS.pdf	103696 0c6363556dac8dbebd76e16d0c03ac980e9e6ee6	no	2

Warnings:

Information:

2	Information Disclosure Statement (IDS) Form (SB08)	0123_SB08.pdf	114611 43d39088f9e445f46ded9157048b5f43b919ba8f	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	A5.pdf	1766629 da1a9cd3aedaa3ec41f1ecdc703a3d10cd19522c	no	43
Warnings:					
Information:					
4	Foreign Reference	A6.pdf	1074294 1bf2f733200214e72b02c04baa1812c8678e4854	no	17
Warnings:					
Information:					
5	Non Patent Literature	A7.pdf	458875 95b30c9579a0aa1da4b06fa1d7bdd9a2c21c54ad	no	6
Warnings:					
Information:					
6	Non Patent Literature	A8.pdf	17463973 596a28f11c172d36926ca60b444dbce365156e32	no	391
Warnings:					
Information:					
7	Non Patent Literature	A9.pdf	473644 e79734368fa0436530e5748f64fb6bd7c9303cf8	no	12
Warnings:					
Information:					
8	Non Patent Literature	A10.pdf	2007920 d60268fe4111c9362508e3a3741b753d53e355d4	no	8
Warnings:					
Information:					
9	Non Patent Literature	A11.pdf	1098334 67688d7e4259205ec69aa5cc07059b36d5aebfd9	no	8
Warnings:					
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10	Non Patent Literature	A12.pdf	1232972 36aa5618137f9c7b55ed9fa781169b28c2817c4a	no	15

Warnings:					
Information:					
11	Non Patent Literature	A13.pdf	548840 52d1e71dc3182e3a79a0723e6c69087b792582ac	no	8
Warnings:					
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12	Non Patent Literature	A14.pdf	401276 3aaa2fd7cc5b4ae9b90f57c0c19864dc1a59abf8	no	9
Warnings:					
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13	Non Patent Literature	A15.pdf	436661 099fe5d997b1cd698e4422c57dbfffd4f2b19672	no	8
Warnings:					
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14	Non Patent Literature	A16.pdf	245059 3c671987d72438b50e2ed5a7785ef6ef4f6f5aba	no	51
Warnings:					
Information:					
15	Non Patent Literature	A17.pdf	457919 1758f3bfbff43bc9bfa14f4d1f9fb1bb0be293ec	no	6
Warnings:					
Information:					
16	Non Patent Literature	A18.pdf	84105 54ad197efbaa264da326d20c3dc92c725cebb249	no	2
Warnings:					
Information:					
17	Non Patent Literature	A19.pdf	113844 fe1cd9d0eb281763f3ef7399d8bf2344199f228d	no	3
Warnings:					
Information:					
18	Non Patent Literature	A20.pdf	333085 da2f868c2f78927c4bccc0ac02798c10f8ba0b5b	no	39
Warnings:					
Information:					
19	Non Patent Literature	A21.pdf	1920226 120237fdf2ca7bdca1c80c80b544e7e9be30dc50	no	35

Warnings:					
Information:					
20	Non Patent Literature	A22.pdf	82715 6221ed234da60c84b20bdaffc76af40146b1dad0	no	9
Warnings:					
Information:					
21	Non Patent Literature	A23.pdf	77638 5fa12bd41b05a5df479293d4c740c7344cdf8fc0	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	30496316		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio VINCIARELLI
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Unassigned
Art Unit:	2836
Confirmation Number:	5889

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicants respectfully request that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

CONCISE EXPLANATION OF RELEVANCE

Applicant directs the Examiner's attention to the following related United States reexamination proceedings:

Serial No.	Filing Date
95/001,637	05/31/2011
95/001,702	09/08/2011
95/001,853	12/14/2011
95/001,861	12/21/2011

An English translation is provided for foreign language documents A5-A6.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), before the mailing date of the first Office Action on the merits.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account No. 19-0741.

Respectfully submitted,

Date January 13, 2014

By: /John D. Lanza/

FOLEY & LARDNER LLP
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John D. Lanza
Attorney for Applicant
Registration No. 40,060

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 05/11/2016

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
05/11/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

Office Action Summary	Application No. 13/933,252	Applicant(s) VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/2/13*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-24* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-24* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *7/2/13* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *1/3/14, 7/2/13*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

Claims 1-4, 6, 8-12, 14, 16-20, 22-24 are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Farrington et al (US 20080211304).

Regarding claim 1, Farrington et al discloses an apparatus comprising:

a power distribution system (Fig. 1) comprising a source for providing power at a DC source voltage Vs (101);

a bus converter (102) comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, KDC, at an output current, wherein an input voltage Vly is applied to the input circuit and an output voltage Voux is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as KDC = VOUT / VIN;

a power distribution bus (lines) connected to distribute power from the output circuit(103) of the bus converter at the output voltage VOUT; and

a plurality of regulators (105), wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the

bus converter and a regulator output connected to supply power to a respective load (intended), the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter (Fig 2) and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage VIN applied to the input circuit is approximately equal to the absolute value of the DC source voltage Vs minus a number N times the absolute value of the output voltage VOUT, where N is at least 1 (it is noted that the functional feature/limitation is inherently present in the circuit because the prior art shows structurally identical as recited in the claim).

Regarding claim 9, Farrington et al discloses an apparatus comprising:

a power converter (102) comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage Vs (101), the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, KDC, at an output current, wherein an input voltage VIN is applied to the input circuit and an output voltage VOUT is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as KDC = VOUT / VIN, wherein the power converter further comprises:

a series connection (Fig 2) between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such

that an absolute value of the input voltage Vly applied to the input circuit is approximately equal to the absolute value of the DC source voltage Vs minus a number N times the absolute value of the output voltage VOUT, where N is at least 1 (it is noted that the functional feature/limitation is inherently present in the circuit because the prior art shows structurally identical as recited in the claim).

Regarding claim 16, Farrington et al discloses an apparatus comprising:

a bus converter (102) comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage Vs, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, KDC, at an output current, wherein an input voltage VIN is applied to the input circuit and an output voltage Vout is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as KDC = VOUT / VIN;

a power distribution bus (lines) connected to distribute power from the output circuit of the bus converter (102) at the output voltage Vout; and

a plurality of regulators (105), wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load (intended), the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series (Fig 2) across the source (101) such that an absolute value of the input voltage VIN applied to the input circuit is approximately equal to the absolute value of the DC source voltage Vs minus a number N times the absolute value of the output voltage Vout, where N is at least 1 (it is noted that the functional feature/limitation is inherently present in the circuit because the prior art shows structurally identical as recited in the claim).

Regarding claims 22-23, Farrington et al discloses an apparatus (Fig 1-3) comprising:

an intermediate bus architecture power distribution system (Title) for a telecommunications system comprising a source for providing power at a DC source voltage;

a circuit board (Fig 1) comprising a bus converter (102), the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding (209), the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding (210, 211), wherein the primary and secondary transformer windings are galvanically connected in series (Fig 2), and wherein the bus converter is configured to provide power to a power distribution bus (lines) that is not galvanically isolated from the source; and

the circuit board (Fig 1) further comprising a plurality of regulators (105), wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output

connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, KDC, at an output current, wherein an input voltage VIN is applied to the input circuit and an output voltage VOUT is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as KDC = VOUT / VIN; and wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage VIN applied to the input circuit is approximately equal to the absolute value of the DC source voltage Vs minus a number N times the absolute value of the output voltage VOUT, where N is at least 1 (it is noted that the functional feature/limitation is inherently present in the circuit because the prior art shows structurally identical as recited in the claim).

Regarding claims 2, 10, 17, Fig. 2 shows full-bridge circuit.

Regarding claims 3, 11, 18, Fig 2 shows center-tap output circuit 209, 210, 211).

Regarding claims 4, 12, 20, Fig. 2 shows the second polarity being opposite the first polarity.

Regarding claims 6, 14, 19, 24, Fig. 2 shows a bus converter being a self-contained assembly.

Regarding claim 8, Fig. 2 show a claim circuit (207, 208 prevent the output voltage from exceeding a predetermined level).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 7, 13, 15, and 21, rejected under 35 U.S.C. 103 as being unpatentable over Farrington et al.

Regarding claims 5, 13, 21, a resonant circuit, not shown in Farrington et al is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use such circuit for a mere substitution of art recognized equivalency.

Regarding claims 7, 15, it is intended that power supply circuit elements are in a circuit board and supply power to an integrated circuit in a telecommunications application.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH CHANG whose telephone number is (571)272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

Notice of References Cited	Application/Control No. 13/933,252	Applicant(s)/Patent Under Reexamination VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2008/0211304 A1	09-2008	Farrington; Richard W.	H02M3/33592	307/31
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

CPC- SEARCHED		
Symbol	Date	Examiner
M02M3/33576; H02M3/33561	5/4/16	JC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	82	5/4/16	JC

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History attached	5/4/16	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

1449/SB/08 (09-06)

Approved for use through 03/31/2007. OMB 0651-0031
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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	Unassigned
				Filing Date	Herewith
Date Submitted: July 2, 2013				**First Named Inventor**	Patrizio VINCIARELLI
				Art Unit	Unassigned
(use as many sheets as necessary)				Examiner Name	Unassigned
Sheet	1	of	1	Attorney Docket Number	092377-0123

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	6,930,893 B2	08-16-2005	Vinciarelli	
	A2	7,145,786 B2	12-05-2006	Vinciarelli	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] *(if known)*	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

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Examiner Signature	/JOSEPH CHANG/	Date Considered	04/29/2016

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4852-2688-5140.1

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	8	distance bus adj converter	US-PGPUB; USPAT	SAME	OFF	2016/04/29 13:49
L5	963	bus adj converter	US-PGPUB; USPAT	AND	ON	2016/04/29 13:52
L6	76	transformer galvanic$3 near4 series	US-PGPUB; USPAT	AND	ON	2016/04/29 13:54
L7	0	5 and 6	US-PGPUB; USPAT	AND	ON	2016/04/29 13:54
L8	325	bus adj converter and transformer	US-PGPUB; USPAT	AND	ON	2016/04/29 14:27
L9	155	bus adj converter and transformer and regulator	US-PGPUB; USPAT	AND	ON	2016/04/29 14:36
L10	598	H02M3/33576.cpc.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:20
L11	853	H02M3/33561.cpc.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:22
L12	173	(vinciarelli near patrizio).in.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:37
L13	5	(d'amico near andrew).in.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:52
L14	1	"5999417".pn.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:54
L15	1	"7050309".pn.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:56
S1	2	(("6930893") or ("7145786")).PN.	USPAT; USOCR	OR	OFF	2016/04/29 09:38
S2	4	(("5377090") or ("5274539") or ("5999417") or ("4586119")).PN.	USPAT; USOCR	OR	OFF	2016/04/29 09:54
S3	1087	307/82.ccls.	US-PGPUB; USPAT	OR	OFF	2016/04/29 10:12

4/29/2016 4:10:50 PM
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CONFIRMATION NO. 5889

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/933,252	07/02/2013	307	2842	111664-0123 (VA1078)

APPLICANTS
VLT, INC., Sunnyvale, CA

INVENTORS
Patrizio VINCIARELLI, Boston, MA;
Andrew D'Amico, Andover, MA;

**** CONTINUING DATA ***************************

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
07/24/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☐ No Verified and Acknowledged /JOSEPH CHANG/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		MA	7	24	4

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UNITED STATES

TITLE
POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: January 13, 2014				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio VINCIARELLI
(use as many sheets as necessary)				Art Unit	2836
				Examiner Name	Unassigned
Sheet	1	of	2	Attorney Docket Number	092377-0123

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	5,377,090	12-27-1994	Steigerwald	
	A2	5,274,539	12-28-1993	Steigerwald	
	A3	5,999,417	12-07-1999	Schlecht	
	A4	4,586,119	04-29-1986	Sutton	

UNPUBLISHED U.S. PATENT APPLICATION DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Application Document Serial Number-Kind Code[2] (*if known*)	Filing Date of Cited Document MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	A5	JP 2004-254393	09-09-2004	TDK Corporation		✓
	A6	JP H5-64446	03-12-1993	Yamaha Corporation		✓

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A7	COBOS, J.A. et al. "Low Output Voltage DC/DC Conversion". 1994 IEEE, pp. 1676-1681.	
	A8	PRESSMAN, A. "Switching and Linear Power Supply, Power Converter Design". Hayden Book Company: Rochelle Park, New Jersey, 1977.	
	A9	JOVANOVIC, M. et al. "Distributed Power Systems – Benefits and Challenges". Int. J. Electronics, Vol 77 No. 5, 1994, pp. 601-612.	
	A10	KASSAKIAN, J.G. et al. "Principles of Power Electronics". Addison-Wesley Publishing Company: Reading, MA, 1991.	

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Date Submitted: January 13, 2014

(use as many sheets as necessary)

Sheet 2 of 2

Complete if Known	
Application Number	13/933,252
Filing Date	7/2/2013
First Named Inventor	Patrizio VINCIARELLI
Art Unit	2836
Examiner Name	Unassigned
Attorney Docket Number	092377-0123

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A11	COBOS, J.A. et al. "Study of the Applicability of Self-Driven Synchronous Rectification to Resonant Topologies". 1992 IEEE, pp. 933-940.	
	A12	KASSAKIAN, J.G. et al. "High-Frequency High-Density Converters for Distributed Power Supply Systems". Proceedings of the IEEE, Vol. 76 No. 4, April 1988, pp. 362-376.	
	A13	UCEDA, J. et al. "Supplying Power at Low Voltage (3.3V)". 1995 IEEE, pp. 244-251.	
	A14	JI, H.K. et al. "Active Clamp Forward Converter with MOSFET Synchronous Rectification". 1994 IEEE, pp. 895-901.	
	A15	de la CRUZ, E. et al. "Analysis of Suitable PWM Topologies to Meet Very High Efficienty Requirements for On Board DC/DC Converters in Future Telecom Systems". DC/DC Converters: Distributed Power, pp. 207-214.	
	A16	Trial Testimony Transcript of December 14, 2010, AM Session, *SynQor, Inc. v. Artesyn Technologies, et al.*, Case No. 2:07-CV-479 (51 pages).	
	A17	NARVESON, B. "What is the Right Bus Voltage?" IEEE, 1988, pp. 883-888.	
	A18	"BusQor Series". SynQor website, 14 August 2002, retrieved from http://web.archive.org/web/20020814221649/ http://www.synqor.com/products/busqor_qb.html (2 pages).	
	A19	"Specifications". SynQor website, 30 April 2001, retrieved from http://web.archive.org/web/20010430163217/http://www.synqor.com/synqor/synqor.nsf/Content/852566E9:007C0DA6 (3 pages.)	
	A20	*Tokai Corp. v. Eastern Enterprises, Inc.*, 632 F.3d 1358, 1369 (Fed. Cir. 2011). 31 January 2011, 39 pages.	
	A21	SCHLECT, M. "The Fundamentals of Switching Regulators and Their Control Circuits". 27 August 1998 (35 pages.)	
	A22	"Technology Overview". SynQor website, 8 February 2002, retrieved from http://web.archive.org/web/20020208055450/http://www.synqor.com/products/2_2_tech_overview.html (9 pages.)	
	A23	"TI Unveils Next-Generation Point-of-Load Power Modules with Ultra-Fast Transient Response". Texas Instruments News Center website, 7 November 2005, retrieved from http://newscenter.ti.com/Blogs/newsroom/archive/2005/11/07/ti-unveils-next-generation-point-of-load-power-modules-with-ultra-fast-transient-response-sc05226.aspx (2 pages.)	

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4849-4640-8005.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/04/2016								
	1	✓								
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Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

2. (Original) The apparatus of claim 1, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of

turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

3. (Original) The apparatus of claim 1, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to approximately 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

4. (Original) The apparatus of claim 1, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

5. (Original) The apparatus of claim 1, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

6. (Original) The apparatus of claim 1, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

7. (Original) The apparatus of claim 1, further comprising a circuit board, wherein the bus converter and at least one regulator are assembled to the circuit board, and the regulator is configured to supply power to an integrated circuit in a telecommunications application.

8. (Original) The apparatus of claim 1, further comprising a clamp circuit connected to prevent the output voltage, V_{OUT}, from exceeding a predetermined level.

9. (Original) An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$, wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

10. (Original) The apparatus of claim 9, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

11. (Original) The apparatus of claim 9, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is approximately equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

12. (Original) The apparatus of claim 9, wherein the power converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

13. (Original) The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. (Original) The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

15. (Original) The apparatus of claim 9, further comprising a circuit board, and wherein the power converter is configured to supply power to a plurality of regulators over a power distribution bus, the regulators disposed at a distance to the power converter, and wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit in a telecommunications application.

16. (Original) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

17. (Original) The apparatus of claim 16, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

18. (Original) The apparatus of claim 16, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same

number of turns, and wherein N is equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

19. (Original) The apparatus of claim 16, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

20. (Original) The apparatus of claim 16, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, wherein the first polarity is opposite the second polarity.

21. (Original) The apparatus of claim 16, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

22. (Original) An apparatus comprising:

an intermediate bus architecture power distribution system for a telecommunications system comprising a source for providing power at a DC source voltage;

a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series,

and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and

the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

23. (Original) The apparatus of claim 22, wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

24. (Original) The apparatus of claim 22, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the following remarks.

Status of Claims

Claims 1–24 remain pending in this application. Applicant respectfully requests reconsideration of these claims in light of the following remarks.

Rejections Under 35 U.S.C. § 102

Claims 1–4, 6, 8–12, 14, 16–20 and 22–24 were rejected under 35 U.S.C. § 102(a)(1) as allegedly being anticipated by U.S. Patent Publication No. 2008/0211304 ("Farrington"). In order for a claim to be anticipated under 35 U.S.C. § 102(b), a single prior art reference must show all of the recited limitations arranged or combined in the same way as recited in the claim. *Net Money, Inc v. Verisign, Inc.,* 545 F.3d 1359, 1369 (Fed. Cir. 2008). Accordingly, Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter.

Independent Claim 1

Applicants respectfully submit that Claim 1 is not anticipated by Farrington, as Farrington fails to disclose each and every element, as claimed. Specifically, Farrington does not disclose "wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1."

First, Farrington does not disclose an "input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source."

(Emphasis added). In support of the current rejection, the Office Action refers only to FIG. 2 in general to show a disclosure of the above element. However, the output circuit of Farrington (including secondary windings 210 and 211), is not connected in series across the source 101, either in part or in whole. Nor is the output circuit of Farrington connected in series with the input circuit (shown to include primary winding 209). Rather, the output circuit of Farrington is galvanically isolated from the source V_S, as the input circuit is connected to the output circuit via magnetic coupling between the primary winding 209 and the secondary windings 210 and 211 of the isolation transformer. *See Farrington,* paragraph [0029] and FIG. 2. This galvanic isolation via the isolation transformer clearly illustrates that no portion of the output circuit is "connected in series across the source," as claimed. Accordingly, Claim 1 is not anticipated by Farrington, as Farrington fails to disclose each and every element of the claim.

Additionally, the Office Action appears to indicate that the above element of "wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1," is inherent in Farrington, stating that "it is noted that the functional feature/limitation is inherently present in the circuit because the prior art shows structurally identical as recited in claim." Office Action p. 3. Applicant respectfully disagrees. First, as described above, Farrington is not "structurally identical" to Claim 1, as Farrington does not disclose an "input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source."

Second, the above element is, in fact, structural, as it recites a structural configuration of the bus converter, and is therefore not purely functional as claimed in the Office Action. Thus, the Office Action is required to show a disclosure of the above structural element in the rejection. Per MPEP 2114, the disclosure of functional limitations is not required only if the functions are found to be inherent in the prior art disclosure. However, in this matter, the

elements described above are not functional, but rather structural. Further, the Office is required to provide "'a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flow from the teachings of the applied prior art.' *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)." *MPEP* 2112(IV) (emphasis in original). Nothing in Farrington discloses or teaches an "input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1." Furthermore, the Office Action has provided no showing that the above elements would necessarily flow from the teachings of the applied art, as required in an inherency rejection. Moreover, Applicants assert that there is no factual basis that would show that the above element would necessarily flow from the teachings of Farrington, as not only does Farrington not disclose a structural similarity to the apparatus recited in Claim 1, but there is no factual or technical reasoning that would support the assertion that Farrington inherently discloses the element of "wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1." Therefore, Claim 1 is further allowable as Farrington fails to disclose each and every element of the claim, either explicitly or inherently.

In light of the above, Applicants respectfully request withdrawal of the pending rejection of Claim 1 and all claims that depend therefrom.

Independent Claim 9

Independent Claim 9 recites similar subject matter to that disclosed in Claim 1. Accordingly, Applicants respectfully submit that Claim 9 is not anticipated by Farrington for at

least those reasons presented above in regards to Claim 1, and request withdrawal of the pending rejection under 35 U.S.C. § 102.

Independent Claim 16

Independent Claim 16 recites similar subject matter to that disclosed in Claim 1. Accordingly, Applicants respectfully submit that Claim 16 is not anticipated by Farrington for at least those reasons presented above in regards to Claim 1, and request withdrawal of the pending rejection under 35 U.S.C. § 102.

Independent Claim 22

Claim 22 is not anticipated by Farrington, as Farrington fails to teach each and every element of the Claim. Specifically, Farrington does not disclose "the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer winding are galvanically connected series, and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source."

The Office Action, on page 5, states that the primary transformer winding (209) is "galvanically connected in series" with the secondary transformer winding (210, 211) of the isolation transformer, relying only on a reference to FIG. 2 of Farrington for support. However, the primary winding (209) and the secondary winding (210, 211) of Farrington are clearly not galvanically connected in series, as they are galvanically isolated from each other as shown in FIG. 2. There is nothing in either the figures or the specification of Farrington that shows that the primary and secondary windings are coupled in series at all, as described above in regards to Claim 1. Further, there is no disclosure that the primary and secondary windings are galvanically connected in any form at all.

Moreover, Claim 22 recites that the "bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source." (Emphasis added). In contrast, Farrington discloses a system wherein the output is galvanically isolated from the source, via the galvanic isolation between the primary winding (209) and the secondary windings (210, 211) of the isolation transformer. *See* Farrington, paragraph [0029]. Thus, Farrington cannot anticipate Claim 22, as Farrington fails to disclose each and every element of the Claim.

In light of the above, Applicants respectfully request withdrawal of the pending rejection of Claim 1 and all claims that depend therefrom.

Dependent Claims 2–4, 8, 10–12, 14, 17–20, and 22–24

Dependent Claims 2–4 and 8 depend from Claim 1, and should therefore be allowable at least due to the chain of dependency. Claims 10–12, and 14 depend from Claim 9, and should also therefore be allowable at least due to the chain of dependency. Claims 17–20 depend from Claim 16 and should therefore be allowable at least due to the chain of dependency. Finally, Claims 23–24 depend from Claim 22, and should also be allowable, at least due to the chain of dependency.

Rejections Under 35 U.S.C. § 103

Claims 5, 7, 13, 15 and 21 were rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Farrington. Claims 5 and 7 depend from Claim 1, and should therefore be allowable, at least due to the chain of dependency. Claims 13 and 15 depend from Claim 9 and should be allowable, at least due to the chain of dependency. Finally, Claim 21 depends from Claim 16, and should be allowable, at least due to the chain of dependency.

Concluding Remarks

Applicant believes that the application is in condition for allowance. Favorable reconsideration is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance prosecution.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application, or credit any overpayment, to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date August 4, 2016

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
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Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

Electronic Acknowledgement Receipt

EFS ID:	26551673
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	04-AUG-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:25:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response.pdf	177284 1be0230fa5d84e3d9f40d643d480d5efd4b20efb	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Amendment Copy Claims/Response to Suggested Claims	2	8
	Applicant Arguments/Remarks Made in an Amendment	9	14
Warnings:			
Information:			
	Total Files Size (in bytes):	177284	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

REPLY UNDER 37 C.F.R. § 1.111

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This communication is responsive to the non-final Office Action mailed May 11, 2016, concerning the above-referenced patent application.

Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 9 of this document.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/933,252	Filing Date 07/02/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **08/04/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 24	Minus	** 24	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/SHARON HARRIS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

112754 7590 09/13/2016

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER
CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 09/13/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/13/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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Page 109

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 09/13/2016
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/13/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
❑ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 09/13/2016

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 09/13/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice Requiring Inventor's Oath or Declaration	Application No. 13/933,252	Applicant(s) Patrizio VINCIARELLI	
	Examiner CHANG, JOSEPH	Art Unit 2842	

This notice is an attachment to the Notice of Allowability (PTOL-37), or the Notice of Allowability For A Design Application (PTOL-37D).

An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor has not yet been submitted.

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor (for any inventor for which a compliant oath, declaration, or substitute statement has not yet been submitted) MUST be filed no later than the date on which the issue fee is paid. See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application.

A properly executed inventor's oath to declaration has not been received for the following inventor(s):

If applicant previously filed one or more oaths, declarations, or substitute statements, applicant may have received an informational notice regarding deficiencies therein.

The following deficiencies are noted:

INFORMAL ACTION PROBLEMS

- A properly executed inventor's oath or declaration has not been received for the following inventor(s): **Patrizio VINCIARELLI** and **Andrew D'Amico**.
  Applicant may submit the inventor's oath or declaration at any time before the Notice of Allowance and Fee(s) Due, PTOL-85, is mailed.

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/933,252	Applicant(s) VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the remarks of 8/4/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-24*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

CPC- SEARCHED		
Symbol	Date	Examiner
M02M3/33576; H02M3/33561	5/4/16	JC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	82	5/4/16	JC

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History attached	5/4/16	JC
updated	9/2/16	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUB text search - Sep. 2, 2016 see interference search printout	9/2/16	JC

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	(bus and converter and power and distribution and voltage adj transformation adj ratio and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:27
L2	2	(bus and converter and power and distribution and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:27
L3	7	(converter and power and distribution and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:28

9/2/2016 1:28:46 PM
C:\Users\jchang3\Documents\EAST\Workspaces\13933252.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

CPC						
Symbol					**Type**	**Version**
H02M		3	/	33576	F	2013-01-01
H02M		3	/	33561	I	2013-01-01
			/			
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			/			

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	09/02/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No. 20160902

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	82	H	0	2	M	3 / 335 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											
307	31											

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	09/02/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	09/02/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

REQUEST FOR CORRECTED FILING RECEIPT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attn: Appl. Processing Division, Customer Correction Branch

Commissioner:

Attached is a copy of the official Filing Receipt received from the PTO in the above-referenced application.

There is an error with respect to the inventors' names. The names should read:

Patrizio Vinciarelli, Boston, MA;

Andrew D'Amico, Marina Del Rey, CA

Applicants previously submitted a marked-up Application Data Sheet showing the change to inventor D'Amico's residence on July 31, 2013 (copy enclosed). Issuance of a corrected Filing Receipt is respectfully requested.

Respectfully submitted,

Date: 9/21/2016

By: /Kenneth S. Brooks/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 297-4964
Facsimile: (414) 297-4900

Kenneth S. Brooks
Attorney for Applicant
Registration No. 73,613

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/933,252	07/02/2013	2836	2480	092377-0123	24	4

CONFIRMATION NO. 5889

112754
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

FILING RECEIPT



Date Mailed: 07/29/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Patrizio VINCIARELLI, Boston, MA;
Andrew D'Amico, ~~Andover, MA;~~ Marina Del Rey, CA

Applicant(s)

VLT, INC., Sunnyvale, CA

Power of Attorney: The patent practitioners associated with Customer Number 112754

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 07/24/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/933,252**
Projected Publication Date: Request for Non-Publication Acknowledged
Non-Publication Request: Yes
Early Publication Request: No

Title

POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

Preliminary Class

307

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Electronic Acknowledgement Receipt

EFS ID:	26995658
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Kenneth S. Brooks/Jennifer Robins
Filer Authorized By:	Kenneth S. Brooks
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	21-SEP-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:59:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	111664-0123_Marked_Up_ADS.pdf	236010 f9da3672adcbb6046ee30a28fe4a6aa95bbfcffd	no	5

Warnings:

Information:					
This is not an USPTO supplied ADS fillable form					
2	Request for Corrected Filing Receipt	111664-0123_Request_FR.pdf	4120501 caf80c4be80b08d6cc71cc5446b0080aad740a59	no	5
Warnings:					
Information:					
			Total Files Size (in bytes):	4356511	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Patrizio		VINCIARELLI	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Boston	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	294 Beacon Street		
Address 2			
City	Boston	State/Province	MA
Postal Code	02116	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Andrew		D'AMICO	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Marina Del Rey	Country of Residence	California

Mailing Address of Inventor:

Address 1	~~c/o Vicor Corp.~~ 14004 Palawan Way, No. 211		
Address 2	~~25 Frontage Road~~		
City	~~Andover~~ Marina Del Rey	State/Province	~~MA~~ CA
Postal Code	~~01810~~ 90292	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	112754		
Email Address	IPDocketing@foley.com	Add Email	Remove Email

Application Information:

Title of the Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER		
Attorney Docket Number	092377-0123	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	7	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☒ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	112754		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

○ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
◉ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	VLT, INC.

Mailing Address Information For Applicant:

Address 1	560 OAKMEAD PARKWAY		
Address 2			
City	SUNNYVALE	**State/Province**	CA
Country		Postal Code	94086
Phone Number		Fax Number	

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	092377-0123
	Application Number	13/933,252
Title of Invention	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER	

Email Address	

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/Brett P. Belden/			Date (YYYY-MM-DD)	2013-07-31
First Name	Brett	Last Name	Belden	Registration Number	57,705

Additional Signature may be generated within this form by selecting the Add button.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

7590 09/22/2016

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
09/22/2016	ELECTRONIC

Letter Withdrawing a Notice Requiring Inventor's Oath or Declaration

The Notice Requiring Inventor's Oath or Declaration mailed on 9.13.2016 was sent in error, and is hereby withdrawn. The time period set forth in the Notice of Allowance and Fee(s) Due to file a reply and pay the required fees continues to run from the mailing date of the Notice of Allowance and Fee(s) Due. Any time period set forth in the Notice of Allowability continues to run from the mailing date of the Notice of Allowability.

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

(571)-272-4200 or 1(888)-786-0101
Patent Publication Branch
Office of Data Management

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/933,252	07/02/2013	2842	2480	111664-0123 (VA1078)	24	4

CONFIRMATION NO. 5889

CORRECTED FILING RECEIPT

112754
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

OC000000083997224

Date Mailed: 09/23/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Patrizio VINCIARELLI, Boston, MA;
Andrew D'Amico, Marina Del Rey, CA;

Applicant(s)

VLT, INC., Sunnyvale, CA

Power of Attorney: The patent practitioners associated with Customer Number 112754

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 07/24/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/933,252**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

Title

POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

Preliminary Class

307

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 10/03/2016

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
10/03/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Application No. : 13933252
Applicant : Vinciarelli
Filing Date : 07/02/2013
Date Mailed : 10/03/2016

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED.

See attachment(s).

A copy of this notice MUST be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

/Midel Geronimo/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 13933252

IDENTIFICATION OF APPLICATION DEFICIENCIES IN APPLICATION FILED ON OR AFTER SEPTEMBER 16, 2012

[X] Applicant must provide legible text for the following item(s).

- [X] Specification filed 07/02/2013, page(s) 9.
- [ ] Claims filed , claim(s) .
- [ ] Other: .

[ ] Applicant must provide missing information on the following page(s) of the specification by amending the specification to add the missing text. No new matter may be added.
Page/line no(s).

[ ] The specification refers to one or more applications by attorney docket number and does not show the U.S. application number(s). Applicant must supply the U.S. application number in place of each attorney docket number.
Page/line no(s).

[ ] Applicant must provide an Abstract of the Disclosure.

[ ] The Application Data Sheet (ADS dated) does not supply the inventor's city and/or does not supply the inventor's U.S. state and/or does not supply the inventor's country. Applicant must submit a signed, in accordance with 37 CFR 1.76(e) and 1.33(b), application data sheet that corrects this deficiency. To be in compliance with 37 CFR 1.76, the corrected application data sheet must identify the information being changed by using underlining for additions and strikethroughs or brackets for deletions.

[ ] Other:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This communication is responsive to the Notice to File Corrected Papers mailed October 3, 2016, concerning the above-referenced patent application.

Amendments to the Specification begin on page 2 of this document.

Remarks begin on page 3 of this document.

Amendment to the Specification

Please replace paragraph [0028] on page 9 of the application with the following paragraph.

The power processed by the isolated SAC shown in Fig. 4 may be compared with that of the series-connected SAC 200 (Fig. 5) by summing the product of maximum voltage across (V_n) and average current (I_n) through each switch (n=1 through 8).

~~$P_{Processed} = \sum_{n=1}^{n=8} (Vn * In)$ (5)~~

$$P_{Processed} = \sum_{n=1}^{n=8n} (Vn * In) \qquad (5)$$

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the following remarks.

Status of Claims

Claims 1–24 remain pending in this application. Applicant respectfully requests reconsideration of these claims in light of the following remarks.

Amendment to the Specification

The specification has been amended in accordance with 37 CFR § 1.121 to address the clarity issues cited in the Notice to File Corrected Application Papers. Applicant respectfully submits that no new subject matter has been added, and respectfully request that the amendment be entered.

Concluding Remarks

Applicant believes that the application is in condition for issuance. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance prosecution.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application, or credit any overpayment, to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date December 2, 2016

By /John D. Lanza/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (617) 502-4084
Facsimile: (617) 502-4001

John D. Lanza
Attorney for Applicant
Registration No. 40,060

Electronic Acknowledgement Receipt

EFS ID:	27676959
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	John D. Lanza/Eljona Jahaj
Filer Authorized By:	John D. Lanza
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	02-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	13:36:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	VA_1078_Response_NTCP.pdf	136252 2731d5172bf98ea4e53be3fb390975c970254a13	no	4
Warnings:					

Information:	
Total Files Size (in bytes):	136252

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 12/08/2016

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
12/08/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

Response to Rule 312 Communication	Application No. 13/933,252	Applicant(s)
	Examiner	Art Unit

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

1. ☒ The amendment filed on *12/02/2016* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

Publishing Division

B.Crittenden

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Appl. Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. This RCE and the enclosed items listed below are being filed prior to the earliest of: (1) payment of the issue fee (unless a petition under 37 C.F.R. § 1.313 is granted); (2) abandonment of the application; or (3) the filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. §141, or the commencement of a civil action under 35 U.S.C. §145 or §146 (unless the appeal or civil action is terminated).

1. Submission **required** under 37 C.F.R. §1.114: (check items that apply)

a. Previously submitted:

[ ] Please enter and consider the amendment and/or reply previously filed on __.

[ ] Please consider the Affidavit(s)/Declaration(s) previously filed on __ but not considered.

[ ] Please consider the arguments in the Appeal Brief or Reply previously filed on __.

[ ] Other Documents .

b. Enclosed are:

[ ] Amendment/Reply.

[ ] Affidavit(s)/Declaration(s).

[**X**] Information Disclosure Statement.

[**X**] Form PTO/SB/08.

[ ] PTO/SB/424 - Request for Prioritized Examination.

[ ] Other Documents

Miscellaneous:

[ ] Suspension of action of the above-identified application is requested under 37 C.F.R. § 1.103(c) for a period of __ months.

The filing fee is calculated below at the large entity rate:

	Claims as Amended		Previously Paid For		Extra Claims Present		Rate		Fee Totals
RCE Fee 1.17(e):							$1,200.00	=	$1,200.00
Total Claims:	20	-	20	=	0	x	$80.00	=	$0.00
Independents	3	-	3	=	0	x	$420.00	=	$0.00
First presentation of any Multiple Dependent Claims:						+	$780.00	=	$0.00
CLAIMS FEE TOTAL:								=	$1,200.00

[ ] Applicant hereby petitions for an extension of time under 37 C.F.R. §1.136(a) for the total number of months checked below:

[ ]	Extension for response filed within the first month:	$200.00	0	$0.00
[ ]	Extension for response filed within the second month:	$600.00		$0.00
[ ]	Extension for response filed within the third month:	$1,400.00		$0.00
[ ]	Extension for response filed within the fourth month:	$2,200.00		$0.00
[ ]	Extension for response filed within the fifth month:	$3,000.00		$0.00
	EXTENSION FEE SUBTOTAL:			$0.00
	EXTENSION FEE ALREADY PAID:		-	$0.00
	EXTENSION FEE TOTAL			$0.00
	CLAIMS AND EXTENSION FEE TOTAL:			$1,200.00
	Prioritized Examination fee (Track I) under 37 C.F.R. § 1.17 (c)			$0.00
	Processing Fee (Track I) under 37 C.F.R. § 1.17 (i)			$0.00
	Publication Fee			$0.00
[ ]	Suspension of action requested under 37 C.F.R. § 1.103(c)			$0.00
	TOTAL FEE:			$1,200.00

The above-identified fees of $1,200.00 are being paid by credit card via EFS-Web.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date December 13, 2016

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: December 13, 2016				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	443,441	1890-12-23	HANSON, M.	
	A2	1,181,803	1916-05-02	GEN ELECTRIC	
	A3	2,042,274	1936-05-26	STANDARD OIL DEV CO	
	A4	2,497,534	1950-02-14	GEN ELECTRIC	
	A5	2,852,730	1958-09-16	MOTOROLA INC	
	A6	2,902,862	1959-09-08	TWIFORD HARRY G	
	A7	2,953,738	1960-09-20	WESTINGHOUSE ELECTRIC CORP	
	A8	3,008,068	1961-11-07	PHILIPS CORP	
	A9	3,008,506	1961-11-14	LED BALLAST INC	
	A10	3,029,398	1962-04-10	THOMPSON RAMO WOOLDRIDGE INC	
	A11	3,083,328	1963-03-26	BELL TELEPHONE LABOR INC	
	A12	3,141,140	1964-07-14	ACOUSTICA ASSOCIATES INC	
	A13	3,146,406	1964-08-25	PHILIPS CORP	
	A14	3,161,837	1964-12-15	DAVEN COMPANY	
	A15	3,174,042	1965-03-16	EFFNER WHITE RALPH	
	A16	3,229,111	1966-01-11	ELECTRO SEAL CORP	
	A17	3,241,035	1966-03-15	WARREN MFG COMPANY INC	
	A18	3,295,042	1966-12-27	ROBERTSHAW CONTROLS CO	
	A19	3,307,073	1967-02-28	MOTOROLA INC	
	A20	3,313,996	1967-04-11	HONEYWELL INC	
	A21	3,343,073	1967-09-19	LORAIN PROD CORP	
	A22	3,400,325	1968-09-03	RCA CORP	
	A23	3,435,375	1969-03-25	MOTOROLA, INC.	
	A24	3,443,194	1969-05-06	IBM	
	A25	3,448,370	1969-06-03	AT&T CORP.	
	A26	3,454,853	1969-07-08	HONEYWELL INC.	
	A27	3,458,798	1969-07-29	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A28	3,459,957	1969-08-05	ITE IMPERIAL CORP	
	A29	3,471,747	1969-10-07	GEN MOTORS CORP	
	A30	3,495,157	1970-02-10	FORBRO DESIGN CORP.	
	A31	3,506,908	1970-04-14	TRW INC.	

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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A32	3,514,692	1970-05-26	HONEYWELL INC.	
	A33	3,517,301	1970-06-23	BUNKER RAMO CORPORATION	
	A34	3,553,428	1971-01-05	DU PONT	
	A35	3,564,393	1971-02-16	NORTH AMERICAN ROCKWELL	
	A36	3,569,818	1971-03-09	HUGHES AIRCRAFT CO	
	A37	3,573,483	1971-04-06	ESSEX INTERNATIONAL INC	
	A38	3,573,494	1971-04-06	AUTOMATIC TIMING AND CONTROLS, INC.	
	A39	3,573,508	1971-04-06	BELL TELEPHONE LABOR INC	
	A40	3,573,544	1971-04-06	ENERGY ELECTRONICS	
	A41	3,573,597	1971-04-06	GENERAL ELECTRIC COMPANY	
	A42	3,579,026	1971-05-18	SYLVANIA ELECTRIC PROD	
	A43	3,581,186	1971-05-25	MOTOROLA, INC.	
	A44	3,582,754	1971-06-01	WANDEL U. GOLTERMANN ELEKTRONISCHE PRAZISIONSMESSGERATE	
	A45	3,582,758	1971-06-01	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A46	3,584,289	1971-06-08	BELL TELEPHONE LABOR INC	
	A47	3,588,595	1971-06-28	KIDDE, INC.	
	A48	3,599,073	1971-08-10	TEXAS INSTRUMENTS INC	
	A49	3,604,920	1971-09-14	DONALD M NILES	
	A50	3,619,713	1971-11-09	SOLA BASIC IND INC	
	A51	3,629,648	1971-12-21	BRENT W BROWN	
	A52	3,629,725	1971-12-21	AT&T CORP.	
	A53	3,638,099	1972-01-25	COLLINS RADIO COMPANY	
	A54	3,643,152	1972-02-15	HITACHI, LTD	
	A55	3,646,395	1972-02-29	AMERICAN OPTICAL CORPORATION	
	A56	3,657,631	1972-04-18	INTERNATIONAL STANDARD ELECTRIC CORPORATION (ITTC)	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A57	3,660,672	1972-05-02	PIONEER MAGNETICS INC	
	A58	3,663,941	1972-05-16	UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND	
	A59	3,665,203	1972-05-23	JERRY D HOGG	
	A60	3,668,508	1972-06-06	ACME ELECTRIC CORP.	
	A61	3,684,891	1972-08-15	DUAL LITE CO	
	A62	3,696,286	1972-10-03	NORTH AMERICAN ROCKWELL	
	A63	3,704,381	1972-11-28	FORBRO DESIGN CORP	
	A64	3,710,231	1973-01-09	WESTINGHOUSE ELECTRIC CORP.	
	A65	3,714,545	1973-01-30	COMTEURS SCHLUMBERGER MONTROAGE	
	A66	3,733,538	1973-05-15	WESTINGHOUSE ELECTRIC CORP.	
	A67	3,735,235	1973-05-22	AT&T CORP.	
	A68	3,737,755	1973-06-05	AT&T CORP.	
	A69	3,742,242	1973-06-26	SONY CORP	
	A70	3,743,861	1973-07-03	HONEYWELL INC.	
	A71	3,751,676	1973-08-07	MATSUSHITA ELECTRIC IND CO LTD	
	A72	3,753,071	1973-08-14	WESTINGHOUSE ELECTRIC CORP	
	A73	3,753,076	1973-08-14	LIGHTING SYSTEMS INC	
	A74	3,754,177	1973-08-21	LECTRON CORPORATION	
	A75	3,757,195	1973-09-04	HONEYWELL INC.	
	A76	3,769,545	1973-10-30	KODAN INC	
	A77	3,771,040	1973-11-06	NASA	
	A78	3,781,505	1973-12-25	GENERAL ELECTRIC COMPANY	
	A79	3,781,638	1973-12-25	GENERAL ELECTRIC COMPANY	
	A80	3,787,730	1974-01-22	UNITED AIRCRAFT CORP	
	A81	3,805,094	1974-04-16	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A82	3,816,810	1974-06-11	HONEYWELL	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				INFORMATION SYSTEMS INC.	
	A83	3,818,237	1974-06-18	HUGHES AIRCRAFT CO	
	A84	3,818,312	1974-06-18	U.S. PHILIPS CORPORATION	
	A85	3,820,008	1974-06-25	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A86	3,824,450	1974-07-16	RCA CORPORATION	
	A87	3,845,404	1974-10-29	TRILLING T	
	A88	3,848,175	1974-11-12	GEN ELECTRIC	
	A89	3,851,240	1974-11-26	GENERAL ELECTRIC COMPANY	
	A90	3,851,278	1974-11-26	BELL + HOWELL JAPAN, LTD.	
	A91	3,859,638	1975-01-07	INTERSIL INC	
	A92	3,873,846	1975-03-25	SONY CORP	
	A93	3,879,647	1975-04-22	AT&T CORP.	
	A94	3,879,652	1975-04-22	WESTINGHOUSE ELECTRIC CORP.	
	A95	3,904,950	1975-09-09	AT&T CORP.	
	A96	3,909,695	1975-09-30	HEWLETT PACKARD COMPANY	
	A97	3,909,700	1975-09-30	GENERAL ELECTRIC COMPANY	
	A98	3,912,940	1975-10-14	HONEYWELL INC	
	A99	3,913,002	1975-10-14	GENERAL ELECTRIC COMPANY	
	A100	3,913,036	1975-10-14	VICTOR COMPTOMETER CORPORATION	
	A101	3,916,289	1975-10-28	UNITED STATES OF AMERICA, AIR FORCE	
	A102	3,919,656	1975-11-11	SOKAL NATHAN O; SOKAL ALAN D	
	A103	3,927,363	1975-12-16	ROCKWELL INTERNATIONAL CORPORATION	
	A104	3,930,196	1975-12-30	GENERAL ELECTRIC COMPANY	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A105	3,932,764	1976-01-13	ESB INC	
	A106	3,938,024	1976-02-10	Bell Telephone Laboratories, Incorporated	
	A107	3,940,682	1976-02-24	General Electric Company	
	A108	3,949,238	1976-04-06	NORTHERN ELECTRIC CO	
	A109	3,959,716	1976-05-25	The Bendix Corporation	
	A110	3,974,397	1976-08-10	S & C ELECTRIC CO	
	A111	3,976,932	1976-08-24	General Electric Company	
	A112	3,986,052	1976-10-12	North Electric Company	
	A113	3,986,097	1976-10-12	Bell Telephone Laboratories, Incorporated	
	A114	3,989,995	1976-11-02	Bell Telephone Laboratories, Incorporated	
	A115	3,991,319	1976-11-09	INSTRUMENTATION & CONTROL SYST	
	A116	4,005,335	1977-01-25	IOTA ENGINEERING INC	
	A117	4,007,413	1977-02-08	BELL TELEPHONE LABOR INC	
	A118	4,010,381	1977-03-01	BELL TELEPHONE LABOR INC	
	A119	4,011,518	1977-03-08	The United States of America as represented by the Secretary of the Navy	
	A120	4,017,746	1977-04-12	Nartron Corporation	
	A121	4,017,783	1977-04-12	Telefonaktiebolaget L M Ericsson	
	A122	4,017,784	1977-04-12	Litton Systems, Inc.	
	A123	4,027,228	1977-05-31	GEN ELECTRIC	
	A124	4,037,271	1977-07-19	BOSCHERT ASSOCIATES	
	A125	4,044,268	1977-08-23	GATES RUBBER CO	
	A126	4,051,445	1977-09-27	Boschert Assoc.	
	A127	4,058,369	1977-11-15	BENTLEY LAB	
	A128	4,060,757	1977-11-29	General Electric Co.	
	A129	4,066,945	1978-01-03	BENDIX CORP	
	A130	4,074,182	1978-02-14	GEN ELECTRIC	
	A131	4,078,247	1978-03-07	RCA Corporation	

Examiner Signature		Date Considered	

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	A132	4,104,539	1978-08-01	HASE A M	
	A133	4,106,084	1978-08-08	Societe Nationale des Petroles d'Aquitaine	
	A134	4,109,192	1978-08-22	Hughes Aircraft Company	
	A135	4,114,048	1978-09-12	WESTINGHOUSE ELECTRIC CORP	
	A136	4,115,704	1978-09-19	US NAVY	
	A137	4,122,359	1978-10-24	HONEYWELL INC	
	A138	4,126,793	1978-11-21	ZELLWEGER USTER AG	
	A139	4,128,868	1978-12-05	RCA CORPORATION	
	A140	4,131,860	1978-12-26	THOMSON-CSF	
	A141	4,140,959	1979-02-20	POWELL WILLIAM S	
	A142	4,150,423	1979-04-17	Boschert Associates	
	A143	4,177,389	1979-12-04	SIEMENS AG	
	A144	4,184,197	1980-01-15	California Institute of Technology	
	A145	4,187,458	1980-02-05	The United States of America as represented by the Secretary of the Army	
	A146	4,194,147	1980-03-18	BURR BROWN RES CORP	
	A147	4,205,368	1980-05-27	SIEMENS AG	
	A148	4,207,475	1980-06-10	KEPCO INC	
	A149	4,208,594	1980-06-17	HONEYWELL INC	
	A150	4,208,706	1980-06-17	Sony Corporation	
	A151	4,209,710	1980-06-24	HONEYWELL INC	
	A152	4,210,858	1980-07-01	International Business Machines Corporation	
	A153	4,210,958	1980-07-01	Ikenoue, Tsuneo	
	A154	4,238,690	1980-12-09	BELL TELEPHONE LABOR INC	
	A155	4,238,691	1980-12-09	BELL TELEPHONE LABOR INC	
	A156	4,241,261	1980-12-23	BELL TELEPHONE LABOR INC	
	A157	4,245,194	1981-01-13	GTE Products Corporation	
	A158	4,245,286	1981-01-13	NASA	
	A159	4,251,857	1981-02-17	Sperry Corporation	
	A160	4,253,136	1981-02-24	SANYO ELECTRIC CO	
	A161	4,254,459	1981-03-03	JMJ Electronics Corp.	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A162	4,257,087	1981-03-17	California Institute of Technology	
	A163	4,257,089	1981-03-17	The United States of America as represented by the Secretary of the Army	
	A164	4,262,214	1981-04-14	FOXBORO CO	
	A165	4,268,476	1981-05-19	BENTLEY LAB	
	A166	4,270,164	1981-05-26	Contraves Goerz Corporation	
	A167	4,270,165	1981-05-26	QUALIDYNE SYSTEMS INC	
	A168	4,272,806	1981-06-09	EASTMAN KODAK CO	
	A169	4,274,133	1981-06-16	California Institute of Technology	
	A170	4,275,317	1981-06-23	FROSCH; ROBERT A. ADMINISTRATOR OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WITH RESPECT TO AN INVENTION OF	
	A171	4,276,594	1981-06-30	Gould Inc. Modicon Division	
	A172	4,277,726	1981-07-07	LITTON SYSTEMS INC	
	A173	4,277,728	1981-07-07	STEVENS LUMINOPTICS	
	A174	4,288,739	1981-09-08	Kepco, Inc.	
	A175	4,288,865	1981-09-08	MOSTEK CORP	
	A176	4,292,581	1981-09-29	TAN; TAT S.	
	A177	4,293,902	1981-10-06	AEL Mirrotel, Ltd.	
	A178	4,293,904	1981-10-06	The United States of America as represented by the Secretary of the Navy	
	A179	4,297,590	1981-10-27	VAIL ANDE	
	A180	4,300,191	1981-11-10	POWERCUBE CORPORATION	
	A181	4,301,496	1981-11-17	ITT	
	A182	4,302,803	1981-11-24	Sperry Corporation	
	A183	4,307,441	1981-12-22	United Technologies Corporation	
	A184	4,310,771	1982-01-12	BECKWITH ELECTRIC CO	

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				INC	
	A185	4,313,060	1982-01-26	BELL TELEPHONE LABOR INC	
	A186	4,315,207	1982-02-09	Advanced Micro Devices, Inc.	
	A187	4,316,097	1982-02-16	REYNOLDS WILLIAM R	
	A188	4,317,056	1982-02-23	GTE PROD CORP	
	A189	4,318,007	1982-03-02	SITS SOC IT TELECOM SIEMENS	
	A190	4,318,164	1982-03-02	TOKYO SHIBAURA DENKI KABUSHIKI KAISHA	
	A191	4,322,817	1982-03-30	Gte Automatic Electric Labs Inc.	
	A192	4,323,787	1982-04-06	CLARION CO LTD	
	A193	4,323,788	1982-04-06	BORG WARNER	
	A194	4,323,962	1982-04-06	GEN ELECTRIC	
	A195	4,325,017	1982-04-13	RCA CORP	
	A196	4,327,298	1982-04-27	BORG WARNER	
	A197	4,328,482	1982-05-04	CONSUMER ELEC PROD	
	A198	4,330,816	1982-05-18	Fujitsu Fanuc Limited	
	A199	4,334,263	1982-06-08	Pioneer Electronic Corporation	
	A200	4,336,587	1982-06-22	BOETTCHER, JR.; CHARLES W.	
	A201	4,344,122	1982-08-10	General Electric Company	
	A202	4,344,124	1982-08-10	Motorola, Inc.	
	A203	4,346,342	1982-08-24	Rockwell International Corporation	
	A204	4,347,558	1982-08-31	Rockwell International Corporation	
	A205	4,353,113	1982-10-05	Electrotech Instruments Limited	
	A206	4,355,884	1982-10-26	CANON KK	
	A207	4,356,541	1982-10-26	IKENOUE TSUNEO	
	A208	4,357,654	1982-11-02	IKENOUE TSUNEO	
	A209	4,368,409	1983-01-11	Thomson-Brandt	
	A210	4,371,919	1983-02-01	Bell Telephone Laboratories, Incorporated	

Examiner Signature		Date Considered	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A211	4,381,457	1983-04-26	LADCO DEV CO INC	
	A212	4,386,394	1983-05-31	GEN ELECTRIC	
	A213	4,393,316	1983-07-12	Reliance Electric Co.	
	A214	4,395,639	1983-07-26	SAB NIFE AB	
	A215	4,398,156	1983-08-09	AALAND; KRISTIAN	
	A216	4,399,499	1983-08-16	GTE AUTOMATIC ELECTRIC LAB INC	
	A217	4,403,269	1983-09-06	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A218	4,415,960	1983-11-15	Sperry Corporation	
	A219	4,423,341	1983-12-27	Sperry Corporation	
	A220	4,427,899	1984-01-24	SIEMENS AG	
	A221	4,438,411	1984-03-20	Ford Aerospace & Communications Corporation	
	A222	4,441,070	1984-04-03	Motorola, Inc.	
	A223	4,442,339	1984-04-10	Mitsubishi Denki Kabushiki Kaisha	
	A224	4,443,840	1984-04-17	LICENTIA GMBH	
	A225	4,449,173	1984-05-15	Tohoku Metal Industries, Inc.	
	A226	4,449,174	1984-05-15	Bell Telephone Laboratories, Incorporated	
	A227	4,449,175	1984-05-15	Toko, Inc.	
	A228	4,451,743	1984-05-29	Citizen Watch Company Limited	
	A229	4,451,876	1984-05-29	Hitachi Metals, Ltd.	
	A230	4,465,966	1984-08-14	Motorola, Inc.	
	A231	4,471,289	1984-09-11	NCR CORPORATION	
	A232	4,473,756	1984-09-25	CALOYERAS INC	
	A233	4,476,399	1984-10-09	FUJI ELECTRIC CO LTD	
	A234	4,479,175	1984-10-23	Honeywell Inc.	
	A235	4,484,084	1984-11-20	NCR CO	
	A236	4,499,531	1985-02-12	501 Gateway Technology, Inc.	
	A237	4,504,895	1985-03-12	GENERAL ELECTRIC COMPANY	
	A238	4,519,024	1985-05-21	AT&T Bell Laboratories	

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	A239	4,520,296	1985-05-28	Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH	
	A240	4,523,265	1985-06-11	Compagnie de Signaux et D'Entreprises Electriques	
	A241	4,524,411	1985-06-18	RCA Corporation	
	A242	4,524,413	1985-06-18	IKENOUE TSUNEO	
	A243	4,527,228	1985-07-02	CHI YU; SIMON S.	
	A244	4,528,459	1985-07-09	ROCKWELL INTERNATIONAL CORP	
	A245	4,533,986	1985-08-06	GENERAL ELECTRIC COMPANY	
	A246	4,535,399	1985-08-13	National Semiconductor Corporation	
	A247	4,536,700	1985-08-20	United Technologies Corporation	
	A248	4,538,073	1985-08-27	CONVERGENT TECHNOLOGIES INC	
	A249	4,538,101	1985-08-27	Nippon Chemi-Con Corporation	
	A250	4,539,487	1985-09-03	MITSUBISHI ELECTRIC CORP	
	A251	4,546,421	1985-10-08	United Technologies Corporation	
	A252	4,553,039	1985-11-12	STIFTER FRANCIS J	
	A253	4,556,802	1985-12-03	NISHIMU DENSHI KOGYO KK	
	A254	4,561,046	1985-12-24	GTE Automatic Electric Incorporated	
	A255	4,562,522	1985-12-31	HONEYWELL INC	
	A256	4,564,800	1986-01-14	Jetronic Industries, Inc.	
	A257	4,566,059	1986-01-21	VENUS SCIENTIFIC INC.	
	A258	4,571,551	1986-02-18	WASHINGTON INNOVATIVE TECHNOLOGY, INC.	
	A259	4,575,640	1986-03-11	GEN ELECTRIC	
	A260	4,578,631	1986-03-25	SMITH; STEVE	
	A261	4,584,635	1986-04-22	International Business Machines Corp.	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A262	4,586,119	1986-04-29	ITT Corporation	
	A263	4,587,604	1986-05-06	RELIANCE ELECTRIC CO	
	A264	4,591,782	1986-05-27	General Electric Company	
	A265	4,593,213	1986-06-03	United Technologies Corporation	
	A266	4,605,999	1986-08-12	AT&T BELL LABORATORIES	
	A267	4,607,195	1986-08-19	U.S. Philips Corporation	
	A268	4,607,323	1986-08-19	SOKAL; NATHAN O.	
	A269	4,618,919	1986-10-21	SPERRY CORP	
	A270	4,621,313	1986-11-04	ZENITH ELECTRONICS CORP	
	A271	4,622,511	1986-11-11	Raytheon Company	
	A272	4,622,629	1986-11-11	Sundstrand Corporation	
	A273	4,626,982	1986-12-02	General Electric Company	
	A274	4,628,426	1986-12-09	GENERAL ELECTRIC COMPANY	
	A275	4,635,179	1987-01-06	ELDEC CORP	
	A276	4,638,175	1987-01-20	UNITED TECHNOLOGIES CORP	
	A277	4,642,475	1987-02-10	SIEMENS AG	
	A278	4,642,743	1987-02-10	International Business Machines Corp.	
	A279	4,644,440	1987-02-17	WESTINGHOUSE ELECTRIC CORP	
	A280	4,648,017	1987-03-03	RELIANCE ELECTRIC COMPANY	
	A281	4,651,020	1987-03-17	WESTINGHOUSE ELECTRIC CORP	
	A282	4,652,769	1987-03-24	ION TECH INC	
	A283	4,659,942	1987-04-21	DRAPER LAB CHARLES S	
	A284	4,663,699	1987-05-05	PIONEER MAGNETICS INC	
	A285	4,670,661	1987-06-02	TOKYO ELECTRIC CO LTD	
	A286	4,672,517	1987-06-09	Pioneer Magnetics, Inc.	
	A287	4,672,518	1987-06-09	American Telephone and Telegraph Co., AT&T Bell Labs	
	A288	4,672,528	1987-06-09	GENERAL ELECTRIC COMPANY	
	A289	4,674,019	1987-06-16	Keller-Mullett Technology	

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	A290	4,675,796	1987-06-23	VEECO INSTRUMENTS, INC.	
	A291	4,677,311	1987-06-30	HITACHI LTD	
	A292	4,677,534	1987-06-30	KABUSHIKI KAISHA TOSHIBA	
	A293	4,680,688	1987-07-14	YOKOGAWA HOKUSHIN ELECTRIC CORPORATION	
	A294	4,680,689	1987-07-14	PAYNE; DONALD W.	
	A295	4,683,528	1987-07-28	INTERSIL INC	
	A296	4,685,039	1987-08-04	YOKOGAWA HOKUSHIN ELECTRIC	
	A297	4,688,160	1987-08-18	AMERICAN TELEPHONE AND TELEGRAPH CO., AT&T BELL LABS	
	A298	4,691,273	1987-09-01	NIPPON TELEGRAPH & TELEPHONE CORP.	
	A299	4,694,384	1987-09-15	GEN ELECTRIC	
	A300	4,694,386	1987-09-15	THOMSON CSF	
	A301	4,695,935	1987-09-22	ALCATEL NV	
	A302	4,697,136	1987-09-29	SHIKOKU ELEC POWER	
	A303	4,698,738	1987-10-06	UNISYS CORP	
	A304	4,706,177	1987-11-10	JOSEPHSON ELLIOT	
	A305	4,709,316	1987-11-24	GENERAL ELECTRIC COMPANY	
	A306	4,709,318	1987-11-24	LIEBERT CORP	
	A307	4,716,514	1987-12-29	UNITRODE CORP	
	A308	4,717,833	1988-01-05	BOSCHERT INC	
	A309	4,727,308	1988-02-23	IBM	
	A310	4,727,469	1988-02-23	RELIANCE COMM/TEC CORPORATION	
	A311	4,730,242	1988-03-08	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A312	4,733,102	1988-03-22	Mitsubishi Jukogyo Kabushiki Kaisha	
	A313	4,734,839	1988-03-29	BARTHOLD; FRED O.	
	A314	4,734,844	1988-03-29	NCR Corporation	
	A315	4,734,924	1988-03-29	Kabushiki Kaisha Toshiba	
	A316	4,745,299	1988-05-17	AMERICAN TELEPHONE & TELEGRAPH	

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	A317	4,745,538	1988-05-17	Coutant Electronics Limited	
	A318	4,747,034	1988-05-24	DICKEY; DAVID V.	
	A319	4,748,550	1988-05-31	KABUSHIKI KAISHA TOSHIBA	
	A320	4,754,160	1988-06-28	INTERSIL INC	
	A321	4,754,161	1988-06-28	WESTINGHOUSE ELECTRIC CORP	
	A322	4,760,276	1988-07-26	UNISYS CORP	
	A323	4,763,237	1988-08-09	WIECZOREK JOHN P	
	A324	4,768,141	1988-08-30	HUBERTUS; GUIDO	
	A325	4,772,994	1988-09-20	Nishimu Electronics Industries, Co., Ltd.	
	A326	4,777,382	1988-10-11	ALLIED SIGNAL INC	
	A327	4,777,575	1988-10-11	HITACHI LTD.	
	A328	4,779,185	1988-10-18	SIEMENS AKTIENGESELLSCHAFT	
	A329	4,782,241	1988-11-01	LIEBERT CORP	
	A330	4,783,728	1988-11-08	MODULAR POWER CORP	
	A331	4,785,387	1988-11-15	VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.	
	A332	4,788,450	1988-11-29	GEN ELECTRIC	
	A333	4,788,634	1988-11-29	MASSACHUSETTS INST TECHNOLOGY	
	A334	4,794,506	1988-12-27	HITACHI MEDICAL CORPORATION	
	A335	4,796,173	1989-01-03	GENERAL ELECTRIC COMPANY	
	A336	4,800,479	1989-01-24	Prime Computer, Inc.	
	A337	4,805,078	1989-02-14	Siemens Aktiengesellschaft	
	A338	4,809,148	1989-02-28	BRITISH COLUMBIA TELEPHONE	
	A339	4,811,191	1989-03-07	Catalyst Semiconductor, Inc.	
	A340	4,812,672	1989-03-14	NORTHERN TELECOM LTD	
	A341	4,814,962	1989-03-21	AMERICAN TELEPHONE AND TELEGRAPH	

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				COMPANY, AT&T BELL LABORATORIES	
	A342	4,814,965	1989-03-21	SPECTRA PHYSICS	
	A343	4,823,249	1989-04-18	AMERICAN TELEPHONE AND TELEGRAPH COMPANY AT&T BELL LABORATORIES	
	A344	4,825,348	1989-04-25	GENERAL ELECTRIC COMPANY	
	A345	4,829,216	1989-05-09	RCA Licensing Corporation	
	A346	4,841,160	1989-06-20	NCR CO	
	A347	4,853,832	1989-08-01	UNIVERSITY OF TOLEDO	
	A348	4,853,837	1989-08-01	GULCZYNSKI ZDZISLAW	
	A349	4,855,858	1989-08-08	International Business Machines Corporation	
	A350	4,855,888	1989-08-08	UNISYS CORPORATION	
	A351	4,860,184	1989-08-22	VIRGINIA TECH INTELL PROP	
	A352	4,860,185	1989-08-22	ELECTRONIC RESEARCH GROUP INC	
	A353	4,860,188	1989-08-22	TEXAS INSTRUMENTS INC	
	A354	4,860,189	1989-08-22	INTERNATIONAL BUSINESS MACHINES CORP.	
	A355	4,864,479	1989-09-05	General Electric Company	
	A356	4,864,483	1989-09-05	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A357	4,866,588	1989-09-12	American Telephone and Telegraph Company AT&T Bell Laboratories	
	A358	4,866,589	1989-09-12	HITACHI, LTD.	
	A359	4,868,729	1989-09-19	CANON KK	
	A360	4,870,555	1989-09-26	COMPAQ COMPUTER CORP	
	A361	4,873,616	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A362	4,873,618	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A363	4,877,972	1989-10-31	BOEING CO	
	A364	4,881,014	1989-11-14	TOSHIBA KK	

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	A365	4,882,646	1989-11-21	Honeywell Bull Inc.	
	A366	4,882,664	1989-11-21	Rane Corporation	
	A367	4,882,665	1989-11-21	CHOI; KEH-KUN	
	A368	4,885,674	1989-12-05	VARGA; LJUBOMIR D.	
	A369	4,890,210	1989-12-26	GILBARCO, INC.	
	A370	4,890,214	1989-12-26	NEC Corporation	
	A371	4,893,227	1990-01-09	VENUS SCIENTIFIC, INC.	
	A372	4,893,228	1990-01-09	Hewlett Packard Company	
	A373	4,896,092	1990-01-23	Power Distribution, Inc.	
	A374	4,899,271	1990-02-06	Scanpower	
	A375	4,900,885	1990-02-13	Kabushiki Kaisha Toshiba	
	A376	4,902,508	1990-02-20	PURDUE RESEARCH FOUNDATION	
	A377	4,903,183	1990-02-20	Hitachi, Ltd.	
	A378	4,903,189	1990-02-20	GEN ELECTRIC	
	A379	4,908,857	1990-03-13	Siemens Transmission Systems, Inc.	
	A380	4,916,599	1990-04-10	HyperPower, Inc.	
	A381	4,920,470	1990-04-24	ZIRCO, INC.	
	A382	4,922,397	1990-05-01	DIGITAL EQUIPMENT CORPORATION	
	A383	4,922,404	1990-05-01	General Electric Company	
	A384	4,924,170	1990-05-08	Unisys Corporation	
	A385	4,926,303	1990-05-15	Qualitron, Inc.	
	A386	4,929,605	1990-05-29	MERRELL DOW PHARMA	
	A387	4,931,918	1990-06-05	Yokogawa Electric Corporation	
	A388	4,935,857	1990-06-19	SUNDSTRAND CORPORATION	
	A389	4,937,468	1990-06-26	Sundstrand Corporation	
	A390	4,952,849	1990-08-28	PHILIPS CORP	
	A391	4,953,068	1990-08-28	UNISYS CORPORATION	
	A392	4,958,268	1990-09-18	Matsushita Electric Industrial Co., Ltd.	
	A393	4,959,764	1990-09-25	COMPUTER PRODUCTS INC	
	A394	4,959,766	1990-09-25	CA NAT RESEARCH COUNCIL	
	A395	4,961,128	1990-10-02	ZENITH ELECTRONICS	

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				CORPORATION	
	A396	4,975,823	1990-12-04	DEUTSCHE THOMSON-BRANDT GMBH	
	A397	4,982,149	1991-01-01	TOSHIBA KK	
	A398	5,001,318	1991-03-19	Kabushiki Kaisha Toshiba	
	A399	5,006,782	1991-04-09	INTERNATIONAL RECTIFIER CORPORATION	
	A400	5,008,795	1991-04-16	Unisys Corporation	
	A401	5,010,261	1991-04-23	GENERAL ELECTRIC COMPANY	
	A402	5,012,401	1991-04-30	Allied-Signal Inc.	
	A403	5,013,980	1991-05-07	Thomson Consumer Electronics, Inc.	
	A404	5,016,245	1991-05-14	SIEMENS AG	
	A405	5,017,800	1991-05-21	WISCONSIN ALUMNI RES FOUND	
	A406	5,019,717	1991-05-28	ELEGANT DESIGN SOLUTIONS INC	
	A407	5,019,719	1991-05-28	International Rectifier Corporation	
	A408	5,019,954	1991-05-28	ALLIED SIGNAL INC	
	A409	5,023,766	1991-06-11	BRITISH TELECOMM	
	A410	5,027,002	1991-06-25	WESTINGHOUSE ELECTRIC CORP	
	A411	5,027,264	1991-06-25	Wisconsin Alumni Research Foundation	
	A412	5,029,062	1991-07-02	Alcatel Espace	
	A413	5,036,452	1991-07-30	AT & T BELL LAB	
	A414	5,038,264	1991-08-06	GENERAL ELECTRIC COMPANY	
	A415	5,038,265	1991-08-06	BULL SA	
	A416	5,038,266	1991-08-06	General Electric Company	
	A417	5,041,777	1991-08-20	PHILIPS CORP	
	A418	5,043,859	1991-08-27	GEN ELECTRIC	
	A419	5,047,911	1991-09-10	Leybold Aktiengesellschaft	
	A420	5,055,722	1992-12-01	THOMAS S LATOS	
	A421	5,057,698	1991-10-15	EXIDE ELECTRONICS	
	A422	5,057,986	1991-10-15	UNISYS CORPORATION	
	A423	5,063,338	1991-11-05	ALCATEL ESPACE	

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	A424	5,063,489	1991-11-05	NEC CORP	
	A425	5,066,900	1991-11-19	COMPUTER PRODUCTS INC	
	A426	5,073,848	1991-12-17	GEN ELECTRIC	
	A427	5,077,486	1991-12-31	MARSON GARY	
	A428	5,079,686	1992-01-07	VLT Corporation	
	A429	5,097,403	1992-03-17	ASTEC INT LTD	
	A430	5,099,406	1992-03-24	UNIV KYUSHU	
	A431	5,101,336	1992-03-31	Alcatel N.V.	
	A432	5,103,110	1992-04-07	KELTRONICS CORP	
	A433	5,103,387	1992-04-07	NORTHERN TELECOM LTD	
	A434	5,105,351	1992-04-14	Kabushiki Kaisha Toshiba	
	A435	5,111,372	1992-05-05	TOKO INC	
	A436	5,111,374	1992-05-05	The University of Tennessee Research Corp.	
	A437	5,113,334	1992-05-12	Rifala Pty. Ltd.	
	A438	5,113,337	1992-05-12	GEN ELECTRIC	
	A439	5,119,013	1992-06-02	SQUARE D COMPANY	
	A440	5,119,283	1992-06-02	GEN ELECTRIC	
	A441	5,119,284	1992-06-02	GEN ELECTRIC	
	A442	5,122,726	1992-06-16	Alcatel Network Systems, Inc.	
	A443	5,122,945	1992-06-16	Reliance Comm/Tec Corporation	
	A444	5,126,651	1992-06-30	Motorola, Inc.	
	A445	5,128,603	1992-07-07	ALCATEL NV	
	A446	5,132,888	1992-07-21	UNISYS CORPORATION	
	A447	5,132,889	1992-07-21	IBM CORPORATION	
	A448	5,138,184	1992-08-11	POWERTROL INC	
	A449	5,138,249	1992-08-11	Alcatel Espace	
	A450	5,140,509	1992-08-18	Allied-Signal Inc.	
	A451	5,140,512	1992-08-18	O'SULLIVAN; DERMOT	
	A452	5,140,514	1992-08-18	Kone Elevator GmbH	
	A453	5,144,547	1992-09-01	NEC CORP	
	A454	5,146,394	1992-09-08	MATSUSHITA ELECTRIC IND CO LTD	
	A455	5,157,269	1992-10-20	UNITRODE CORP	
	A456	5,159,541	1992-10-27	NORTHERN TELECOM LTD	
	A457	5,161,241	1992-11-03	Matsushita Electric	

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				Industrial Co., Ltd.	
	A458	5,162,663	1992-11-10	NCR CO	
	A459	5,164,609	1992-11-17	DONNELLY CORP	
	A460	5,168,435	1992-12-01	NEC CORP	
	A461	5,173,846	1992-12-22	Astec International Ltd.	
	A462	5,177,675	1993-01-05	SHINDENGEN ARCHER CORP	
	A463	5,179,512	1993-01-12	GEN ELECTRIC	
	A464	5,206,800	1993-04-27	ASTEC INTERNATIONAL, LTD.	
	A465	5,208,740	1993-05-04	The Texas A & M University System	
	A466	5,216,351	1993-06-01	Seiko Instruments Inc.	
	A467	5,218,522	1993-06-08	Hughes Aircraft Company	
	A468	5,221,887	1993-06-22	GULCZYNSKI; ZDZISLAW	
	A469	5,224,025	1993-06-29	WISCONSIN ALUMNI RES FOUND	
	A470	5,233,509	1993-08-03	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A471	5,235,502	1993-08-10	VLT Corporation	
	A472	5,237,208	1993-08-17	NISHIMU DENSHI KOGYO KK	
	A473	5,237,606	1993-08-17	CHARLES IND LTD	
	A474	5,254,930	1993-10-19	DIGITAL EQUIPMENT CORP	
	A475	5,255,174	1993-10-19	Allied-Signal Inc.	
	A476	5,264,736	1993-11-23	RAYTHEON COMPANY	
	A477	5,267,135	1993-11-30	NEC CORP	
	A478	5,267,137	1993-11-30	Kohler, Schmid Partner	
	A479	5,268,830	1993-12-07	AT&T BELL LABORATORIES	
	A480	5,272,612	1993-12-21	Kabushiki Kaisha Toshiba	
	A481	5,272,613	1993-12-21	PHILIPS CORP	
	A482	5,274,539	1993-12-28	GEN ELECTRIC	
	A483	5,274,543	1993-12-28	AT & T BELL LAB	
	A484	5,289,364	1994-02-22	HITACHI LTD	
	A485	5,303,138	1994-04-12	AT & T BELL LAB	
	A486	5,304,875	1994-04-19	ASTEC INT LTD	
	A487	5,305,191	1994-04-19	AT & T BELL LAB	
	A488	5,305,192	1994-04-19	LINEAR TECHNOLOGY	

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	A490	5,353,212	1994-10-04	AT & T BELL LAB	
	A491	5,355,077	1994-10-11	DELL USA LP	
	A492	5,355,293	1994-10-11	CARLSTEDT ELEKTRONIK AB	
	A493	5,355,294	1994-10-11	GEN ELECTRIC	
	A494	5,363,323	1994-11-08	International Business Machines Corporation	
	A495	5,377,090	1994-12-27	MARTIN MARIETTA CORP	
	A496	5,383,858	1996-10-29	MEDRAD INC	
	A497	5,386,359	1995-01-31	NEC CORP	
	A498	5,396,412	1995-03-07	ALLIED SIGNAL INC	
	A499	5,398,182	1995-03-14	NAMCO CONTROLS CORP	
	A500	5,400,239	1995-03-21	Northern Telecom Limited	
	A501	5,410,467	1995-04-25	Astec International Limited	
	A502	5,412,308	1995-05-02	HEWLETT PACKARD CORP	
	A503	5,412,557	1995-05-02	Electronic Power Conditioning, Inc.	
	A504	5,424,932	1995-06-13	Yokogawa Electric Corporation	
	A505	5,428,523	1995-06-27	RO ASSOCIATES	
	A506	5,430,632	1995-07-04	POWERPAQ TECH INC	
	A507	5,430,633	1995-07-04	ASTEC INT LTD	
	A508	5,434,770	1995-07-18	United States Department of Energy	
	A509	5,438,499	1995-08-01	LINEAR TECHNOLOGY CORP.	
	A510	5,442,534	1995-08-15	California Institute of Technology	
	A511	5,448,469	1995-09-05	THOMSON BRANDT GMBH	
	A512	5,461,301	1995-10-24	Qualidyne Systems	
	A513	5,477,091	1995-12-19	MERLIN GERIN	
	A514	5,481,178	1996-01-02	LINEAR TECHN INC	
	A515	5,481,449	1996-01-02	GEN ELECTRIC	
	A516	5,500,791	1996-03-19	GENERAL ELECTRIC COMPANY	

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	A517	5,513,092	1996-04-30	Bruker Analytische Messtechnik GmbH	
	A518	5,514,921	1996-05-07	GEN ELECTRIC	
	A519	5,519,599	1996-05-21	NEC CORP	
	A520	5,528,480	1996-06-18	Elonex Technologies, Inc.	
	A521	5,528,482	1996-06-18	AT & T CORP	
	A522	5,530,635	1996-06-25	Nemic-Lambda Kabushiki Kaisha	
	A523	5,534,768	1996-07-09	HARRIS CORP	
	A524	5,535,112	1996-07-09	ALCATEL NV	
	A525	5,537,021	1996-07-16	ALCATEL BELL-SDT S.A.	
	A526	5,539,630	1996-07-23	California Institute of Technology	
	A527	5,539,631	1996-07-23	Ion Systems Incorporated	
	A528	5,541,827	1996-07-30	DOBLE ENG	
	A529	5,552,695	1996-09-03	LINEAR TECHN INC	
	A530	5,559,423	1996-09-24	Norhtern Telecom Limited	
	A531	5,559,682	1996-09-24	HITACHI LTD	
	A532	5,570,276	1996-10-29	OPTIMUN POWER CONVERSION INC	
	A533	5,576,940	1996-11-19	GEN ELECTRIC	
	A534	5,590,032	1996-12-31	LUCENT TECHNOLOGIES INC	
	A535	5,594,629	1997-01-14	General Electric Company	
	A536	5,621,621	1997-04-15	Lindmark Electric AB	
	A537	5,625,541	1997-04-29	LUCENT TECHNOLOGIES INC	
	A538	5,635,826	1997-06-03	Chiyoda Corporation	
	A539	5,636,107	1997-06-03	INTERNATIONAL POWER DEVICES, INC.	
	A540	5,636,116	1997-06-03	MELCHER AG	
	A541	5,663,876	1997-09-02	Lucent Technologies Inc.	
	A542	5,663,877	1997-09-02	MELCHER AG	
	A543	5,663,887	1997-09-02	PROGRESSIVE INTERNATIONAL ELECTRONICS	
	A544	5,691,870	1997-11-25	COMPAQ COMPUTER CORP	
	A545	5,708,571	1998-01-13	NEC CORP	

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	A547	5,726,869	1998-03-10	FUJITSU LTD	
	A548	5,729,444	1998-03-17	AGENCE SPATIALE EUROPEENNE	
	A549	5,734,563	1998-03-31	NEC CORP	
	A550	5,736,843	1998-04-07	Silicon Graphics, Inc.	
	A551	5,742,491	1998-04-21	LUCENT TECHNOLOGIES INC	
	A552	5,745,359	1998-04-28	COMPAQ COMPUTER CORP	
	A553	5,754,414	1998-05-19	HANINGTON; GARY J.	
	A554	5,757,625	1998-05-26	PHILIPS CORP	
	A555	5,757,627	1998-05-26	Compaq Computer Corporation	
	A556	5,768,118	1998-06-16	Compaq Computer Corporation	
	A557	5,771,160	1998-06-23	SAMSUNG ELECTRONICS CO LTD	
	A558	5,774,350	1998-06-30	SGS THOMSON MICROELECTRONICS	
	A559	5,781,420	1998-07-14	INT POWER DEVICES INC	
	A560	5,781,421	1998-07-14	GENERAL ELECTRIC COMPANY	
	A561	5,784,266	1998-07-21	Virginia Power Technologies, Inc	
	A562	5,805,432	1998-09-08	NEC CORP	
	A563	5,818,704	1998-10-06	INT RECTIFIER CORP	
	A564	5,831,839	1998-11-03	PHILIPS CORP	
	A565	5,841,641	1998-11-24	COMPAQ COMPUTER CORPORATION	
	A566	5,841,643	1998-11-24	LINEAR TECHNOLOGY CORPORATION	
	A567	5,862,042	1999-01-19	LUCENT TECHNOLOGIES INC	
	A568	5,870,299	1999-02-09	LUCENT TECHNOLOGIES INC	
	A569	5,872,705	1999-02-16	LUCENT TECHNOLOGIES INC	

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	A570	5,880,939	1999-03-09	SINFOR	
	A571	5,880,949	1999-03-09	ALCATEL ALSTHOM COMPAGNIE GENERALE D'ELECTRICITE	
	A572	5,894,412	1999-04-13	COMPAQ COMPUTER CORP	
	A573	5,901,052	1999-05-04	U.S. Philips Corporation	
	A574	5,903,452	1999-05-11	SYSTEM GENERAL CORPORATION	
	A575	5,907,481	1999-05-25	ERICSSON TELEFON AB L M	
	A576	5,916,313	1999-06-29	DELL USA LP	
	A577	5,929,692	1999-07-27	COMPUTER PRODUCTS INC	
	A578	5,946,202	1999-08-31	BAKER HUGHES INCORPORATED	
	A579	5,946,207	1999-08-31	PHILIPS CORP	
	A580	5,949,658	1999-09-07	Lucent Technologies, Inc.	
	A581	5,956,242	1999-09-21	PHILIPS ELECTRONICS NA	
	A582	5,956,245	1999-09-21	LUCENT TECHNOLOGIES INC	
	A583	5,959,370	1999-09-28	PARDO; HERBERT	
	A584	5,991,167	1999-11-23	PHILIPS CORP	
	A585	5,999,417	1999-12-07	FISCHE LLC	
	A586	6,002,597	1999-12-14	LUCENT TECHNOLOGIES INC	
	A587	6,005,773	1999-12-21	LUCENT TECHNOLOGIES INC.	
	A588	6,011,703	2000-01-04	LUCENT TECHNOLOGIES INC	
	A589	6,016,258	2000-01-18	Nortel Networks Corporation	
	A590	6,016,261	2000-01-18	PHILIPS CORP	
	A591	6,026,005	2000-02-15	INT RECTIFIER CORP	
	A592	6,038,148	2000-03-14	ERICSSON INC	
	A593	6,046,920	2000-04-04	Alcatel	
	A594	6,058,026	2000-05-02	Lucent Technologies, Inc.	
	A595	6,066,943	2000-05-23	Texas Instruments Incorporated	

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	A597	6,069,804	2000-05-30	CONDOR D C POWER SUPPLIES INC	
	A598	6,084,792	2000-07-04	VPT INC	
	A599	6,087,817	2000-07-11	LINEAR TECHN INC	
	A600	6,088,329	2000-07-11	TELEFONAKTIEBOLAGET LM ERICSSON	
	A601	6,091,616	2000-07-18	LUCENT TECHNOLOGIES INC	
	A602	6,137,697	2000-10-24	CIT ALCATEL	
	A603	6,137,698	2000-10-24	SHINDENGEN ELECTRIC MFG	
	A604	6,141,224	2000-10-31	INTERNAT POWER DEVICES INC	
	A605	6,169,675	2001-01-02	Fujitsu Limited	
	A606	6,191,964	2001-02-20	Lucent Technologies Inc.	
	A607	6,208,535	2001-03-27	Texas Instruments Incorporated	
	A608	6,211,657	2001-04-03	Communications & Power Industries, Inc.	
	A609	6,222,742	2001-04-24	SynQor, Inc.	
	A610	6,246,592	2001-06-12	Texas Instruments Incorporated	
	A611	6,252,781	2001-06-26	Artesyn Technologies, Inc.	
	A612	6,278,621	2001-08-21	International Power Devices, Inc.	
	A613	6,385,059	2002-05-07	Iwatt, Inc.	
	A614	6,417,653	2002-07-09	Intel Corporation	
	A615	6,421,262	2002-07-16	VLT Corporation	
	A616	6,430,071	2002-08-06	NTT Data Corporation	
	A617	6,477,065	2002-11-05	Texas Instruments Incorporated	
	A618	6,487,093	2002-11-26	Intel Corporation	
	A619	6,504,267	2003-01-07	Koninklijke Philips Electronics N.V.	
	A620	6,535,407	2003-03-18	NEC Corporation	
	A621	6,552,917	2003-04-22	Koninklijke Philips Electronics N.V.	

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	A623	6,594,159	2003-07-15	SynQor, Inc.	
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	A625	6,696,882	2004-02-24	Artesyn Technologies, Inc.	
	A626	6,700,365	2004-03-02	Intersil Americas Inc.	
	A627	6,721,192	2004-04-13	System General Corp.	
	A628	6,728,118	2004-04-27	Innoveta Technologies, Inc.	
	A629	6,731,520	2004-05-04	SynQor, Inc.	
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	A631	6,804,125	2004-10-12	di/dt Inc.	
	A632	6,836,415	2004-12-28	Systems General Corp.	
	A633	6,845,019	2005-01-18	Fairchild Korea Semiconductor Ltd.	
	A634	6,853,563	2005-02-08	System General Corp.	
	A635	6,853,568	2005-02-08	Delta Electronics, Inc.	
	A636	6,862,194	2005-03-01	System General Corp.	
	A637	6,862,198	2005-03-01	iWatt, Inc.	
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	A639	6,930,893	2005-08-16	VLT, Inc.	
	A640	6,970,366	2005-11-29	Power-One AS	
	A641	6,987,679	2006-01-17	Delta Electronics, Inc.	
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	A643	7,031,128	2006-04-18	Samsung Electronics Co., Ltd.	
	A644	7,035,120	2006-04-25	Shindengen Electric Manufacturing Co., Ltd.	
	A645	7,050,309	2006-05-23	SynQor, Inc.	
	A646	7,055,309	2006-06-06	Robert Bosch GmbH	
	A647	7,072,190	2006-07-04	SynQor, Inc.	
	A648	7,187,562	2007-03-06	International Rectifier Corporation	
	A649	7,269,034	2007-09-11	SynQor, Inc.	
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	A652	7,558,083	2009-07-07	SynQor, Inc.	
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	A656	8,023,290	2011-09-20	SynQor, Inc.	
	A657	8,493,751	2013-07-23	Synqor, Inc.	
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	A659	2005/0047177	2005-03-03	TOBITA ATSUHIRO	
	A660	2006/0209572	2006-09-21	SCHLECHT MARTIN F	
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	A662	2006/0285368	2006-12-21	SCHLECHT MARTIN F	
	A663	2008/0175024	2008-07-24	SCHLECHT MARTIN F	
	A664	2009-0051221	2009-02-26	INNOCOM TECHNOLOGY (SHENZHEN) CO., LTD.; INNOLUX DISPLAY CORP.	
	A665	2010-0091526	2010-04-15	SCHLECHT MARTIN F	
	A666	2011-0176333	2011-07-21	SynQor, Inc.	
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	A669	6,191,964 B1	2001-02-20	Lucent Technologies Inc.	
	A670	6,208,535 B1	2001-03-27	Texas Instruments Incorporated	
	A671	6,222,742 B1	2001-04-24	SynQor, Inc.	
	A672	6,246,592 B1	2001-06-12	Texas Instruments Incorporated	
	A673	6,278,621 B1	2001-08-21	International Power Devices, Inc.	
	A674	6,385,059 B1	2002-05-07	Iwatt, Inc.	
	A675	6,477,065 B2	2002-11-05	Texas Instruments Incorporated	
	A676	6,535,407 B1	2003-03-18	NEC Corporation	
	A677	6,580,258 B2	2003-06-17	Linear Technology Corporation	
	A678	6,608,768 B2	2003-08-19	Salcomp Oy	
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	A680	6,836,415 B1	2004-12-28	Systems General Corp.	
	A681	6,845,019 B2	2005-01-18	Fairchild Korea Semiconductor Ltd.	
	A682	6,853,563 B1	2005-02-08	System General Corp.	
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				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: December 13, 2016				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	52	of	54	Attorney Docket Number	111664-0123 (VA1078)

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Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
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Examiner Signature		Date Considered	

Substitute for form 1449/PTO				***Complete if Known***	
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				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
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Examiner Signature		Date Considered	

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/Eljona Jahaj
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 1st Request	1801	1	1200	1200
		Total in USD ($)		**1200**

Electronic Acknowledgement Receipt	
EFS ID:	27752368
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:50:19
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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	27753155
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:52:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	C48.pdf	1943388 de074aa5f6db1ba5448cd3e56083b9181226fcd9	no	12

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	27753407
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:53:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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Electronic Acknowledgement Receipt

EFS ID:	27755524
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:58:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	27755546
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:59:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

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Electronic Acknowledgement Receipt

EFS ID:	27753969
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
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Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:55:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	27754293
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:56:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	27754433
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	16:57:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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Electronic Acknowledgement Receipt

EFS ID:	27755549
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Eljona Jahaj
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2016
Filing Date:	02-JUL-2013
Time Stamp:	17:00:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO98-11658.pdf	945613 17789691c2086b327b72ada70bedb6b4b07e9bd1	no	28

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2	Foreign Reference	WO98-18198.pdf	506013 6687d705c620d352d39cc57b1fe17d78008ffb05	no	16
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3	Foreign Reference	WO2004-082119A2.pdf	1292902 decbd2236101ca1cf0f8374731a53712f30dea7c	no	26
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112754 7590 02/02/2017

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER
CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 02/02/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	05/02/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

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Page 294

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P.O. Box 1450
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112754 7590 02/02/2017
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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	05/02/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
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(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
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3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 02/02/2017

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 02/02/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

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Page 296

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/933,252	Applicant(s) VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE of 12/13/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-24*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 12/13/16
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☒ Other *Examiner's remark on IDS*.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

The information disclosure statement filed 12/13/16 fails to comply with 37 CFR 1.98(a)(3)(i) because it does not include a **concise** explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each reference listed that is not in the English language. The purpose of the references in the IDS written in the English language is for **Examiner** to examine and review each one of the references in the IDS. In the case of an excess number of references, over a thousand, the references are as if not in English language because Examiner simply cannot review all the references in the IDS within limited time per patent applicant. Therefore, the IDS filed 12/13/16 has been placed in the application file, but the information referred to therein has **not** been considered.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH CHANG whose telephone number is (571)272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: December 13, 2016				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	1	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	443,441	1890-12-23	HANSON, M.	
	A2	1,181,803	1916-05-02	GEN ELECTRIC	
	A3	2,042,274	1936-05-26	STANDARD OIL DEV CO	
	A4	2,497,534	1950-02-14	GEN ELECTRIC	
	A5	2,852,730	1958-09-16	MOTOROLA INC	
	A6	2,902,862	1959-09-08	TWIFORD HARRY G	
	A7	2,953,738	1960-09-20	WESTINGHOUSE ELECTRIC CORP	
	A8	3,008,068	1961-11-07	PHILIPS CORP	
	A9	3,008,506	1961-11-14	LED BALLAST INC	
	A10	3,029,398	1962-04-10	THOMPSON RAMO WOOLDRIDGE INC	
	A11	3,083,328	1963-03-26	BELL TELEPHONE LABOR INC	
	A12	3,141,140	1964-07-14	ACOUSTICA ASSOCIATES INC	
	A13	3,146,406	1964-08-25	PHILIPS CORP	
	A14	3,161,837	1964-12-15	DAVEN COMPANY	
	A15	3,174,042	1965-03-16	EFFNER WHITE RALPH	
	A16	3,229,111	1966-01-11	ELECTRO SEAL CORP	
	A17	3,241,035	1966-03-15	WARREN MFG COMPANY INC	
	A18	3,295,042	1966-12-27	ROBERTSHAW CONTROLS CO	
	A19	3,307,073	1967-02-28	MOTOROLA INC	
	A20	3,313,996	1967-04-11	HONEYWELL INC	
	A21	3,343,073	1967-09-19	LORAIN PROD CORP	
	A22	3,400,325	1968-09-03	RCA CORP	
	A23	3,435,375	1969-03-25	MOTOROLA, INC.	
	A24	3,443,194	1969-05-06	IBM	
	A25	3,448,370	1969-06-03	AT&T CORP.	
	A26	3,454,853	1969-07-08	HONEYWELL INC.	
	A27	3,458,798	1969-07-29	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A28	3,459,957	1969-08-05	ITE IMPERIAL CORP	
	A29	3,471,747	1969-10-07	GEN MOTORS CORP	
	A30	3,495,157	1970-02-10	FORBRO DESIGN CORP.	
	A31	3,506,908	1970-04-14	TRW INC.	

Examiner Signature		Date Considered	

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: December 13, 2016				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	2	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A32	3,514,692	1970-05-26	HONEYWELL INC.	
	A33	3,517,301	1970-06-23	BUNKER RAMO CORPORATION	
	A34	3,553,428	1971-01-05	DU PONT	
	A35	3,564,393	1971-02-16	NORTH AMERICAN ROCKWELL	
	A36	3,569,818	1971-03-09	HUGHES AIRCRAFT CO	
	A37	3,573,483	1971-04-06	ESSEX INTERNATIONAL INC	
	A38	3,573,494	1971-04-06	AUTOMATIC TIMING AND CONTROLS, INC.	
	A39	3,573,508	1971-04-06	BELL TELEPHONE LABOR INC	
	A40	3,573,544	1971-04-06	ENERGY ELECTRONICS	
	A41	3,573,597	1971-04-06	GENERAL ELECTRIC COMPANY	
	A42	3,579,026	1971-05-18	SYLVANIA ELECTRIC PROD	
	A43	3,581,186	1971-05-25	MOTOROLA, INC.	
	A44	3,582,754	1971-06-01	WANDEL U. GOLTERMANN ELEKTRONISCHE PRAZISIONSMESSGERATE	
	A45	3,582,758	1971-06-01	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A46	3,584,269	1971-06-08	BELL TELEPHONE LABOR INC	
	A47	3,588,595	1971-06-28	KIDDE, INC.	
	A48	3,599,073	1971-08-10	TEXAS INSTRUMENTS INC	
	A49	3,604,920	1971-09-14	DONALD M NILES	
	A50	3,619,713	1971-11-09	SOLA BASIC IND INC	
	A51	3,629,648	1971-12-21	BRENT W BROWN	
	A52	3,629,725	1971-12-21	AT&T CORP.	
	A53	3,638,099	1972-01-25	COLLINS RADIO COMPANY	
	A54	3,643,152	1972-02-15	HITACHI, LTD	
	A55	3,646,395	1972-02-29	AMERICAN OPTICAL CORPORATION	
	A56	3,657,631	1972-04-18	INTERNATIONAL STANDARD ELECTRIC CORPORATION (ITTC)	

Examiner Signature		Date Considered	

4887-6151-3021.2

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: December 13, 2016				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	3	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A57	3,660,672	1972-05-02	PIONEER MAGNETICS INC	
	A58	3,663,941	1972-05-16	UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND	
	A59	3,665,203	1972-05-23	JERRY D HOGG	
	A60	3,668,508	1972-06-06	ACME ELECTRIC CORP.	
	A61	3,684,891	1972-08-15	DUAL LITE CO	
	A62	3,696,286	1972-10-03	NORTH AMERICAN ROCKWELL	
	A63	3,704,381	1972-11-28	FORBRO DESIGN CORP	
	A64	3,710,231	1973-01-09	WESTINGHOUSE ELECTRIC CORP.	
	A65	3,714,545	1973-01-30	COMTEURS SCHLUMBERGER MONTROAGE	
	A66	3,733,538	1973-05-15	WESTINGHOUSE ELECTRIC CORP.	
	A67	3,735,235	1973-05-22	AT&T CORP.	
	A68	3,737,755	1973-06-05	AT&T CORP.	
	A69	3,742,242	1973-06-26	SONY CORP	
	A70	3,743,861	1973-07-03	HONEYWELL INC.	
	A71	3,751,676	1973-08-07	MATSUSHITA ELECTRIC IND CO LTD	
	A72	3,753,071	1973-08-14	WESTINGHOUSE ELECTRIC CORP	
	A73	3,753,076	1973-08-14	LIGHTING SYSTEMS INC	
	A74	3,754,177	1973-08-21	LECTRON CORPORATION	
	A75	3,757,195	1973-09-04	HONEYWELL INC.	
	A76	3,769,545	1973-10-30	KODAN INC	
	A77	3,771,040	1973-11-06	NASA	
	A78	3,781,505	1973-12-25	GENERAL ELECTRIC COMPANY	
	A79	3,781,638	1973-12-25	GENERAL ELECTRIC COMPANY	
	A80	3,787,730	1974-01-22	UNITED AIRCRAFT CORP	
	A81	3,805,094	1974-04-16	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A82	3,816,810	1974-06-11	HONEYWELL	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: December 13, 2016				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	4	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				INFORMATION SYSTEMS INC.	
	A83	3,818,237	1974-06-18	HUGHES AIRCRAFT CO	
	A84	3,818,312	1974-06-18	U.S. PHILIPS CORPORATION	
	A85	3,820,808	1974-06-25	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A86	3,824,450	1974-07-16	RCA CORPORATION	
	A87	3,845,404	1974-10-29	TRILLING T.	
	A88	3,848,175	1974-11-12	GEN ELECTRIC	
	A89	3,851,240	1974-11-26	GENERAL ELECTRIC COMPANY	
	A90	3,851,278	1974-11-26	BELL + HOWELL JAPAN, LTD.	
	A91	3,859,638	1975-01-07	INTERSIL INC	
	A92	3,873,846	1975-03-25	SONY CORP	
	A93	3,879,647	1975-04-22	AT&T CORP.	
	A94	3,879,652	1975-04-22	WESTINGHOUSE ELECTRIC CORP.	
	A95	3,904,950	1975-09-09	AT&T CORP.	
	A96	3,909,695	1975-09-30	HEWLETT PACKARD COMPANY	
	A97	3,909,700	1975-09-30	GENERAL ELECTRIC COMPANY	
	A98	3,912,940	1975-10-14	HONEYWELL INC	
	A99	3,913,002	1975-10-14	GENERAL ELECTRIC COMPANY	
	A100	3,913,036	1975-10-14	VICTOR COMPTOMETER CORPORATION	
	A101	3,916,289	1975-10-28	UNITED STATES OF AMERICA, AIR FORCE	
	A102	3,919,656	1975-11-11	SOKAL NATHAN O; SOKAL ALAN D	
	A103	3,927,363	1975-12-16	ROCKWELL INTERNATIONAL CORPORATION	
	A104	3,930,196	1975-12-30	GENERAL ELECTRIC COMPANY	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: December 13, 2016				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	5	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A105	3,932,764	1976-01-13	ESB INC	
	A106	3,938,024	1976-02-10	Bell Telephone Laboratories, Incorporated	
	A107	3,940,682	1976-02-24	General Electric Company	
	A108	3,949,238	1976-04-06	NORTHERN ELECTRIC CO	
	A109	3,959,716	1976-05-25	The Bendix Corporation	
	A110	3,974,397	1976-08-10	S & C ELECTRIC CO	
	A111	3,976,932	1976-08-24	General Electric Company	
	A112	3,986,052	1976-10-12	North Electric Company	
	A113	3,986,097	1976-10-12	Bell Telephone Laboratories, Incorporated	
	A114	3,989,995	1976-11-02	Bell Telephone Laboratories, Incorporated	
	A115	3,991,319	1976-11-09	INSTRUMENTATION & CONTROL SYST	
	A116	4,005,335	1977-01-25	IOTA ENGINEERING INC	
	A117	4,007,413	1977-02-08	BELL TELEPHONE LABOR INC	
	A118	4,010,381	1977-03-01	BELL TELEPHONE LABOR INC	
	A119	4,011,518	1977-03-08	The United States of America as represented by the Secretary of the Navy	
	A120	4,017,746	1977-04-12	Nartron Corporation	
	A121	4,017,783	1977-04-12	Telefonaktiebolaget L M Ericsson	
	A122	4,017,784	1977-04-12	Litton Systems, Inc.	
	A123	4,027,228	1977-05-31	GEN ELECTRIC	
	A124	4,037,271	1977-07-19	BOSCHERT ASSOCIATES	
	A125	4,044,268	1977-08-23	GATES RUBBER CO	
	A126	4,051,445	1977-09-27	Boschert Assoc.	
	A127	4,058,369	1977-11-15	BENTLEY LAB	
	A128	4,060,757	1977-11-29	General Electric Co.	
	A129	4,066,945	1978-01-03	BENDIX CORP	
	A130	4,074,182	1978-02-14	GEN ELECTRIC	
	A131	4,078,247	1978-03-07	RCA Corporation	

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	A132	4,104,539	1978-08-01	HASE A M	
	A133	4,106,084	1978-08-08	Societe Nationale des Petroles d'Aquitaine	
	A134	4,109,192	1978-08-22	Hughes Aircraft Company	
	A135	4,114,048	1978-09-12	WESTINGHOUSE ELECTRIC CORP	
	A136	4,115,704	1978-09-19	US NAVY	
	A137	4,122,359	1978-10-24	HONEYWELL INC	
	A138	4,126,793	1978-11-21	ZELLWEGER USTER AG	
	A139	4,128,868	1978-12-05	RCA CORPORATION	
	A140	4,131,860	1978-12-26	THOMSON-CSF	
	A141	4,140,959	1979-02-20	POWELL WILLIAM S	
	A142	4,150,423	1979-04-17	Bosehert Associates	
	A143	4,177,389	1979-12-04	SIEMENS AG	
	A144	4,184,197	1980-01-15	California Institute of Technology	
	A145	4,187,458	1980-02-05	The United States of America as represented by the Secretary of the Army	
	A146	4,194,147	1980-03-18	BURR BROWN RES CORP	
	A147	4,205,368	1980-05-27	SIEMENS AG	
	A148	4,207,475	1980-06-10	KEPCO INC	
	A149	4,208,594	1980-06-17	HONEYWELL INC	
	A150	4,208,706	1980-06-17	Sony Corporation	
	A151	4,209,710	1980-06-24	HONEYWELL INC	
	A152	4,210,858	1980-07-01	International Business Machines Corporation	
	A153	4,210,958	1980-07-01	Ikenoue, Tsuneo	
	A154	4,238,690	1980-12-09	BELL TELEPHONE LABOR INC	
	A155	4,238,691	1980-12-09	BELL TELEPHONE LABOR INC	
	A156	4,241,261	1980-12-23	BELL TELEPHONE LABOR INC	
	A157	4,245,194	1981-01-13	GTE Products Corporation	
	A158	4,245,286	1981-01-13	NASA	
	A159	4,251,857	1981-02-17	Sperry Corporation	
	A160	4,253,136	1981-02-24	SANYO ELECTRIC CO	
	A161	4,254,459	1981-03-03	JMJ Electronics Corp.	

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	A162	4,257,087	1981-03-17	California Institute of Technology	
	A163	4,257,089	1981-03-17	The United States of America as represented by the Secretary of the Army	
	A164	4,262,214	1981-04-14	FOXBORO CO	
	A165	4,268,476	1981-05-19	BENTLEY LAB	
	A166	4,270,164	1981-05-26	Contraves Goerz Corporation	
	A167	4,270,165	1981-05-26	QUALIDYNE SYSTEMS INC	
	A168	4,272,806	1981-06-09	EASTMAN KODAK CO	
	A169	4,274,133	1981-06-16	California Institute of Technology	
	A170	4,275,317	1981-06-23	FROSCH; ROBERT A. ADMINISTRATOR OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WITH RESPECT TO AN INVENTION OF	
	A171	4,276,594	1981-06-30	Gould Inc. Modicon Division	
	A172	4,277,726	1981-07-07	LITTON SYSTEMS INC	
	A173	4,277,728	1981-07-07	STEVENS LUMINOPTICS	
	A174	4,288,739	1981-09-08	Kepco, Inc.	
	A175	4,288,865	1981-09-08	MOSTEK CORP	
	A176	4,292,581	1981-09-29	TAN; TAT S.	
	A177	4,293,902	1981-10-06	AEL Mirrotel, Ltd.	
	A178	4,293,904	1981-10-06	The United States of America as represented by the Secretary of the Navy	
	A179	4,297,590	1981-10-27	VAIL ANDE	
	A180	4,300,191	1981-11-10	POWERCUBE CORPORATION	
	A181	4,301,496	1981-11-17	ITT	
	A182	4,302,803	1981-11-24	Sperry Corporation	
	A183	4,307,441	1981-12-22	United Technologies Corporation	
	A184	4,310,771	1982-01-12	BECKWITH ELECTRIC CO	

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				INC	
	A185	4,313,060	1982-01-26	BELL TELEPHONE LABOR INC	
	A186	4,315,207	1982-02-09	Advanced Micro Devices, Inc.	
	A187	4,316,097	1982-02-16	REYNOLDS WILLIAM R	
	A188	4,317,056	1982-02-23	GTE PROD CORP	
	A189	4,318,007	1982-03-02	SITS SOC IT TELECOM SIEMENS	
	A190	4,318,164	1982-03-02	TOKYO SHIBAURA DENKI KABUSHIKI KAISHA	
	A191	4,322,817	1982-03-30	Gte Automatic Electric Labs Inc.	
	A192	4,323,787	1982-04-06	CLARION CO LTD	
	A193	4,323,788	1982-04-06	BORG WARNER	
	A194	4,323,962	1982-04-06	GEN ELECTRIC	
	A195	4,325,017	1982-04-13	RCA CORP	
	A196	4,327,298	1982-04-27	BORG WARNER	
	A197	4,328,482	1982-05-04	CONSUMER ELEC PROD	
	A198	4,330,816	1982-05-18	Fujitsu Fanuc Limited	
	A199	4,334,263	1982-06-08	Pioneer Electronic Corporation	
	A200	4,336,587	1982-06-22	BOETTCHER, JR.; CHARLES W.	
	A201	4,344,122	1982-08-10	General Electric Company	
	A202	4,344,124	1982-08-10	Motorola, Inc.	
	A203	4,346,342	1982-08-24	Rockwell International Corporation	
	A204	4,347,558	1982-08-31	Rockwell International Corporation	
	A205	4,353,113	1982-10-05	Electrotech Instruments Limited	
	A206	4,355,884	1982-10-26	CANON KK	
	A207	4,356,541	1982-10-26	IKENOUE TSUNEO	
	A208	4,357,654	1982-11-02	IKENOUE TSUNEO	
	A209	4,368,409	1983-01-11	Thomson-Brandt	
	A210	4,371,919	1983-02-01	Bell Telephone Laboratories, Incorporated	

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	A211	4,381,457	1983-04-26	LADCO DEV CO INC	
	A212	4,386,394	1983-05-31	GEN ELECTRIC	
	A213	4,393,316	1983-07-12	Reliance Electric Co.	
	A214	4,395,639	1983-07-26	SAB NIFE AB	
	A215	4,398,156	1983-08-09	AALAND; KRISTIAN	
	A216	4,399,499	1983-08-16	GTE AUTOMATIC ELECTRIC LAB INC	
	A217	4,403,269	1983-09-06	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A218	4,415,960	1983-11-15	Sperry Corporation	
	A219	4,423,341	1983-12-27	Sperry Corporation	
	A220	4,427,899	1984-01-24	SIEMENS AG	
	A221	4,438,411	1984-03-20	Ford Aerospace & Communications Corporation	
	A222	4,441,070	1984-04-03	Motorola, Inc.	
	A223	4,442,339	1984-04-10	Mitsubishi Denki Kabushiki Kaisha	
	A224	4,443,840	1984-04-17	LICENTIA GMBH	
	A225	4,449,173	1984-05-15	Tohoku Metal Industries, Inc.	
	A226	4,449,174	1984-05-15	Bell Telephone Laboratories, Incorporated	
	A227	4,449,175	1984-05-15	Toko, Inc.	
	A228	4,451,743	1984-05-29	Citizen Watch Company Limited	
	A229	4,451,876	1984-05-29	Hitachi Metals, Ltd.	
	A230	4,465,966	1984-08-14	Motorola, Inc.	
	A231	4,471,289	1984-09-11	NCR CORPORATION	
	A232	4,473,756	1984-09-25	CALOYERAS INC	
	A233	4,476,399	1984-10-09	FUJI ELECTRIC CO LTD	
	A234	4,479,175	1984-10-23	Honeywell Inc.	
	A235	4,484,084	1984-11-20	NCR CO	
	A236	4,499,531	1985-02-12	501 Gateway Technology, Inc.	
	A237	4,504,895	1985-03-12	GENERAL ELECTRIC COMPANY	
	A238	4,519,024	1985-05-21	AT&T Bell Laboratories	

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	A239	4,520,296	1985-05-28	Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH	
	A240	4,523,265	1985-06-11	Compagnie de Signaux et D'Entreprises Electriques	
	A241	4,524,411	1985-06-18	RCA Corporation	
	A242	4,524,413	1985-06-18	IKENOUE TSUNEO	
	A243	4,527,228	1985-07-02	CHI YU; SIMON S.	
	A244	4,528,459	1985-07-09	ROCKWELL INTERNATIONAL CORP	
	A245	4,533,986	1985-08-06	GENERAL ELECTRIC COMPANY	
	A246	4,535,399	1985-08-13	National Semiconductor Corporation	
	A247	4,536,700	1985-08-20	United Technologies Corporation	
	A248	4,538,073	1985-08-27	CONVERGENT TECHNOLOGIES INC	
	A249	4,538,101	1985-08-27	Nippon Chemi-Con Corporation	
	A250	4,539,487	1985-09-03	MITSUBISHI ELECTRIC CORP	
	A251	4,546,421	1985-10-08	United Technologies Corporation	
	A252	4,553,039	1985-11-12	STIFTER FRANCIS J	
	A253	4,556,802	1985-12-03	NISHIMU DENSHI KOGYO KK	
	A254	4,561,046	1985-12-24	GTE Automatic Electric Incorporated	
	A255	4,562,522	1985-12-31	HONEYWELL INC	
	A256	4,564,800	1986-01-14	Jetronic Industries, Inc.	
	A257	4,566,059	1986-01-21	VENUS SCIENTIFIC INC.	
	A258	4,571,551	1986-02-18	WASHINGTON INNOVATIVE TECHNOLOGY, INC.	
	A259	4,575,640	1986-03-11	GEN ELECTRIC	
	A260	4,578,631	1986-03-25	SMITH; STEVE	
	A261	4,584,635	1986-04-22	International Business Machines Corp.	

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	A262	4,586,119	1986-04-29	ITT Corporation	
	A263	4,587,604	1986-05-06	RELIANCE ELECTRIC CO	
	A264	4,591,782	1986-05-27	General Electric Company	
	A265	4,593,213	1986-06-03	United Technologies Corporation	
	A266	4,605,999	1986-08-12	AT&T BELL LABORATORIES	
	A267	4,607,195	1986-08-19	U.S. Philips Corporation	
	A268	4,607,323	1986-08-19	SOKAL; NATHAN O.	
	A269	4,618,919	1986-10-21	SPERRY CORP	
	A270	4,621,313	1986-11-04	ZENITH ELECTRONICS CORP	
	A271	4,622,511	1986-11-11	Raytheon Company	
	A272	4,622,629	1986-11-11	Sundstrand Corporation	
	A273	4,626,982	1986-12-02	General Electric Company	
	A274	4,628,426	1986-12-09	GENERAL ELECTRIC COMPANY	
	A275	4,635,179	1987-01-06	ELDEC CORP	
	A276	4,638,175	1987-01-20	UNITED TECHNOLOGIES CORP	
	A277	4,642,475	1987-02-10	SIEMENS AG	
	A278	4,642,743	1987-02-10	International Business Machines Corp.	
	A279	4,644,440	1987-02-17	WESTINGHOUSE ELECTRIC CORP	
	A280	4,648,017	1987-03-03	RELIANCE ELECTRIC COMPANY	
	A281	4,651,020	1987-03-17	WESTINGHOUSE ELECTRIC CORP	
	A282	4,652,769	1987-03-24	ION TECH INC	
	A283	4,659,942	1987-04-21	DRAPER LAB CHARLES S	
	A284	4,663,699	1987-05-05	PIONEER MAGNETICS INC	
	A285	4,670,661	1987-06-02	TOKYO ELECTRIC CO LTD	
	A286	4,672,517	1987-06-09	Pioneer Magnetics, Inc.	
	A287	4,672,518	1987-06-09	American Telephone and Telegraph Co., AT&T Bell Labs	
	A288	4,672,528	1987-06-09	GENERAL ELECTRIC COMPANY	
	A289	4,674,019	1987-06-16	Keller-Mullett Technology	

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	A290	4,675,796	1987-06-23	VEECO INSTRUMENTS, INC.	
	A291	4,677,311	1987-06-30	HITACHI LTD	
	A292	4,677,534	1987-06-30	KABUSHIKI KAISHA TOSHIBA	
	A293	4,680,688	1987-07-14	YOKOGAWA HOKUSHIN ELECTRIC CORPORATION	
	A294	4,680,689	1987-07-14	PAYNE; DONALD W.	
	A295	4,683,528	1987-07-28	INTERSIL INC	
	A296	4,685,039	1987-08-04	YOKOGAWA HOKUSHIN ELECTRIC	
	A297	4,688,160	1987-08-18	AMERICAN TELEPHONE AND TELEGRAPH CO., AT&T BELL LABS	
	A298	4,691,273	1987-09-01	NIPPON TELEGRAPH & TELEPHONE CORP.	
	A299	4,694,384	1987-09-15	GEN ELECTRIC	
	A300	4,694,386	1987-09-15	THOMSON CSF	
	A301	4,695,935	1987-09-22	ALCATEL NV	
	A302	4,697,136	1987-09-29	SHIKOKU ELEC POWER	
	A303	4,698,738	1987-10-06	UNISYS CORP	
	A304	4,706,177	1987-11-10	JOSEPHSON ELLIOT	
	A305	4,709,316	1987-11-24	GENERAL ELECTRIC COMPANY	
	A306	4,709,318	1987-11-24	LIEBERT CORP	
	A307	4,716,514	1987-12-29	UNITRODE CORP	
	A308	4,717,833	1988-01-05	BOSCHERT INC	
	A309	4,727,308	1988-02-23	IBM	
	A310	4,727,469	1988-02-23	RELIANCE COMM/TEC CORPORATION	
	A311	4,730,242	1988-03-08	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A312	4,733,102	1988-03-22	Mitsubishi Jukogyo Kabushiki Kaisha	
	A313	4,734,839	1988-03-29	BARTHOLD; FRED O.	
	A314	4,734,844	1988-03-29	NCR Corporation	
	A315	4,734,924	1988-03-29	Kabushiki Kaisha Toshiba	
	A316	4,745,299	1988-05-17	AMERICAN TELEPHONE & TELEGRAPH	

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	A317	4,745,538	1988-05-17	Coutant Electronics Limited	
	A318	4,747,034	1988-05-24	DICKEY; DAVID V.	
	A319	4,748,550	1988-05-31	KABUSHIKI KAISHA TOSHIBA	
	A320	4,754,160	1988-06-28	INTERSIL INC	
	A321	4,754,161	1988-06-28	WESTINGHOUSE ELECTRIC CORP	
	A322	4,760,276	1988-07-26	UNISYS CORP.	
	A323	4,763,237	1988-08-09	WIECZOREK JOHN P	
	A324	4,768,141	1988-08-30	HUBERTUS; GUIDO	
	A325	4,772,994	1988-09-20	Nishimu Electronics Industries, Co., Ltd.	
	A326	4,777,382	1988-10-11	ALLIED SIGNAL INC	
	A327	4,777,575	1988-10-11	HITACHI LTD.	
	A328	4,779,185	1988-10-18	SIEMENS AKTIENGESELLSCHAFT	
	A329	4,782,241	1988-11-01	LIEBERT CORP	
	A330	4,783,728	1988-11-08	MODULAR POWER CORP	
	A331	4,785,387	1988-11-15	VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.	
	A332	4,788,450	1988-11-29	GEN ELECTRIC	
	A333	4,788,634	1988-11-29	MASSACHUSETTS INST TECHNOLOGY	
	A334	4,794,506	1988-12-27	HITACHI MEDICAL CORPORATION	
	A335	4,796,173	1989-01-03	GENERAL ELECTRIC COMPANY	
	A336	4,800,479	1989-01-24	Prime Computer, Inc.	
	A337	4,805,078	1989-02-14	Siemens Aktiengesellschaft	
	A338	4,809,148	1989-02-28	BRITISH COLUMBIA TELEPHONE	
	A339	4,811,191	1989-03-07	Catalyst Semiconductor, Inc.	
	A340	4,812,672	1989-03-14	NORTHERN TELECOM LTD	
	A341	4,814,962	1989-03-21	AMERICAN TELEPHONE AND TELEGRAPH	

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				COMPANY, AT&T BELL LABORATORIES	
	A342	4,814,965	1989-03-21	SPECTRA PHYSICS	
	A343	4,823,249	1989-04-18	AMERICAN TELEPHONE AND TELEGRAPH COMPANY AT&T BELL LABORATORIES	
	A344	4,825,348	1989-04-25	GENERAL ELECTRIC COMPANY	
	A345	4,829,216	1989-05-09	RCA Licensing Corporation	
	A346	4,841,160	1989-06-20	NCR CO	
	A347	4,853,832	1989-08-01	UNIVERSITY OF TOLEDO	
	A348	4,853,837	1989-08-01	GULCZYNSKI ZDZISLAW	
	A349	4,855,858	1989-08-08	International Business Machines Corporation	
	A350	4,855,888	1989-08-08	UNISYS CORPORATION	
	A351	4,860,184	1989-08-22	VIRGINIA TECH INTELL PROP	
	A352	4,860,185	1989-08-22	ELECTRONIC RESEARCH GROUP INC	
	A353	4,860,188	1989-08-22	TEXAS INSTRUMENTS INC	
	A354	4,860,189	1989-08-22	INTERNATIONAL BUSINESS MACHINES CORP.	
	A355	4,864,479	1989-09-05	General Electric Company	
	A356	4,864,483	1989-09-05	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A357	4,866,588	1989-09-12	American Telephone and Telegraph Company AT&T Bell Laboratories	
	A358	4,866,589	1989-09-12	HITACHI, LTD.	
	A359	4,868,729	1989-09-19	CANON KK	
	A360	4,870,555	1989-09-26	COMPAQ COMPUTER CORP	
	A361	4,873,616	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A362	4,873,618	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A363	4,877,972	1989-10-31	BOEING CO	
	A364	4,881,014	1989-11-14	TOSHIBA KK	

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	A365	4,882,646	1989-11-21	Honeywell Bull Inc.	
	A366	4,882,664	1989-11-21	Rane Corporation	
	A367	4,882,665	1989-11-21	CHOI; KEH-KUN	
	A368	4,885,674	1989-12-05	VARGA; LJUBOMIR D.	
	A369	4,890,210	1989-12-26	GILBARCO, INC.	
	A370	4,890,214	1989-12-26	NEC Corporation	
	A371	4,893,227	1990-01-09	VENUS SCIENTIFIC, INC.	
	A372	4,893,228	1990-01-09	Hewlett Packard Company	
	A373	4,896,092	1990-01-23	Power Distribution, Inc.	
	A374	4,899,271	1990-02-06	Scanpower	
	A375	4,900,885	1990-02-13	Kabushiki Kaisha Toshiba	
	A376	4,902,508	1990-02-20	PURDUE RESEARCH FOUNDATION	
	A377	4,903,183	1990-02-20	Hitachi, Ltd.	
	A378	4,903,189	1990-02-20	GEN ELECTRIC	
	A379	4,908,857	1990-03-13	Siemens Transmission Systems, Inc.	
	A380	4,916,599	1990-04-10	HyperPower, Inc.	
	A381	4,920,470	1990-04-24	ZIRCO, INC.	
	A382	4,922,397	1990-05-01	DIGITAL EQUIPMENT CORPORATION	
	A383	4,922,404	1990-05-01	General Electric Company	
	A384	4,924,170	1990-05-08	Unisys Corporation	
	A385	4,926,303	1990-05-15	Qualitron, Inc.	
	A386	4,929,605	1990-05-29	MERRELL DOW PHARMA	
	A387	4,931,918	1990-06-05	Yokogawa Electric Corporation	
	A388	4,935,857	1990-06-19	SUNDSTRAND CORPORATION	
	A389	4,937,468	1990-06-26	Sundstrand Corporation	
	A390	4,952,849	1990-08-28	PHILIPS CORP	
	A391	4,953,068	1990-08-28	UNISYS CORPORATION	
	A392	4,958,268	1990-09-18	Matsushita Electric Industrial Co., Ltd.	
	A393	4,959,764	1990-09-25	COMPUTER PRODUCTS INC	
	A394	4,959,766	1990-09-25	CA NAT RESEARCH COUNCIL	
	A395	4,961,128	1990-10-02	ZENITH ELECTRONICS	

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				CORPORATION	
	A396	4,975,823	1990-12-04	DEUTSCHE THOMSON-BRANDT GMBH	
	A397	4,982,149	1991-01-01	TOSHIBA KK	
	A398	5,001,318	1991-03-19	Kabushiki Kaisha Toshiba	
	A399	5,006,782	1991-04-09	INTERNATIONAL RECTIFIER CORPORATION	
	A400	5,008,795	1991-04-16	Unisys Corporation	
	A401	5,010,261	1991-04-23	GENERAL ELECTRIC COMPANY	
	A402	5,012,401	1991-04-30	Allied-Signal Inc.	
	A403	5,013,980	1991-05-07	Thomson Consumer Electronics, Inc.	
	A404	5,016,245	1991-05-14	SIEMENS AG	
	A405	5,017,800	1991-05-21	WISCONSIN ALUMNI RES FOUND	
	A406	5,019,717	1991-05-28	ELEGANT DESIGN SOLUTIONS INC	
	A407	5,019,719	1991-05-28	International Rectifier Corporation	
	A408	5,019,954	1991-05-28	ALLIED SIGNAL INC	
	A409	5,023,766	1991-06-11	BRITISH TELECOMM	
	A410	5,027,002	1991-06-25	WESTINGHOUSE ELECTRIC CORP	
	A411	5,027,264	1991-06-25	Wisconsin Alumni Research Foundation	
	A412	5,029,062	1991-07-02	Alcatel Espace	
	A413	5,036,452	1991-07-30	AT & T BELL LAB	
	A414	5,038,264	1991-08-06	GENERAL ELECTRIC COMPANY	
	A415	5,038,265	1991-08-06	BULL SA	
	A416	5,038,266	1991-08-06	General Electric Company	
	A417	5,041,777	1991-08-20	PHILIPS CORP	
	A418	5,043,859	1991-08-27	GEN ELECTRIC	
	A419	5,047,911	1991-09-10	Leybold Aktiengesellschaft	
	A420	5,055,722	1992-12-01	THOMAS S LATOS	
	A421	5,057,698	1991-10-15	EXIDE ELECTRONICS	
	A422	5,057,986	1991-10-15	UNISYS CORPORATION	
	A423	5,063,338	1991-11-05	ALCATEL ESPACE	

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	A424	5,063,489	1991-11-05	NEC CORP	
	A425	5,066,900	1991-11-19	COMPUTER PRODUCTS INC	
	A426	5,073,848	1991-12-17	GEN ELECTRIC	
	A427	5,077,486	1991-12-31	MARSON GARY	
	A428	5,079,686	1992-01-07	VLT Corporation	
	A429	5,097,403	1992-03-17	ASTEC INT LTD	
	A430	5,099,406	1992-03-24	UNIV KYUSHU	
	A431	5,101,336	1992-03-31	Alcatel N.V.	
	A432	5,103,110	1992-04-07	KELTRONICS CORP	
	A433	5,103,387	1992-04-07	NORTHERN TELECOM LTD	
	A434	5,105,351	1992-04-14	Kabushiki Kaisha Toshiba	
	A435	5,111,372	1992-05-05	TOKO INC	
	A436	5,111,374	1992-05-05	The University of Tennessee Research Corp.	
	A437	5,113,334	1992-05-12	Rifala Pty. Ltd.	
	A438	5,113,337	1992-05-12	GEN ELECTRIC	
	A439	5,119,013	1992-06-02	SQUARE D COMPANY	
	A440	5,119,283	1992-06-02	GEN ELECTRIC	
	A441	5,119,284	1992-06-02	GEN ELECTRIC	
	A442	5,122,726	1992-06-16	Alcatel Network Systems, Inc.	
	A443	5,122,945	1992-06-16	Reliance Comm/Tec Corporation	
	A444	5,126,651	1992-06-30	Motorola, Inc.	
	A445	5,128,603	1992-07-07	ALCATEL NV	
	A446	5,132,888	1992-07-21	UNISYS CORPORATION	
	A447	5,132,889	1992-07-21	IBM CORPORATION	
	A448	5,138,184	1992-08-11	POWERTROL INC	
	A449	5,138,249	1992-08-11	Alcatel Espace	
	A450	5,140,509	1992-08-18	Allied-Signal Inc.	
	A451	5,140,512	1992-08-18	O'SULLIVAN; DERMOT	
	A452	5,140,514	1992-08-18	Kone Elevator GmbH	
	A453	5,144,547	1992-09-01	NEC CORP	
	A454	5,146,394	1992-09-08	MATSUSHITA ELECTRIC IND CO LTD	
	A455	5,157,269	1992-10-20	UNITRODE CORP	
	A456	5,159,541	1992-10-27	NORTHERN TELECOM LTD	
	A457	5,161,241	1992-11-03	Matsushita Electric	

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				Industrial Co., Ltd.	
	A458	5,162,663	1992-11-10	NCR CO	
	A459	5,164,609	1992-11-17	DONNELLY CORP	
	A460	5,168,435	1992-12-01	NEC CORP	
	A461	5,173,846	1992-12-22	Astec International Ltd.	
	A462	5,177,675	1993-01-05	SHINDENGEN ARCHER CORP	
	A463	5,179,512	1993-01-12	GEN ELECTRIC	
	A464	5,206,800	1993-04-27	ASTEC INTERNATIONAL, LTD.	
	A465	5,208,740	1993-05-04	The Texas A & M University System	
	A466	5,216,351	1993-06-01	Seiko Instruments Inc.	
	A467	5,218,522	1993-06-08	Hughes Aircraft Company	
	A468	5,221,887	1993-06-22	GULCZYNSKI; ZDZISLAW	
	A469	5,224,025	1993-06-29	WISCONSIN ALUMNI RES FOUND	
	A470	5,233,509	1993-08-03	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A471	5,235,502	1993-08-10	VLT Corporation	
	A472	5,237,208	1993-08-17	NISHIMU DENSHI KOGYO KK	
	A473	5,237,606	1993-08-17	CHARLES IND LTD	
	A474	5,254,930	1993-10-19	DIGITAL EQUIPMENT CORP	
	A475	5,255,174	1993-10-19	Allied-Signal Inc.	
	A476	5,264,736	1993-11-23	RAYTHEON COMPANY	
	A477	5,267,135	1993-11-30	NEC CORP	
	A478	5,267,137	1993-11-30	Kohler, Schmid Partner	
	A479	5,268,830	1993-12-07	AT&T BELL LABORATORIES	
	A480	5,272,612	1993-12-21	Kabushiki Kaisha Toshiba	
	A481	5,272,613	1993-12-21	PHILIPS CORP	
	A482	5,274,539	1993-12-28	GEN ELECTRIC	
	A483	5,274,543	1993-12-28	AT & T BELL LAB	
	A484	5,289,364	1994-02-22	HITACHI LTD	
	A485	5,303,138	1994-04-12	AT & T BELL LAB	
	A486	5,304,875	1994-04-19	ASTEC INT LTD	
	A487	5,305,191	1994-04-19	AT & T BELL LAB	
	A488	5,305,192	1994-04-19	LINEAR TECHNOLOGY	

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	A489	5,343,383	1994-08-30	NEC CORP	
	A490	5,353,212	1994-10-04	AT & T BELL LAB	
	A491	5,355,077	1994-10-11	DELL USA LP	
	A492	5,355,293	1994-10-11	CARLSTEDT ELEKTRONIK AB	
	A493	5,355,294	1994-10-11	GEN ELECTRIC	
	A494	5,363,323	1994-11-08	International Business Machines Corporation	
	A495	5,377,090	1994-12-27	MARTIN MARIETTA CORP	
	A496	5,383,858	1995-10-29	MEDRAD INC	
	A497	5,386,359	1995-01-31	NEC CORP	
	A498	5,396,412	1995-03-07	ALLIED SIGNAL INC	
	A499	5,398,182	1995-03-14	NAMCO CONTROLS CORP	
	A500	5,400,239	1995-03-21	Northern Telecom Limited	
	A501	5,410,467	1995-04-25	Astec International Limited	
	A502	5,412,308	1995-05-02	HEWLETT PACKARD CORP	
	A503	5,412,557	1995-05-02	Electronic Power Conditioning, Inc.	
	A504	5,424,932	1995-06-13	Yokogawa Electric Corporation	
	A505	5,428,523	1995-06-27	RO ASSOCIATES	
	A506	5,430,632	1995-07-04	POWERPAD TECH INC	
	A507	5,430,633	1995-07-04	ASTEC INT LTD	
	A508	5,434,770	1995-07-18	United States Department of Energy	
	A509	5,438,499	1995-08-01	LINEAR TECHNOLOGY CORP.	
	A510	5,442,534	1995-08-15	California Institute of Technology	
	A511	5,448,469	1995-09-05	THOMSON BRANDT GMBH	
	A512	5,461,301	1995-10-24	Qualidyne Systems	
	A513	5,477,091	1995-12-19	MERLIN GERIN	
	A514	5,481,178	1996-01-02	LINEAR TECHN INC	
	A515	5,481,449	1996-01-02	GEN ELECTRIC	
	A516	5,500,791	1996-03-19	GENERAL ELECTRIC COMPANY	

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	A517	5,513,092	1996-04-30	Bruker Analytische Messtechnik GmbH	
	A518	5,514,921	1996-05-07	GEN ELECTRIC	
	A519	5,519,599	1996-05-21	NEC CORP	
	A520	5,528,480	1996-06-18	Elonex Technologies, Inc.	
	A521	5,528,482	1996-06-18	AT & T CORP	
	A522	5,530,635	1996-06-25	Nemic-Lambda Kabushiki Kaisha	
	A523	5,534,768	1996-07-09	HARRIS CORP.	
	A524	5,535,112	1996-07-09	ALCATEL NV	
	A525	5,537,021	1996-07-16	ALCATEL BELL-SDT S.A.	
	A526	5,539,630	1996-07-23	California Institute of Technology	
	A527	5,539,631	1996-07-23	Ion Systems Incorporated	
	A528	5,541,827	1996-07-30	DOBLE ENG	
	A529	5,552,695	1996-09-03	LINEAR TECHN INC	
	A530	5,559,423	1996-09-24	Norhtern Telecom Limited	
	A531	5,559,682	1996-09-24	HITACHI LTD	
	A532	5,570,276	1996-10-29	OPTIMUN POWER CONVERSION INC	
	A533	5,576,940	1996-11-19	GEN ELECTRIC	
	A534	5,590,032	1996-12-31	LUCENT TECHNOLOGIES INC	
	A535	5,594,629	1997-01-14	General Electric Company	
	A536	5,621,621	1997-04-15	Lindmark Electric AB	
	A537	5,625,541	1997-04-29	LUCENT TECHNOLOGIES INC	
	A538	5,635,826	1997-06-03	Chiyoda Corporation	
	A539	5,636,107	1997-06-03	INTERNATIONAL POWER DEVICES, INC.	
	A540	5,636,116	1997-06-03	MELCHER AG	
	A541	5,663,876	1997-09-02	Lucent Technologies Inc.	
	A542	5,663,877	1997-09-02	MELCHER AG	
	A543	5,663,887	1997-09-02	PROGRESSIVE INTERNATIONAL ELECTRONICS	
	A544	5,691,870	1997-11-25	COMPAQ COMPUTER CORP	
	A545	5,708,571	1998-01-13	NEC CORP	

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	A546	5,719,754	1998-02-17	LUCENT TECHNOLOGIES INC	
	A547	5,726,869	1998-03-10	FUJITSU LTD	
	A548	5,729,444	1998-03-17	AGENCE SPATIALE EUROPEENNE	
	A549	5,734,563	1998-03-31	NEC CORP	
	A550	5,736,843	1998-04-07	Silicon Graphics, Inc.	
	A551	5,742,491	1998-04-21	LUCENT TECHNOLOGIES INC	
	A552	5,745,359	1998-04-28	COMPAQ COMPUTER CORP	
	A553	5,754,414	1998-05-19	HANINGTON; GARY J.	
	A554	5,757,625	1998-05-26	PHILIPS CORP	
	A555	5,757,627	1998-05-26	Compaq Computer Corporation	
	A556	5,768,118	1998-06-16	Compaq Computer Corporation	
	A557	5,771,160	1998-06-23	SAMSUNG ELECTRONICS CO LTD	
	A558	5,774,350	1998-06-30	SGS THOMSON MICROELECTRONICS	
	A559	5,781,420	1998-07-14	INT POWER DEVICES INC	
	A560	5,781,421	1998-07-14	GENERAL ELECTRIC COMPANY	
	A561	5,784,266	1998-07-21	Virginia Power Technologies, Inc	
	A562	5,805,432	1998-09-08	NEC CORP	
	A563	5,818,704	1998-10-06	INT RECTIFIER CORP	
	A564	5,831,839	1998-11-03	PHILIPS CORP	
	A565	5,841,641	1998-11-24	COMPAQ COMPUTER CORPORATION	
	A566	5,841,643	1998-11-24	LINEAR TECHNOLOGY CORPORATION	
	A567	5,862,042	1999-01-19	LUCENT TECHNOLOGIES INC	
	A568	5,870,299	1999-02-09	LUCENT TECHNOLOGIES INC	
	A569	5,872,705	1999-02-16	LUCENT TECHNOLOGIES INC	

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	A570	5,880,939	1999-03-09	SINFOR	
	A571	5,880,949	1999-03-09	ALCATEL ALSTHOM COMPAGNIE GENERALE D'ELECTRICITE	
	A572	5,894,412	1999-04-13	COMPAQ COMPUTER CORP	
	A573	5,901,052	1999-05-04	U.S. Philips Corporation	
	A574	5,903,452	1999-05-11	SYSTEM GENERAL CORPORATION	
	A575	5,907,481	1999-05-25	ERICSSON TELEFON AB L M	
	A576	5,916,313	1999-06-29	DELL USA LP	
	A577	5,929,692	1999-07-27	COMPUTER PRODUCTS INC	
	A578	5,946,202	1999-08-31	BAKER HUGHES INCORPORATED	
	A579	5,946,207	1999-08-31	PHILIPS CORP	
	A580	5,949,658	1999-09-07	Lucent Technologies, Inc.	
	A581	5,956,242	1999-09-21	PHILIPS ELECTRONICS NA	
	A582	5,956,245	1999-09-21	LUCENT TECHNOLOGIES INC	
	A583	5,959,370	1999-09-28	PARDO; HERBERT	
	A584	5,991,167	1999-11-23	PHILIPS CORP	
	A585	5,999,417	1999-12-07	FISCHE LLC	
	A586	6,002,597	1999-12-14	LUCENT TECHNOLOGIES INC	
	A587	6,005,773	1999-12-21	LUCENT TECHNOLOGIES INC.	
	A588	6,011,703	2000-01-04	LUCENT TECHNOLOGIES INC	
	A589	6,016,258	2000-01-18	Nortel Networks Corporation	
	A590	6,016,261	2000-01-18	PHILIPS CORP	
	A591	6,026,005	2000-02-15	INT RECTIFIER CORP	
	A592	6,038,148	2000-03-14	ERICSSON INC	
	A593	6,046,920	2000-04-04	Alcatel	
	A594	6,058,026	2000-05-02	Lucent Technologies, Inc.	
	A595	6,066,943	2000-05-23	Texas Instruments Incorporated	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: December 13, 2016				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
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	A598	6,084,792	2000-07-04	VPT INC	
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Date Submitted: December 13, 2016				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	49	of	54	Attorney Docket Number	111664-0123 (VA1078)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
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Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
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Examiner Signature		Date Considered	

4887-6151-3021.2

Substitute for form 1449/PTO				*Complete if Known*	
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Date Submitted: December 13, 2016				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	51	of	54	Attorney Docket Number	111664-0123 (VA1078)

NON PATENT LITERATURE DOCUMENTS			
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Date Submitted: December 13, 2016				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	52	of	54	Attorney Docket Number	111664-0123 (VA1078)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
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PTO/SB/08 (modified)

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Examiner Signature	/JOSEPH CHANG/	Date Considered	01/19/2017

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

CPC- SEARCHED		
Symbol	Date	Examiner
M02M3/33576; H02M3/33561	5/4/16	JC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	82	5/4/16	JC

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History attached	5/4/16	JC
updated	9/2/16	JC
updated	1/19/17	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUB text search - Sep. 2, 2016 see interference search printout	9/2/16	JC
	updated	1/19/17	JC

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	Examiner	**Art Unit**
	JOSEPH CHANG	2842

CPC						
Symbol					**Type**	**Version**
H02M		3	/	33576	F	2013-01-01
H02M		3	/	33561	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
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NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	01/19/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

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	Examiner	**Art Unit**
	JOSEPH CHANG	2842

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	82	H	0	2	M	3 / 335 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											
307	31											

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	01/19/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

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	Examiner	**Art Unit**
	JOSEPH CHANG	2842

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	01/19/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Appl. Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. This RCE and the enclosed items listed below are being filed prior to the earliest of: (1) payment of the issue fee (unless a petition under 37 C.F.R. § 1.313 is granted); (2) abandonment of the application; or (3) the filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. §141, or the commencement of a civil action under 35 U.S.C. §145 or §146 (unless the appeal or civil action is terminated).

Submission **required** under 37 C.F.R. §1.114: (check items that apply)

Enclosed are:

[**X**] Information Disclosure Statement (3 pages).

[**X**] Form PTO/SB/08 (54 pages).

The filing fee is calculated below at the large entity rate:

	Claims as Amended		Previously Paid For	Extra Claims Present		Rate		Fee Totals
RCE Fee 1.17(e):						$1,700.00	=	$1,700.00
Total Claims:	20	-	20	= 0	x	$80.00	=	$0.00
Independents	3	-	3	= 0	x	$420.00	=	$0.00
First presentation of any Multiple Dependent Claims:					+	$780.00	=	$0.00
CLAIMS FEE TOTAL:							=	$1,700.00

[ ] Applicant hereby petitions for an extension of time under 37 C.F.R. §1.136(a) for the total number of months checked below:

[ ]	Extension for response filed within the first month:	$200.00 0	$0.00
[ ]	Extension for response filed within the second month:	$600.00	$0.00
[ ]	Extension for response filed within the third month:	$1,400.00	$0.00
[ ]	Extension for response filed within the fourth month:	$2,200.00	$0.00
[ ]	Extension for response filed within the fifth month:	$3,000.00	$0.00
	EXTENSION FEE SUBTOTAL:		$0.00
	EXTENSION FEE ALREADY PAID:	-	$0.00
	EXTENSION FEE TOTAL		$0.00
	CLAIMS AND EXTENSION FEE TOTAL:		$1,700.00
	Prioritized Examination fee (Track I) under 37 C.F.R. § 1.17 (c)		$0.00
	Processing Fee (Track I) under 37 C.F.R. § 1.17 (i)		$0.00
	Publication Fee		$0.00
[ ]	Suspension of action requested under 37 C.F.R. § 1.103(c)		$0.00
	TOTAL FEE:		$1,700.00

The above-identified fees of $1,700.00 are being paid by credit card via EFS-Web.

For the reasons set forth in the attached Information Disclosure Statement, Applicant respectfully submits that it was error for the Examiner to decline to consider the information submitted in the Information Disclosure Statement previously submitted on December 13, 2016. Nevertheless, Applicant resubmits the Information Disclosure Statement herewith along with another Request for Continued Examination and again requests consideration of the references contained therein in the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date May 2, 2017 By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Application No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation No.:	5889

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicants respectfully request that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicants do not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith. However, in accordance with MPEP §

609.04(a)(I), Applicant hereby states that for items for which the date of publication supplied does not include the month of publication, the year of publication is sufficiently earlier than the effective U.S. filing date and any foreign priority date so that the particular month of publication is not in issue.

Applicant notes that copies of the majority of the references cited herein were previously submitted with the Information Disclosure Statement filed December 13, 2016 ("the December IDS"), and copies of the same are not being submitted again with the present filing as the Examiner is believed to have access to the references already. If the Examiner would like any copies resubmitted, they are available upon request.

CONCISE EXPLANATION OF RELEVANCE AND REQUEST FOR RECONSIDERATION OF PRIOR DECISION NOT TO CONSIDER REFERENCES

English language Abstracts have been provided for foreign language documents B5, B7, B18, B45, B60, B67, B68, B79-B97, B99, B100, B103, B110, B113-B129, B136, and B139-B148. An English Equivalent, A171, has been provided for foreign language document B3. An Abstract for the English Equivalent has been provided for foreign language document B15. An English language translation is provided for foreign language document B112. All of the other references not listed above are provided in English.

Unless otherwise indicated, no English translation is readily available (not considering machine-generated translations that may be freely available online, to both the Applicant and the PTO) for the non-English language documents. English Abstracts have been provided as indicated above. Inasmuch as Applicant has endeavored to provide at least one item that complies with the requirement for a "concise explanation of relevance" for the non-English language documents, the documents have been submitted in compliance with the PTO requirements and should be considered by the Examiner *(37 CFR §1.97, §1.98 and MPEP §609).*

In the Notice of Allowance dated February 2, 2017 ("the Notice of Allowance"), the Examiner declined to consider the references previously submitted in the December IDS, stating as follows:

> The information disclosure statement filed 12/13/16 fails to comply with 37 CFR 1.98(a)(3)(i) because it does not include a **concise** explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each reference listed that is not in the English language. The purpose of the references in the IDS written in the English language is for **Examiner** to examine and review each one of the references in the IDS. In the case of an excess number of references, over a thousand, the references are as if not in English language because Examiner simply cannot review all the references in the IDS within limited time per patent applicant. Therefore, the IDS filed 12/13/16 has been placed in the application file, but the information referred to therein has **not** been considered.

Applicant respectfully submits that the decision in the Notice of Allowance not to consider the references cited in the December IDS is error. With the present submission, Applicant resubmits the references for consideration and requests reconsideration of the decision not to consider the references. 37 C.F.R. 1.98 requires, in relevant part, "[a] concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed **that is not in the English language**." *37 C.F.R. 1.98(a)(3)*, emphasis added.

The presently submitted documents were cited in relation to one or more of the following reexaminations:

Serial No.	Filing Date
95/001,637	05/31/2011
95/001,702	09/08/2011
95/001,853	12/14/2011
95/001,861	12/21/2011

While Applicant makes no assertions regarding the materiality, or lack thereof, of the submitted materials, Applicant submits each of the documents for the Examiner's consideration out of caution in the event the Examiner considered one or more of the documents pertinent to the present application. Applicant notes that many of the materials were submitted by parties other than Applicant in the above-identified reexaminations.

The MPEP is unambiguously clear that only non-English documents require an explanation of relevance, stating that "[t]he requirement for a concise explanation of relevance is **limited to information that is not in the English language**." *MPEP 609.04(A)(III)*, emphasis added. The Examiner's statement that "[i]n the case of an excess number of references, over a thousand, the references are as if not in English language because Examiner simply cannot review all the references in the IDS within limited time per patent applicant" is entirely without support in the CFR, the MPEP, or otherwise. Many of the references are in the English language, and the MPEP plainly states that an explanation of relevance for such references is not required. Further, Applicant has provided an explanation of relevance, noting that the references are submitted due to their citation in relation to one or more of the above-identified reexaminations. Finally, for the non-English references submitted herewith, an English abstract or other submission has been provided.

The MPEP states that "[o]nce the minimum requirements of 37 CFR 1.97 and 37 CFR 1.98 are met, **the examiner has an obligation to consider the information**." *MPEP 609*, emphasis added. The Notice of Allowance fails to set forth any reasoning why the minimum

requirements of 37 CFR 1.97 and 37 CFR 1.98 have not been met for the reasons set forth above. Accordingly, the Examiner must consider the information submitted herewith, and Applicant requests that the Examiner consider each reference in relation to the present application.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), before the mailing of a first Office action after the filing of a RCE.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account Number 19-0741.

Respectfully submitted,

Date May 2, 2017 By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	1	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	443,441	1890-12-23	HANSON, M.	
	A2	1,181,803	1916-05-02	GEN ELECTRIC	
	A3	2,042,274	1936-05-26	STANDARD OIL DEV CO	
	A4	2,497,534	1950-02-14	GEN ELECTRIC	
	A5	2,852,730	1958-09-16	MOTOROLA INC	
	A6	2,902,862	1959-09-08	TWIFORD HARRY G	
	A7	2,953,738	1960-09-20	WESTINGHOUSE ELECTRIC CORP	
	A8	3,008,068	1961-11-07	PHILIPS CORP	
	A9	3,008,506	1961-11-14	LED BALLAST INC	
	A10	3,029,398	1962-04-10	THOMPSON RAMO WOOLDRIDGE INC	
	A11	3,083,328	1963-03-26	BELL TELEPHONE LABOR INC	
	A12	3,141,140	1964-07-14	ACOUSTICA ASSOCIATES INC	
	A13	3,146,406	1964-08-25	PHILIPS CORP	
	A14	3,161,837	1964-12-15	DAVEN COMPANY	
	A15	3,174,042	1965-03-16	EFFNER WHITE RALPH	
	A16	3,229,111	1966-01-11	ELECTRO SEAL CORP	
	A17	3,241,035	1966-03-15	WARREN MFG COMPANY INC	
	A18	3,295,042	1966-12-27	ROBERTSHAW CONTROLS CO	
	A19	3,307,073	1967-02-28	MOTOROLA INC	
	A20	3,313,996	1967-04-11	HONEYWELL INC	
	A21	3,343,073	1967-09-19	LORAIN PROD CORP	
	A22	3,400,325	1968-09-03	RCA CORP	
	A23	3,435,375	1969-03-25	MOTOROLA, INC.	
	A24	3,443,194	1969-05-06	IBM	
	A25	3,448,370	1969-06-03	AT&T CORP.	
	A26	3,454,853	1969-07-08	HONEYWELL INC.	
	A27	3,458,798	1969-07-29	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A28	3,459,957	1969-08-05	ITE IMPERIAL CORP	
	A29	3,471,747	1969-10-07	GEN MOTORS CORP	
	A30	3,495,157	1970-02-10	FORBRO DESIGN CORP.	
	A31	3,506,908	1970-04-14	TRW INC.	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	2	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A32	3,514,692	1970-05-26	HONEYWELL INC.	
	A33	3,517,301	1970-06-23	BUNKER RAMO CORPORATION	
	A34	3,553,428	1971-01-05	DU PONT	
	A35	3,564,393	1971-02-16	NORTH AMERICAN ROCKWELL	
	A36	3,569,818	1971-03-09	HUGHES AIRCRAFT CO	
	A37	3,573,483	1971-04-06	ESSEX INTERNATIONAL INC	
	A38	3,573,494	1971-04-06	AUTOMATIC TIMING AND CONTROLS, INC.	
	A39	3,573,508	1971-04-06	BELL TELEPHONE LABOR INC	
	A40	3,573,544	1971-04-06	ENERGY ELECTRONICS	
	A41	3,573,597	1971-04-06	GENERAL ELECTRIC COMPANY	
	A42	3,579,026	1971-05-18	SYLVANIA ELECTRIC PROD	
	A43	3,581,186	1971-05-25	MOTOROLA, INC.	
	A44	3,582,754	1971-06-01	WANDEL U. GOLTERMANN ELEKTRONISCHE PRAZISIONSMESSGERATE	
	A45	3,582,758	1971-06-01	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A46	3,584,289	1971-06-08	BELL TELEPHONE LABOR INC	
	A47	3,588,595	1971-06-28	KIDDE, INC.	
	A48	3,599,073	1971-08-10	TEXAS INSTRUMENTS INC	
	A49	3,604,920	1971-09-14	DONALD M NILES	
	A50	3,619,713	1971-11-09	SOLA BASIC IND INC	
	A51	3,629,648	1971-12-21	BRENT W BROWN	
	A52	3,629,725	1971-12-21	AT&T CORP.	
	A53	3,638,099	1972-01-25	COLLINS RADIO COMPANY	
	A54	3,643,152	1972-02-15	HITACHI, LTD	
	A55	3,646,395	1972-02-29	AMERICAN OPTICAL CORPORATION	
	A56	3,657,631	1972-04-18	INTERNATIONAL STANDARD ELECTRIC CORPORATION (ITTC)	

Examiner Signature		Date Considered	

4840-7798-1255.1

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A57	3,660,672	1972-05-02	PIONEER MAGNETICS INC	
	A58	3,663,941	1972-05-16	UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND	
	A59	3,665,203	1972-05-23	JERRY D HOGG	
	A60	3,668,508	1972-06-06	ACME ELECTRIC CORP.	
	A61	3,684,891	1972-08-15	DUAL LITE CO	
	A62	3,696,286	1972-10-03	NORTH AMERICAN ROCKWELL	
	A63	3,704,381	1972-11-28	FORBRO DESIGN CORP	
	A64	3,710,231	1973-01-09	WESTINGHOUSE ELECTRIC CORP.	
	A65	3,714,545	1973-01-30	COMTEURS SCHLUMBERGER MONTROAGE	
	A66	3,733,538	1973-05-15	WESTINGHOUSE ELECTRIC CORP.	
	A67	3,735,235	1973-05-22	AT&T CORP.	
	A68	3,737,755	1973-06-05	AT&T CORP.	
	A69	3,742,242	1973-06-26	SONY CORP	
	A70	3,743,861	1973-07-03	HONEYWELL INC.	
	A71	3,751,676	1973-08-07	MATSUSHITA ELECTRIC IND CO LTD	
	A72	3,753,071	1973-08-14	WESTINGHOUSE ELECTRIC CORP	
	A73	3,753,076	1973-08-14	LIGHTING SYSTEMS INC	
	A74	3,754,177	1973-08-21	LECTRON CORPORATION	
	A75	3,757,195	1973-09-04	HONEYWELL INC.	
	A76	3,769,545	1973-10-30	KODAN INC	
	A77	3,771,040	1973-11-06	NASA	
	A78	3,781,505	1973-12-25	GENERAL ELECTRIC COMPANY	
	A79	3,781,638	1973-12-25	GENERAL ELECTRIC COMPANY	
	A80	3,787,730	1974-01-22	UNITED AIRCRAFT CORP	
	A81	3,805,094	1974-04-16	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A82	3,816,810	1974-06-11	HONEYWELL	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				INFORMATION SYSTEMS INC.	
	A83	3,818,237	1974-06-18	HUGHES AIRCRAFT CO	
	A84	3,818,312	1974-06-18	U.S. PHILIPS CORPORATION	
	A85	3,820,008	1974-06-25	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A86	3,824,450	1974-07-16	RCA CORPORATION	
	A87	3,845,404	1974-10-29	TRILLING T	
	A88	3,848,175	1974-11-12	GEN ELECTRIC	
	A89	3,851,240	1974-11-26	GENERAL ELECTRIC COMPANY	
	A90	3,851,278	1974-11-26	BELL + HOWELL JAPAN, LTD.	
	A91	3,859,638	1975-01-07	INTERSIL INC	
	A92	3,873,846	1975-03-25	SONY CORP	
	A93	3,879,647	1975-04-22	AT&T CORP.	
	A94	3,879,652	1975-04-22	WESTINGHOUSE ELECTRIC CORP.	
	A95	3,904,950	1975-09-09	AT&T CORP.	
	A96	3,909,695	1975-09-30	HEWLETT PACKARD COMPANY	
	A97	3,909,700	1975-09-30	GENERAL ELECTRIC COMPANY	
	A98	3,912,940	1975-10-14	HONEYWELL INC	
	A99	3,913,002	1975-10-14	GENERAL ELECTRIC COMPANY	
	A100	3,913,036	1975-10-14	VICTOR COMPTOMETER CORPORATION	
	A101	3,916,289	1975-10-28	UNITED STATES OF AMERICA, AIR FORCE	
	A102	3,919,656	1975-11-11	SOKAL NATHAN O; SOKAL ALAN D	
	A103	3,927,363	1975-12-16	ROCKWELL INTERNATIONAL CORPORATION	
	A104	3,930,196	1975-12-30	GENERAL ELECTRIC COMPANY	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
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Date Submitted: May 2, 2017				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A105	3,932,764	1976-01-13	ESB INC	
	A106	3,938,024	1976-02-10	Bell Telephone Laboratories, Incorporated	
	A107	3,940,682	1976-02-24	General Electric Company	
	A108	3,949,238	1976-04-06	NORTHERN ELECTRIC CO	
	A109	3,959,716	1976-05-25	The Bendix Corporation	
	A110	3,974,397	1976-08-10	S & C ELECTRIC CO	
	A111	3,976,932	1976-08-24	General Electric Company	
	A112	3,986,052	1976-10-12	North Electric Company	
	A113	3,986,097	1976-10-12	Bell Telephone Laboratories, Incorporated	
	A114	3,989,995	1976-11-02	Bell Telephone Laboratories, Incorporated	
	A115	3,991,319	1976-11-09	INSTRUMENTATION & CONTROL SYST	
	A116	4,005,335	1977-01-25	IOTA ENGINEERING INC	
	A117	4,007,413	1977-02-08	BELL TELEPHONE LABOR INC	
	A118	4,010,381	1977-03-01	BELL TELEPHONE LABOR INC	
	A119	4,011,518	1977-03-08	The United States of America as represented by the Secretary of the Navy	
	A120	4,017,746	1977-04-12	Nartron Corporation	
	A121	4,017,783	1977-04-12	Telefonaktiebolaget L M Ericsson	
	A122	4,017,784	1977-04-12	Litton Systems, Inc.	
	A123	4,027,228	1977-05-31	GEN ELECTRIC	
	A124	4,037,271	1977-07-19	BOSCHERT ASSOCIATES	
	A125	4,044,268	1977-08-23	GATES RUBBER CO	
	A126	4,051,445	1977-09-27	Boschert Assoc.	
	A127	4,058,369	1977-11-15	BENTLEY LAB	
	A128	4,060,757	1977-11-29	General Electric Co.	
	A129	4,066,945	1978-01-03	BENDIX CORP	
	A130	4,074,182	1978-02-14	GEN ELECTRIC	
	A131	4,078,247	1978-03-07	RCA Corporation	

Examiner Signature		Date Considered	

Substitute for form 1449/PTO				***Complete if Known***	
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Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	6	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A132	4,104,539	1978-08-01	HASE A M	
	A133	4,106,084	1978-08-08	Societe Nationale des Petroles d'Aquitaine	
	A134	4,109,192	1978-08-22	Hughes Aircraft Company	
	A135	4,114,048	1978-09-12	WESTINGHOUSE ELECTRIC CORP	
	A136	4,115,704	1978-09-19	US NAVY	
	A137	4,122,359	1978-10-24	HONEYWELL INC	
	A138	4,126,793	1978-11-21	ZELLWEGER USTER AG	
	A139	4,128,868	1978-12-05	RCA CORPORATION	
	A140	4,131,860	1978-12-26	THOMSON-CSF	
	A141	4,140,959	1979-02-20	POWELL WILLIAM S	
	A142	4,150,423	1979-04-17	Boschert Associates	
	A143	4,177,389	1979-12-04	SIEMENS AG	
	A144	4,184,197	1980-01-15	California Institute of Technology	
	A145	4,187,458	1980-02-05	The United States of America as represented by the Secretary of the Army	
	A146	4,194,147	1980-03-18	BURR BROWN RES CORP	
	A147	4,205,368	1980-05-27	SIEMENS AG	
	A148	4,207,475	1980-06-10	KEPCO INC	
	A149	4,208,594	1980-06-17	HONEYWELL INC	
	A150	4,208,706	1980-06-17	Sony Corporation	
	A151	4,209,710	1980-06-24	HONEYWELL INC	
	A152	4,210,858	1980-07-01	International Business Machines Corporation	
	A153	4,210,958	1980-07-01	Ikenoue, Tsuneo	
	A154	4,238,690	1980-12-09	BELL TELEPHONE LABOR INC	
	A155	4,238,691	1980-12-09	BELL TELEPHONE LABOR INC	
	A156	4,241,261	1980-12-23	BELL TELEPHONE LABOR INC	
	A157	4,245,194	1981-01-13	GTE Products Corporation	
	A158	4,245,286	1981-01-13	NASA	
	A159	4,251,857	1981-02-17	Sperry Corporation	
	A160	4,253,136	1981-02-24	SANYO ELECTRIC CO	

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	A161	4,254,459	1981-03-03	JMJ Electronics Corp.	
	A162	4,257,087	1981-03-17	California Institute of Technology	
	A163	4,257,089	1981-03-17	The United States of America as represented by the Secretary of the Army	
	A164	4,262,214	1981-04-14	FOXBORO CO	
	A165	4,268,476	1981-05-19	BENTLEY LAB	
	A166	4,270,164	1981-05-26	Contraves Goerz Corporation	
	A167	4,270,165	1981-05-26	QUALIDYNE SYSTEMS INC	
	A168	4,272,806	1981-06-09	EASTMAN KODAK CO	
	A169	4,274,133	1981-06-16	California Institute of Technology	
	A170	4,275,317	1981-06-23	FROSCH; ROBERT A. ADMINISTRATOR OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WITH RESPECT TO AN INVENTION OF	
	A171	4,276,594	1981-06-30	Gould Inc. Modicon Division	
	A172	4,277,726	1981-07-07	LITTON SYSTEMS INC	
	A173	4,277,728	1981-07-07	STEVENS LUMINOPTICS	
	A174	4,288,739	1981-09-08	Kepco, Inc.	
	A175	4,288,865	1981-09-08	MOSTEK CORP	
	A176	4,292,581	1981-09-29	TAN; TAT S.	
	A177	4,293,902	1981-10-06	AEL Mirrotel, Ltd.	
	A178	4,293,904	1981-10-06	The United States of America as represented by the Secretary of the Navy	
	A179	4,297,590	1981-10-27	VAIL ANDE	
	A180	4,300,191	1981-11-10	POWERCUBE CORPORATION	
	A181	4,301,496	1981-11-17	ITT	
	A182	4,302,803	1981-11-24	Sperry Corporation	
	A183	4,307,441	1981-12-22	United Technologies Corporation	

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	A184	4,310,771	1982-01-12	BECKWITH ELECTRIC CO INC	
	A185	4,313,060	1982-01-26	BELL TELEPHONE LABOR INC	
	A186	4,315,207	1982-02-09	Advanced Micro Devices, Inc.	
	A187	4,316,097	1982-02-16	REYNOLDS WILLIAM R	
	A188	4,317,056	1982-02-23	GTE PROD CORP	
	A189	4,318,007	1982-03-02	SITS SOC IT TELECOM SIEMENS	
	A190	4,318,164	1982-03-02	TOKYO SHIBAURA DENKI KABUSHIKI KAISHA	
	A191	4,322,817	1982-03-30	Gte Automatic Electric Labs Inc.	
	A192	4,323,787	1982-04-06	CLARION CO LTD	
	A193	4,323,788	1982-04-06	BORG WARNER	
	A194	4,323,962	1982-04-06	GEN ELECTRIC	
	A195	4,325,017	1982-04-13	RCA CORP	
	A196	4,327,298	1982-04-27	BORG WARNER	
	A197	4,328,482	1982-05-04	CONSUMER ELEC PROD	
	A198	4,330,816	1982-05-18	Fujitsu Fanuc Limited	
	A199	4,334,263	1982-06-08	Pioneer Electronic Corporation	
	A200	4,336,587	1982-06-22	BOETTCHER, JR.; CHARLES W.	
	A201	4,344,122	1982-08-10	General Electric Company	
	A202	4,344,124	1982-08-10	Motorola, Inc.	
	A203	4,346,342	1982-08-24	Rockwell International Corporation	
	A204	4,347,558	1982-08-31	Rockwell International Corporation	
	A205	4,353,113	1982-10-05	Electrotech Instruments Limited	
	A206	4,355,884	1982-10-26	CANON KK	
	A207	4,356,541	1982-10-26	IKENOUE TSUNEO	
	A208	4,357,654	1982-11-02	IKENOUE TSUNEO	
	A209	4,368,409	1983-01-11	Thomson-Brandt	
	A210	4,371,919	1983-02-01	Bell Telephone Laboratories,	

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				Incorporated	
	A211	4,381,457	1983-04-26	LADCO DEV CO INC	
	A212	4,386,394	1983-05-31	GEN ELECTRIC	
	A213	4,393,316	1983-07-12	Reliance Electric Co.	
	A214	4,395,639	1983-07-26	SAB NIFE AB	
	A215	4,398,156	1983-08-09	AALAND; KRISTIAN	
	A216	4,399,499	1983-08-16	GTE AUTOMATIC ELECTRIC LAB INC	
	A217	4,403,269	1983-09-06	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A218	4,415,960	1983-11-15	Sperry Corporation	
	A219	4,423,341	1983-12-27	Sperry Corporation	
	A220	4,427,899	1984-01-24	SIEMENS AG	
	A221	4,438,411	1984-03-20	Ford Aerospace & Communications Corporation	
	A222	4,441,070	1984-04-03	Motorola, Inc.	
	A223	4,442,339	1984-04-10	Mitsubishi Denki Kabushiki Kaisha	
	A224	4,443,840	1984-04-17	LICENTIA GMBH	
	A225	4,449,173	1984-05-15	Tohoku Metal Industries, Inc.	
	A226	4,449,174	1984-05-15	Bell Telephone Laboratories, Incorporated	
	A227	4,449,175	1984-05-15	Toko, Inc.	
	A228	4,451,743	1984-05-29	Citizen Watch Company Limited	
	A229	4,451,876	1984-05-29	Hitachi Metals, Ltd.	
	A230	4,465,966	1984-08-14	Motorola, Inc.	
	A231	4,471,289	1984-09-11	NCR CORPORATION	
	A232	4,473,756	1984-09-25	CALOYERAS INC	
	A233	4,476,399	1984-10-09	FUJI ELECTRIC CO LTD	
	A234	4,479,175	1984-10-23	Honeywell Inc.	
	A235	4,484,084	1984-11-20	NCR CO	
	A236	4,499,531	1985-02-12	501 Gateway Technology, Inc.	
	A237	4,504,895	1985-03-12	GENERAL ELECTRIC COMPANY	

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	A238	4,519,024	1985-05-21	AT&T Bell Laboratories	
	A239	4,520,296	1985-05-28	Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH	
	A240	4,523,265	1985-06-11	Compagnie de Signaux et D'Entreprises Electriques	
	A241	4,524,411	1985-06-18	RCA Corporation	
	A242	4,524,413	1985-06-18	IKENOUE TSUNEO	
	A243	4,527,228	1985-07-02	CHI YU; SIMON S.	
	A244	4,528,459	1985-07-09	ROCKWELL INTERNATIONAL CORP	
	A245	4,533,986	1985-08-06	GENERAL ELECTRIC COMPANY	
	A246	4,535,399	1985-08-13	National Semiconductor Corporation	
	A247	4,536,700	1985-08-20	United Technologies Corporation	
	A248	4,538,073	1985-08-27	CONVERGENT TECHNOLOGIES INC	
	A249	4,538,101	1985-08-27	Nippon Chemi-Con Corporation	
	A250	4,539,487	1985-09-03	MITSUBISHI ELECTRIC CORP	
	A251	4,546,421	1985-10-08	United Technologies Corporation	
	A252	4,553,039	1985-11-12	STIFTER FRANCIS J	
	A253	4,556,802	1985-12-03	NISHIMU DENSHI KOGYO KK	
	A254	4,561,046	1985-12-24	GTE Automatic Electric Incorporated	
	A255	4,562,522	1985-12-31	HONEYWELL INC	
	A256	4,564,800	1986-01-14	Jetronic Industries, Inc.	
	A257	4,566,059	1986-01-21	VENUS SCIENTIFIC INC.	
	A258	4,571,551	1986-02-18	WASHINGTON INNOVATIVE TECHNOLOGY, INC.	
	A259	4,575,640	1986-03-11	GEN ELECTRIC	
	A260	4,578,631	1986-03-25	SMITH; STEVE	
	A261	4,584,635	1986-04-22	International Business	

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				Machines Corp.	
	A262	4,586,119	1986-04-29	ITT Corporation	
	A263	4,587,604	1986-05-06	RELIANCE ELECTRIC CO	
	A264	4,591,782	1986-05-27	General Electric Company	
	A265	4,593,213	1986-06-03	United Technologies Corporation	
	A266	4,605,999	1986-08-12	AT&T BELL LABORATORIES	
	A267	4,607,195	1986-08-19	U.S. Philips Corporation	
	A268	4,607,323	1986-08-19	SOKAL; NATHAN O.	
	A269	4,618,919	1986-10-21	SPERRY CORP	
	A270	4,621,313	1986-11-04	ZENITH ELECTRONICS CORP	
	A271	4,622,511	1986-11-11	Raytheon Company	
	A272	4,622,629	1986-11-11	Sundstrand Corporation	
	A273	4,626,982	1986-12-02	General Electric Company	
	A274	4,628,426	1986-12-09	GENERAL ELECTRIC COMPANY	
	A275	4,635,179	1987-01-06	ELDEC CORP	
	A276	4,638,175	1987-01-20	UNITED TECHNOLOGIES CORP	
	A277	4,642,475	1987-02-10	SIEMENS AG	
	A278	4,642,743	1987-02-10	International Business Machines Corp.	
	A279	4,644,440	1987-02-17	WESTINGHOUSE ELECTRIC CORP	
	A280	4,648,017	1987-03-03	RELIANCE ELECTRIC COMPANY	
	A281	4,651,020	1987-03-17	WESTINGHOUSE ELECTRIC CORP	
	A282	4,652,769	1987-03-24	ION TECH INC	
	A283	4,659,942	1987-04-21	DRAPER LAB CHARLES S	
	A284	4,663,699	1987-05-05	PIONEER MAGNETICS INC	
	A285	4,670,661	1987-06-02	TOKYO ELECTRIC CO LTD	
	A286	4,672,517	1987-06-09	Pioneer Magnetics, Inc.	
	A287	4,672,518	1987-06-09	American Telephone and Telegraph Co., AT&T Bell Labs	
	A288	4,672,528	1987-06-09	GENERAL ELECTRIC COMPANY	

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	A289	4,674,019	1987-06-16	Keller-Mullett Technology	
	A290	4,675,796	1987-06-23	VEECO INSTRUMENTS, INC.	
	A291	4,677,311	1987-06-30	HITACHI LTD	
	A292	4,677,534	1987-06-30	KABUSHIKI KAISHA TOSHIBA	
	A293	4,680,688	1987-07-14	YOKOGAWA HOKUSHIN ELECTRIC CORPORATION	
	A294	4,680,689	1987-07-14	PAYNE; DONALD W.	
	A295	4,683,528	1987-07-28	INTERSIL INC	
	A296	4,685,039	1987-08-04	YOKOGAWA HOKUSHIN ELECTRIC	
	A297	4,688,160	1987-08-18	AMERICAN TELEPHONE AND TELEGRAPH CO., AT&T BELL LABS	
	A298	4,691,273	1987-09-01	NIPPON TELEGRAPH & TELEPHONE CORP.	
	A299	4,694,384	1987-09-15	GEN ELECTRIC	
	A300	4,694,386	1987-09-15	THOMSON CSF	
	A301	4,695,935	1987-09-22	ALCATEL NV	
	A302	4,697,136	1987-09-29	SHIKOKU ELEC POWER	
	A303	4,698,738	1987-10-06	UNISYS CORP	
	A304	4,706,177	1987-11-10	JOSEPHSON ELLIOT	
	A305	4,709,316	1987-11-24	GENERAL ELECTRIC COMPANY	
	A306	4,709,318	1987-11-24	LIEBERT CORP	
	A307	4,716,514	1987-12-29	UNITRODE CORP	
	A308	4,717,833	1988-01-05	BOSCHERT INC	
	A309	4,727,308	1988-02-23	IBM	
	A310	4,727,469	1988-02-23	RELIANCE COMM/TEC CORPORATION	
	A311	4,730,242	1988-03-08	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A312	4,733,102	1988-03-22	Mitsubishi Jukogyo Kabushiki Kaisha	
	A313	4,734,839	1988-03-29	BARTHOLD; FRED O.	
	A314	4,734,844	1988-03-29	NCR Corporation	
	A315	4,734,924	1988-03-29	Kabushiki Kaisha Toshiba	
	A316	4,745,299	1988-05-17	AMERICAN TELEPHONE &	

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				TELEGRAPH	
	A317	4,745,538	1988-05-17	Coutant Electronics Limited	
	A318	4,747,034	1988-05-24	DICKEY; DAVID V.	
	A319	4,748,550	1988-05-31	KABUSHIKI KAISHA TOSHIBA	
	A320	4,754,160	1988-06-28	INTERSIL INC	
	A321	4,754,161	1988-06-28	WESTINGHOUSE ELECTRIC CORP	
	A322	4,760,276	1988-07-26	UNISYS CORP	
	A323	4,763,237	1988-08-09	WIECZOREK JOHN P	
	A324	4,768,141	1988-08-30	HUBERTUS; GUIDO	
	A325	4,772,994	1988-09-20	Nishimu Electronics Industries, Co., Ltd.	
	A326	4,777,382	1988-10-11	ALLIED SIGNAL INC	
	A327	4,777,575	1988-10-11	HITACHI LTD.	
	A328	4,779,185	1988-10-18	SIEMENS AKTIENGESELLSCHAFT	
	A329	4,782,241	1988-11-01	LIEBERT CORP	
	A330	4,783,728	1988-11-08	MODULAR POWER CORP	
	A331	4,785,387	1988-11-15	VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.	
	A332	4,788,450	1988-11-29	GEN ELECTRIC	
	A333	4,788,634	1988-11-29	MASSACHUSETTS INST TECHNOLOGY	
	A334	4,794,506	1988-12-27	HITACHI MEDICAL CORPORATION	
	A335	4,796,173	1989-01-03	GENERAL ELECTRIC COMPANY	
	A336	4,800,479	1989-01-24	Prime Computer, Inc.	
	A337	4,805,078	1989-02-14	Siemens Aktiengesellschaft	
	A338	4,809,148	1989-02-28	BRITISH COLUMBIA TELEPHONE	
	A339	4,811,191	1989-03-07	Catalyst Semiconductor, Inc.	
	A340	4,812,672	1989-03-14	NORTHERN TELECOM LTD	
	A341	4,814,962	1989-03-21	AMERICAN TELEPHONE	

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				AND TELEGRAPH COMPANY, AT&T BELL LABORATORIES	
	A342	4,814,965	1989-03-21	SPECTRA PHYSICS	
	A343	4,823,249	1989-04-18	AMERICAN TELEPHONE AND TELEGRAPH COMPANY AT&T BELL LABORATORIES	
	A344	4,825,348	1989-04-25	GENERAL ELECTRIC COMPANY	
	A345	4,829,216	1989-05-09	RCA Licensing Corporation	
	A346	4,841,160	1989-06-20	NCR CO	
	A347	4,853,832	1989-08-01	UNIVERSITY OF TOLEDO	
	A348	4,853,837	1989-08-01	GULCZYNSKI ZDZISLAW	
	A349	4,855,858	1989-08-08	International Business Machines Corporation	
	A350	4,855,888	1989-08-08	UNISYS CORPORATION	
	A351	4,860,184	1989-08-22	VIRGINIA TECH INTELL PROP	
	A352	4,860,185	1989-08-22	ELECTRONIC RESEARCH GROUP INC	
	A353	4,860,188	1989-08-22	TEXAS INSTRUMENTS INC	
	A354	4,860,189	1989-08-22	INTERNATIONAL BUSINESS MACHINES CORP.	
	A355	4,864,479	1989-09-05	General Electric Company	
	A356	4,864,483	1989-09-05	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A357	4,866,588	1989-09-12	American Telephone and Telegraph Company AT&T Bell Laboratories	
	A358	4,866,589	1989-09-12	HITACHI, LTD.	
	A359	4,868,729	1989-09-19	CANON KK	
	A360	4,870,555	1989-09-26	COMPAQ COMPUTER CORP	
	A361	4,873,616	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A362	4,873,618	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A363	4,877,972	1989-10-31	BOEING CO	

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	A364	4,881,014	1989-11-14	TOSHIBA KK	
	A365	4,882,646	1989-11-21	Honeywell Bull Inc.	
	A366	4,882,664	1989-11-21	Rane Corporation	
	A367	4,882,665	1989-11-21	CHOI; KEH-KUN	
	A368	4,885,674	1989-12-05	VARGA; LJUBOMIR D.	
	A369	4,890,210	1989-12-26	GILBARCO, INC.	
	A370	4,890,214	1989-12-26	NEC Corporation	
	A371	4,893,227	1990-01-09	VENUS SCIENTIFIC, INC.	
	A372	4,893,228	1990-01-09	Hewlett Packard Company	
	A373	4,896,092	1990-01-23	Power Distribution, Inc.	
	A374	4,899,271	1990-02-06	Scanpower	
	A375	4,900,885	1990-02-13	Kabushiki Kaisha Toshiba	
	A376	4,902,508	1990-02-20	PURDUE RESEARCH FOUNDATION	
	A377	4,903,183	1990-02-20	Hitachi, Ltd.	
	A378	4,903,189	1990-02-20	GEN ELECTRIC	
	A379	4,908,857	1990-03-13	Siemens Transmission Systems, Inc.	
	A380	4,916,599	1990-04-10	HyperPower, Inc.	
	A381	4,920,470	1990-04-24	ZIRCO, INC.	
	A382	4,922,397	1990-05-01	DIGITAL EQUIPMENT CORPORATION	
	A383	4,922,404	1990-05-01	General Electric Company	
	A384	4,924,170	1990-05-08	Unisys Corporation	
	A385	4,926,303	1990-05-15	Qualitron, Inc.	
	A386	4,929,605	1990-05-29	MERRELL DOW PHARMA	
	A387	4,931,918	1990-06-05	Yokogawa Electric Corporation	
	A388	4,935,857	1990-06-19	SUNDSTRAND CORPORATION	
	A389	4,937,468	1990-06-26	Sundstrand Corporation	
	A390	4,952,849	1990-08-28	PHILIPS CORP	
	A391	4,953,068	1990-08-28	UNISYS CORPORATION	
	A392	4,958,268	1990-09-18	Matsushita Electric Industrial Co., Ltd.	
	A393	4,959,764	1990-09-25	COMPUTER PRODUCTS INC	
	A394	4,959,766	1990-09-25	CA NAT RESEARCH COUNCIL	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A395	4,961,128	1990-10-02	ZENITH ELECTRONICS CORPORATION	
	A396	4,975,823	1990-12-04	DEUTSCHE THOMSON-BRANDT GMBH	
	A397	4,982,149	1991-01-01	TOSHIBA KK	
	A398	5,001,318	1991-03-19	Kabushiki Kaisha Toshiba	
	A399	5,006,782	1991-04-09	INTERNATIONAL RECTIFIER CORPORATION	
	A400	5,008,795	1991-04-16	Unisys Corporation	
	A401	5,010,261	1991-04-23	GENERAL ELECTRIC COMPANY	
	A402	5,012,401	1991-04-30	Allied-Signal Inc.	
	A403	5,013,980	1991-05-07	Thomson Consumer Electronics, Inc.	
	A404	5,016,245	1991-05-14	SIEMENS AG	
	A405	5,017,800	1991-05-21	WISCONSIN ALUMNI RES FOUND	
	A406	5,019,717	1991-05-28	ELEGANT DESIGN SOLUTIONS INC	
	A407	5,019,719	1991-05-28	International Rectifier Corporation	
	A408	5,019,954	1991-05-28	ALLIED SIGNAL INC	
	A409	5,023,766	1991-06-11	BRITISH TELECOMM	
	A410	5,027,002	1991-06-25	WESTINGHOUSE ELECTRIC CORP	
	A411	5,027,264	1991-06-25	Wisconsin Alumni Research Foundation	
	A412	5,029,062	1991-07-02	Alcatel Espace	
	A413	5,036,452	1991-07-30	AT & T BELL LAB	
	A414	5,038,264	1991-08-06	GENERAL ELECTRIC COMPANY	
	A415	5,038,265	1991-08-06	BULL SA	
	A416	5,038,266	1991-08-06	General Electric Company	
	A417	5,041,777	1991-08-20	PHILIPS CORP	
	A418	5,043,859	1991-08-27	GEN ELECTRIC	
	A419	5,047,911	1991-09-10	Leybold Aktiengesellschaft	
	A420	5,055,722	1992-12-01	THOMAS S LATOS	
	A421	5,057,698	1991-10-15	EXIDE ELECTRONICS	
	A422	5,057,986	1991-10-15	UNISYS CORPORATION	

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	A423	5,063,338	1991-11-05	ALCATEL ESPACE	
	A424	5,063,489	1991-11-05	NEC CORP	
	A425	5,066,900	1991-11-19	COMPUTER PRODUCTS INC	
	A426	5,073,848	1991-12-17	GEN ELECTRIC	
	A427	5,077,486	1991-12-31	MARSON GARY	
	A428	5,079,686	1992-01-07	VLT Corporation	
	A429	5,097,403	1992-03-17	ASTEC INT LTD	
	A430	5,099,406	1992-03-24	UNIV KYUSHU	
	A431	5,101,336	1992-03-31	Alcatel N.V.	
	A432	5,103,110	1992-04-07	KELTRONICS CORP	
	A433	5,103,387	1992-04-07	NORTHERN TELECOM LTD	
	A434	5,105,351	1992-04-14	Kabushiki Kaisha Toshiba	
	A435	5,111,372	1992-05-05	TOKO INC	
	A436	5,111,374	1992-05-05	The University of Tennessee Research Corp.	
	A437	5,113,334	1992-05-12	Rifala Pty. Ltd.	
	A438	5,113,337	1992-05-12	GEN ELECTRIC	
	A439	5,119,013	1992-06-02	SQUARE D COMPANY	
	A440	5,119,283	1992-06-02	GEN ELECTRIC	
	A441	5,119,284	1992-06-02	GEN ELECTRIC	
	A442	5,122,726	1992-06-16	Alcatel Network Systems, Inc.	
	A443	5,122,945	1992-06-16	Reliance Comm/Tec Corporation	
	A444	5,126,651	1992-06-30	Motorola, Inc.	
	A445	5,128,603	1992-07-07	ALCATEL NV	
	A446	5,132,888	1992-07-21	UNISYS CORPORATION	
	A447	5,132,889	1992-07-21	IBM CORPORATION	
	A448	5,138,184	1992-08-11	POWERTROL INC	
	A449	5,138,249	1992-08-11	Alcatel Espace	
	A450	5,140,509	1992-08-18	Allied-Signal Inc.	
	A451	5,140,512	1992-08-18	O'SULLIVAN; DERMOT	
	A452	5,140,514	1992-08-18	Kone Elevator GmbH	
	A453	5,144,547	1992-09-01	NEC CORP	
	A454	5,146,394	1992-09-08	MATSUSHITA ELECTRIC IND CO LTD	
	A455	5,157,269	1992-10-20	UNITRODE CORP	
	A456	5,159,541	1992-10-27	NORTHERN TELECOM LTD	

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	A457	5,161,241	1992-11-03	Matsushita Electric Industrial Co., Ltd.	
	A458	5,162,663	1992-11-10	NCR CO	
	A459	5,164,609	1992-11-17	DONNELLY CORP	
	A460	5,168,435	1992-12-01	NEC CORP	
	A461	5,173,846	1992-12-22	Astec International Ltd.	
	A462	5,177,675	1993-01-05	SHINDENGEN ARCHER CORP	
	A463	5,179,512	1993-01-12	GEN ELECTRIC	
	A464	5,206,800	1993-04-27	ASTEC INTERNATIONAL, LTD.	
	A465	5,208,740	1993-05-04	The Texas A & M University System	
	A466	5,216,351	1993-06-01	Seiko Instruments Inc.	
	A467	5,218,522	1993-06-08	Hughes Aircraft Company	
	A468	5,221,887	1993-06-22	GULCZYNSKI; ZDZISLAW	
	A469	5,224,025	1993-06-29	WISCONSIN ALUMNI RES FOUND	
	A470	5,233,509	1993-08-03	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A471	5,235,502	1993-08-10	VLT Corporation	
	A472	5,237,208	1993-08-17	NISHIMU DENSHI KOGYO KK	
	A473	5,237,606	1993-08-17	CHARLES IND LTD	
	A474	5,254,930	1993-10-19	DIGITAL EQUIPMENT CORP	
	A475	5,255,174	1993-10-19	Allied-Signal Inc.	
	A476	5,264,736	1993-11-23	RAYTHEON COMPANY	
	A477	5,267,135	1993-11-30	NEC CORP	
	A478	5,267,137	1993-11-30	Kohler, Schmid Partner	
	A479	5,268,830	1993-12-07	AT&T BELL LABORATORIES	
	A480	5,272,612	1993-12-21	Kabushiki Kaisha Toshiba	
	A481	5,272,613	1993-12-21	PHILIPS CORP	
	A482	5,274,539	1993-12-28	GEN ELECTRIC	
	A483	5,274,543	1993-12-28	AT & T BELL LAB	
	A484	5,289,364	1994-02-22	HITACHI LTD	
	A485	5,303,138	1994-04-12	AT & T BELL LAB	
	A486	5,304,875	1994-04-19	ASTEC INT LTD	
	A487	5,305,191	1994-04-19	AT & T BELL LAB	

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	A488	5,305,192	1994-04-19	LINEAR TECHNOLOGY CORPORATION	
	A489	5,343,383	1994-08-30	NEC CORP	
	A490	5,353,212	1994-10-04	AT & T BELL LAB	
	A491	5,355,077	1994-10-11	DELL USA LP	
	A492	5,355,293	1994-10-11	CARLSTEDT ELEKTRONIK AB	
	A493	5,355,294	1994-10-11	GEN ELECTRIC	
	A494	5,363,323	1994-11-08	International Business Machines Corporation	
	A495	5,377,090	1994-12-27	MARTIN MARIETTA CORP	
	A496	5,383,858	1996-10-29	MEDRAD INC	
	A497	5,386,359	1995-01-31	NEC CORP	
	A498	5,396,412	1995-03-07	ALLIED SIGNAL INC	
	A499	5,398,182	1995-03-14	NAMCO CONTROLS CORP	
	A500	5,400,239	1995-03-21	Northern Telecom Limited	
	A501	5,410,467	1995-04-25	Astec International Limited	
	A502	5,412,308	1995-05-02	HEWLETT PACKARD CORP	
	A503	5,412,557	1995-05-02	Electronic Power Conditioning, Inc.	
	A504	5,424,932	1995-06-13	Yokogawa Electric Corporation	
	A505	5,428,523	1995-06-27	RO ASSOCIATES	
	A506	5,430,632	1995-07-04	POWERPAQ TECH INC	
	A507	5,430,633	1995-07-04	ASTEC INT LTD	
	A508	5,434,770	1995-07-18	United States Department of Energy	
	A509	5,438,499	1995-08-01	LINEAR TECHNOLOGY CORP.	
	A510	5,442,534	1995-08-15	California Institute of Technology	
	A511	5,448,469	1995-09-05	THOMSON BRANDT GMBH	
	A512	5,461,301	1995-10-24	Qualidyne Systems	
	A513	5,477,091	1995-12-19	MERLIN GERIN	
	A514	5,481,178	1996-01-02	LINEAR TECHN INC	
	A515	5,481,449	1996-01-02	GEN ELECTRIC	
	A516	5,500,791	1996-03-19	GENERAL ELECTRIC	

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				COMPANY	
	A517	5,513,092	1996-04-30	Bruker Analytische Messtechnik GmbH	
	A518	5,514,921	1996-05-07	GEN ELECTRIC	
	A519	5,519,599	1996-05-21	NEC CORP	
	A520	5,528,480	1996-06-18	Elonex Technologies, Inc.	
	A521	5,528,482	1996-06-18	AT & T CORP	
	A522	5,530,635	1996-06-25	Nemic-Lambda Kabushiki Kaisha	
	A523	5,534,768	1996-07-09	HARRIS CORP	
	A524	5,535,112	1996-07-09	ALCATEL NV	
	A525	5,537,021	1996-07-16	ALCATEL BELL-SDT S.A.	
	A526	5,539,630	1996-07-23	California Institute of Technology	
	A527	5,539,631	1996-07-23	Ion Systems Incorporated	
	A528	5,541,827	1996-07-30	DOBLE ENG	
	A529	5,552,695	1996-09-03	LINEAR TECHN INC	
	A530	5,559,423	1996-09-24	Norhtern Telecom Limited	
	A531	5,559,682	1996-09-24	HITACHI LTD	
	A532	5,570,276	1996-10-29	OPTIMUN POWER CONVERSION INC	
	A533	5,576,940	1996-11-19	GEN ELECTRIC	
	A534	5,590,032	1996-12-31	LUCENT TECHNOLOGIES INC	
	A535	5,594,629	1997-01-14	General Electric Company	
	A536	5,621,621	1997-04-15	Lindmark Electric AB	
	A537	5,625,541	1997-04-29	LUCENT TECHNOLOGIES INC	
	A538	5,635,826	1997-06-03	Chiyoda Corporation	
	A539	5,636,107	1997-06-03	INTERNATIONAL POWER DEVICES, INC.	
	A540	5,636,116	1997-06-03	MELCHER AG	
	A541	5,663,876	1997-09-02	Lucent Technologies Inc.	
	A542	5,663,877	1997-09-02	MELCHER AG	
	A543	5,663,887	1997-09-02	PROGRESSIVE INTERNATIONAL ELECTRONICS	
	A544	5,691,870	1997-11-25	COMPAQ COMPUTER CORP	

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	A545	5,708,571	1998-01-13	NEC CORP	
	A546	5,719,754	1998-02-17	LUCENT TECHNOLOGIES INC	
	A547	5,726,869	1998-03-10	FUJITSU LTD	
	A548	5,729,444	1998-03-17	AGENCE SPATIALE EUROPEENNE	
	A549	5,734,563	1998-03-31	NEC CORP	
	A550	5,736,843	1998-04-07	Silicon Graphics, Inc.	
	A551	5,742,491	1998-04-21	LUCENT TECHNOLOGIES INC	
	A552	5,745,359	1998-04-28	COMPAQ COMPUTER CORP	
	A553	5,754,414	1998-05-19	HANINGTON; GARY J.	
	A554	5,757,625	1998-05-26	PHILIPS CORP	
	A555	5,757,627	1998-05-26	Compaq Computer Corporation	
	A556	5,768,118	1998-06-16	Compaq Computer Corporation	
	A557	5,771,160	1998-06-23	SAMSUNG ELECTRONICS CO LTD	
	A558	5,774,350	1998-06-30	SGS THOMSON MICROELECTRONICS	
	A559	5,781,420	1998-07-14	INT POWER DEVICES INC	
	A560	5,781,421	1998-07-14	GENERAL ELECTRIC COMPANY	
	A561	5,784,266	1998-07-21	Virginia Power Technologies, Inc	
	A562	5,805,432	1998-09-08	NEC CORP	
	A563	5,818,704	1998-10-06	INT RECTIFIER CORP	
	A564	5,831,839	1998-11-03	PHILIPS CORP	
	A565	5,841,641	1998-11-24	COMPAQ COMPUTER CORPORATION	
	A566	5,841,643	1998-11-24	LINEAR TECHNOLOGY CORPORATION	
	A567	5,862,042	1999-01-19	LUCENT TECHNOLOGIES INC	
	A568	5,870,299	1999-02-09	LUCENT TECHNOLOGIES INC	
	A569	5,872,705	1999-02-16	LUCENT TECHNOLOGIES	

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				INC	
	A570	5,880,939	1999-03-09	SINFOR	
	A571	5,880,949	1999-03-09	ALCATEL ALSTHOM COMPAGNIE GENERALE D'ELECTRICITE	
	A572	5,894,412	1999-04-13	COMPAQ COMPUTER CORP	
	A573	5,901,052	1999-05-04	U.S. Philips Corporation	
	A574	5,903,452	1999-05-11	SYSTEM GENERAL CORPORATION	
	A575	5,907,481	1999-05-25	ERICSSON TELEFON AB L M	
	A576	5,916,313	1999-06-29	DELL USA LP	
	A577	5,929,692	1999-07-27	COMPUTER PRODUCTS INC	
	A578	5,946,202	1999-08-31	BAKER HUGHES INCORPORATED	
	A579	5,946,207	1999-08-31	PHILIPS CORP	
	A580	5,949,658	1999-09-07	Lucent Technologies, Inc.	
	A581	5,956,242	1999-09-21	PHILIPS ELECTRONICS NA	
	A582	5,956,245	1999-09-21	LUCENT TECHNOLOGIES INC	
	A583	5,959,370	1999-09-28	PARDO; HERBERT	
	A584	5,991,167	1999-11-23	PHILIPS CORP	
	A585	5,999,417	1999-12-07	FISCHE LLC	
	A586	6,002,597	1999-12-14	LUCENT TECHNOLOGIES INC	
	A587	6,005,773	1999-12-21	LUCENT TECHNOLOGIES INC.	
	A588	6,011,703	2000-01-04	LUCENT TECHNOLOGIES INC	
	A589	6,016,258	2000-01-18	Nortel Networks Corporation	
	A590	6,016,261	2000-01-18	PHILIPS CORP	
	A591	6,026,005	2000-02-15	INT RECTIFIER CORP	
	A592	6,038,148	2000-03-14	ERICSSON INC	
	A593	6,046,920	2000-04-04	Alcatel	
	A594	6,058,026	2000-05-02	Lucent Technologies, Inc.	
	A595	6,066,943	2000-05-23	Texas Instruments	

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				Incorporated	
	A596	6,069,799	2000-05-30	LUCENT TECHNOLOGIES INC	
	A597	6,069,804	2000-05-30	CONDOR D C POWER SUPPLIES INC	
	A598	6,084,792	2000-07-04	VPT INC	
	A599	6,087,817	2000-07-11	LINEAR TECHN INC	
	A600	6,088,329	2000-07-11	TELEFONAKTIEBOLAGET LM ERICSSON	
	A601	6,091,616	2000-07-18	LUCENT TECHNOLOGIES INC	
	A602	6,137,697	2000-10-24	CIT ALCATEL	
	A603	6,137,698	2000-10-24	SHINDENGEN ELECTRIC MFG	
	A604	6,141,224	2000-10-31	INTERNAT POWER DEVICES INC	
	A605	6,169,675	2001-01-02	Fujitsu Limited	
	A606	6,191,964	2001-02-20	Lucent Technologies Inc.	
	A607	6,208,535	2001-03-27	Texas Instruments Incorporated	
	A608	6,211,657	2001-04-03	Communications & Power Industries, Inc.	
	A609	6,222,742	2001-04-24	SynQor, Inc.	
	A610	6,246,592	2001-06-12	Texas Instruments Incorporated	
	A611	6,252,781	2001-06-26	Artesyn Technologies, Inc.	
	A612	6,278,621	2001-08-21	International Power Devices, Inc.	
	A613	6,385,059	2002-05-07	Iwatt, Inc.	
	A614	6,417,653	2002-07-09	Intel Corporation	
	A615	6,421,262	2002-07-16	VLT Corporation	
	A616	6,430,071	2002-08-06	NTT Data Corporation	
	A617	6,477,065	2002-11-05	Texas Instruments Incorporated	
	A618	6,487,093	2002-11-26	Intel Corporation	
	A619	6,504,267	2003-01-07	Koninklijke Philips Electronics N.V.	
	A620	6,535,407	2003-03-18	NEC Corporation	
	A621	6,552,917	2003-04-22	Koninklijke Philips	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: May 2, 2017				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
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				First Named Inventor	Patrizio Vinciarelli
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				First Named Inventor	Patrizio Vinciarelli
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				First Named Inventor	Patrizio Vinciarelli
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				Examiner Name	Chang, Joseph
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				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
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				Examiner Name	Chang, Joseph
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	50	of	54	Attorney Docket Number	111664-0123 (VA1078)

NON PATENT LITERATURE DOCUMENTS			
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Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	52	of	54	Attorney Docket Number	111664-0123 (VA1078)

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Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/Bobbie-Jean Corbin
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1700	1700
		Total in USD ($)		**1700**

Electronic Acknowledgement Receipt	
EFS ID:	29096607
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Bobbie-Jean Corbin
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	02-MAY-2017
Filing Date:	02-JUL-2013
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Application Type:	Utility under 35 USC 111(a)

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RAM confirmation Number	050317INTEFSW18181000
Deposit Account	190741
Authorized User	Bobbie-Jean Corbin
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	111664-0123_2017-05-02_RCE.pdf	113742 2b21a9959a6859d43b058a96172467d76b335079	no	4
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2	Transmittal Letter	111664-0123_2017-05-02_IDS_Transmittal.pdf	132728 34a8662612f2270f49f985913526638ac3d832ba	no	5
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Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	111664-0123_2017-05-02_SB08.pdf	609747 17fda81943fdd36c9a1bcd439433f8808381b01b	no	54
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4	Foreign Reference	EP41883.pdf	1835393 3f4d4e4ce237f929f35ed9881208d951ab4d4db9	no	23
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6	Foreign Reference	EP291403B1.pdf	1386256 796dd48c008923ab0b1f2fd792c61562aea71a0d	no	19

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9	Foreign Reference	EP925638B1.pdf	828807 811a1553279076 5f9a1b0cb16fcf08457226f02b	no	16
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10	Foreign Reference	FR2535133.pdf	943366 6d6dd8abd3340d8876e610ed28578dc5f16ae1f7	no	20
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11	Foreign Reference	FR2608857.pdf	502738 c2c941002431fbb9a471f9bec3e12e9ab428cc5e	no	14
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12	Foreign Reference	JP05-199744A.pdf	640698 7872e58b51caac24c39bdc6addd987ab658c6fb4	no	11
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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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Electronic Acknowledgement Receipt	
EFS ID:	29096607
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/Bobbie-Jean Corbin
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	02-MAY-2017
Filing Date:	02-JUL-2013
Time Stamp:	18:16:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1700
RAM confirmation Number	050317INTEFSW18181000
Deposit Account	190741
Authorized User	Bobbie-Jean Corbin
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37 CFR 1.19 (Document supply fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	111664-0123_2017-05-02_RCE.pdf	113742 2b21a9959a6859d43b058a96172467d76b335079	no	4
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2	Transmittal Letter	111664-0123_2017-05-02_IDS_Transmittal.pdf	132728 34a8662612f2270f49f985913526638ac3d832ba	no	5
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3	Information Disclosure Statement (IDS) Form (SB08)	111664-0123_2017-05-02_SB08.pdf	609747 17fda81943fdd36c9a1bcd439433f8808381b01b	no	54
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

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Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER
CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 06/05/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	09/05/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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Page 446

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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 06/05/2017
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	09/05/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
❑ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DELTA ELECTRONICS EX. 1002
Page 447

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 06/05/2017

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 06/05/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/933,252	Applicant(s) VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE of 5/2/17*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-24*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 5/2/17
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	1	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	443,441	1890-12-23	HANSON, M.	
	A2	1,181,803	1916-05-02	GEN ELECTRIC	
	A3	2,042,274	1936-05-26	STANDARD OIL DEV CO	
	A4	2,497,534	1950-02-14	GEN ELECTRIC	
	A5	2,852,730	1958-09-16	MOTOROLA INC	
	A6	2,902,862	1959-09-08	TWIFORD HARRY G	
	A7	2,953,738	1960-09-20	WESTINGHOUSE ELECTRIC CORP	
	A8	3,008,068	1961-11-07	PHILIPS CORP	
	A9	3,008,506	1961-11-14	LED BALLAST INC	
	A10	3,029,398	1962-04-10	THOMPSON RAMO WOOLDRIDGE INC	
	A11	3,083,328	1963-03-26	BELL TELEPHONE LABOR INC	
	A12	3,141,140	1964-07-14	ACOUSTICA ASSOCIATES INC	
	A13	3,146,406	1964-08-25	PHILIPS CORP	
	A14	3,161,837	1964-12-15	DAVEN COMPANY	
	A15	3,174,042	1965-03-16	EFFNER WHITE RALPH	
	A16	3,229,111	1966-01-11	ELECTRO SEAL CORP	
	A17	3,241,035	1966-03-15	WARREN MFG COMPANY INC	
	A18	3,295,042	1966-12-27	ROBERTSHAW CONTROLS CO	
	A19	3,307,073	1967-02-28	MOTOROLA INC	
	A20	3,313,996	1967-04-11	HONEYWELL INC	
	A21	3,343,073	1967-09-19	LORAIN PROD CORP	
	A22	3,400,325	1968-09-03	RCA CORP	
	A23	3,435,375	1969-03-25	MOTOROLA, INC.	
	A24	3,443,194	1969-05-06	IBM	
	A25	3,448,370	1969-06-03	AT&T CORP.	
	A26	3,454,853	1969-07-08	HONEYWELL INC.	
	A27	3,458,798	1969-07-29	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A28	3,459,957	1969-08-05	ITE IMPERIAL CORP	
	A29	3,471,747	1969-10-07	GEN MOTORS CORP	
	A30	3,495,157	1970-02-10	FORBRO DESIGN CORP.	
	A31	3,506,908	1970-04-14	TRW INC.	

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	2	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A32	3,514,692	1970-05-26	HONEYWELL INC.	
	A33	3,517,301	1970-06-23	BUNKER RAMO CORPORATION	
	A34	3,553,428	1971-01-05	DU PONT	
	A35	3,564,393	1971-02-16	NORTH AMERICAN ROCKWELL	
	A36	3,569,818	1971-03-09	HUGHES AIRCRAFT CO	
	A37	3,573,483	1971-04-06	ESSEX INTERNATIONAL INC	
	A38	3,573,494	1971-04-06	AUTOMATIC TIMING AND CONTROLS, INC.	
	A39	3,573,508	1971-04-06	BELL TELEPHONE LABOR INC	
	A40	3,573,544	1971-04-06	ENERGY ELECTRONICS	
	A41	3,573,597	1971-04-06	GENERAL ELECTRIC COMPANY	
	A42	3,579,026	1971-05-18	SYLVANIA ELECTRIC PROD	
	A43	3,581,186	1971-05-25	MOTOROLA, INC.	
	A44	3,582,754	1971-06-01	WANDEL U. GOLTERMANN ELEKTRONISCHE PRAZISIONSMESSGERATE	
	A45	3,582,758	1971-06-01	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A46	3,584,289	1971-06-08	BELL TELEPHONE LABOR INC	
	A47	3,588,595	1971-06-28	KIDDE, INC.	
	A48	3,599,073	1971-08-10	TEXAS INSTRUMENTS INC	
	A49	3,604,920	1971-09-14	DONALD M NILES	
	A50	3,619,713	1971-11-09	SOLA BASIC IND INC	
	A51	3,629,648	1971-12-21	BRENT W BROWN	
	A52	3,629,725	1971-12-21	AT&T CORP.	
	A53	3,638,099	1972-01-25	COLLINS RADIO COMPANY	
	A54	3,643,152	1972-02-15	HITACHI, LTD	
	A55	3,646,395	1972-02-29	AMERICAN OPTICAL CORPORATION	
	A56	3,657,631	1972-04-18	INTERNATIONAL STANDARD ELECTRIC CORPORATION (ITTC)	

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	3	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A57	3,660,672	1972-05-02	PIONEER MAGNETICS INC	
	A58	3,663,941	1972-05-16	UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND	
	A59	3,665,203	1972-05-23	JERRY D HOGG	
	A60	3,668,508	1972-06-06	ACME ELECTRIC CORP.	
	A61	3,684,891	1972-08-15	DUAL LITE CO	
	A62	3,696,286	1972-10-03	NORTH AMERICAN ROCKWELL	
	A63	3,704,381	1972-11-28	FORBRO DESIGN CORP	
	A64	3,710,231	1973-01-09	WESTINGHOUSE ELECTRIC CORP.	
	A65	3,714,545	1973-01-30	COMTEURS SCHLUMBERGER MONTROAGE	
	A66	3,733,538	1973-05-15	WESTINGHOUSE ELECTRIC CORP.	
	A67	3,735,235	1973-05-22	AT&T CORP.	
	A68	3,737,755	1973-06-05	AT&T CORP.	
	A69	3,742,242	1973-06-26	SONY CORP	
	A70	3,743,861	1973-07-03	HONEYWELL INC.	
	A71	3,751,676	1973-08-07	MATSUSHITA ELECTRIC IND CO LTD	
	A72	3,753,071	1973-08-14	WESTINGHOUSE ELECTRIC CORP	
	A73	3,753,076	1973-08-14	LIGHTING SYSTEMS INC	
	A74	3,754,177	1973-08-21	LECTRON CORPORATION	
	A75	3,757,195	1973-09-04	HONEYWELL INC.	
	A76	3,769,545	1973-10-30	KODAN INC	
	A77	3,771,040	1973-11-06	NASA	
	A78	3,781,505	1973-12-25	GENERAL ELECTRIC COMPANY	
	A79	3,781,638	1973-12-25	GENERAL ELECTRIC COMPANY	
	A80	3,787,730	1974-01-22	UNITED AIRCRAFT CORP	
	A81	3,805,094	1974-04-16	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A82	3,816,810	1974-06-11	HONEYWELL	

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	4	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				INFORMATION SYSTEMS INC.	
	A83	3,818,237	1974-06-18	HUGHES AIRCRAFT CO	
	A84	3,818,312	1974-06-18	U.S. PHILIPS CORPORATION	
	A85	3,820,008	1974-06-25	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A86	3,824,450	1974-07-16	RCA CORPORATION	
	A87	3,845,404	1974-10-29	TRILLING T	
	A88	3,848,175	1974-11-12	GEN ELECTRIC	
	A89	3,851,240	1974-11-26	GENERAL ELECTRIC COMPANY	
	A90	3,851,278	1974-11-26	BELL + HOWELL JAPAN, LTD.	
	A91	3,859,638	1975-01-07	INTERSIL INC	
	A92	3,873,846	1975-03-25	SONY CORP	
	A93	3,879,647	1975-04-22	AT&T CORP.	
	A94	3,879,652	1975-04-22	WESTINGHOUSE ELECTRIC CORP.	
	A95	3,904,950	1975-09-09	AT&T CORP.	
	A96	3,909,695	1975-09-30	HEWLETT PACKARD COMPANY	
	A97	3,909,700	1975-09-30	GENERAL ELECTRIC COMPANY	
	A98	3,912,940	1975-10-14	HONEYWELL INC	
	A99	3,913,002	1975-10-14	GENERAL ELECTRIC COMPANY	
	A100	3,913,036	1975-10-14	VICTOR COMPTOMETER CORPORATION	
	A101	3,916,289	1975-10-28	UNITED STATES OF AMERICA, AIR FORCE	
	A102	3,919,656	1975-11-11	SOKAL NATHAN O; SOKAL ALAN D	
	A103	3,927,363	1975-12-16	ROCKWELL INTERNATIONAL CORPORATION	
	A104	3,930,196	1975-12-30	GENERAL ELECTRIC COMPANY	

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

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				First Named Inventor	Patrizio Vinciarelli
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Sheet	5	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A105	3,932,764	1976-01-13	ESB INC	
	A106	3,938,024	1976-02-10	Bell Telephone Laboratories, Incorporated	
	A107	3,940,682	1976-02-24	General Electric Company	
	A108	3,949,238	1976-04-06	NORTHERN ELECTRIC CO	
	A109	3,959,716	1976-05-25	The Bendix Corporation	
	A110	3,974,397	1976-08-10	S & C ELECTRIC CO	
	A111	3,976,932	1976-08-24	General Electric Company	
	A112	3,986,052	1976-10-12	North Electric Company	
	A113	3,986,097	1976-10-12	Bell Telephone Laboratories, Incorporated	
	A114	3,989,995	1976-11-02	Bell Telephone Laboratories, Incorporated	
	A115	3,991,319	1976-11-09	INSTRUMENTATION & CONTROL SYST	
	A116	4,005,335	1977-01-25	IOTA ENGINEERING INC	
	A117	4,007,413	1977-02-08	BELL TELEPHONE LABOR INC	
	A118	4,010,381	1977-03-01	BELL TELEPHONE LABOR INC	
	A119	4,011,518	1977-03-08	The United States of America as represented by the Secretary of the Navy	
	A120	4,017,746	1977-04-12	Nartron Corporation	
	A121	4,017,783	1977-04-12	Telefonaktiebolaget L M Ericsson	
	A122	4,017,784	1977-04-12	Litton Systems, Inc.	
	A123	4,027,228	1977-05-31	GEN ELECTRIC	
	A124	4,037,271	1977-07-19	BOSCHERT ASSOCIATES	
	A125	4,044,268	1977-08-23	GATES RUBBER CO	
	A126	4,051,445	1977-09-27	Boschert Assoc.	
	A127	4,058,369	1977-11-15	BENTLEY LAB	
	A128	4,060,757	1977-11-29	General Electric Co.	
	A129	4,066,945	1978-01-03	BENDIX CORP	
	A130	4,074,182	1978-02-14	GEN ELECTRIC	
	A131	4,078,247	1978-03-07	RCA Corporation	

Examiner Signature		Date Considered	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A132	4,104,539	1978-08-01	HASE A M	
	A133	4,106,084	1978-08-08	Societe Nationale des Petroles d'Aquitaine	
	A134	4,109,192	1978-08-22	Hughes Aircraft Company	
	A135	4,114,048	1978-09-12	WESTINGHOUSE ELECTRIC CORP	
	A136	4,115,704	1978-09-19	US NAVY	
	A137	4,122,359	1978-10-24	HONEYWELL INC	
	A138	4,126,793	1978-11-21	ZELLWEGER USTER AG	
	A139	4,128,868	1978-12-05	RCA CORPORATION	
	A140	4,131,860	1978-12-26	THOMSON-CSF	
	A141	4,140,959	1979-02-20	POWELL WILLIAM S	
	A142	4,150,423	1979-04-17	Boschert Associates	
	A143	4,177,389	1979-12-04	SIEMENS AG	
	A144	4,184,197	1980-01-15	California Institute of Technology	
	A145	4,187,458	1980-02-05	The United States of America as represented by the Secretary of the Army	
	A146	4,194,147	1980-03-18	BURR BROWN RES CORP	
	A147	4,205,368	1980-05-27	SIEMENS AG	
	A148	4,207,475	1980-06-10	KEPCO INC	
	A149	4,208,594	1980-06-17	HONEYWELL INC	
	A150	4,208,706	1980-06-17	Sony Corporation	
	A151	4,209,710	1980-06-24	HONEYWELL INC	
	A152	4,210,858	1980-07-01	International Business Machines Corporation	
	A153	4,210,958	1980-07-01	Ikenoue, Tsuneo	
	A154	4,238,690	1980-12-09	BELL TELEPHONE LABOR INC	
	A155	4,238,691	1980-12-09	BELL TELEPHONE LABOR INC	
	A156	4,241,261	1980-12-23	BELL TELEPHONE LABOR INC	
	A157	4,245,194	1981-01-13	GTE Products Corporation	
	A158	4,245,286	1981-01-13	NASA	
	A159	4,251,857	1981-02-17	Sperry Corporation	
	A160	4,253,136	1981-02-24	SANYO ELECTRIC CO	

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	A161	4,254,459	1981-03-03	JMJ Electronics Corp.	
	A162	4,257,087	1981-03-17	California Institute of Technology	
	A163	4,257,089	1981-03-17	The United States of America as represented by the Secretary of the Army	
	A164	4,262,214	1981-04-14	FOXBORO CO	
	A165	4,268,476	1981-05-19	BENTLEY LAB	
	A166	4,270,164	1981-05-26	Contraves Goerz Corporation	
	A167	4,270,165	1981-05-26	QUALIDYNE SYSTEMS INC	
	A168	4,272,806	1981-06-09	EASTMAN KODAK CO	
	A169	4,274,133	1981-06-16	California Institute of Technology	
	A170	4,275,317	1981-06-23	FROSCH; ROBERT A. ADMINISTRATOR OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WITH RESPECT TO AN INVENTION OF	
	A171	4,276,594	1981-06-30	Gould Inc. Modicon Division	
	A172	4,277,726	1981-07-07	LITTON SYSTEMS INC	
	A173	4,277,728	1981-07-07	STEVENS LUMINOPTICS	
	A174	4,288,739	1981-09-08	Kepco, Inc.	
	A175	4,288,865	1981-09-08	MOSTEK CORP	
	A176	4,292,581	1981-09-29	TAN; TAT S.	
	A177	4,293,902	1981-10-06	AEL Mirrotel, Ltd.	
	A178	4,293,904	1981-10-06	The United States of America as represented by the Secretary of the Navy	
	A179	4,297,590	1981-10-27	VAIL ANDE	
	A180	4,300,191	1981-11-10	POWERCUBE CORPORATION	
	A181	4,301,496	1981-11-17	ITT	
	A182	4,302,803	1981-11-24	Sperry Corporation	
	A183	4,307,441	1981-12-22	United Technologies Corporation	

Examiner Signature		Date Considered	

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	A184	4,310,771	1982-01-12	BECKWITH ELECTRIC CO INC	
	A185	4,313,060	1982-01-26	BELL TELEPHONE LABOR INC	
	A186	4,315,207	1982-02-09	Advanced Micro Devices, Inc.	
	A187	4,316,097	1982-02-16	REYNOLDS WILLIAM R	
	A188	4,317,056	1982-02-23	GTE PROD CORP	
	A189	4,318,007	1982-03-02	SITS SOC IT TELECOM SIEMENS	
	A190	4,318,164	1982-03-02	TOKYO SHIBAURA DENKI KABUSHIKI KAISHA	
	A191	4,322,817	1982-03-30	Gte Automatic Electric Labs Inc.	
	A192	4,323,787	1982-04-06	CLARION CO LTD	
	A193	4,323,788	1982-04-06	BORG WARNER	
	A194	4,323,962	1982-04-06	GEN ELECTRIC	
	A195	4,325,017	1982-04-13	RCA CORP	
	A196	4,327,298	1982-04-27	BORG WARNER	
	A197	4,328,482	1982-05-04	CONSUMER ELEC PROD	
	A198	4,330,816	1982-05-18	Fujitsu Fanuc Limited	
	A199	4,334,263	1982-06-08	Pioneer Electronic Corporation	
	A200	4,336,587	1982-06-22	BOETTCHER, JR.; CHARLES W.	
	A201	4,344,122	1982-08-10	General Electric Company	
	A202	4,344,124	1982-08-10	Motorola, Inc.	
	A203	4,346,342	1982-08-24	Rockwell International Corporation	
	A204	4,347,558	1982-08-31	Rockwell International Corporation	
	A205	4,353,113	1982-10-05	Electrotech Instruments Limited	
	A206	4,355,884	1982-10-26	CANON KK	
	A207	4,356,541	1982-10-26	IKENOUE TSUNEO	
	A208	4,357,654	1982-11-02	IKENOUE TSUNEO	
	A209	4,368,409	1983-01-11	Thomson-Brandt	
	A210	4,371,919	1983-02-01	Bell Telephone Laboratories,	

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				Incorporated	
	A211	4,381,457	1983-04-26	LADCO DEV CO INC	
	A212	4,386,394	1983-05-31	GEN ELECTRIC	
	A213	4,393,316	1983-07-12	Reliance Electric Co.	
	A214	4,395,639	1983-07-26	SAB NIFE AB	
	A215	4,398,156	1983-08-09	AALAND; KRISTIAN	
	A216	4,399,499	1983-08-16	GTE AUTOMATIC ELECTRIC LAB INC	
	A217	4,403,269	1983-09-06	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A218	4,415,960	1983-11-15	Sperry Corporation	
	A219	4,423,341	1983-12-27	Sperry Corporation	
	A220	4,427,899	1984-01-24	SIEMENS AG	
	A221	4,438,411	1984-03-20	Ford Aerospace & Communications Corporation	
	A222	4,441,070	1984-04-03	Motorola, Inc.	
	A223	4,442,339	1984-04-10	Mitsubishi Denki Kabushiki Kaisha	
	A224	4,443,840	1984-04-17	LICENTIA GMBH	
	A225	4,449,173	1984-05-15	Tohoku Metal Industries, Inc.	
	A226	4,449,174	1984-05-15	Bell Telephone Laboratories, Incorporated	
	A227	4,449,175	1984-05-15	Toko, Inc.	
	A228	4,451,743	1984-05-29	Citizen Watch Company Limited	
	A229	4,451,876	1984-05-29	Hitachi Metals, Ltd.	
	A230	4,465,966	1984-08-14	Motorola, Inc.	
	A231	4,471,289	1984-09-11	NCR CORPORATION	
	A232	4,473,756	1984-09-25	CALOYERAS INC	
	A233	4,476,399	1984-10-09	FUJI ELECTRIC CO LTD	
	A234	4,479,175	1984-10-23	Honeywell Inc.	
	A235	4,484,084	1984-11-20	NCR CO	
	A236	4,499,531	1985-02-12	501 Gateway Technology, Inc.	
	A237	4,504,895	1985-03-12	GENERAL ELECTRIC COMPANY	

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	A238	4,519,024	1985-05-21	AT&T Bell Laboratories	
	A239	4,520,296	1985-05-28	Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH	
	A240	4,523,265	1985-06-11	Compagnie de Signaux et D'Entreprises Electriques	
	A241	4,524,411	1985-06-18	RCA Corporation	
	A242	4,524,413	1985-06-18	IKENOUE TSUNEO	
	A243	4,527,228	1985-07-02	CHI YU; SIMON S.	
	A244	4,528,459	1985-07-09	ROCKWELL INTERNATIONAL CORP	
	A245	4,533,986	1985-08-06	GENERAL ELECTRIC COMPANY	
	A246	4,535,399	1985-08-13	National Semiconductor Corporation	
	A247	4,536,700	1985-08-20	United Technologies Corporation	
	A248	4,538,073	1985-08-27	CONVERGENT TECHNOLOGIES INC	
	A249	4,538,101	1985-08-27	Nippon Chemi-Con Corporation	
	A250	4,539,487	1985-09-03	MITSUBISHI ELECTRIC CORP	
	A251	4,546,421	1985-10-08	United Technologies Corporation	
	A252	4,553,039	1985-11-12	STIFTER FRANCIS J	
	A253	4,556,802	1985-12-03	NISHIMU DENSHI KOGYO KK	
	A254	4,561,046	1985-12-24	GTE Automatic Electric Incorporated	
	A255	4,562,522	1985-12-31	HONEYWELL INC	
	A256	4,564,800	1986-01-14	Jetronic Industries, Inc.	
	A257	4,566,059	1986-01-21	VENUS SCIENTIFIC INC.	
	A258	4,571,551	1986-02-18	WASHINGTON INNOVATIVE TECHNOLOGY, INC.	
	A259	4,575,640	1986-03-11	GEN ELECTRIC	
	A260	4,578,631	1986-03-25	SMITH; STEVE	
	A261	4,584,635	1986-04-22	International Business	

Examiner Signature		Date Considered	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				Machines Corp.	
	A262	4,586,119	1986-04-29	ITT Corporation	
	A263	4,587,604	1986-05-06	RELIANCE ELECTRIC CO	
	A264	4,591,782	1986-05-27	General Electric Company	
	A265	4,593,213	1986-06-03	United Technologies Corporation	
	A266	4,605,999	1986-08-12	AT&T BELL LABORATORIES	
	A267	4,607,195	1986-08-19	U.S. Philips Corporation	
	A268	4,607,323	1986-08-19	SOKAL; NATHAN O.	
	A269	4,618,919	1986-10-21	SPERRY CORP	
	A270	4,621,313	1986-11-04	ZENITH ELECTRONICS CORP	
	A271	4,622,511	1986-11-11	Raytheon Company	
	A272	4,622,629	1986-11-11	Sundstrand Corporation	
	A273	4,626,982	1986-12-02	General Electric Company	
	A274	4,628,426	1986-12-09	GENERAL ELECTRIC COMPANY	
	A275	4,635,179	1987-01-06	ELDEC CORP	
	A276	4,638,175	1987-01-20	UNITED TECHNOLOGIES CORP	
	A277	4,642,475	1987-02-10	SIEMENS AG	
	A278	4,642,743	1987-02-10	International Business Machines Corp.	
	A279	4,644,440	1987-02-17	WESTINGHOUSE ELECTRIC CORP	
	A280	4,648,017	1987-03-03	RELIANCE ELECTRIC COMPANY	
	A281	4,651,020	1987-03-17	WESTINGHOUSE ELECTRIC CORP	
	A282	4,652,769	1987-03-24	ION TECH INC	
	A283	4,659,942	1987-04-21	DRAPER LAB CHARLES S	
	A284	4,663,699	1987-05-05	PIONEER MAGNETICS INC	
	A285	4,670,661	1987-06-02	TOKYO ELECTRIC CO LTD	
	A286	4,672,517	1987-06-09	Pioneer Magnetics, Inc.	
	A287	4,672,518	1987-06-09	American Telephone and Telegraph Co., AT&T Bell Labs	
	A288	4,672,528	1987-06-09	GENERAL ELECTRIC COMPANY	

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	A289	4,674,019	1987-06-16	Keller-Mullett Technology	
	A290	4,675,796	1987-06-23	VEECO INSTRUMENTS, INC.	
	A291	4,677,311	1987-06-30	HITACHI LTD	
	A292	4,677,534	1987-06-30	KABUSHIKI KAISHA TOSHIBA	
	A293	4,680,688	1987-07-14	YOKOGAWA HOKUSHIN ELECTRIC CORPORATION	
	A294	4,680,689	1987-07-14	PAYNE; DONALD W.	
	A295	4,683,528	1987-07-28	INTERSIL INC	
	A296	4,685,039	1987-08-04	YOKOGAWA HOKUSHIN ELECTRIC	
	A297	4,688,160	1987-08-18	AMERICAN TELEPHONE AND TELEGRAPH CO., AT&T BELL LABS	
	A298	4,691,273	1987-09-01	NIPPON TELEGRAPH & TELEPHONE CORP.	
	A299	4,694,384	1987-09-15	GEN ELECTRIC	
	A300	4,694,386	1987-09-15	THOMSON CSF	
	A301	4,695,935	1987-09-22	ALCATEL NV	
	A302	4,697,136	1987-09-29	SHIKOKU ELEC POWER	
	A303	4,698,738	1987-10-06	UNISYS CORP	
	A304	4,706,177	1987-11-10	JOSEPHSON ELLIOT	
	A305	4,709,316	1987-11-24	GENERAL ELECTRIC COMPANY	
	A306	4,709,318	1987-11-24	LIEBERT CORP	
	A307	4,716,514	1987-12-29	UNITRODE CORP	
	A308	4,717,833	1988-01-05	BOSCHERT INC	
	A309	4,727,308	1988-02-23	IBM	
	A310	4,727,469	1988-02-23	RELIANCE COMM/TEC CORPORATION	
	A311	4,730,242	1988-03-08	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A312	4,733,102	1988-03-22	Mitsubishi Jukogyo Kabushiki Kaisha	
	A313	4,734,839	1988-03-29	BARTHOLD; FRED O.	
	A314	4,734,844	1988-03-29	NCR Corporation	
	A315	4,734,924	1988-03-29	Kabushiki Kaisha Toshiba	
	A316	4,745,299	1988-05-17	AMERICAN TELEPHONE &	

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				TELEGRAPH	
	A317	4,745,538	1988-05-17	Coutant Electronics Limited	
	A318	4,747,034	1988-05-24	DICKEY; DAVID V.	
	A319	4,748,550	1988-05-31	KABUSHIKI KAISHA TOSHIBA	
	A320	4,754,160	1988-06-28	INTERSIL INC	
	A321	4,754,161	1988-06-28	WESTINGHOUSE ELECTRIC CORP	
	A322	4,760,276	1988-07-26	UNISYS CORP	
	A323	4,763,237	1988-08-09	WIECZOREK JOHN P	
	A324	4,768,141	1988-08-30	HUBERTUS; GUIDO	
	A325	4,772,994	1988-09-20	Nishimu Electronics Industries, Co., Ltd.	
	A326	4,777,382	1988-10-11	ALLIED SIGNAL INC	
	A327	4,777,575	1988-10-11	HITACHI LTD.	
	A328	4,779,185	1988-10-18	SIEMENS AKTIENGESELLSCHAFT	
	A329	4,782,241	1988-11-01	LIEBERT CORP	
	A330	4,783,728	1988-11-08	MODULAR POWER CORP	
	A331	4,785,387	1988-11-15	VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.	
	A332	4,788,450	1988-11-29	GEN ELECTRIC	
	A333	4,788,634	1988-11-29	MASSACHUSETTS INST TECHNOLOGY	
	A334	4,794,506	1988-12-27	HITACHI MEDICAL CORPORATION	
	A335	4,796,173	1989-01-03	GENERAL ELECTRIC COMPANY	
	A336	4,800,479	1989-01-24	Prime Computer, Inc.	
	A337	4,805,078	1989-02-14	Siemens Aktiengesellschaft	
	A338	4,809,148	1989-02-28	BRITISH COLUMBIA TELEPHONE	
	A339	4,811,191	1989-03-07	Catalyst Semiconductor, Inc.	
	A340	4,812,672	1989-03-14	NORTHERN TELECOM LTD	
	A341	4,814,962	1989-03-21	AMERICAN TELEPHONE	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
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				AND TELEGRAPH COMPANY, AT&T BELL LABORATORIES	
	A342	4,814,965	1989-03-21	SPECTRA PHYSICS	
	A343	4,823,249	1989-04-18	AMERICAN TELEPHONE AND TELEGRAPH COMPANY AT&T BELL LABORATORIES	
	A344	4,825,348	1989-04-25	GENERAL ELECTRIC COMPANY	
	A345	4,829,216	1989-05-09	RCA Licensing Corporation	
	A346	4,841,160	1989-06-20	NCR CO	
	A347	4,853,832	1989-08-01	UNIVERSITY OF TOLEDO	
	A348	4,853,837	1989-08-01	GULCZYNSKI ZDZISLAW	
	A349	4,855,858	1989-08-08	International Business Machines Corporation	
	A350	4,855,888	1989-08-08	UNISYS CORPORATION	
	A351	4,860,184	1989-08-22	VIRGINIA TECH INTELL PROP	
	A352	4,860,185	1989-08-22	ELECTRONIC RESEARCH GROUP INC	
	A353	4,860,188	1989-08-22	TEXAS INSTRUMENTS INC	
	A354	4,860,189	1989-08-22	INTERNATIONAL BUSINESS MACHINES CORP.	
	A355	4,864,479	1989-09-05	General Electric Company	
	A356	4,864,483	1989-09-05	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A357	4,866,588	1989-09-12	American Telephone and Telegraph Company AT&T Bell Laboratories	
	A358	4,866,589	1989-09-12	HITACHI, LTD.	
	A359	4,868,729	1989-09-19	CANON KK	
	A360	4,870,555	1989-09-26	COMPAQ COMPUTER CORP	
	A361	4,873,616	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A362	4,873,618	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A363	4,877,972	1989-10-31	BOEING CO	

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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A364	4,881,014	1989-11-14	TOSHIBA KK	
	A365	4,882,646	1989-11-21	Honeywell Bull Inc.	
	A366	4,882,664	1989-11-21	Rane Corporation	
	A367	4,882,665	1989-11-21	CHOI; KEH-KUN	
	A368	4,885,674	1989-12-05	VARGA; LJUBOMIR D.	
	A369	4,890,210	1989-12-26	GILBARCO, INC.	
	A370	4,890,214	1989-12-26	NEC Corporation	
	A371	4,893,227	1990-01-09	VENUS SCIENTIFIC, INC.	
	A372	4,893,228	1990-01-09	Hewlett Packard Company	
	A373	4,896,092	1990-01-23	Power Distribution, Inc.	
	A374	4,899,271	1990-02-06	Scanpower	
	A375	4,900,885	1990-02-13	Kabushiki Kaisha Toshiba	
	A376	4,902,508	1990-02-20	PURDUE RESEARCH FOUNDATION	
	A377	4,903,183	1990-02-20	Hitachi, Ltd.	
	A378	4,903,189	1990-02-20	GEN ELECTRIC	
	A379	4,908,857	1990-03-13	Siemens Transmission Systems, Inc.	
	A380	4,916,599	1990-04-10	HyperPower, Inc.	
	A381	4,920,470	1990-04-24	ZIRCO, INC.	
	A382	4,922,397	1990-05-01	DIGITAL EQUIPMENT CORPORATION	
	A383	4,922,404	1990-05-01	General Electric Company	
	A384	4,924,170	1990-05-08	Unisys Corporation	
	A385	4,926,303	1990-05-15	Qualitron, Inc.	
	A386	4,929,605	1990-05-29	MERRELL DOW PHARMA	
	A387	4,931,918	1990-06-05	Yokogawa Electric Corporation	
	A388	4,935,857	1990-06-19	SUNDSTRAND CORPORATION	
	A389	4,937,468	1990-06-26	Sundstrand Corporation	
	A390	4,952,849	1990-08-28	PHILIPS CORP	
	A391	4,953,068	1990-08-28	UNISYS CORPORATION	
	A392	4,958,268	1990-09-18	Matsushita Electric Industrial Co., Ltd.	
	A393	4,959,764	1990-09-25	COMPUTER PRODUCTS INC	
	A394	4,959,766	1990-09-25	CA NAT RESEARCH COUNCIL	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A395	4,961,128	1990-10-02	ZENITH ELECTRONICS CORPORATION	
	A396	4,975,823	1990-12-04	DEUTSCHE THOMSON-BRANDT GMBH	
	A397	4,982,149	1991-01-01	TOSHIBA KK	
	A398	5,001,318	1991-03-19	Kabushiki Kaisha Toshiba	
	A399	5,006,782	1991-04-09	INTERNATIONAL RECTIFIER CORPORATION	
	A400	5,008,795	1991-04-16	Unisys Corporation	
	A401	5,010,261	1991-04-23	GENERAL ELECTRIC COMPANY	
	A402	5,012,401	1991-04-30	Allied-Signal Inc.	
	A403	5,013,980	1991-05-07	Thomson Consumer Electronics, Inc.	
	A404	5,016,245	1991-05-14	SIEMENS AG	
	A405	5,017,800	1991-05-21	WISCONSIN ALUMNI RES FOUND	
	A406	5,019,717	1991-05-28	ELEGANT DESIGN SOLUTIONS INC	
	A407	5,019,719	1991-05-28	International Rectifier Corporation	
	A408	5,019,954	1991-05-28	ALLIED SIGNAL INC	
	A409	5,023,766	1991-06-11	BRITISH TELECOMM	
	A410	5,027,002	1991-06-25	WESTINGHOUSE ELECTRIC CORP	
	A411	5,027,264	1991-06-25	Wisconsin Alumni Research Foundation	
	A412	5,029,062	1991-07-02	Alcatel Espace	
	A413	5,036,452	1991-07-30	AT & T BELL LAB	
	A414	5,038,264	1991-08-06	GENERAL ELECTRIC COMPANY	
	A415	5,038,265	1991-08-06	BULL SA	
	A416	5,038,266	1991-08-06	General Electric Company	
	A417	5,041,777	1991-08-20	PHILIPS CORP	
	A418	5,043,859	1991-08-27	GEN ELECTRIC	
	A419	5,047,911	1991-09-10	Leybold Aktiengesellschaft	
	A420	5,055,722	1992-12-01	THOMAS S LATOS	
	A421	5,057,698	1991-10-15	EXIDE ELECTRONICS	
	A422	5,057,986	1991-10-15	UNISYS CORPORATION	

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	A423	5,063,338	1991-11-05	ALCATEL ESPACE	
	A424	5,063,489	1991-11-05	NEC CORP	
	A425	5,066,900	1991-11-19	COMPUTER PRODUCTS INC	
	A426	5,073,848	1991-12-17	GEN ELECTRIC	
	A427	5,077,486	1991-12-31	MARSON GARY	
	A428	5,079,686	1992-01-07	VLT Corporation	
	A429	5,097,403	1992-03-17	ASTEC INT LTD	
	A430	5,099,406	1992-03-24	UNIV KYUSHU	
	A431	5,101,336	1992-03-31	Alcatel N.V.	
	A432	5,103,110	1992-04-07	KELTRONICS CORP	
	A433	5,103,387	1992-04-07	NORTHERN TELECOM LTD	
	A434	5,105,351	1992-04-14	Kabushiki Kaisha Toshiba	
	A435	5,111,372	1992-05-05	TOKO INC	
	A436	5,111,374	1992-05-05	The University of Tennessee Research Corp.	
	A437	5,113,334	1992-05-12	Rifala Pty. Ltd.	
	A438	5,113,337	1992-05-12	GEN ELECTRIC	
	A439	5,119,013	1992-06-02	SQUARE D COMPANY	
	A440	5,119,283	1992-06-02	GEN ELECTRIC	
	A441	5,119,284	1992-06-02	GEN ELECTRIC	
	A442	5,122,726	1992-06-16	Alcatel Network Systems, Inc.	
	A443	5,122,945	1992-06-16	Reliance Comm/Tec Corporation	
	A444	5,126,651	1992-06-30	Motorola, Inc.	
	A445	5,128,603	1992-07-07	ALCATEL NV	
	A446	5,132,888	1992-07-21	UNISYS CORPORATION	
	A447	5,132,889	1992-07-21	IBM CORPORATION	
	A448	5,138,184	1992-08-11	POWERTROL INC	
	A449	5,138,249	1992-08-11	Alcatel Espace	
	A450	5,140,509	1992-08-18	Allied-Signal Inc.	
	A451	5,140,512	1992-08-18	O'SULLIVAN; DERMOT	
	A452	5,140,514	1992-08-18	Kone Elevator GmbH	
	A453	5,144,547	1992-09-01	NEC CORP	
	A454	5,146,394	1992-09-08	MATSUSHITA ELECTRIC IND CO LTD	
	A455	5,157,269	1992-10-20	UNITRODE CORP	
	A456	5,159,541	1992-10-27	NORTHERN TELECOM LTD	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A457	5,161,241	1992-11-03	Matsushita Electric Industrial Co., Ltd.	
	A458	5,162,663	1992-11-10	NCR CO	
	A459	5,164,609	1992-11-17	DONNELLY CORP	
	A460	5,168,435	1992-12-01	NEC CORP	
	A461	5,173,846	1992-12-22	Astec International Ltd.	
	A462	5,177,675	1993-01-05	SHINDENGEN ARCHER CORP	
	A463	5,179,512	1993-01-12	GEN ELECTRIC	
	A464	5,206,800	1993-04-27	ASTEC INTERNATIONAL, LTD.	
	A465	5,208,740	1993-05-04	The Texas A & M University System	
	A466	5,216,351	1993-06-01	Seiko Instruments Inc.	
	A467	5,218,522	1993-06-08	Hughes Aircraft Company	
	A468	5,221,887	1993-06-22	GULCZYNSKI; ZDZISLAW	
	A469	5,224,025	1993-06-29	WISCONSIN ALUMNI RES FOUND	
	A470	5,233,509	1993-08-03	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A471	5,235,502	1993-08-10	VLT Corporation	
	A472	5,237,208	1993-08-17	NISHIMU DENSHI KOGYO KK	
	A473	5,237,606	1993-08-17	CHARLES IND LTD	
	A474	5,254,930	1993-10-19	DIGITAL EQUIPMENT CORP	
	A475	5,255,174	1993-10-19	Allied-Signal Inc.	
	A476	5,264,736	1993-11-23	RAYTHEON COMPANY	
	A477	5,267,135	1993-11-30	NEC CORP	
	A478	5,267,137	1993-11-30	Kohler, Schmid Partner	
	A479	5,268,830	1993-12-07	AT&T BELL LABORATORIES	
	A480	5,272,612	1993-12-21	Kabushiki Kaisha Toshiba	
	A481	5,272,613	1993-12-21	PHILIPS CORP	
	A482	5,274,539	1993-12-28	GEN ELECTRIC	
	A483	5,274,543	1993-12-28	AT & T BELL LAB	
	A484	5,289,364	1994-02-22	HITACHI LTD	
	A485	5,303,138	1994-04-12	AT & T BELL LAB	
	A486	5,304,875	1994-04-19	ASTEC INT LTD	
	A487	5,305,191	1994-04-19	AT & T BELL LAB	

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	A488	5,305,192	1994-04-19	LINEAR TECHNOLOGY CORPORATION	
	A489	5,343,383	1994-08-30	NEC CORP	
	A490	5,353,212	1994-10-04	AT & T BELL LAB	
	A491	5,355,077	1994-10-11	DELL USA LP	
	A492	5,355,293	1994-10-11	CARLSTEDT ELEKTRONIK AB	
	A493	5,355,294	1994-10-11	GEN ELECTRIC	
	A494	5,363,323	1994-11-08	International Business Machines Corporation	
	A495	5,377,090	1994-12-27	MARTIN MARIETTA CORP	
	A496	5,383,858	1996-10-29	MEDRAD INC	
	A497	5,386,359	1995-01-31	NEC CORP	
	A498	5,396,412	1995-03-07	ALLIED SIGNAL INC	
	A499	5,398,182	1995-03-14	NAMCO CONTROLS CORP	
	A500	5,400,239	1995-03-21	Northern Telecom Limited	
	A501	5,410,467	1995-04-25	Astec International Limited	
	A502	5,412,308	1995-05-02	HEWLETT PACKARD CORP	
	A503	5,412,557	1995-05-02	Electronic Power Conditioning, Inc.	
	A504	5,424,932	1995-06-13	Yokogawa Electric Corporation	
	A505	5,428,523	1995-06-27	RO ASSOCIATES	
	A506	5,430,632	1995-07-04	POWERPAQ TECH INC	
	A507	5,430,633	1995-07-04	ASTEC INT LTD	
	A508	5,434,770	1995-07-18	United States Department of Energy	
	A509	5,438,499	1995-08-01	LINEAR TECHNOLOGY CORP.	
	A510	5,442,534	1995-08-15	California Institute of Technology	
	A511	5,448,469	1995-09-05	THOMSON BRANDT GMBH	
	A512	5,461,301	1995-10-24	Qualidyne Systems	
	A513	5,477,091	1995-12-19	MERLIN GERIN	
	A514	5,481,178	1996-01-02	LINEAR TECHN INC	
	A515	5,481,449	1996-01-02	GEN ELECTRIC	
	A516	5,500,791	1996-03-19	GENERAL ELECTRIC	

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				COMPANY	
	A517	5,513,092	1996-04-30	Bruker Analytische Messtechnik GmbH	
	A518	5,514,921	1996-05-07	GEN ELECTRIC	
	A519	5,519,599	1996-05-21	NEC CORP	
	A520	5,528,480	1996-06-18	Elonex Technologies, Inc.	
	A521	5,528,482	1996-06-18	AT & T CORP	
	A522	5,530,635	1996-06-25	Nemic-Lambda Kabushiki Kaisha	
	A523	5,534,768	1996-07-09	HARRIS CORP	
	A524	5,535,112	1996-07-09	ALCATEL NV	
	A525	5,537,021	1996-07-16	ALCATEL BELL-SDT S.A.	
	A526	5,539,630	1996-07-23	California Institute of Technology	
	A527	5,539,631	1996-07-23	Ion Systems Incorporated	
	A528	5,541,827	1996-07-30	DOBLE ENG	
	A529	5,552,695	1996-09-03	LINEAR TECHN INC	
	A530	5,559,423	1996-09-24	Norhtern Telecom Limited	
	A531	5,559,682	1996-09-24	HITACHI LTD	
	A532	5,570,276	1996-10-29	OPTIMUN POWER CONVERSION INC	
	A533	5,576,940	1996-11-19	GEN ELECTRIC	
	A534	5,590,032	1996-12-31	LUCENT TECHNOLOGIES INC	
	A535	5,594,629	1997-01-14	General Electric Company	
	A536	5,621,621	1997-04-15	Lindmark Electric AB	
	A537	5,625,541	1997-04-29	LUCENT TECHNOLOGIES INC	
	A538	5,635,826	1997-06-03	Chiyoda Corporation	
	A539	5,636,107	1997-06-03	INTERNATIONAL POWER DEVICES, INC.	
	A540	5,636,116	1997-06-03	MELCHER AG	
	A541	5,663,876	1997-09-02	Lucent Technologies Inc.	
	A542	5,663,877	1997-09-02	MELCHER AG	
	A543	5,663,887	1997-09-02	PROGRESSIVE INTERNATIONAL ELECTRONICS	
	A544	5,691,870	1997-11-25	COMPAQ COMPUTER CORP	

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	A545	5,708,571	1998-01-13	NEC CORP	
	A546	5,719,754	1998-02-17	LUCENT TECHNOLOGIES INC	
	A547	5,726,869	1998-03-10	FUJITSU LTD	
	A548	5,729,444	1998-03-17	AGENCE SPATIALE EUROPEENNE	
	A549	5,734,563	1998-03-31	NEC CORP	
	A550	5,736,843	1998-04-07	Silicon Graphics, Inc.	
	A551	5,742,491	1998-04-21	LUCENT TECHNOLOGIES INC	
	A552	5,745,359	1998-04-28	COMPAQ COMPUTER CORP	
	A553	5,754,414	1998-05-19	HANINGTON; GARY J.	
	A554	5,757,625	1998-05-26	PHILIPS CORP	
	A555	5,757,627	1998-05-26	Compaq Computer Corporation	
	A556	5,768,118	1998-06-16	Compaq Computer Corporation	
	A557	5,771,160	1998-06-23	SAMSUNG ELECTRONICS CO LTD	
	A558	5,774,350	1998-06-30	SGS THOMSON MICROELECTRONICS	
	A559	5,781,420	1998-07-14	INT POWER DEVICES INC	
	A560	5,781,421	1998-07-14	GENERAL ELECTRIC COMPANY	
	A561	5,784,266	1998-07-21	Virginia Power Technologies, Inc	
	A562	5,805,432	1998-09-08	NEC CORP	
	A563	5,818,704	1998-10-06	INT RECTIFIER CORP	
	A564	5,831,839	1998-11-03	PHILIPS CORP	
	A565	5,841,641	1998-11-24	COMPAQ COMPUTER CORPORATION	
	A566	5,841,643	1998-11-24	LINEAR TECHNOLOGY CORPORATION	
	A567	5,862,042	1999-01-19	LUCENT TECHNOLOGIES INC	
	A568	5,870,299	1999-02-09	LUCENT TECHNOLOGIES INC	
	A569	5,872,705	1999-02-16	LUCENT TECHNOLOGIES	

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				First Named Inventor	Patrizio Vinciarelli
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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
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	A570	5,880,939	1999-03-09	SINFOR	
	A571	5,880,949	1999-03-09	ALCATEL ALSTHOM COMPAGNIE GENERALE D'ELECTRICITE	
	A572	5,894,412	1999-04-13	COMPAQ COMPUTER CORP	
	A573	5,901,052	1999-05-04	U.S. Philips Corporation	
	A574	5,903,452	1999-05-11	SYSTEM GENERAL CORPORATION	
	A575	5,907,481	1999-05-25	ERICSSON TELEFON AB L M	
	A576	5,916,313	1999-06-29	DELL USA LP	
	A577	5,929,692	1999-07-27	COMPUTER PRODUCTS INC	
	A578	5,946,202	1999-08-31	BAKER HUGHES INCORPORATED	
	A579	5,946,207	1999-08-31	PHILIPS CORP	
	A580	5,949,658	1999-09-07	Lucent Technologies, Inc.	
	A581	5,956,242	1999-09-21	PHILIPS ELECTRONICS NA	
	A582	5,956,245	1999-09-21	LUCENT TECHNOLOGIES INC	
	A583	5,959,370	1999-09-28	PARDO; HERBERT	
	A584	5,991,167	1999-11-23	PHILIPS CORP	
	A585	5,999,417	1999-12-07	FISCHE LLC	
	A586	6,002,597	1999-12-14	LUCENT TECHNOLOGIES INC	
	A587	6,005,773	1999-12-21	LUCENT TECHNOLOGIES INC.	
	A588	6,011,703	2000-01-04	LUCENT TECHNOLOGIES INC	
	A589	6,016,258	2000-01-18	Nortel Networks Corporation	
	A590	6,016,261	2000-01-18	PHILIPS CORP	
	A591	6,026,005	2000-02-15	INT RECTIFIER CORP	
	A592	6,038,148	2000-03-14	ERICSSON INC	
	A593	6,046,920	2000-04-04	Alcatel	
	A594	6,058,026	2000-05-02	Lucent Technologies, Inc.	
	A595	6,066,943	2000-05-23	Texas Instruments	

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	A597	6,069,804	2000-05-30	CONDOR D C POWER SUPPLIES INC	
	A598	6,084,792	2000-07-04	VPT INC	
	A599	6,087,817	2000-07-11	LINEAR TECHN INC	
	A600	6,088,329	2000-07-11	TELEFONAKTIEBOLAGET LM ERICSSON	
	A601	6,091,616	2000-07-18	LUCENT TECHNOLOGIES INC	
	A602	6,137,697	2000-10-24	CIT ALCATEL	
	A603	6,137,698	2000-10-24	SHINDENGEN ELECTRIC MFG	
	A604	6,141,224	2000-10-31	INTERNAT POWER DEVICES INC	
	A605	6,169,675	2001-01-02	Fujitsu Limited	
	A606	6,191,964	2001-02-20	Lucent Technologies Inc.	
	A607	6,208,535	2001-03-27	Texas Instruments Incorporated	
	A608	6,211,657	2001-04-03	Communications & Power Industries, Inc.	
	A609	6,222,742	2001-04-24	SynQor, Inc.	
	A610	6,246,592	2001-06-12	Texas Instruments Incorporated	
	A611	6,252,781	2001-06-26	Artesyn Technologies, Inc.	
	A612	6,278,621	2001-08-21	International Power Devices, Inc.	
	A613	6,385,059	2002-05-07	Iwatt, Inc.	
	A614	6,417,653	2002-07-09	Intel Corporation	
	A615	6,421,262	2002-07-16	VLT Corporation	
	A616	6,430,071	2002-08-06	NTT Data Corporation	
	A617	6,477,065	2002-11-05	Texas Instruments Incorporated	
	A618	6,487,093	2002-11-26	Intel Corporation	
	A619	6,504,267	2003-01-07	Koninklijke Philips Electronics N.V.	
	A620	6,535,407	2003-03-18	NEC Corporation	
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	A623	6,594,159	2003-07-15	SynQor, Inc.	
	A624	6,608,768	2003-08-19	Salcomp Oy	
	A625	6,696,882	2004-02-24	Artesyn Technologies, Inc.	
	A626	6,700,365	2004-03-02	Intersil Americas Inc.	
	A627	6,721,192	2004-04-13	System General Corp.	
	A628	6,728,118	2004-04-27	Innoveta Technologies, Inc.	
	A629	6,731,520	2004-05-04	SynQor, Inc.	
	A630	6,735,094	2004-05-11	General Electric Company	
	A631	6,804,125	2004-10-12	di/dt Inc.	
	A632	6,836,415	2004-12-28	Systems General Corp.	
	A633	6,845,019	2005-01-18	Fairchild Korea Semiconductor Ltd.	
	A634	6,853,563	2005-02-08	System General Corp.	
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	A638	6,927,987	2005-08-09	SynQor, Inc.	
	A639	6,930,893	2005-08-16	VLT, Inc.	
	A640	6,970,366	2005-11-29	Power-One AS	
	A641	6,987,679	2006-01-17	Delta Electronics, Inc.	
	A642	7,019,997	2006-03-28	Matsushita Electric Industrial Co., Ltd.	
	A643	7,031,128	2006-04-18	Samsung Electronics Co., Ltd.	
	A644	7,035,120	2006-04-25	Shindengen Electric Manufacturing Co., Ltd.	
	A645	7,050,309	2006-05-23	SynQor, Inc.	
	A646	7,055,309	2006-06-06	Robert Bosch GmbH	
	A647	7,072,190	2006-07-04	SynQor, Inc.	
	A648	7,187,562	2007-03-06	International Rectifier Corporation	
	A649	7,269,034	2007-09-11	SynQor, Inc.	
	A650	7,272,023	2007-09-18	SynQor, Inc.	
	A651	7,501,715	2009-03-10	Delta Electronics, Inc.	
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	A656	8,023,290	2011-09-20	SynQor, Inc.	
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	A664	2009-0051221	2009-02-26	INNOCOM TECHNOLOGY (SHENZHEN) CO., LTD.; INNOLUX DISPLAY CORP.	
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	A678	6,608,768 B2	2003-08-19	Salcomp Oy	
	A679	6,721,192 B1	2004-04-13	System General Corp.	
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	A687	7,031,128 B2	2006-04-18	Samsung Electronics Co., Ltd.	
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	A689	7,187,562 B2	2007-03-06	International Rectifier Corporation	
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	B3	DE 29 02 862	08-23-1979	FUNCTIONAL AUTOMATION, INC.		
	B4	EP 0 016 537	11-02-198	SPERRY CORP.		
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(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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				Examiner Name	Chang, Joseph
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	C370	PTX 1839, Mankikar, M., Power Electronics Industry Newsletter, MTC/PowerElectronics Industry News, Issue 107, Sept. 2003.	
	C371	Trial Testimony Transcript of December 14, 2010, AM Session, SynQor, Inc. v. Artesyn Technologies, et al., Case No. 2:07-CV-479 (51 pages).	
	C372	Schlecht Technology Tutorial	
	C373	R.L. Steigerwald, et al., "High Density Power for Low Voltage Pulsed Loads", APEC '93. Conference Proceedings (1993).	
	C374	Kassakian, John G., et al., "Principles of Power Electronics", Chapter 20, Massachusetts Institute of Technology, Addison-Wesley Publishing Company, copyright 1991, pages 576-581, 8 pages.	
	C375	PTX 1799, Ericsson Power Modules AB, Design Note 23: Selection of Architecture for Systems using Bus Converters and POL Converters, May 2005.	
	C376	BusQor Series". SynQor website, retrieved on August 14 2002, from http://web.archive.org/web/20020814221649/http://www.synqorcom/products/buscior_qb.html, copyright 2002, 2 pages.	
	C377	Choosing a Power Architecture, Tom Curatolo, Vicor, March, 2004 (PTX 1846).	
	C378	COBOS, J.A. et al. "Study of the Applicability of Self-Driven Synchronous Rectification to Resonant Topologies". 1992 IEEE, pp. 933-940.	
	C379	Factorized Power Architecture & VI Chips – Power Paradigm of the Future?" Webcast. Dr. Patrizio Vinciarelli, President & CEO, Vicor Corporation, date unknown. Accessed: 23 May 2016. (Vicor Webcast) <http://cdn.vicorpower.com/documents/webcasts/fp_webcast.swf>	

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	54	of	54	Attorney Docket Number	111664-0123 (VA1078)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	C380	PTX 1819, Goodenough, F., Power-Supply Rails Plummet and Proliferate; Electronic Design; July 1995.	
	C381	PTX 1821, Power-One, Inc., Form 10-K 2003 Annual Report, March 2004.	
	C382	JI, H.K. et al. "Active Clamp Forward Converter with MOSFET Synchronous Rectification". 1994 IEEE, pp. 895-901.	
	C383	Office Action dated November 21, 2014 in Application No. 13/947,893, which published as US 2014-0085939 A	
	C384	J.A. Cobos & J. Uceda, Low Output Voltage DC/DC Conversion, 1994 20th Int'l Conf. on Indus. Electronics, Control & Instrumentation 1676.	
	C385	Arduini, Douglas P., "A Distributed Power System with a Low-Cost Universal DC/DC Converter," Power Conversion Electronics September 1995 Proceedings, pp. 315-322. (DMMP0001584 - DMMP000I591).	
	C386	Miwa, B.A., Interleaved Conversion Techniques for High Density Power Supplies, Massachusetts Institute of Technology, May 1992, 194 pages.	
	C387	de la Cruz, E., et al., "Review of Suitable Topologies for on Board DC/DC Converters in Distributed Power Architectures for Telecom Applications," copyright 1992 IEEE, pages 59-65, ISBN 0-78030779-8/92. (DMMP0002305 - DMMP0002311).	
	C388	Uceda et al., "Supplying Power at Low Voltage (3.3V)," Proc of the 1995 First IEEE International Caracas Conference on Devices, Circuits and Systems (December 12-14, 1995) pages 244-251.	
	C389	Tokai Corp. v. Eastern Enterprises, Inc., 632 F.3d 1358, 1369 (Fed. Cir. 2011). 31 January 2011, 39 pages.	
	C390	Mammano, B., "Fueling the Megaprocessors - Empowering Dynamic Energy Management," Unitrode Power Design Seminar SEM-1200, 1996, pp. 1-1 to 1-22.	

Examiner Signature	/JOSEPH CHANG/	Date Considered	05/26/2017

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	27	(("4,310,771") or ("4,313,060") or ("4,315,207") or ("4,316,097") or ("4,317,056") or ("4,318,007") or ("4,318,164") or ("4,322,817") or ("4,323,787") or ("4,323,788") or ("4,323,962 ") or ("4,325,017 ") or ("4,327,298 ") or ("4,328,482 ") or ("4,330,816") or ("4,334,263") or ("4,336,587") or ("4,344,122") or ("4,344,124") or ("4,346,342") or ("4,347,558") or ("4,353,113") or ("4,355,884") or ("4,356,541") or ("4,357,654") or ("4,368,409") or ("4,371,919")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 13:23
L2	27	(("4,381,457") or ("4,386,394") or ("4,393,316") or ("4,395,639") or ("4,398,156") or ("4,399,499") or ("4,403,269") or ("4,415,960") or ("4,423,341") or ("4,427,899") or ("4,438,411") or ("4,441,070") or ("4,442,339") or ("4,443,840") or ("4,449,173") or ("4,449,174") or ("4,449,175") or ("4,451,743") or ("4,451,876") or ("4,465,966") or ("4,471,289") or ("4,473,756") or ("4,476,399") or ("4,479,175") or ("4,484,084") or ("4,499,531") or ("4,504,895")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 13:29
L3	24	(("4,519,024") or ("4,520,296") or ("4,523,265") or ("4,524,411") or ("4,524,413") or ("4,527,228") or ("4,528,459") or ("4,533,986") or ("4,535,399") or ("4,536,700") or ("4,538,073") or ("4,538,101") or ("4,539,487") or ("4,546,421") or ("4,553,039") or ("4,556,802") or ("4,561,046") or ("4,562,522") or ("4,564,800") or ("4,566,059") or ("4,571,551") or ("4,575,640") or ("4,578,631") or ("4,584,635")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 13:37
L4	27	(("4,586,119") or ("4,587,604") or ("4,591,782") or ("4,593,213") or ("4,605,999") or ("4,607,195") or ("4,607,323") or ("4,618,919") or ("4,621,313") or ("4,622,511") or ("4,622,629") or ("4,626,982") or ("4,628,426") or ("4,635,179") or ("4,638,175") or ("4,642,475") or ("4,642,743") or ("4,644,440") or ("4,648,017") or ("4,651,020") or ("4,652,769") or ("4,659,942") or ("4,663,699") or ("4,670,661") or	US-PGPUB; USPAT	OR	OFF	2017/05/24 13:47

		("4,672,517") or ("4,672,518") or ("4,672,528")).PN.				
L5	28	(("4,674,019") or ("4,675,796") or ("4,677,311") or ("4,677,534") or ("4,680,688") or ("4,680,689") or ("4,683,528") or ("4,685,039") or ("4,688,160") or ("4,691,273") or ("4,694,384") or ("4,694,386") or ("4,695,935") or ("4,697,136") or ("4,698,738") or ("4,706,177") or ("4,709,316") or ("4,709,318") or ("4,716,514") or ("4,717,833") or ("4,727,308") or ("4,727,469") or ("4,730,242") or ("4,733,102") or ("4,734,839") or ("4,734,844") or ("4,734,924") or ("4,745,299")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 13:55
L6	25	(("4,745,538") or ("4,747,034") or ("4,748,550") or ("4,754,160") or ("4,754,161") or ("4,760,276 ") or ("4,763,237 ") or ("4,768,141") or ("4,772,994") or ("4,777,382 ") or ("4,111,575") or ("4,779,185") or ("4,782,241") or ("4,783,728") or ("4,785,387") or ("4,788,450") or ("4,788,634") or ("4,794,506") or ("4,796,173") or ("4,800,479") or ("4,805,078") or ("4,809,148") or ("4,811,191") or ("4,812,672") or ("4,814,962")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 14:04
L7	22	(("4,814,965") or ("4,823,249") or ("4,825,348") or ("4,829,216") or ("4,841,160") or ("4,853,832") or ("4,853,837") or ("4,855,858") or ("4,855,888") or ("4,860,184") or ("4,860,185") or ("4,860,188") or ("4,860,189") or ("4,864,479") or ("4,864,483") or ("4,866,588") or ("4,866,589") or ("4,868,729") or ("4,870,555") or ("4,873,616") or ("4,873,618") or ("4,877,972")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 14:26
L8	31	(("4,881,014") or ("4,882,646") or ("4,882,664") or ("4,882,665") or ("4,885,674 ") or ("4,890,210 ") or ("4,890,214") or ("4,893,227") or ("4,893,228") or ("4,896,092 ") or ("4,899,271 ") or ("4,900,885") or ("4,902,508") or ("4,903,183") or ("4,903,189") or ("4,908,857") or ("4,916,599 ") or ("4,920,470") or ("4,922,397") or ("4,922,404") or ("4,924,170") or ("4,926,303") or ("4,929,605") or ("4,931,918") or ("4,935,857") or ("4,937,468 ") or ("4,952,849 ") or ("4,953,068") or ("4,958,268") or ("4,959,764") or ("4,959,766")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 15:16
L9	28	(("4,961,128") or ("4,975,823") or ("4,982,149") or ("5,001,318") or ("5,006,782") or ("5,008,795") or ("5,010,261") or ("5,012,401") or ("5,013,980") or ("5,016,245") or ("5,017,800") or ("5,019,717") or	US-PGPUB; USPAT	OR	OFF	2017/05/24 15:27

		("5,019,719") or ("5,019,954") or ("5,023,766") or ("5,027,002") or ("5,027,264") or ("5,029,062 ") or ("5,036,452") or ("5,038,264") or ("5,038,265") or ("5,038,266") or ("5,041,777 ") or ("5,043,859 ") or ("5,047,911 ") or ("5,055,722 ") or ("5,057,698 ") or ("5,057,986")).PN.				
L10	34	(("5,063,338") or ("5,063,489") or ("5,066,900") or ("5,073,848") or ("5,077,486") or ("5,079,686") or ("5,097,403") or ("5,099,406") or ("5,101,336") or ("5,103,110 ") or ("5,103,387 ") or ("5,105,351 ") or ("5,111,372") or ("5,111,374") or ("5,113,334") or ("5,113,337") or ("5,119,013") or ("5,119,283") or ("5,119,284") or ("5,122,726") or ("5,122,945") or ("5,126,651") or ("5,128,603") or ("5,132,888") or ("5,132,889") or ("5,138,184 ") or ("5,138,249 ") or ("5,140,509 ") or ("5,140,512 ") or ("5,140,514 ") or ("5,144,547") or ("5,146,394") or ("5,157,269") or ("5,159,541")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 15:39
L11	31	(("5,161,241") or ("5,162,663") or ("5,164,609") or ("5,168,435") or ("5,173,846") or ("5,177,675") or ("5,179,512") or ("5,206,800") or ("5,208,740") or ("5,216,351") or ("5,218,522") or ("5,221,887") or ("5,224,025") or ("5,233,509") or ("5,235,502") or ("5,237,208") or ("5,237,606") or ("5,254,930") or ("5,255,174") or ("5,264,736") or ("5,267,135") or ("5,267,137") or ("5,268,830") or ("5,272,612") or ("5,272,613") or ("5,274,539 ") or ("5,274,543 ") or ("5,289,364") or ("5,303,138") or ("5,304,875 ") or ("5,305,191")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 16:02
L12	29	(("5,305,192") or ("5,343,383") or ("5,353,212") or ("5,355,077") or ("5,355,293") or ("5,355,294") or ("5,363,323") or ("5,377,090") or ("5,383,858 ") or ("5,386,359 ") or ("5,396,412 ") or ("5,398,182 ") or ("5,400,239") or ("5,410,467") or ("5,412,308") or ("5,412,557") or ("5,424,932") or ("5,428,523") or ("5,430,632") or ("5,430,633") or ("5,434,770") or ("5,438,499") or ("5,442,534") or ("5,448,469") or ("5,461,301") or ("5,477,091") or ("5,481,178 ") or ("5,481,449 ") or ("5,500,791")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 16:18
L13	28	(("5,513,092") or ("5,514,921") or ("5,519,599") or ("5,528,480") or ("5,528,482") or ("5,530,635") or ("5,534,768") or ("5,535,112") or ("5,537,021") or ("5,539,630") or ("5,539,631") or ("5,541,827 ") or ("5,552,695 ") or ("5,559,423 ") or	US-PGPUB; USPAT	OR	OFF	2017/05/24 16:35

		("5,559,682") or ("5,570,276") or ("5,576,940") or ("5,590,032") or ("5,594,629") or ("5,621,621") or ("5,625,541") or ("5,635,826") or ("5,636,107") or ("5,636,116") or ("5,663,876") or ("5,663,877") or ("5,663,887") or ("5,691,870")).PN.				
L14	25	(("5,708,571") or ("5,719,754") or ("5,726,869") or ("5,729,444") or ("5,734,563") or ("5,736,843") or ("5,742,491") or ("5,745,359") or ("5,754,414") or ("5,757,625") or ("5,757,627") or ("5,768,118") or ("5,771,160") or ("5,774,350") or ("5,781,420") or ("5,781,421") or ("5,784,266") or ("5,805,432") or ("5,818,704") or ("5,831,839") or ("5,841,641") or ("5,841,643") or ("5,862,042") or ("5,870,299") or ("5,872,705")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 16:40
L15	26	(("5,880,939") or ("5,880,949") or ("5,894,412") or ("5,901,052") or ("5,903,452") or ("5,907,481") or ("5,916,313") or ("5,929,692") or ("5,946,202") or ("5,946,207") or ("5,949,658") or ("5,956,242") or ("5,956,245") or ("5,959,370") or ("5,991,167") or ("5,999,417") or ("6,002,597") or ("6,005,773") or ("6,011,703") or ("6,016,258") or ("6,016,261") or ("6,026,005") or ("6,038,148") or ("6,046,920") or ("6,058,026") or ("6,066,943")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 16:51
L16	26	(("6,069,799") or ("6,069,804") or ("6,084,792") or ("6,087,817") or ("6,088,329") or ("6,091,616") or ("6,137,697") or ("6,137,698") or ("6,141,224") or ("6,169,675") or ("6,191,964") or ("6,208,535") or ("6,211,657") or ("6,222,742") or ("6,246,592") or ("6,252,781") or ("6,278,621") or ("6,385,059 ") or ("6,417,653 ") or ("6,421,262 ") or ("6,430,071") or ("6,477,065") or ("6,487,093") or ("6,504,267") or ("6,535,407") or ("6,552,917")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 17:14
L17	29	(("6,580,258") or ("6,594,159") or ("6,608,768") or ("6,696,882") or ("6.700.365") or ("6,721,192") or ("6,728,118") or ("6,731,520") or ("6,735,094") or ("6,804,125") or ("6,836,415") or ("6,845,019") or ("6,853,563") or ("6,853,568") or ("6,862,194") or ("6,862,198") or ("6,927,987") or ("6,930,893") or ("6.970.366") or ("6,987,679") or ("7,019,997") or ("7,031,128") or ("7,035,120") or ("7,050,309") or ("7,055,309") or ("7,072,190") or ("7,187,562") or ("7,269,034") or ("7,272,023") or ("7,501,715") or ("7,558,083")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 17:19

L18	31	(("7,564,702") or ("7,727,021") or ("7,768,801") or ("8,023,290") or ("8,493,751") or ("20030174522") or ("20050047177") or ("20060209572") or ("20060262575") or ("20060285368") or ("20080175024") or ("20090051221") or ("20100091526") or ("20110176333 ") or ("20140085939") or ("6,169,675") or ("6,191,964") or ("6,208,535") or ("6,222,742") or ("6,246,592") or ("6,278,621") or ("6,385,059") or ("6,477,065") or ("6,535,407") or ("6,580,258") or ("6,608,768 ") or ("6,721,192 ") or ("6,836,415") or ("6,845,019") or ("6,853,563 ") or ("6,862,194")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 17:25
L19	13	(("6,862,198") or ("6,927,987 ") or ("6,930,893") or ("7,031,128") or ("7,050,309") or ("7,187,562") or ("7,558,083 ") or ("7,564,702") or ("RE36,571") or ("RE37,510 ") or ("RE37,889 ") or ("RE37,898 ") or ("RE40,438")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 17:36
S1	2	(("6930893") or ("7145786")).PN.	USPAT; USOCR	OR	OFF	2016/04/29 09:38
S2	4	(("5377090") or ("5274539") or ("5999417") or ("4586119")).PN.	USPAT; USOCR	OR	OFF	2016/04/29 09:54
S3	1087	307/82.ccls.	US-PGPUB; USPAT	OR	OFF	2016/04/29 10:12
S4	8	distance bus adj converter	US-PGPUB; USPAT	SAME	OFF	2016/04/29 13:49
S5	963	bus adj converter	US-PGPUB; USPAT	AND	ON	2016/04/29 13:52
S6	76	transformer galvanic$3 near4 series	US-PGPUB; USPAT	AND	ON	2016/04/29 13:54
S7	0	S5 and S6	US-PGPUB; USPAT	AND	ON	2016/04/29 13:54
S8	325	bus adj converter and transformer	US-PGPUB; USPAT	AND	ON	2016/04/29 14:27
S9	155	bus adj converter and transformer and regulator	US-PGPUB; USPAT	AND	ON	2016/04/29 14:36
S10	598	H02M3/33576.cpc.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:20
S11	853	H02M3/33561.cpc.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:22
S12	173	(vinciarelli near patrizio).in.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:37
S13	5	(d'amico near andrew).in.	US-PGPUB;	AND	ON	2016/04/29 15:52

			USPAT			
S14	1	"5999417".pn.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:54
S15	1	"7050309".pn.	US-PGPUB; USPAT	AND	ON	2016/04/29 15:56
S19	31	((("0443,441") or ("1,181,803") or ("2,042,274") or ("2,497,534") or ("2,852,730") or ("2,902,862") or ("2,953,738") or ("3,008,068") or ("3,008,506") or ("3,029,398") or ("3,083,328") or ("3,141,140") or ("3,146,406") or ("3,161,837") or ("3,174,042") or ("3,229,111 ") or ("3,241,035") or ("3,295,042") or ("3,307,073") or ("3,313,996") or ("3,343,073") or ("3,400,325 ") or ("3,435,375 ") or ("3,443,194 ") or ("3,448,370 ") or ("3,454,853 ") or ("3,458,798") or ("3,459,957") or ("3,471,747") or ("3,495,157") or ("3,506,908")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 06:18
S20	24	((("3,514,692") or ("3,517,301") or ("3,553,428") or ("3,564,393") or ("3,569,818") or ("3,573,483") or ("3,573,494") or ("3,573,508") or ("3,573,544") or ("3,573,597") or ("3,579,026") or ("3,581,186") or ("3,582,754") or ("3,582,758") or ("3,584,289") or ("3,588,595") or ("3,599,073") or ("3,604,920") or ("3,619,713") or ("3,629,648") or ("3,629,725") or ("3,638,099") or ("3,643,152") or ("3,646,395")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 08:17
S21	25	((("3,660,672") or ("3,663,941") or ("3,665,203") or ("3,668,508") or ("3,684,891") or ("3,696,286") or ("3,704,381") or ("3,710,231") or ("3,714,545") or ("3,733,538") or ("3,735,235") or ("3,737,755") or ("3,742,242") or ("3,743,861") or ("3,751,676") or ("3,753,071") or ("3,753,076") or ("3,754,177") or ("3,757,195") or ("3,769,545") or ("3,771,040 ") or ("3,781,505") or ("3,781,638") or ("3,787,730") or ("3,805,094")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 08:58
S22	22	((("3,818,237") or ("3,818,312") or ("3,820,008") or ("3,824,450") or ("3,845,404") or ("3,848,175") or ("3,851,240") or ("3,851,278") or ("3,859,638") or ("3,873,846") or ("3,879,647") or ("3,879,652") or ("3,904,950") or ("3,909,695") or ("3,909,700") or ("3,912,940") or ("3,913,002") or ("3,913,036") or ("3,916,289") or ("3,919,656") or ("3,927,363") or ("3,930,196")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 09:16
S23	17	((("3,932,764") or ("3,938,024") or ("3,940,682") or ("3,949,238") or ("3,959,716") or ("3,974,397") or	US-PGPUB; USPAT	OR	OFF	2017/05/24 09:34

		("3,976,932") or ("3,986,052") or ("3,986,097") or ("3,989,995") or ("3,991,319") or ("4,005,335") or ("4,007,413") or ("4,010,381") or ("4,011,518") or ("4,017,746") or ("4,017,783")).PN.				
S24	27	(("3,932,764") or ("3,938,024") or ("3,940,682") or ("3,949,238") or ("3,959,716") or ("3,974,397") or ("3,976,932") or ("3,986,052") or ("3,986,097") or ("3,989,995") or ("3,991,319") or ("4,005,335") or ("4,007,413") or ("4,010,381") or ("4,011,518") or ("4,017,746") or ("4,017,783") or ("4,017,784") or ("4,027,228") or ("4,037,271") or ("4,044,268") or ("4,051,445") or ("4,058,369") or ("4,060,757") or ("4,066,945") or ("4,074,182") or ("4,078,247")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 09:41
S25	28	(("4,104,539") or ("4,106,084") or ("4,109,192") or ("4,114,048") or ("4,115,704") or ("4,122,359") or ("4,126,793") or ("4,128,868") or ("4,131,860") or ("4,140,959") or ("4,150,423") or ("4,177,389") or ("4,184,197") or ("4,187,458") or ("4,194,147") or ("4,205,368 ") or ("4,207,475 ") or ("4,208,594 ") or ("4,208,706 ") or ("4,209,710 ") or ("4,210,858") or ("4,210,958") or ("4,238,690") or ("4,238,691") or ("4,241,261") or ("4,245,194") or ("4,245,286") or ("4,251,857")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 10:45
S26	23	(("4,254,459") or ("4,257,087") or ("4,257,089") or ("4,262,214") or ("4,268,476") or ("4,270,164") or ("4,270,165") or ("4,272,806 ") or ("4,274,133") or ("4,275,317") or ("4,276,594") or ("4,277,726") or ("4,277,728") or ("4,288,739") or ("4,288,865") or ("4,292,581") or ("4,293,902") or ("4,293,904") or ("4,297,590") or ("4,300,191") or ("4,301,496") or ("4,302,803") or ("4,307,441")).PN.	US-PGPUB; USPAT	OR	OFF	2017/05/24 11:19

5/ 24/ 2017 5:42:54 PM
C:\ Users\ jchang3\ Documents\ EAST\ Workspaces\ 13933252.wsp

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L20	287	(power and dc and converter and input and output and ratio and series).clm.	US-PGPUB	OR	ON	2017/05/24 17:50
S16	0	(bus and converter and power and distribution and voltage adj transformation adj ratio and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:27
S17	2	(bus and converter and power and distribution and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:27
S18	7	(converter and power and distribution and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:28

5/24/2017 5:56:40 PM
C:\Users\jchang3\Documents\EAST\Workspaces\13933252.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

CPC- SEARCHED		
Symbol	Date	Examiner
M02M3/33576; H02M3/33561	5/4/16	JC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	82	5/4/16	JC

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History attached	5/4/16	JC
updated	9/2/16	JC
updated	1/19/17	JC
IDS of 5/2/17 has been considered.	5/26/17	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUB text search - Sep. 2, 2016 see interference search printout	9/2/16	JC
	updated	1/19/17	JC
	updated	5/26/17	JC

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

CPC						
Symbol					**Type**	**Version**
H02M		3	/	33576	F	2013-01-01
H02M		3	/	33561	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	05/26/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No. 20170526

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	82	H	0	2	M	3 / 335 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											
307	31											

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	05/26/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	05/26/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Appl. Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. This RCE and the enclosed items listed below are being filed prior to the earliest of: (1) payment of the issue fee (unless a petition under 37 C.F.R. § 1.313 is granted); (2) abandonment of the application; or (3) the filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. §141, or the commencement of a civil action under 35 U.S.C. §145 or §146 (unless the appeal or civil action is terminated).

Submission **required** under 37 C.F.R. §1.114: (check items that apply)

Enclosed is:

[**X**] Amendment.

The filing fee is calculated below at the large entity rate:

	Claims as Amended		Previously Paid For		Extra Claims Present		Rate		Fee Totals
RCE Fee 1.17(e):							$1700.00	=	$1,700.00
Total Claims:	27	-	24	=	3	x	$80.00	=	$240.00
Independents	3	-	3	=	0	x	$420.00	=	$0.00
First presentation of any Multiple Dependent Claims:						+	$780.00	=	$0.00
							CLAIMS FEE TOTAL:	=	$1,940.00

The above-identified fees of $1,940.00 are being paid by credit card via EFS-Web.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date September 1, 2017 By /Brett P. Belden/

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Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

AMENDMENT ACCOMPANYING RCE

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This communication is responsive to the Notice of Allowance mailed June 5, 2017, concerning the above-referenced patent application.

Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 10 of this document.

Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

2. (Original) The apparatus of claim 1, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of

turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

3. (Original) The apparatus of claim 1, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to approximately 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

4. (Original) The apparatus of claim 1, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

5. (Original) The apparatus of claim 1, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

6. (Original) The apparatus of claim 1, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

7. (Original) The apparatus of claim 1, further comprising a circuit board, wherein the bus converter and at least one regulator are assembled to the circuit board, and the regulator is configured to supply power to an integrated circuit in a telecommunications application.

8. (Original) The apparatus of claim 1, further comprising a clamp circuit connected to prevent the output voltage, V_{OUT}, from exceeding a predetermined level.

9. (Original) An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$, wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

10. (Original) The apparatus of claim 9, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

11. (Original) The apparatus of claim 9, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is approximately equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

12. (Original) The apparatus of claim 9, wherein the power converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

13. (Original) The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. (Original) The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

15. (Original) The apparatus of claim 9, further comprising a circuit board, and wherein the power converter is configured to supply power to a plurality of regulators over a power distribution bus, the regulators disposed at a distance to the power converter, and wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit in a telecommunications application.

16. (Original) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

17. (Original) The apparatus of claim 16, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

18. (Original) The apparatus of claim 16, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same

number of turns, and wherein N is equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

19. (Original) The apparatus of claim 16, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

20. (Original) The apparatus of claim 16, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, wherein the first polarity is opposite the second polarity.

21. (Original) The apparatus of claim 16, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

22. (Original) An apparatus comprising:

an intermediate bus architecture power distribution system for a telecommunications system comprising a source for providing power at a DC source voltage;

a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series,

and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and

the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

23. (Original) The apparatus of claim 22, wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

24. (Original) The apparatus of claim 22, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

25. (New) The apparatus of claim 1, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

26. (New) The apparatus of claim 9, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

27. (New) The apparatus of claim 16, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

REMARKS

Applicant respectfully requests reconsideration of the present application in view of new claims 25-27.

Status of Claims

Claims 1–27 are now pending in this application, with claims 24-27 being newly added. Applicant respectfully requests reconsideration of these claims.

Concluding Remarks

Applicant believes that the application is in condition for allowance. Favorable reconsideration is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance prosecution.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application, or credit any overpayment, to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date September 1, 2017 By /Brett P. Belden/

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Brett P. Belden
Attorney for Applicant
Registration No. 57,705

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	3	80	240
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1700	1700
		Total in USD ($)		**1940**

Electronic Acknowledgement Receipt	
EFS ID:	30253589
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	01-SEP-2017
Filing Date:	02-JUL-2013
Time Stamp:	15:16:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1940
RAM confirmation Number	090517INTEFSW15174500
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE_Transmittal.pdf	102253 0013f84abd2aab82524e1b67656ca16bd2c6af32	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Amendment Submitted/Entered with Filing of CPA/RCE	Amendment.pdf	117547 a2a53b10fb0df885bcc4acf4ec50fe2a8861d5c4	no	10
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32469 215775c1ce835967abd6ffcfe1e8aab58edff8db	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	252269		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/933,252	Filing Date 07/02/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	09/01/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 27	Minus	** 24	= 3	X $80 =	240
	Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**240**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
TRACEY HARRIS

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

112754 7590 09/21/2017

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER
CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 09/21/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/21/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

DELTA ELECTRONICS EX. 1002
Page 535

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 09/21/2017
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/21/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DELTA ELECTRONICS EX. 1002
Page 536

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 09/21/2017

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 09/21/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/933,252	Applicant(s) VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE of 9/1/17*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-27*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claims 1-27 are allowed.

The following is an examiner's statement of reasons for allowance: Examiner agrees the remark dated 8/4/2016. The newly added claims 25-27 are dependent from independent claims 1, 9 and 16 respectively.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH CHANG whose telephone number is (571)272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

CPC- SEARCHED		
Symbol	Date	Examiner
M02M3/33576; H02M3/33561	5/4/16	JC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	82	5/4/16	JC

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History attached	5/4/16	JC
updated	9/2/16	JC
updated	1/19/17	JC
IDS of 5/2/17 has been considered.	5/26/17	JC
updated	9/14/17	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUB text search - Sep. 2, 2016 see interference search printout	9/2/16	JC
	updated	1/19/17	JC
	updated	5/26/17	JC
	updated	9/14/17	JC

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

CPC						
Symbol					**Type**	**Version**
H02M		3	/	33576	F	2013-01-01
H02M		3	/	33561	I	2013-01-01
			/			
			/			
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 27	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	09/14/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office

Part of Paper No. 20170914

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	82	H	0	2	M	3 / 335 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											
307	31											

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	27	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842	09/14/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 27	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	09/14/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

AMENDMENT UNDER 37 CFR 1.312

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant acknowledges receipt of a Notice of Allowance in the above-captioned application. Please amend the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 10 of this document.

Please amend the application as follows:

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

2. (Original) The apparatus of claim 1, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of

turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

3. (Original) The apparatus of claim 1, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to approximately 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

4. (Original) The apparatus of claim 1, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

5. (Original) The apparatus of claim 1, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

6. (Original) The apparatus of claim 1, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

7. (Currently Amended) The apparatus of claim 1, further comprising a circuit board, wherein the bus converter and at least one regulator are assembled to the circuit board, and the

regulator is configured to supply power to an integrated circuit in an electrical ~~telecommunications~~ application.

8. (Original) The apparatus of claim 1, further comprising a clamp circuit connected to prevent the output voltage, V_{OUT}, from exceeding a predetermined level.

9. (Original) An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$, wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

10. (Original) The apparatus of claim 9, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

11. (Original) The apparatus of claim 9, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of

turns, and wherein N is approximately equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

12. (Original) The apparatus of claim 9, wherein the power converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

13. (Original) The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. (Original) The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

15. (Currently Amended) The apparatus of claim 9, further comprising a circuit board, and wherein the power converter is configured to supply power to a plurality of regulators over a power distribution bus, the regulators disposed at a distance to the power converter, and wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit in an electrical ~~telecommunications~~ application.

16. (Original) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

17. (Original) The apparatus of claim 16, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

18. (Original) The apparatus of claim 16, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of

turns, and wherein N is equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

19. (Original) The apparatus of claim 16, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

20. (Original) The apparatus of claim 16, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, wherein the first polarity is opposite the second polarity.

21. (Original) The apparatus of claim 16, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

22. (Currently Amended) An apparatus comprising:

an intermediate bus architecture power distribution system for an electrical ~~telecommunications~~ system comprising a source for providing power at a DC source voltage;

a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series, and wherein

the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and

the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

23. (Original) The apparatus of claim 22, wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

24. (Original) The apparatus of claim 22, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

25. (Previously Presented) The apparatus of claim 1, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

26. (Previously Presented) The apparatus of claim 9, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

27. (Previously Presented) The apparatus of claim 16, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

REMARKS

This amendment is being filed prior to payment of the issue fee. Claims 7, 15 and 22 have been amended to replace "telecommunication" with "electrical". No new matter has been added.

During a telephone conversation between the Examiner and Applicant's representative, the Examiner agreed that the foregoing amendments could be entered via the present Rule 312 amendment. Applicant thanks the Examiner for his willingness to enter the amendments. Accordingly, entry of the foregoing amendments are respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application, or credit any overpayment, to Deposit Account No. 19-0741.

Respectfully submitted,

Date November 21, 2017 By /Brett P. Belden/

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Electronic Acknowledgement Receipt

EFS ID:	31012493
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
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Application Type:	Utility under 35 USC 111(a)

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1	Amendment after Notice of Allowance (Rule 312)	Amendment.pdf	115057 b8c1af6cad97b0643766894a3a1c1ca79b8209ca	no	10

Warnings:

Information:	
Total Files Size (in bytes):	115057

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 12/04/2017

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3000 K Street N.W.
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Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
12/04/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

Response to Rule 312 Communication	Application No.	Applicant(s)
	13/933,252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

1. ☒ The amendment filed on *22 November 2017* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

OK TO ENTER: /J.C/

Atty. Dkt. No. 111664-0123 (0198-US-1)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

OK TO ENTER: /J.C/

AMENDMENT UNDER 37 CFR 1.312

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant acknowledges receipt of a Notice of Allowance in the above-captioned application. Please amend the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 10 of this document.

Please amend the application as follows:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

AMENDMENT UNDER 37 CFR 1.312

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant acknowledges receipt of a Notice of Allowance in the above-captioned application. Please amend the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 10 of this document.

Please amend the application as follows:

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

2. (Original) The apparatus of claim 1, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of

turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

3. (Original) The apparatus of claim 1, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to approximately 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

4. (Original) The apparatus of claim 1, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

5. (Original) The apparatus of claim 1, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

6. (Original) The apparatus of claim 1, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

7. (Currently Amended) The apparatus of claim 1, further comprising a circuit board, wherein the bus converter and at least one regulator are assembled to the circuit board, and the regulator is configured to supply power to an integrated circuit ~~in an electrical application~~.

8. (Original) The apparatus of claim 1, further comprising a clamp circuit connected to prevent the output voltage, V_{OUT}, from exceeding a predetermined level.

9. (Original) An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$, wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

10. (Original) The apparatus of claim 9, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

11. (Original) The apparatus of claim 9, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is approximately equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

12. (Original) The apparatus of claim 9, wherein the power converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

13. (Original) The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. (Original) The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

15. (Currently Amended) The apparatus of claim 9, further comprising a circuit board, and wherein the power converter is configured to supply power to a plurality of regulators over a power distribution bus, the regulators disposed at a distance to the power converter, and wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit ~~in an electrical application~~.

16. (Original) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

17. (Original) The apparatus of claim 16, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

18. (Original) The apparatus of claim 16, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

19. (Original) The apparatus of claim 16, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

20. (Original) The apparatus of claim 16, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, wherein the first polarity is opposite the second polarity.

21. (Original) The apparatus of claim 16, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuitry including two or more primary switches connected to drive the resonant circuit and the output circuitry being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

22. (Previously Presented) An apparatus comprising:

an intermediate bus architecture power distribution system for an electrical system comprising a source for providing power at a DC source voltage;

a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising

an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series, and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and

the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

23. (Original) The apparatus of claim 22, wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

24. (Original) The apparatus of claim 22, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

25. (Previously Presented) The apparatus of claim 1, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

26. (Previously Presented) The apparatus of claim 9, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

27. (Previously Presented) The apparatus of claim 16, wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

REMARKS

This amendment is being filed prior to payment of the issue fee. Claims 7 and 15 have been amended to remove "in an electrical application". No new matter has been added.

During a telephone conversation between the Examiner and Applicant's representative on December 13, 2017, the Examiner agreed that the foregoing amendments could be entered via the present Rule 312 amendment. Applicant thanks the Examiner for his willingness to enter the amendments. Accordingly, entry of the foregoing amendments is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application, or credit any overpayment, to Deposit Account No. 19-0741.

Respectfully submitted,

Date December 13, 2017 By /Brett P. Belden/

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Brett P. Belden
Attorney for Applicant
Registration No. 57,705

Electronic Acknowledgement Receipt

EFS ID:	31217352
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	13-DEC-2017
Filing Date:	02-JUL-2013
Time Stamp:	15:36:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment after Notice of Allowance (Rule 312)	312_Amendment.pdf	115095 c701c4a494f1059e512778a1857642d5623d6889	no	10

Warnings:

Information:	
Total Files Size (in bytes):	115095

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Atty. Dkt. No. 111664-0123 (VA1078)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

ISSUE FEE TRANSMITTAL

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Enclosed herewith please find Issue Fee Transmittal Form PTOL-85(B).

Fees in the amount of $975.00 for payment of the Issue Fee and five additional copies of the issued utility patent are being paid by credit card via EFS-Web.

AMENDMENT AFTER NOTICE OF ALLOWANCE (RULE 1.312)

Applicant respectfully requests entry of the amendment after allowance filed on December 13, 2017.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Respectfully submitted,

Date December 20, 2017

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 09/21/2017
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	12/21/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 **Foley & Lardner LLP**
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: **VLT, Inc.**

(B) RESIDENCE: (CITY and STATE OR COUNTRY): **Sunnyvale, California**

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☒ Advance Order - # of Copies 5

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 19-0741 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Brett P. Belden/ Date December 20, 2017
Typed or printed name **Brett P. Belden** Registration No. **57,705**

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
Printed copy of patent - no color	8001	5	3	15
		Total in USD ($)		**975**

Electronic Acknowledgement Receipt	
EFS ID:	31294404
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	20-DEC-2017
Filing Date:	02-JUL-2013
Time Stamp:	17:46:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$975
RAM confirmation Number	122117INTEFSW17475901
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.20 (Post Issuance fees)	

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	Transmittal.pdf	98640 f7a735b6e84dea258408df6638b62f9842d761f2	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	PTOL85.pdf	183336 4191971d0cf25e6888b36cd33f2b2917cfb62ff3	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32383 c05a285988da46c8f3a72d58d6785cc5a5c8a6c9	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	314359		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 12/26/2017

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
12/26/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocketing@foley.com

Response to Rule 312 Communication	Application No.	Applicant(s)
	13/933,252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

1. ☒ The amendment filed on *13 December 2017* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

OK TO ENTER: /J.C/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

AMENDMENT UNDER 37 CFR 1.312

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant acknowledges receipt of a Notice of Allowance in the above-captioned application. Please amend the application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 10 of this document.

Please amend the application as follows:

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**140**

Electronic Acknowledgement Receipt	
EFS ID:	31518509
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	16-JAN-2018
Filing Date:	02-JUL-2013
Time Stamp:	21:22:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$140
RAM confirmation Number	011718INTEFSW21240600
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	CHEN.pdf	11588091 b141a30193cb2092b16e461a2c3a3162bd9ea978	no	21
Warnings:					
Information:					
2	Non Patent Literature	KESARWANI.pdf	918179 5ec56d95bd9bf7ae9b3217d10400031a5cab79e3	no	7
Warnings:					
Information:					
3	Non Patent Literature	ORAW_.pdf	5667062 1d85546da41c2a7d6cbde592a84c8c0e3c8e2b0d	no	8
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30481 77d15b410883d36aa39459f7a8b57c69bfdcac21	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	18203813		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: January 16, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	1	of	1	Attorney Docket Number	111664-0123 (0198-US-1)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A1	CHEN, Jikang, "Resonant Switched Capacitor DC-DC Converter with Stackable Conversion Ratios," Electrical Engineering and Computer Sciences, Univ. of California at Berkeley, Technical Report No. UCB/EECS-2016-187, 21 pages (December 1, 2016)	
	A2	ORAW, Bradley et al., "Load Adaptive, High Efficiency, Switched Capacitor Intermediate Bus Converter," Telecommunications Energy Conference, IEEE 2007, pp. 628-635 (Sept. 30 – Oct. 4, 2007)	
	A3	KESARWANI, K. et al., "Resonant switched-capacitor converters for chip-scale power delivery: Modeling and design," 2013 IEEE 14th Workshop on Control and Modeling for Power Electronics (COMPEL), pp. 1–7, published October 10, 2013 (date of conference: June 23-26, 2013)	

Examiner Signature		Date Considered	

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**2040**

Electronic Acknowledgement Receipt	
EFS ID:	31518850
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	16-JAN-2018
Filing Date:	02-JUL-2013
Time Stamp:	22:48:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$2040
RAM confirmation Number	011718INTEFSW22495300
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE_Transmittal.pdf	103137 42a46cf2707b0dccbf7a2dbe0101a1c729c3c69e	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Transmittal Letter	IDS_Transmittal.pdf	100412 e833219f1b66e082615633d3dad55348887b9fec	no	2
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	IDS_SB08.pdf	87344 983ad270c80bc3d6aeb046f3d91ccee58ff1e41f	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Fee Worksheet (SB06)	fee-info.pdf	32240 a10d39a0ec81a142f6b093562b52c64908a32434	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	323133		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Appl. Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. This RCE and the enclosed items listed below are being filed prior to the earliest of: (1) payment of the issue fee (unless a petition under 37 C.F.R. § 1.313 is granted); (2) abandonment of the application; or (3) the filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. §141, or the commencement of a civil action under 35 U.S.C. §145 or §146 (unless the appeal or civil action is terminated).

1. Submission **required** under 37 C.F.R. §1.114: (check items that apply)

a. Enclosed is:

[**X**] Information Disclosure Statement.

[**X**] Form PTO/SB/08.

Miscellaneous:

[**X**] Suspension of action of the above-identified application is requested under 37 C.F.R. § 1.103(c) for a period of 3 months.

The filing fee is calculated below at the large entity rate:

	RCE Fee	$1,900.00
[X]	Suspension of action requested under 37 C.F.R. § 1.103(c)	$140.00
	TOTAL FEE:	$2,040.00

The above-identified fees of $2,040.00 are being paid by credit card via EFS-Web.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date January 16, 2018 By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Application No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation No.:	5889

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicant respectfully requests that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicant does not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith. Concerning reference A3 on the

attached SB/08 (KESARWANI et al.), Applicant draws the Examiner's attention to the fact that the publication date of KESARWANI et al. is October 10, 2013 but the material is purportedly associated with an industry conference held June 23-26, 2013. Therefore, Applicant submits the reference and requests consideration by the Examiner but reserves the right to argue that the reference does not constitute prior art in this or future proceedings.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), before the mailing of a first Office action after the filing of a RCE.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account Number 19-0741.

Respectfully submitted,

Date January 16, 2018 By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

Doc Code: PET.AUTO Document Description: Petition automatically granted by EFS-Web	PTO/SB/140 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**PETITION TO WITHDRAW AN APPLICATION FROM ISSUE AFTER PAYMENT OF THE ISSUE FEE UNDER 37 CFR 1.313(c)**
Application Number	13933252
Filing Date	02-Jul-2013
First Named Inventor	Patrizio VINCIARELLI
Art Unit	2842
Examiner Name	JOSEPH CHANG
Attorney Docket Number	111664-0123 (VA1078)
Title	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

An application may be withdrawn from issue for further action upon petition by the applicant. To request that the Office withdraw an application from issue, applicant must file a petition under this section including the fee set forth in § 1.17(h) and a showing of good and sufficient reasons why withdrawal of the application from issue is necessary.

APPLICANT HEREBY PETITIONS TO WITHDRAW THIS APPLICATION FROM ISSUE UNDER 37 CFR 1.313(c).

A grantable petition requires the following items:
(1) Petition fee; and
(2) One of the following reasons:
(a) Unpatentability of one or more claims, which must be accompanied by an unequivocal statement that one or more claims are unpatentable, an amendment to such claim or claims, and an explanation as to how the amendment causes such claim or claims to be patentable;
(b) Consideration of a request for continued examination in compliance with § 1.114 (for a utility or plant application only); or
(c) Express abandonment of the application. Such express abandonment may be in favor of a continuing application, but not a CPA under 37 CFR 1.53(d).

Petition Fee

- ○ Small Entity
- ○ Micro Entity
- ◉ Regular Undiscounted

Reason for withdrawal from issue

○ One or more claims are unpatentable ◉ Consideration of a request for continued examination (RCE) (List of Required Documents and Fees) ○ Applicant hereby expressly abandons the instant application (any attorney/agent signing for this reason must have power of attorney pursuant to 37 CFR 1.32(b)).
RCE request,submission, and fee. ☒ I certify, in accordance with 37 CFR 1.4(d)(4) that : The RCE request ,submission, and fee have already been filed in the above-identified application on 2018.01.17 ☐ Are attached.
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application. ○ An attorney or agent registered to practice before the Patent and Trademark Office, acting in a representative capacity. ○ A sole inventor ○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ○ A joint inventor; all of whom are signing this e-petition

Signature	/Brett P. Belden/
Name	Brett P. Belden
Registration Number	57705

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**140**

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : January 17, 2018

In re Application of :

Patrizio VINCIARELLI

DECISION ON PETITION
UNDER CFR 1.313(c)(2)

Application No : 13933252

Filed : 02-Jul-2013

Attorney Docket No : 111664-0123 (VA1078)

This is an electronic decision on the petition under 37 CFR 1.313(c)(2), filed January 17, 2018 , to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED.**

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid in this application cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being referred to Technology Center AU 2842 for processing of the request for continuing examination under 37 CFR 1.114 .

Office of Petitions

Electronic Acknowledgement Receipt	
EFS ID:	31518471
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	17-JAN-2018
Filing Date:	02-JUL-2013
Time Stamp:	00:02:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$140
RAM confirmation Number	011718INTEFSW00022500
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition automatically granted by EFS	petition-request.pdf	31715 01195c81e29d0a06edd403f2b8a900ff1e4475615	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30470 d8b9df3094bc27cc7905a8d85f4a787cec21447d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	62185		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

112754 7590 01/31/2018

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER
CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 01/31/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$960	$1000	04/30/2018

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 01/31/2018
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$960	$1000	04/30/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
❑ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DELTA ELECTRONICS EX. 1002
Page 607

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 01/31/2018

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 01/31/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/933,252	Applicant(s) VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE of 1/16/18*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-27*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 1/6/18
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claims 1-27 are allowed.

Claims 1, 9, 16 and 22 are the independent claims.

The following is an examiner's statement of reasons for allowance: none of the cited references discloses nor suggests the claimed invention including "the bus converter … galvanically connected in series … is not galvanically isolated from the source" as set forth in claim 22; and including "the input … and the output … of the bus converter are connected in series across the source such that an absolute value of the input voltage Vin applied to the input circuit is approximately equal to the absolute value of the DC source voltage Vs minus a number N times the absolute value of the output voltage Vout, where N is at least 1" as set forth in claims 1, 9 and 16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSEPH CHANG whose telephone number is (571)272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an

interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

CPC						
Symbol					**Type**	**Version**
H02M		3	/	33576	F	2013-01-01
H02M		3	/	33561	I	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 27	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	01/26/2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

U.S. Patent and Trademark Office

Part of Paper No. 20180126

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	82	H	0	2	M	3 / 335 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											
307	31											

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 27	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	01/26/2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 27	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	01/26/2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: January 16, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	1	of	1	Attorney Docket Number	111664-0123 (0198-US-1)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
/J.C/	A1	CHEN, Jikang, "Resonant Switched Capacitor DC-DC Converter with Stackable Conversion Ratios," Electrical Engineering and Computer Sciences, Univ. of California at Berkeley, Technical Report No. UCB/EECS-2016-187, 21 pages (December 1, 2016)	
/J.C/	A2	ORAW, Bradley et al., "Load Adaptive, High Efficiency, Switched Capacitor Intermediate Bus Converter," Telecommunications Energy Conference, IEEE 2007, pp. 628-635 (Sept. 30 – Oct. 4, 2007)	
/J.C/	A3	KESARWANI, K. et al., "Resonant switched-capacitor converters for chip-scale power delivery: Modeling and design," 2013 IEEE 14th Workshop on Control and Modeling for Power Electronics (COMPEL), pp. 1–7, published October 10, 2013 (date of conference: June 23-26, 2013)	

Examiner Signature	/JOSEPH CHANG/	Date Considered	01/26/2018

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

CPC- SEARCHED		
Symbol	Date	Examiner
M02M3/33576; H02M3/33561	5/4/16	JC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	82	5/4/16	JC

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History attached	5/4/16	JC
updated	9/2/16	JC
updated	1/19/17	JC
IDS of 5/2/17 has been considered.	5/26/17	JC
updated	9/14/17	JC
updated	1/26/18	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUB text search - Sep. 2, 2016 see interference search printout	9/2/16	JC
	updated	1/19/17	JC
	updated	5/26/17	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	updated	9/14/17	JC
	updated	1/26/18	JC

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 02/12/2018

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
02/12/2018	ELECTRONIC

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SUITE 600
WASHINGTON, DC 20007-5109

FEB 12 2018

In re Application of Vinciarelli et al.	:	
Appl. No.: 13/933,252	:	**WITHDRAWAL FROM ISSUE**
Filed: July 2, 2013	:	*37 CFR 1.313*
Attorney Docket No.: 111664-0123(VA1078)	:	
For: POWER DISTRIBUTION ARCHITECTURE WITH SERIES CONNECTED BUS CONVERTER	:	

The purpose of this communication is to inform you that the above identified application is being withdrawn from issue pursuant to 37 CFR 1.313.

The applicant filed a Request for Continued Examination (RCE) on January 16, 2018 with a request for suspension of action under 37 CFR 1.103(c) for a period of three months. A Notice of Allowance and Fee(s) Due was mailed on January 31, 2018. The Notice of Allowance should not have been mailed before April 16, 2018 so as to allow the full 3 month period for suspension of action to expire.

U.S. Patent and Trademark Office records reveal that the issue fee and the publication fee have not been paid. If the issue fee and the publication fee have been submitted, the applicant may request a refund, or may request that the fee be credited to a deposit account. However, applicant may wait until the application is either again found allowable or held abandoned. If the application is allowed, upon receipt of a new Notice of Allowance and Fees Due, applicant may request that any previously submitted issue fee and publication fee be applied toward payment of the issue fee and publication fee in the amount identified on the new Notice of Allowance and Issue and Publication Fee Due. If the application is abandoned, applicant may request either a refund or a credit to a specified Deposit Account.

The application is being forwarded to the examiner for action on the merits after the suspension period expires on April 16, 2018. Any inquiries related to this decision should be directed to Robert Pascal, Supervisory Patent Examiner, at (571) 272-1769.

For:

Robin Evans
Director - Technology Center 2800
Electrical Circuits and Systems
RE:rp:kt

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 02/12/2018

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER
CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
02/12/2018	ELECTRONIC

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SUITE 600
WASHINGTON, DC 20007-5109

FEB 12 2018

In re Application of Vinciarelli et al. :
Appl. No.: 13/933,252 : **WITHDRAWAL FROM ISSUE**
Filed: July 2, 2013 : *37 CFR 1.313*
Attorney Docket No.: 111664-0123(VA1078) :
For: POWER DISTRIBUTION ARCHITECTURE WITH SERIES CONNECTED BUS CONVERTER :

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The application is being forwarded to the examiner for action on the merits after the suspension period expires on April 16, 2018. Any inquiries related to this decision should be directed to Robert Pascal, Supervisory Patent Examiner, at (571) 272-1769.

For:
Robin Evans
Director - Technology Center 2800
Electrical Circuits and Systems
RE:rp:kt

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are galvanically connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1;

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the bus converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

2. (Original) The apparatus of claim 1, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

3. (Original) The apparatus of claim 1, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to approximately 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

4. (Original) The apparatus of claim 1, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

5. (Currently Amended) The apparatus of claim 1, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit ~~circuitry~~ including two or more primary switches connected to drive the resonant circuit and the output circuit ~~circuitry~~ being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

6. (Original) The apparatus of claim 1, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

7. (Previously Presented) The apparatus of claim 1, further comprising a circuit board, wherein the bus converter and at least one regulator are assembled to the circuit board, and the regulator is configured to supply power to an integrated circuit.

8. (Original) The apparatus of claim 1, further comprising a clamp circuit connected to prevent the output voltage, V_{OUT}, from exceeding a predetermined level.

9. (Currently Amended) An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$, wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1;

wherein the power converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the power converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

10. (Original) The apparatus of claim 9, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

11. (Original) The apparatus of claim 9, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is approximately equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

12. (Original) The apparatus of claim 9, wherein the power converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

13. (Currently Amended) The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit ~~circuitry~~ including two or more primary switches connected to drive the resonant circuit and the output circuit ~~circuitry~~ being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. (Original) The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

15. (Previously Presented) The apparatus of claim 9, further comprising a circuit board, and wherein the power converter is configured to supply power to a plurality of regulators over a power distribution bus, the regulators disposed at a distance to the power converter, and wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit.

16. (Currently Amended) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1;

<u>wherein the bus converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and</u>

wherein a current flowing in the inductive component charges and discharges capacitances in the bus converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

17. (Original) The apparatus of claim 16, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

18. (Original) The apparatus of claim 16, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

19. (Original) The apparatus of claim 16, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

20. (Original) The apparatus of claim 16, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, wherein the first polarity is opposite the second polarity.

21. (Currently Amended) The apparatus of claim 16, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit ~~circuitry~~ including two or more primary switches connected to drive the resonant circuit and the output circuit ~~circuitry~~ being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of

essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

22. (Previously Presented) An apparatus comprising:

an intermediate bus architecture power distribution system for an electrical system comprising a source for providing power at a DC source voltage;

a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series, and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and

the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

23. (Original) The apparatus of claim 22, wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

24. (Original) The apparatus of claim 22, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

25. (Previously Presented) The apparatus of claim 1 wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

26. (Previously Presented) The apparatus of claim 9 wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

27. (Previously Presented) The apparatus of claim 16 wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

28. (New) The apparatus of claim 1 wherein the voltage across said one or more power switches is reduced to essentially zero volts prior to turning ON said one or more switches.

29. (New) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected; and

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit or output circuit or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the converter reducing a voltage across said one or more switches prior to turn ON of said one or more switches.

30. (New) The apparatus of claim 29 wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.

31. (New) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output

of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

32. (New) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns; and

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected.

33. (New) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected; and

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit or output circuit or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the converter reducing a voltage across said one or more switches prior to turn ON said one or more switches.

34. (New) The apparatus of claim 33, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

35. (New) The apparatus of claim 33 wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.

36. (New) The apparatus of claim 33 wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

37. (New) The apparatus of claim 33, wherein the input circuit comprises a first winding having a first number of turns, wherein the output circuit comprises a second winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

38. (New) The apparatus of claim 37, wherein at least a portion of the input circuit of the bus converter is connected in series with at least a portion of the output circuit of the bus converter such that an absolute value of a voltage applied to the first winding is approximately equal to the absolute value of the input voltage, V_{IN}, minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

39. (New) The apparatus of claim 22 wherein the bus converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both, and wherein a current flowing in the inductive component charges and discharges capacitances in the bus converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

40. (New) The apparatus of claim 22 wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit.

REMARKS

Status of Claims

Claims 1, 5, 9, 13, 16, and 21 are amended. Claims 28-40 are new. No new matter has been added. These amendments are made without prejudice or disclaimer.

After amending the claims as set forth above, claims 1-40 remain pending in this application. Applicant respectfully requests reconsideration of these claims.

Support for these amendments can be found through the specification and claims as originally filed. Support for portions of the amendments can be found in at least U.S. Patent No. 7,145,786, which is expressly incorporated by reference in its entirety at paragraph [0018] of the specification as originally filed. Specifically, support can be found at least at U.S. Patent No. 7,145,786, col. 15, ll. 58-65; col. 16, ll. 33-35; col. 16, ll. 18-20; col. 17, ll. 24-63; col. 18, ll. 3-21; col. 17, ll. 57-64; col. 20, ll. 65 - col. 21, ll. 22; and col. 23-28.

Concluding Remarks

Applicant believes that the application is in condition for allowance. Favorable consideration is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance prosecution.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extensions under 37 CFR § 1.136 and authorizes payment of any such extension fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date April 2, 2018 By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
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Brett P. Belden
Attorney for Applicant
Registration No. 57,705

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Application No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation No.:	5889

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicant respectfully requests that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicant does not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), before the mailing of a first Office action after the filing of a RCE.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account No. 19-0741.

Respectfully submitted,

Date April 2, 2018 By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: April 2, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	1	of	2	Attorney Docket Number	111664-0123 (0198-US-1)

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	8,582,333	11-12-2013	INTEL CORP.	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A2	SANDERS, S., et al., "The road to fully integrated dc-dc conversion via the switched-capacitor approach," Power Electronics, IEEE Transactions on, vol. 28, pp. 4146–4155, Sept 2013.	
	A3	LE, H.P., et al., "Design techniques for fully integrated switched-capacitor dc-dc converters," Solid-State Circuits, IEEE Journal of, vol. 46, pp. 2120–2131, Sept 2011.	
	A4	SEEMAN, M., et al.,, "Analysis and optimization of switched-capacitor dc-dc converters," Power Electronics, IEEE Transactions on, vol. 23, pp. 841–851, March 2008.	
	A5	LEI, Y., et al., "A general method for analyzing resonant and soft-charging operation of switched-capacitor converters," Power Electronics, IEEE Transactions on, vol. 30, pp. 5650–5664, Oct 2015.	
	A6	SANO, K., et al., "Performance of a high-efficiency switched-capacitor-based resonant converter with phase-shift control," Power Electronics, IEEE Transactions on, vol. 26, pp. 344–354, Feb 2011.	
	A7	LEI, Y., et al., "Split-phase control: Achieving complete soft-charging operation of a dickson switched-capacitor converter," Power Electronics, IEEE Transactions on, vol. PP, no. 99, pp. 1–1, 2015.	
	A8	KESARWANI, et al., "Resonant switched-capacitor converters for chip-scale power delivery: Design amp; implementation," Power Electronics, IEEE Transactions on, vol. PP, no. 99, pp. 1–1, 2014.	
	A9	LI, Y., et al., "Lossless voltage regulation and control of the resonant switched-capacitor dc-dc converter," in Control and Modeling for Power Electronics (COMPEL), 2015 IEEE 16th Workshop on, pp. 1–7, July 2015.	
	A10	FENG, W., et al., "A hybrid strategy with simplified optimal trajectory control for LLC resonant converters," in Proc. IEEE Appl. Power Electron. Conf., Feb. 2012, pp. 1096–1103.	
	A11	CERVERA, A., et al., "A high-efficiency resonant switched capacitor converter with continuous conversion ratio," Power Electronics, IEEE Transactions on, vol. 30, pp. 1373–1382, March 2015.	
	A12	CAO et al.," A Family of Zero Current Switching Switched-Capacitor DC-DC converters," Applied Power Electronics Conference and Exposition (APEC), 2010 Twenty-Fifth Annual IEEE, Mar. 18, 2010.	
	A13	CAO et al., " Zero-Current-Switching Multilevel Modular Switched-Capacitor DC-DC Converter" IEEE Transactions on Industry Applications, 46(6):2536-2544, Sep. 2010	
	A14	Y. P. B. Yeung, K. W. E. Cheng, D. Sutanto and S. L. Ho, "Zerocurrent switching switched-capacitor quasiresonant step-down converter," *Electric Power Applications, IEE Proceedings -,* vol. 149, pp. 111-121, 2002.	

Examiner Signature		Date Considered	

4831-9899-5034.1

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: April 2, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	2	of	2	Attorney Docket Number	111664-0123 (0198-US-1)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A15	Y. P. B. Yeung, K. W. Cheng, S. L. Ho and D. Sutanto, "Generalised analysis of switched-capacitor step-down quasi-resonant converter," *Electronics Letters,* vol. 38, pp. 263-264, 2002.	

Examiner Signature		Date Considered	

4831-9899-5034.1

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	13	100	1300
INDEPENDENT CLAIMS IN EXCESS OF 3	1201	4	460	1840
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**3140**

Electronic Acknowledgement Receipt	
EFS ID:	32225456
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	02-APR-2018
Filing Date:	02-JUL-2013
Time Stamp:	20:03:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$3140
RAM confirmation Number	040318INTEFSW20041800
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	Transmittal.pdf	96776 225051b6fc38aa2ad18cd2ce6d3346041664b735	no	2
Warnings:					
Information:					
2		Amendment.pdf	132475 04d3fb4be7d6caf122ffe40bc98ba9880d90fefb	yes	16

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal Letter	1	1
Amendment Copy Claims/Response to Suggested Claims	2	14
Applicant Arguments/Remarks Made in an Amendment	15	16

Warnings:					
Information:					
3	Transmittal Letter	IDS_Transmittal.pdf	99637 06243d43e772db825dcf2eb6294a78f5b12dd09a	no	2
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	IDS_SB08.pdf	131816 c75a3afedc7fa0bc1cb2d3610a37e5dc4e92f14f	no	2
Warnings:					
Information:					
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5	Non Patent Literature	SANDERS.pdf	819798 ac0c1ef1b806db11fa4d8017b8d1626b9f4f050c	no	10
Warnings:					
Information:					
6	Non Patent Literature	LE.pdf	2427385 9d8857bba07e46f5e3fe5c7aea586d6351b9c906	no	12
Warnings:					
Information:					
7	Non Patent Literature	SEEMAN.pdf	441257 533ea26a8af1f364b92d856f0aae2fc4e1539952	no	11
Warnings:					
Information:					
8	Non Patent Literature	LEI.pdf	742176 4c54f3bcb5e12811b1c825fe8b352ded7578fd9c	no	7
Warnings:					
Information:					
9	Non Patent Literature	SANO.pdf	450257 dd3f4425ec6bb21293a093e635c561fe9e8dc5ee	no	11
Warnings:					
Information:					
10	Non Patent Literature	KESARWANI.pdf	1206297 928dedc20ef5c2ddd2fa3e95f7eda054ddc8482d	no	12
Warnings:					
Information:					
11	Non Patent Literature	FENG.pdf	1665408 ceac0989d6c5b9a350281ec93d806643f9dcc5ff	no	8
Warnings:					
Information:					

12	Non Patent Literature	CAO_.pdf	715684 a5c1f9d2a309a1ba36d64f2979b5782437342e15	no	8
Warnings:					
Information:					
13	Non Patent Literature	CAO_Zero-Current.pdf	1171176 82e2914c990c0ab7dc608db94bb37b833a868c20	no	9
Warnings:					
Information:					
14	Non Patent Literature	YEUNG_Generalised_.pdf	388423 f9c3d03d94d4a697430d11185e795cca01cb361e	no	2
Warnings:					
Information:					
15	Non Patent Literature	YEUNG_Zerocurrent_.pdf	1768186 92ba66c55d9fe109fe5cb75e3e5924ed3cdfef72	no	11
Warnings:					
Information:					
16	Non Patent Literature	CERVERA.pdf	5224737 5ca3ccf221d1564af89c76461fa3b7ff385299f3	no	10
Warnings:					
Information:					
17	Non Patent Literature	LEI_.pdf	1176719 a6aecbbb46bda9b80ea0bee2ae22a89be8686556	no	15
Warnings:					
Information:					
18	Non Patent Literature	LI.pdf	345813 5b8704c5fdff7a28c8c0893bf1270dec9f6e552b	no	7
Warnings:					
Information:					

19	Fee Worksheet (SB06)	fee-info.pdf	32127 18239bca65dbaa151e61d6573b5ca4e50208131d	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	19036147	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

AMENDMENT TRANSMITTAL

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Transmitted herewith is an amendment in the above-identified application.

[**X**] The fee required for additional claims is calculated below:

	Claims As Amended		Previously Paid For		Extra Claims Present		Rate		Additional Claims Fee
Total Claims:	40	-	27	=	13	x	$100.00	=	$1300.00
Independent Claims:	8	-	4	=	4	x	$460.00	=	$1840.00
First presentation of any Multiple Dependent Claims:						+	$820.00	=	$0.00
							CLAIMS FEE TOTAL	=	$3140.00

The Commissioner is hereby authorized to charge any additional fees which may be required for this application to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extensions under 37 CFR § 1.136 and authorizes payment of any such extension fees to Deposit Account No. 19-0741.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date April 2, 2018 By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

AMENDMENT UNDER 37 CFR 1.114

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This communication is responsive to the suspension of action under 37 CFR 1.103(c) and the Request for Continued Examination (RCE), both filed on January 16, 2018, concerning the above-referenced patent application.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 145 of this document.

Please amend the application as follows:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

SUPPLEMENTAL AMENDMENT UNDER 37 CFR 1.111

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This communication is supplemental to the Amendment filed on April 2, 2018, concerning the above-referenced patent application. Amendments are presented relative to the previously submitted Amendment, and presume entry of that Amendment.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this document.

Remarks begin on page 15 of this document.

Please amend the application as follows:

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are galvanically connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1;

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the bus converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

2. (Original) The apparatus of claim 1, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

3. (Original) The apparatus of claim 1, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to approximately 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

4. (Original) The apparatus of claim 1, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

5. (Previously Presented) The apparatus of claim 1, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

6. (Original) The apparatus of claim 1, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

7. (Previously Presented) The apparatus of claim 1, further comprising a circuit board, wherein the bus converter and at least one regulator are assembled to the circuit board, and the regulator is configured to supply power to an integrated circuit.

8. (Original) The apparatus of claim 1, further comprising a clamp circuit connected to prevent the output voltage, V_{OUT}, from exceeding a predetermined level.

9. (Previously Presented) An apparatus comprising:

a power converter comprising an input circuit and an output circuit, wherein the power converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the power converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the power converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$, wherein the power converter further comprises:

a series connection between the input circuit of the power converter and at least a portion of the output circuit of the power converter across the source, such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1;

wherein the power converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the power converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

10. (Original) The apparatus of claim 9, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

11. (Original) The apparatus of claim 9, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is approximately equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

12. (Original) The apparatus of claim 9, wherein the power converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, the second polarity being opposite the first polarity.

13. (Previously Presented) The apparatus of claim 9, wherein the power converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

14. (Original) The apparatus of claim 9, wherein the power converter is part of a bus converter that is a self-contained assembly adapted to be installed as a unit.

15. (Previously Presented) The apparatus of claim 9, further comprising a circuit board, and wherein the power converter is configured to supply power to a plurality of regulators over a power distribution bus, the regulators disposed at a distance to the power converter, and wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit.

16. (Previously Presented) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, wherein the bus converter is configured to receive power from a power distribution system comprising a source for providing power at a DC source voltage V_S, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1;

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the bus converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

17. (Original) The apparatus of claim 16, wherein both the input circuit and the output circuit comprise full-bridge circuits, wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

18. (Original) The apparatus of claim 16, wherein the output circuit comprises a center-tap output circuit comprising two windings, wherein each winding comprises a same number of turns, and wherein N is equal to 2, such that the input voltage V_{IN} is approximately equal to the DC source voltage V_S minus 2 times the output voltage V_{OUT}.

19. (Original) The apparatus of claim 16, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

20. (Original) The apparatus of claim 16, wherein the bus converter is configured to receive an input voltage V_{IN} at the input circuit characterized by a first polarity and output an output voltage V_{OUT} from the output circuit characterized by a second polarity, wherein the first polarity is opposite the second polarity.

21. (Previously Presented) The apparatus of claim 16, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of

essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

22. (Previously Presented) An apparatus comprising:

an intermediate bus architecture power distribution system for an electrical system comprising a source for providing power at a DC source voltage;

a circuit board comprising a bus converter, the bus converter comprising an input circuit, the input circuit comprising a primary transformer winding, the bus converter further comprising an output circuit, the output circuit comprising a secondary transformer winding, wherein the primary and secondary transformer windings are galvanically connected in series, and wherein the bus converter is configured to provide power to a power distribution bus that is not galvanically isolated from the source; and

the circuit board further comprising a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter.

23. (Original) The apparatus of claim 22, wherein the bus converter is adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

24. (Original) The apparatus of claim 22, wherein the bus converter is a self-contained assembly adapted to be installed as a unit.

25. (Previously Presented) The apparatus of claim 1 wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

26. (Previously Presented) The apparatus of claim 9 wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

27. (Previously Presented) The apparatus of claim 16 wherein the input circuit comprises a primary winding and primary switches connected to the primary winding, the output circuit comprises a secondary winding and secondary switches connected to the secondary winding, and a controller for operating the switches in a series of converter operating cycles, wherein the primary and secondary windings are connected in series during at least a portion of each converter operating cycle.

28. (Previously Presented) The apparatus of claim 1 wherein the voltage across said one or more power switches is reduced to essentially zero volts prior to turning ON said one or more switches.

29. (Previously Presented) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected; and

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit or output circuit or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the converter reducing a voltage across said one or more switches prior to turn ON of said one or more switches.

30. (Previously Presented) The apparatus of claim 29 wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.

31. (Previously Presented) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input

voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns; and

wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

32. (Previously Presented) An apparatus comprising:

a power distribution system comprising a source for providing power at a DC source voltage V_S;

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and

a plurality of regulators, wherein each regulator comprises a regulator input connected to the power distribution bus to receive power from the output circuit of the bus converter and a regulator output connected to supply power to a respective load, the plurality of regulators each being separated by a distance from the bus converter;

wherein the input circuit comprises a winding having a first number of turns, wherein the output circuit comprises a winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns; and

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected.

33. (Currently Amended) An apparatus comprising:

a bus converter comprising an input circuit and an output circuit, the bus converter being adapted to convert power from the input circuit to the output circuit at a substantially fixed voltage transformation ratio, K_{DC}, at an output current, wherein an input voltage V_{IN} is applied to the input circuit and an output voltage V_{OUT} is produced by the output of the bus converter, and wherein the substantially fixed voltage transformation ratio can be represented as $K_{DC} = V_{OUT} / V_{IN}$;

~~a power distribution bus connected to distribute power from the output circuit of the bus converter at the output voltage V_{OUT}; and~~

wherein the input circuit of the bus converter and the output circuit of the bus converter are galvanically connected; and

wherein the bus converter comprises an inductive component and one or more power switches in the input circuit or output circuit or both; and

wherein a current flowing in the inductive component charges and discharges capacitances in the converter reducing a voltage across said one or more switches prior to turn ON said one or more switches.

34. (Previously Presented) The apparatus of claim 33, wherein the bus converter comprises:

a transformer, and a resonant circuit including the transformer having a characteristic resonant frequency and period, the input circuit including two or more primary switches connected to drive the resonant circuit and the output circuit being connected to receive power from the transformer; and

a switch controller adapted to operate the primary switches in a series of converter operating cycles, each converter operating cycle characterized by two power transfer intervals of essentially equal duration each interval having a duration less than the characteristics resonant period, during which one or more of the primary switches are ON and power is transferred from the input to the output via the transformer.

35. (Previously Presented) The apparatus of claim 33 wherein the voltage across said one or more switches is reduced to essentially zero volts prior to turn ON of said one or more switches.

36. (Previously Presented) The apparatus of claim 33 wherein the input circuit of the bus converter and at least a portion of the output circuit of the bus converter are connected in series across the source such that an absolute value of the input voltage V_{IN} applied to the input circuit is approximately equal to the absolute value of the DC source voltage V_S minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

37. (Previously Presented) The apparatus of claim 33, wherein the input circuit comprises a first winding having a first number of turns, wherein the output circuit comprises a second winding having a second number of turns, and wherein the voltage transformation ratio is a function of a ratio of the first number of turns to the second number of turns.

38. (Previously Presented) The apparatus of claim 37, wherein at least a portion of the input circuit of the bus converter is connected in series with at least a portion of the output circuit

of the bus converter such that an absolute value of a voltage applied to the first winding is approximately equal to the absolute value of the input voltage, V_{IN}, minus a number N times the absolute value of the output voltage V_{OUT}, where N is at least 1.

39. (Previously Presented) The apparatus of claim 22 wherein the bus converter comprises an inductive component and one or more power switches in the input circuit, the output circuit, or both, and wherein a current flowing in the inductive component charges and discharges capacitances in the bus converter reducing a voltage across said one or more switches prior to turning ON said one or more switches.

40. (Previously Presented) The apparatus of claim 22 wherein at least one of the regulators is assembled to the circuit board and configured to supply power to an integrated circuit.

REMARKS

Status of Claims

Claim 33 is amended. No new matter has been added. This amendment is made without prejudice or disclaimer.

After amending the claims as set forth above, claims 1-40 remain pending in this application. Applicant respectfully requests reconsideration of these claims.

Concluding Remarks

Applicant believes that the application is in condition for allowance. Favorable consideration is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance prosecution.

The Commissioner is hereby authorized to charge any additional fees which may be required for this application to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, applicant hereby petitions for such extensions under 37 CFR § 1.136 and authorizes payment of any such extension fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date April 3, 2018 By /Brett P. Belden/

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Electronic Acknowledgement Receipt

EFS ID:	32235451
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	03-APR-2018
Filing Date:	02-JUL-2013
Time Stamp:	16:21:10
Application Type:	Utility under 35 USC 111(a)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Supplemental Response or Supplemental Amendment	Supplemental_Amendment.pdf	131188 064d17a646539fd4af5a9882b01211a78453c61b	no	15

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/933,252	Filing Date 07/02/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	**280**
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	**280**

APPLICATION AS AMENDED – PART II

AMENDMENT	04/03/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 40	Minus	** 40	= 0	X $100 =	0
	Independent (37 CFR 1.16(h))	* 8	Minus	***8	= 0	X $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**0**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
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The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
GLORIA J. TRAMMELL

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EXAMINER
CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 05/10/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$960	$1000	08/10/2018

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THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

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PTOL-85 (Rev. 02/11)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$960	$1000	08/10/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
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2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DELTA ELECTRONICS EX. 1002
Page 671

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 05/10/2018

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 05/10/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/933,252	Applicant(s) VINCIARELLI ET AL.	
	Examiner JOSEPH CHANG	Art Unit 2842	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment of 4/3/18*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-40*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 4/2/18
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	Art Unit
	JOSEPH CHANG	2842

CPC- SEARCHED		
Symbol	Date	Examiner
M02M3/33576; H02M3/33561	5/4/16	JC

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
307	82	5/4/16	JC

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search History attached	5/4/16	JC
updated	9/2/16	JC
updated	1/19/17	JC
IDS of 5/2/17 has been considered.	5/26/17	JC
updated	9/14/17	JC
updated	1/26/18	JC
IDS of 4/2/18 has been considered and the searches have been updated.	4/19/18	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUB text search - Sep. 2, 2016 see interference search printout	9/2/16	JC
	updated	1/19/17	JC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	updated	5/26/17	JC
	updated	9/14/17	JC
	updated	1/26/18	JC
	updated	4/19/18	JC

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

CPC						
Symbol					**Type**	**Version**
H02M		3	/	33576	F	2013-01-01
H02M		3	/	33561	I	2013-01-01
			/			
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 40	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	04/19/2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
307	82	H	0	2	M	3 / 335 (2006.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											
307	31											

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 40	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	04/19/2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13933252	VINCIARELLI ET AL.
	Examiner	**Art Unit**
	JOSEPH CHANG	2842

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 40	
/JOSEPH CHANG/ Primary Examiner.Art Unit 2842 (Primary Examiner)	04/19/2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S16	0	(bus and converter and power and distribution and voltage adj transformation adj ratio and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:27
S17	2	(bus and converter and power and distribution and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:27
S18	7	(converter and power and distribution and regulator and distance).clm.	US-PGPUB	OR	ON	2016/09/02 13:28
S46	287	(power and dc and converter and input and output and ratio and series).clm.	US-PGPUB	OR	ON	2017/05/24 17:50
S48	3	(converter and power and distribution and regulator and distance and series).clm.	US-PGPUB	OR	ON	2017/09/14 15:06
S52	33	(converter and power and distribution and regulator and series).clm.	US-PGPUB	OR	ON	2018/01/26 13:37
S55	0	((transformer or transformation adj ratio) and galvanically adj3 connected and converter and power adj3 distribution).clm.	US-PGPUB	AND	ON	2018/04/18 11:55
S56	31	((transformer or transformation adj ratio) and galvanically adj3 connected).clm.	US-PGPUB	AND	ON	2018/04/18 11:56

4/ 19/ 2018 7:25:35 AM
C:\ Users\ jchang3\ Documents\ EAST\ Workspaces\ 13933252.wsp

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: April 2, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	1	of	2	Attorney Docket Number	111664-0123 (0198-US-1)

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	8,582,333	11-12-2013	INTEL CORP.	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A2	SANDERS, S., et al., "The road to fully integrated dc-dc conversion via the switched-capacitor approach," Power Electronics, IEEE Transactions on, vol. 28, pp. 4146–4155, Sept 2013.	
	A3	LE, H.P., et al., "Design techniques for fully integrated switched-capacitor dc-dc converters," Solid-State Circuits, IEEE Journal of, vol. 46, pp. 2120–2131, Sept 2011.	
	A4	SEEMAN, M., et al.,, "Analysis and optimization of switched-capacitor dc-dc converters," Power Electronics, IEEE Transactions on, vol. 23, pp. 841–851, March 2008.	
	A5	LEI, Y., et al., "A general method for analyzing resonant and soft-charging operation of switched-capacitor converters," Power Electronics, IEEE Transactions on, vol. 30, pp. 5650–5664, Oct 2015.	
	A6	SANO, K., et al., "Performance of a high-efficiency switched-capacitor-based resonant converter with phase-shift control," Power Electronics, IEEE Transactions on, vol. 26, pp. 344–354, Feb 2011.	
	A7	LEI, Y., et al., "Split-phase control: Achieving complete soft-charging operation of a dickson switched-capacitor converter," Power Electronics, IEEE Transactions on, vol. PP, no. 99, pp. 1–1, 2015.	
	A8	KESARWANI, et al., "Resonant switched-capacitor converters for chip-scale power delivery: Design amp; implementation," Power Electronics, IEEE Transactions on, vol. PP, no. 99, pp. 1–1, 2014.	
	A9	LI, Y., et al., "Lossless voltage regulation and control of the resonant switched-capacitor dc-dc converter," in Control and Modeling for Power Electronics (COMPEL), 2015 IEEE 16th Workshop on, pp. 1–7, July 2015.	
	A10	FENG, W., et al., "A hybrid strategy with simplified optimal trajectory control for LLC resonant converters," in Proc. IEEE Appl. Power Electron. Conf., Feb. 2012, pp. 1096–1103.	
	A11	CERVERA, A., et al., "A high-efficiency resonant switched capacitor converter with continuous conversion ratio," Power Electronics, IEEE Transactions on, vol. 30, pp. 1373–1382, March 2015.	
	A12	CAO et al.," A Family of Zero Current Switching Switched-Capacitor DC-DC converters," Applied Power Electronics Conference and Exposition (APEC), 2010 Twenty-Fifth Annual IEEE, Mar. 18, 2010.	
	A13	CAO et al., " Zero-Current-Switching Multilevel Modular Switched-Capacitor DC-DC Converter" IEEE Transactions on Industry Applications, 46(6):2536-2544, Sep. 2010	
	A14	Y. P. B. Yeung, K. W. E. Cheng, D. Sutanto and S. L. Ho, "Zerocurrent switching switched-capacitor quasiresonant step-down converter," *Electric Power Applications, IEE Proceedings* -, vol. 149, pp. 111-121, 2002.	

Examiner Signature		Date Considered	

4831-9899-5034.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: April 2, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	2	of	2	Attorney Docket Number	111664-0123 (0198-US-1)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A15	Y. P. B. Yeung, K. W. Cheng, S. L. Ho and D. Sutanto, "Generalised analysis of switched-capacitor step-down quasi-resonant converter," *Electronics Letters,* vol. 38, pp. 263-264, 2002.	

Examiner Signature	/JOSEPH CHANG/	Date Considered	04/18/2018

4831-9899-5034.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	0	((transformer or transformation adj ratio) and galvanically adj3 connected and converter and power adj3 distribution).clm.	US-PGPUB	AND	ON	2018/04/18 11:55
L4	31	((transformer or transformation adj ratio) and galvanically adj3 connected).clm.	US-PGPUB	AND	ON	2018/04/18 11:56

4/ 18/ 2018 12:00:34 PM
C:\ Users\ jchang3\ Documents\ EAST\ Workspaces\ 13933252.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

ISSUE FEE TRANSMITTAL

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Enclosed herewith please find Issue Fee Transmittal Form PTOL-85(B).

Fees in the amount of $1,000.00 for payment of the Issue Fee are being paid by credit card via EFS-Web.

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

While Applicant agrees that the allowed claims include a combination of subject matter that is patentable over the cited references, Applicant does not necessarily agree with or acquiesce in the reasoning of the Examiner. Moreover, Applicant notes that various other subject matter and/or combinations of subject matter may be patentable for other reasons than those given by the Examiner. Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance in connection with the present Application or any future proceeding.

DELTA ELECTRONICS EX. 1002
Page 684

REMARKS

These comments on Statement of Reasons for Allowance under 37 C.F.R. § 1.104 are intended to be responsive to the Notice of Allowance dated January 31, 2018 and the Notice of Allowance dated September 21, 2017.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Respectfully submitted,

Date June 28, 2018

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 05/10/2018
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0	$960	$1000	08/10/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 **Foley & Lardner LLP**
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: **VLT, Inc.**

(B) RESIDENCE: (CITY and STATE OR COUNTRY): **Sunnyvale, California**

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
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4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
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☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number **19-0741** (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Brett P. Belden/ Date Brett P. Belden/
Typed or printed name **Brett P. Belden** Registration No. **57,705**

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DELTA ELECTRONICS EX. 1002
Page 686

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

Electronic Acknowledgement Receipt	
EFS ID:	33042048
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	28-JUN-2018
Filing Date:	02-JUL-2013
Time Stamp:	20:04:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1000
RAM confirmation Number	062918INTEFSW20070800
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.20 (Post Issuance fees)	

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	Transmittal.pdf	98043 ccd0a759e44a5ee8fde296f94199283203b7f1ef	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	PTOL85.pdf	1625405 4339f0ab6e56efe28510947a5559c0f2ecb91eb6	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30445 f524d50121a4a9043f02cae563964aa20d10bb2a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1753893		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	7	of	54	Attorney Docket Number	111664-0123 (VA1078)

Change(s) applied to document, /J.H./ 2/2/2018

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A161	4,254,459	1981-03-03	~~JMJ Electronics Corp.~~	Belson
	A162	4,257,087	1981-03-17	~~California Institute of Technology~~	Cuk
	A163	4,257,089	1981-03-17	~~The United States of America as represented by the Secretary of the Army~~	Ravis
	A164	4,262,214	1981-04-14	~~FOXBORO CO~~	Patel
	A165	4,268,476	1981-05-19	~~BENTLEY LAB~~	Raible
	A166	4,270,164	1981-05-26	~~Contraves Goerz Corporation~~	Wyman et al.
	A167	4,270,165	1981-05-26	~~QUALIDYNE SYSTEMS INC~~	Carpenter et al.
	A168	4,272,806	1981-06-09	~~EASTMAN KODAK CO~~	Metzger
	A169	4,274,133	1981-06-16	~~California Institute of Technology~~	Cuk et al.
	A170	4,275,317	1981-06-23	FROSCH; ROBERT A. ~~ADMINISTRATOR OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WITH RESPECT TO AN INVENTION OF~~	
	A171	4,276,594	1981-06-30	~~Gould Inc. Modicon Division~~	Morley
	A172	4,277,726	1981-07-07	~~LITTON SYSTEMS INC~~	Burke
	A173	4,277,728	1981-07-07	~~STEVENS LUMINOPTICS~~	Stevens
	A174	4,288,739	1981-09-08	~~Kepco, Inc.~~	Nercessian
	A175	4,288,865	1981-09-08	~~MOSTEK CORP~~	Graham
	A176	4,292,581	1981-09-29	TAN; TAT S.	
	A177	4,293,902	1981-10-06	~~AEL Mirrotel, Ltd.~~	White
	A178	4,293,904	1981-10-06	~~The United States of America as represented by the Secretary of the Navy~~	Brooks et al.
	A179	4,297,590	1981-10-27	VAIL ANDE	
	A180	4,300,191	1981-11-10	~~POWERCUBE CORPORATION~~	Baranowski et al.
	A181	4,301,496	1981-11-17	~~ITT~~	Schwarz
	A182	4,302,803	1981-11-24	~~Sperry Corporation~~	Shelly
	A183	4,307,441	1981-12-22	~~United Technologies Corporation~~	Bello

Examiner Signature		Date Considered	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	6	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A132	4,104,539	1978-08-01	HASE A M	
Change(s) applied to document, /J.H./ 1/31/2018	A133	4,106,084	1978-08-08	~~Societe Nationale des Petroles d'Aquitaine~~	Gibert
	A134	4,109,192	1978-08-22	~~Hughes Aircraft Company~~	Burbank et al.
	A135	4,114,048	1978-09-12	~~WESTINGHOUSE ELECTRIC CORP~~	Hull et al.
	A136	4,115,704	1978-09-19	~~US NAVY~~	Hannemann et al.
	A137	4,122,359	1978-10-24	~~HONEYWELL INC~~	Breikss
	A138	4,126,793	1978-11-21	~~ZELLWEGER USTER AG~~	de Vries
	A139	4,128,868	1978-12-05	~~RCA CORPORATION~~	Gamble
	A140	4,131,860	1978-12-26	~~THOMSON-CSF~~	Fyot
	A141	4,140,959	1979-02-20	POWELL WILLIAM S	
	A142	4,150,423	1979-04-17	~~Boschert Associates~~	Boschert
	A143	4,177,389	1979-12-04	~~SIEMENS AG~~	Schott
	A144	4,184,197	1980-01-15	~~California Institute of Technology~~	Cuk et al.
	A145	4,187,458	1980-02-05	~~The United States of America as represented by the Secretary of the Army~~	Milberger et al.
	A146	4,194,147	1980-03-18	~~BURR-BROWN RES CORP~~	Payne et al.
	A147	4,205,368	1980-05-27	~~SIEMENS AG~~	Erche et al.
	A148	4,207,475	1980-06-10	~~KEPCO INC~~	Nercessian
	A149	4,208,594	1980-06-17	~~HONEYWELL INC~~	Guicheteau
	A150	4,208,706	1980-06-17	~~Sony Corporation~~	Suzuki et al.
	A151	4,209,710	1980-06-24	~~HONEYWELL INC~~	Quarton
	A152	4,210,858	1980-07-01	~~International Business Machines Corporation~~	Ford et al.
	A153	4,210,958	1980-07-01	Ikenoue, Tsuneo	
	A154	4,238,690	1980-12-09	~~BELL TELEPHONE LABOR INC~~	Clarke
	A155	4,238,691	1980-12-09	~~BELL TELEPHONE LABOR INC~~	Ebert, Jr.
	A156	4,241,261	1980-12-23	~~BELL TELEPHONE LABOR INC~~	Ebert, Jr.
	A157	4,245,194	1981-01-13	~~GTE Products Corporation~~	Fahlen et al.
	A158	4,245,286	1981-01-13	~~NASA~~	Paulkovich et al.
	A159	4,251,857	1981-02-17	~~Sperry Corporation~~	Shelly
	A160	4,253,136	1981-02-24	~~SANYO ELECTRIC CO~~	Nanko

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

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Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
(use as many sheets as necessary)				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	5	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
Change(s) applied to document, /J.H./ 1/31/2018	A105	3,932,764	1976-01-13	~~ESB INC~~	Corey
	A106	3,938,024	1976-02-10	~~Bell Telephone Laboratories, Incorporated~~	Clarke
	A107	3,940,682	1976-02-24	~~General Electric Company~~	Park et al.
	A108	3,949,238	1976-04-06	~~NORTHERN ELECTRIC CO~~	Brookes
	A109	3,959,716	1976-05-25	~~The Bendix Corporation~~	Gilbert, Jr. et al.
	A110	3,974,397	1976-08-10	~~S & C ELECTRIC CO~~	Killough, Jr.
	A111	3,976,932	1976-08-24	~~General Electric Company~~	Collins
	A112	3,986,052	1976-10-12	~~North Electric Company~~	Hunter
	A113	3,986,097	1976-10-12	~~Bell Telephone Laboratories, Incorporated~~	Woods
	A114	3,989,995	1976-11-02	~~Bell Telephone Laboratories, Incorporated~~	Peterson
	A115	3,991,319	1976-11-09	~~INSTRUMENTATION & CONTROL SYST~~	Servos et al.
	A116	4,005,335	1977-01-25	~~IOTA ENGINEERING INC~~	Perper
	A117	4,007,413	1977-02-08	~~BELL TELEPHONE LABOR INC~~	Fisher et al.
	A118	4,010,381	1977-03-01	~~BELL TELEPHONE LABOR INC~~	Fickenscher et al.
	A119	4,011,518	1977-03-08	~~The United States of America as represented by the Secretary of the Navy~~	Irvine et al.
	A120	4,017,746	1977-04-12	~~Nartron Corporation~~	Miller
	A121	4,017,783	1977-04-12	~~Telefonaktiebolaget L M Ericsson~~	Assow et al.
	A122	4,017,784	1977-04-12	~~Litton Systems, Inc.~~	Simmons et al.
	A123	4,027,228	1977-05-31	~~GEN ELECTRIC~~	Collins
	A124	4,037,271	1977-07-19	~~BOSCHERT ASSOCIATES~~	Keller
	A125	4,044,268	1977-08-23	~~GATES RUBBER CO~~	Hammel et al.
	A126	4,051,445	1977-09-27	~~Boschert Assoc.~~	Boschert
	A127	4,058,369	1977-11-15	~~BENTLEY LAB~~	Bentley et al.
	A128	4,060,757	1977-11-29	~~General Electric Co.~~	McMurray
	A129	4,066,945	1978-01-03	~~BENDIX CORP~~	Korte, Jr.
	A130	4,074,182	1978-02-14	~~GEN ELECTRIC~~	Weischedel
	A131	4,078,247	1978-03-07	~~RCA Corporation~~	Albrecht

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	4	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
Change(s) applied to document,				~~INFORMATION SYSTEMS INC.~~	
/J.H./ 1/31/2018	A83	3,818,237	1974-06-18	~~HUGHES AIRCRAFT CO~~	Straus
	A84	3,818,312	1974-06-18	~~U.S. PHILIPS CORPORATION~~	Luursema et al.
	A85	3,820,008	1974-06-25	~~HONEYWELL INFORMATION SYSTEMS ITALIA~~	Guarnaschelli
	A86	3,824,450	1974-07-16	~~RCA CORPORATION~~	Johnson et al.
	A87	3,845,404	1974-10-29	TRILLING T	
	A88	3,848,175	1974-11-12	~~GEN ELECTRIC~~	Demarest
	A89	3,851,240	1974-11-26	~~GENERAL ELECTRIC COMPANY~~	Park et al.
	A90	3,851,278	1974-11-26	~~BELL + HOWELL JAPAN, LTD.~~	Isono
	A91	3,859,638	1975-01-07	~~INTERSIL INC~~	Hume, Jr.
	A92	3,873,846	1975-03-25	~~SONY CORP~~	Morio et al.
	A93	3,879,647	1975-04-22	~~AT&T CORP.~~	Hamilton et al.
	A94	3,879,652	1975-04-22	~~WESTINGHOUSE ELECTRIC CORP.~~	Billings
	A95	3,904,950	1975-09-09	~~AT&T CORP.~~	Judd et al.
	A96	3,909,695	1975-09-30	~~HEWLETT PACKARD COMPANY~~	Peck
	A97	3,909,700	1975-09-30	~~GENERAL ELECTRIC COMPANY~~	Ferro
	A98	3,912,940	1975-10-14	~~HONEYWELL INC~~	Vince
	A99	3,913,002	1975-10-14	~~GENERAL ELECTRIC COMPANY~~	Steigerwald et al.
	A100	3,913,036	1975-10-14	~~VICTOR COMPTOMETER CORPORATION~~	Hook
	A101	3,916,289	1975-10-28	~~UNITED STATES OF AMERICA, AIR FORCE~~	Lynch
	A102	3,919,656	1975-11-11	SOKAL NATHAN O; SOKAL ALAN D	
	A103	3,927,363	1975-12-16	~~ROCKWELL INTERNATIONAL CORPORATION~~	Mitchell et al.
	A104	3,930,196	1975-12-30	~~GENERAL ELECTRIC COMPANY~~	Park et al.

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	3	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
Change(s) applied to document, /J.H./ 1/30/2018	A57	3,660,672	1972-05-02	~~PIONEER MAGNETICS INC~~	Berger et al.
	A58	3,663,941	1972-05-16	~~UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND~~	Pasciutti
	A59	3,665,203	1972-05-23	~~JERRY D HOGG~~	Barnett et al.
	A60	3,668,508	1972-06-06	~~ACME ELECTRIC CORP.~~	Archer et al.
	A61	3,684,891	1972-08-15	~~DUAL LITE CO~~	Sieron
	A62	3,696,286	1972-10-03	~~NORTH AMERICAN ROCKWELL~~	Ule
	A63	3,704,381	1972-11-28	~~FORBRO DESIGN CORP~~	Nercessian
	A64	3,710,231	1973-01-09	~~WESTINGHOUSE ELECTRIC CORP.~~	Baker
	A65	3,714,545	1973-01-30	~~COMTEURS SCHLUMBERGER MONTROAGE~~	Chiffert
	A66	3,733,538	1973-05-15	~~WESTINGHOUSE ELECTRIC CORP.~~	Kernick et al.
	A67	3,735,235	1973-05-22	~~AT&T CORP.~~	Hamilton et al.
	A68	3,737,755	1973-06-05	~~AT&T CORP.~~	Calkin et al.
	A69	3,742,242	1973-06-26	~~SONY CORP~~	Morio et al.
	A70	3,743,861	1973-07-03	~~HONEYWELL INC.~~	Bolmgren
	A71	3,751,676	1973-08-07	~~MATSUSHITA ELECTRIC IND CO LTD~~	Igarashi et al.
	A72	3,753,071	1973-08-14	~~WESTINGHOUSE ELECTRIC CORP~~	Engel et al.
	A73	3,753,076	1973-08-14	~~LIGHTING SYSTEMS INC~~	Zelina
	A74	3,754,177	1973-08-21	~~LECTRON CORPORATION~~	O'Reilly
	A75	3,757,195	1973-09-04	~~HONEYWELL INC.~~	Sklaroof
	A76	3,769,545	1973-10-30	~~KODAN INC~~	Crane
	A77	3,771,040	1973-11-06	~~NASA~~	Fletcher et al.
	A78	3,781,505	1973-12-25	~~GENERAL ELECTRIC COMPANY~~	Steigerwald
	A79	3,781,638	1973-12-25	~~GENERAL ELECTRIC COMPANY~~	Anderson et al.
	A80	3,787,730	1974-01-22	~~UNITED AIRCRAFT CORP~~	Ray et al.
	A81	3,805,094	1974-04-16	~~HONEYWELL INFORMATION SYSTEMS ITALIA~~	Orlando
	A82	3,816,810	1974-06-11	~~HONEYWELL~~	Friedman et al.

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	2	of	54	Attorney Docket Number	111664-0123 (VA1078)

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
Change(s) applied to document, /J.H./ 1/30/2018	A32	3,514,692	1970-05-26	~~HONEYWELL INC~~.	Lingle
	A33	3,517,301	1970-06-23	~~BUNKER RAMO CORPORATION~~	Huber
	A34	3,553,428	1971-01-05	~~DU PONT~~	McGhee
	A35	3,564,393	1971-02-16	~~NORTH AMERICAN ROCKWELL~~	Williamson
	A36	3,569,818	1971-03-09	~~HUGHES AIRCRAFT CO~~	Dahlinger et al.
	A37	3,573,483	1971-04-06	~~ESSEX INTERNATIONAL INC~~	White
	A38	3,573,494	1971-04-06	~~AUTOMATIC TIMING AND CONTROLS, INC~~.	Houpt et al.
	A39	3,573,508	1971-04-06	~~BELL TELEPHONE LABOR INC~~	Harris
	A40	3,573,544	1971-04-06	~~ENERGY ELECTRONICS~~	Zonis et al.
	A41	3,573,597	1971-04-06	~~GENERAL ELECTRIC COMPANY~~	Genuit et al.
	A42	3,579,026	1971-05-18	~~SYLVANIA ELECTRIC PROD~~	Paget
	A43	3,581,186	1971-05-25	~~MOTOROLA, INC~~.	Weinberger
	A44	3,582,754	1971-06-01	~~WANDEL U. GOLTERMANN ELEKTRONISCHE PRAZISIONSMESSGERATE~~	Hoffmann et al.
	A45	3,582,758	1971-06-01	~~INTERNATIONAL BUSINESS MACHINES CORPORATION~~	Gunn
	A46	3,584,289	1971-06-08	~~BELL TELEPHONE LABOR INC~~	Bishop et al.
	A47	3,588,595	1971-06-28	~~KIDDE, INC.~~	Silvers
	A48	3,599,073	1971-08-10	~~TEXAS INSTRUMENTS INC~~	Wilson et al.
	A49	3,604,920	1971-09-14	DONALD M NILES	
	A50	3,619,713	1971-11-09	~~SOLA BASIC IND INC~~	Biega et al.
	A51	3,629,648	1971-12-21	BRENT W BROWN	
	A52	3,629,725	1971-12-21	~~AT&T CORP~~.	Chun
	A53	3,638,099	1972-01-25	~~COLLINS RADIO COMPANY~~	Centala
	A54	3,643,152	1972-02-15	~~HITACHI, LTD~~	Matsumura et al.
	A55	3,646,395	1972-02-29	~~AMERICAN OPTICAL CORPORATION~~	De Pratti
	A56	3,657,631	1972-04-18	~~INTERNATIONAL STANDARD ELECTRIC CORPORATION (ITTC)~~	Martens et al.

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
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				First Named Inventor	Patrizio Vinciarelli
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
Change(s) applied to document, /J.C/ 1/30/2018	A1	443,441	1890-12-23	HANSON, M.	
	A2	1,181,803	1916-05-02	~~GEN ELECTRIC~~	Sargent
	A3	2,042,274	1936-05-26	~~STANDARD OIL DEV CO~~	Pollack
	A4	2,497,534	1950-02-14	~~GEN ELECTRIC~~	Campbell
	A5	2,852,730	1958-09-16	~~MOTOROLA INC~~	Magnuski
	A6	2,902,862	1959-09-08	TWIFORD HARRY G	
	A7	2,953,738	1960-09-20	~~WESTINGHOUSE ELECTRIC CORP~~	Bright
	A8	3,008,068	1961-11-07	~~PHILIPS CORP~~	Wilting et al.
	A9	3,008,506	1961-11-14	~~LED BALLAST INC~~	Hicks
	A10	3,029,398	1962-04-10	~~THOMPSON RAMO WOOLDRIDGE INC~~	McComb
	A11	3,083,328	1963-03-26	~~BELL TELEPHONE LABOR INC~~	Mallery et al.
	A12	3,141,140	1964-07-14	~~ACOUSTICA ASSOCIATES INC~~	Rich
	A13	3,146,406	1964-08-25	~~PHILIPS CORP~~	Wilting
	A14	3,161,837	1964-12-15	~~DAVEN COMPANY~~	Lloyd
	A15	3,174,042	1965-03-16	EFFNER WHITE RALPH	
	A16	3,229,111	1966-01-11	~~ELECTRO SEAL CORP~~	Schumacher et al.
	A17	3,241,035	1966-03-15	~~WARREN MFG COMPANY INC~~	Rhyne, Jr.
	A18	3,295,042	1966-12-27	~~ROBERTSHAW CONTROLS CO~~	Evalds et al.
	A19	3,307,073	1967-02-28	~~MOTOROLA INC~~	McLaughlin
	A20	3,313,996	1967-04-11	~~HONEYWELL INC~~	Lingle
	A21	3,343,073	1967-09-19	~~LORAIN PROD CORP~~	Mesenhimer
	A22	3,400,325	1968-09-03	~~RCA CORP~~	Webb
	A23	3,435,375	1969-03-25	~~MOTOROLA, INC~~.	Miller, Jr.
	A24	3,443,194	1969-05-06	~~IBM~~	Cielo
	A25	3,448,370	1969-06-03	~~AT&T CORP~~.	Harrigan
	A26	3,454,853	1969-07-08	~~HONEYWELL INC~~.	Hawkins et al.
	A27	3,458,798	1969-07-29	~~INTERNATIONAL BUSINESS MACHINES CORPORATION~~	Fang et al.
	A28	3,459,957	1969-08-05	~~ITE IMPERIAL CORP~~	Kelley
	A29	3,471,747	1969-10-07	~~GEN MOTORS CORP~~	Gershen
	A30	3,495,157	1970-02-10	~~FORBRO DESIGN CORP~~.	Nercessian
	A31	3,506,908	1970-04-14	~~TRW INC~~.	Resch

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Change(s) applied to document, /J.H/ 2/5/2018	A184	4,310,771	1982-01-12	~~BECKWITH ELECTRIC CO~~ INC	Wyatt et al.
	A185	4,313,060	1982-01-26	~~BELL TELEPHONE LABOR INC~~	Fickenscher et al.
	A186	4,315,207	1982-02-09	~~Advanced Micro Devices, Inc.~~	Apfel
	A187	4,316,097	1982-02-16	REYNOLDS WILLIAM R	
	A188	4,317,056	1982-02-23	~~GTE PROD CORP~~	Alberts
	A189	4,318,007	1982-03-02	~~SITS SOC IT TELECOM SIEMENS~~	Rizzi
	A190	4,318,164	1982-03-02	~~TOKYO SHIBAURA DENKI KABUSHIKI KAISHA~~	Onodera et al.
	A191	4,322,817	1982-03-30	~~Gte Automatic Electric Labs Inc.~~	Kuster
	A192	4,323,787	1982-04-06	~~CLARION CO LTD~~	Sato et al.
	A193	4,323,788	1982-04-06	~~BORG WARNER~~	Smith
	A194	4,323,962	1982-04-06	~~GEN ELECTRIC~~	Steigerwald
	A195	4,325,017	1982-04-13	~~RCA CORP~~	Schade, Jr.
	A196	4,327,298	1982-04-27	~~BORG WARNER~~	Burgin
	A197	4,328,482	1982-05-04	~~CONSUMER ELEC PROD~~	Belcher et al.
	A198	4,330,816	1982-05-18	~~Fujitsu Fanuc Limited~~	Imazeki et al.
	A199	4,334,263	1982-06-08	~~Pioneer Electronic Corporation~~	Adachi
	A200	4,336,587	1982-06-22	BOETTCHER, JR.; CHARLES W.	
	A201	4,344,122	1982-08-10	~~General Electric Company~~	Jones
	A202	4,344,124	1982-08-10	~~Motorola, Inc.~~	Panicali
	A203	4,346,342	1982-08-24	~~Rockwell International Corporation~~	Carollo
	A204	4,347,558	1982-08-31	~~Rockwell International Corporation~~	Kalinsky
	A205	4,353,113	1982-10-05	~~Electrotech Instruments Limited~~	Billings
	A206	4,355,884	1982-10-26	~~CANON KK~~	Honda et al.
	A207	4,356,541	1982-10-26	IKENOUE TSUNEO	
	A208	4,357,654	1982-11-02	IKENOUE TSUNEO	
	A209	4,368,409	1983-01-11	~~Thomson-Brandt~~	Sivanesan et al.
	A210	4,371,919	1983-02-01	~~Bell Telephone Laboratories~~,	Andrews et al.

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Change(s) applied to document, /J.H./ 2/6/2018	A211	4,381,457	1983-04-26	~~LADCO DEV CO INC~~	Wiles
	A212	4,386,394	1983-05-31	~~GEN ELECTRIC~~	Kocher et al.
	A213	4,393,316	1983-07-12	~~Reliance Electric Co.~~	Brown
	A214	4,395,639	1983-07-26	~~SAB NIFE AB~~	Bring
	A215	4,398,156	1983-08-09	AALAND; KRISTIAN	
	A216	4,399,499	1983-08-16	~~GTE AUTOMATIC ELECTRIC LAB INC~~	Butcher et al.
	A217	4,403,269	1983-09-06	~~INTERNATIONAL BUSINESS MACHINES CORPORATION~~	Carroll
	A218	4,415,960	1983-11-15	~~Sperry Corporation~~	Clark, Jr.
	A219	4,423,341	1983-12-27	~~Sperry Corporation~~	Shelly
	A220	4,427,899	1984-01-24	~~SIEMENS AG~~	Bruns
	A221	4,438,411	1984-03-20	~~Ford Aerospace & Communications Corporation~~	Rubin et al.
	A222	4,441,070	1984-04-03	~~Motorola, Inc.~~	Davies et al.
	A223	4,442,339	1984-04-10	~~Mitsubishi Denki Kabushiki Kaisha~~	Mizuno et al.
	A224	4,443,840	1984-04-17	~~LICENTIA GMBH~~	Geissler et al.
	A225	4,449,173	1984-05-15	~~Tohoku Metal Industries, Inc~~.	Nishino et al.
	A226	4,449,174	1984-05-15	~~Bell Telephone Laboratories, Incorporated~~	Ziesse
	A227	4,449,175	1984-05-15	~~Toko, Inc~~.	Ishii et al.
	A228	4,451,743	1984-05-29	~~Citizen Watch Company Limited~~	Suzuki et al.
	A229	4,451,876	1984-05-29	~~Hitachi Metals, Ltd~~.	Ogata
	A230	4,465,966	1984-08-14	~~Motorola, Inc~~.	Long et al.
	A231	4,471,289	1984-09-11	~~NCR CORPORATION~~	Duley et al.
	A232	4,473,756	1984-09-25	~~CALOYERAS INC~~	Brigden et al.
	A233	4,476,399	1984-10-09	~~FUJI ELECTRIC CO LTD~~	Yoshida et al.
	A234	4,479,175	1984-10-23	~~Honeywell Inc.~~	Gille et al.
	A235	4,484,084	1984-11-20	~~NCR CO~~	Cheffer
	A236	4,499,531	1985-02-12	~~501 Gateway Technology, Inc~~.	Bray
	A237	4,504,895	1985-03-12	~~GENERAL ELECTRIC COMPANY~~	Steigerwald

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Change(s) applied to document, /J.H./ 2/8/2018	A289	4,674,019	1987-06-16	~~Keller-Mullett Technology~~	Martinelli
	A290	4,675,796	1987-06-23	~~VEECO INSTRUMENTS, INC.~~	Gautherin et al.
	A291	4,677,311	1987-06-30	~~HITACHI LTD~~	Morita
	A292	4,677,534	1987-06-30	~~KABUSHIKI KAISHA TOSHIBA~~	Okochi
	A293	4,680,688	1987-07-14	~~YOKOGAWA HOKUSHIN ELECTRIC CORPORATION~~	Inou et al.
	A294	4,680,689	1987-07-14	PAYNE; DONALD W.	
	A295	4,683,528	1987-07-28	~~INTERSIL INC~~	Snow et al.
	A296	4,685,039	1987-08-04	~~YOKOGAWA HOKUSHIN ELECTRIC~~	Inou et al.
	A297	4,688,160	1987-08-18	~~AMERICAN TELEPHONE AND TELEGRAPH CO., AT&T BELL LABS~~	Fraidlin
	A298	4,691,273	1987-09-01	~~NIPPON TELEGRAPH & TELEPHONE CORP.~~	Kuwata et al.
	A299	4,694,384	1987-09-15	~~GEN ELECTRIC~~	Steigerwald et al.
	A300	4,694,386	1987-09-15	~~THOMSON CSF~~	de Sartre
	A301	4,695,935	1987-09-22	~~ALCATEL NV~~	Oen et al.
	A302	4,697,136	1987-09-29	~~SHIKOKU ELEC POWER~~	Ishikawa
	A303	4,698,738	1987-10-06	~~UNISYS CORP~~	Miller et al.
	A304	4,706,177	1987-11-10	JOSEPHSON ELLIOT	
	A305	4,709,316	1987-11-24	~~GENERAL ELECTRIC COMPANY~~	Ngo et al.
	A306	4,709,318	1987-11-24	~~LIEBERT CORP~~	Gephart et al.
	A307	4,716,514	1987-12-29	~~UNITRODE CORP~~	Patel
	A308	4,717,833	1988-01-05	~~BOSCHERT INC~~	Small
	A309	4,727,308	1988-02-23	~~IBM~~	Huljak et al.
	A310	4,727,469	1988-02-23	~~RELIANCE COMM/TEC CORPORATION~~	Kammiller
	A311	4,730,242	1988-03-08	~~WISCONSIN ALUMNI RESEARCH FOUNDATION~~	Divan
	A312	4,733,102	1988-03-22	~~Mitsubishi Jukogyo Kabushiki Kaisha~~	Nakayama et al.
	A313	4,734,839	1988-03-29	BARTHOLD; FRED O.	
	A314	4,734,844	1988-03-29	~~NCR Corporation~~	Rhoads
	A315	4,734,924	1988-03-29	~~Kabushiki Kaisha Toshiba~~	Yahata et al.
	A316	4,745,299	1988-05-17	~~AMERICAN TELEPHONE &~~	Eng et al.

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				~~Machines Corp.~~	
	A262	4,586,119	1986-04-29	~~ITT Corporation~~	Sutton
	A263	4,587,604	1986-05-06	~~RELIANCE ELECTRIC CO~~	Nerone
	A264	4,591,782	1986-05-27	~~General Electric Company~~	Germer
	A265	4,593,213	1986-06-03	~~United Technologies Corporation~~	Vesce et al.
	A266	4,605,999	1986-08-12	~~AT&T BELL LABORATORIES~~	Bowman et al.
	A267	4,607,195	1986-08-19	~~U.S. Philips Corporation~~	Valkestijn et al.
	A268	4,607,323	1986-08-19	SOKAL; NATHAN O.	
	A269	4,618,919	1986-10-21	~~SPERRY CORP~~	Martin, Jr.
	A270	4,621,313	1986-11-04	~~ZENITH ELECTRONICS CORP~~	Kiteley
	A271	4,622,511	1986-11-11	~~Raytheon Company~~	Moore
	A272	4,622,629	1986-11-11	~~Sundstrand Corporation~~	Glennon
	A273	4,626,982	1986-12-02	~~General Electric Company~~	Huber
	A274	4,628,426	1986-12-09	~~GENERAL ELECTRIC COMPANY~~	Steigerwald
	A275	4,635,179	1987-01-06	~~ELDEC CORP~~	Carsten
	A276	4,638,175	1987-01-20	~~UNITED TECHNOLOGIES CORP~~	Bradford et al.
	A277	4,642,475	1987-02-10	~~SIEMENS AG~~	Fischer et al.
	A278	4,642,743	1987-02-10	~~International Business Machines Corp.~~	Radcliffe
	A279	4,644,440	1987-02-17	~~WESTINGHOUSE ELECTRIC CORP~~	Kenny et al.
	A280	4,648,017	1987-03-03	~~RELIANCE ELECTRIC COMPANY~~	Nerone
	A281	4,651,020	1987-03-17	~~WESTINGHOUSE ELECTRIC CORP~~	Kenny et al.
	A282	4,652,769	1987-03-24	~~ION TECH INC~~	Smith et al.
	A283	4,659,942	1987-04-21	~~DRAPER LAB CHARLES S~~	Volp
	A284	4,663,699	1987-05-05	~~PIONEER MAGNETICS INC~~	Wilkinson
	A285	4,670,661	1987-06-02	~~TOKYO ELECTRIC CO LTD~~	Ishikawa
	A286	4,672,517	1987-06-09	~~Pioneer Magnetics, Inc.~~	Mandelcorn
	A287	4,672,518	1987-06-09	~~American Telephone and Telegraph Co., AT&T Bell Labs~~	Murdock
	A288	4,672,528	1987-06-09	~~GENERAL ELECTRIC COMPANY~~	Park et al.

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Change(s) applied to document, /J.H./ 2/8/2018	A238	4,519,024	1985-05-21	~~AT&T Bell Laboratories~~	Federico et al.
	A239	4,520,296	1985-05-28	~~Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH~~	Lepper, et al.
	A240	4,523,265	1985-06-11	~~Compagnie de Signaux et D'Entreprises Electriques~~	Deprez
	A241	4,524,411	1985-06-18	~~RCA Corporation~~	Willis
	A242	4,524,413	1985-06-18	IKENOUE TSUNEO	
	A243	4,527,228	1985-07-02	CHI YU; SIMON S.	
	A244	4,528,459	1985-07-09	~~ROCKWELL INTERNATIONAL CORP~~	Wiegel
	A245	4,533,986	1985-08-06	~~GENERAL ELECTRIC COMPANY~~	Jones
	A246	4,535,399	1985-08-13	~~National Semiconductor Corporation~~	Szepesi
	A247	4,536,700	1985-08-20	~~United Technologies Corporation~~	Bello et al.
	A248	4,538,073	1985-08-27	~~CONVERGENT TECHNOLOGIES INC~~	Freige et al.
	A249	4,538,101	1985-08-27	~~Nippon Chemi-Con Corporation~~	Shimpo et al.
	A250	4,539,487	1985-09-03	~~MITSUBISHI ELECTRIC CORP~~	Ishii
	A251	4,546,421	1985-10-08	~~United Technologies Corporation~~	Bello et al.
	A252	4,553,039	1985-11-12	STIFTER FRANCIS J	
	A253	4,556,802	1985-12-03	~~NISHIMU DENSHI KOGYO KK~~	Harada et al.
	A254	4,561,046	1985-12-24	~~GTE Automatic Electric Incorporated~~	Kuster
	A255	4,562,522	1985-12-31	~~HONEYWELL INC~~	Adams et al.
	A256	4,564,800	1986-01-14	~~Jetronic Industries, Inc.~~	Orth et al.
	A257	4,566,059	1986-01-21	~~VENUS SCIENTIFIC INC.~~	Gallios et al.
	A258	4,571,551	1986-02-18	~~WASHINGTON INNOVATIVE TECHNOLOGY, INC.~~	Trager
	A259	4,575,640	1986-03-11	~~GEN ELECTRIC~~	Martin
	A260	4,578,631	1986-03-25	SMITH; STEVE	
	A261	4,584,635	1986-04-22	~~International Business~~	MacInnis et al.

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Change(s) applied to document, /J.H./ 2/23/2018	A395	4,961,128	1990-10-02	~~ZENITH ELECTRONICS CORPORATION~~	Bloom
	A396	4,975,823	1990-12-04	~~DEUTSCHE THOMSON-BRANDT GMBH~~	Rilly et al.
	A397	4,982,149	1991-01-01	~~TOSHIBA KK~~	Shimanuki
	A398	5,001,318	1991-03-19	~~Kabushiki Kaisha Toshiba~~	Noda
	A399	5,006,782	1991-04-09	~~INTERNATIONAL RECTIFIER CORPORATION~~	Pelly
	A400	5,008,795	1991-04-16	~~Unisys Corporation~~	Parsley et al.
	A401	5,010,261	1991-04-23	~~GENERAL ELECTRIC COMPANY~~	Steigerwald
	A402	5,012,401	1991-04-30	~~Allied-Signal Inc.~~	Barlage
	A403	5,013,980	1991-05-07	~~Thomson Consumer Electronics, Inc.~~	Stephens et al.
	A404	5,016,245	1991-05-14	~~SIEMENS AG~~	Lobjinski et al.
	A405	5,017,800	1991-05-21	~~WISCONSIN ALUMNI RES FOUND~~	Divan
	A406	5,019,717	1991-05-28	~~ELEGANT DESIGN SOLUTIONS INC~~	McCurry et al.
	A407	5,019,719	1991-05-28	~~International Rectifier Corporation~~	King
	A408	5,019,954	1991-05-28	~~ALLIED SIGNAL INC~~	Bourgeault et al.
	A409	5,023,766	1991-06-11	~~BRITISH TELECOMM~~	Laidler
	A410	5,027,002	1991-06-25	~~WESTINGHOUSE ELECTRIC CORP~~	Thornton
	A411	5,027,264	1991-06-25	~~Wisconsin Alumni Research Foundation~~	DeDoncker et al.
	A412	5,029,062	1991-07-02	~~Alcatel Espace~~	Capel
	A413	5,036,452	1991-07-30	~~AT & T BELL LAB~~	Loftus
	A414	5,038,264	1991-08-06	~~GENERAL ELECTRIC COMPANY~~	Steigerwald
	A415	5,038,265	1991-08-06	~~BULL SA~~	Paladel
	A416	5,038,266	1991-08-06	~~General Electric Company~~	Callen et al.
	A417	5,041,777	1991-08-20	~~PHILIPS CORP~~	Riedger
	A418	5,043,859	1991-08-27	~~GEN ELECTRIC~~	Korman et al.
	A419	5,047,911	1991-09-10	~~Leybold Aktiengesellschaft~~	Sperzel et al.
	A420	5,055,722	~~1992-12-01~~ 10/1991	THOMAS S LATOS	
	A421	5,057,698	1991-10-15	~~EXIDE ELECTRONICS~~	Widener et al.
	A422	5,057,986	1991-10-15	~~UNISYS CORPORATION~~	Henze et al.

Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
Change(s) applied to document, /J.H./ 2/23/2018	A364	4,881,014	1989-11-14	~~TOSHIBA KK~~	Okochi
	A365	4,882,646	1989-11-21	~~Honeywell Bull Inc.~~	Genuit
	A366	4,882,664	1989-11-21	~~Rane Corporation~~	Pennington
	A367	4,882,665	1989-11-21	CHOI; KEH-KUN	
	A368	4,885,674	1989-12-05	VARGA; LJUBOMIR D.	
	A369	4,890,210	1989-12-26	~~GILBARCO, INC.~~	Myers
	A370	4,890,214	1989-12-26	~~NEC Corporation~~	Yamamoto
	A371	4,893,227	1990-01-09	~~VENUS SCIENTIFIC, INC.~~	Gallios et al.
	A372	4,893,228	1990-01-09	~~Hewlett Packard Company~~	Orrick et al.
	A373	4,896,092	1990-01-23	~~Power Distribution, Inc.~~	Flynn
	A374	4,899,271	1990-02-06	~~Seanpower~~	Seiersen
	A375	4,900,885	1990-02-13	~~Kabushiki Kaisha Toshiba~~	Inumada
	A376	4,902,508	1990-02-20	~~PURDUE RESEARCH FOUNDATION~~	Badylak et al.
	A377	4,903,183	1990-02-20	~~Hitachi, Ltd.~~	Noguchi et al.
	A378	4,903,189	1990-02-20	~~GEN ELECTRIC~~	Ngo et al.
	A379	4,908,857	1990-03-13	~~Siemens Transmission Systems, Inc.~~	Burns et al.
	A380	4,916,599	1990-04-10	~~HyperPower, Inc.~~	Traxler et al.
	A381	4,920,470	1990-04-24	~~ZIRCO, INC.~~	Clements
	A382	4,922,397	1990-05-01	~~DIGITAL EQUIPMENT CORPORATION~~	Heyman
	A383	4,922,404	1990-05-01	~~General Electric Company~~	Ludwig et al.
	A384	4,924,170	1990-05-08	~~Unisys Corporation~~	Henze
	A385	4,926,303	1990-05-15	~~Qualitron, Inc.~~	Sturgeon
	A386	4,929,605	1990-05-29	~~MERRELL DOW PHARMA~~	Domet et al.
	A387	4,931,918	1990-06-05	~~Yokogawa Electric Corporation~~	Inou et al.
	A388	4,935,857	1990-06-19	~~SUNDSTRAND CORPORATION~~	Nguyen et al.
	A389	4,937,468	1990-06-26	~~Sundstrand Corporation~~	Shekhawat et al.
	A390	4,952,849	1990-08-28	~~PHILIPS CORP~~	Fellows et al.
	A391	4,953,068	1990-08-28	~~UNISYS CORPORATION~~	Henze
	A392	4,958,268	1990-09-18	~~Matsushita Electric Industrial Co., Ltd.~~	Nagagata et al.
	A393	4,959,764	1990-09-25	~~COMPUTER PRODUCTS INC~~	Bassett
	A394	4,959,766	1990-09-25	~~CA NAT RESEARCH COUNCIL~~	Jain

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Change(s) applied to document, /J.H./ 2/23/2018				~~AND TELEGRAPH COMPANY, AT&T BELL LABORATORIES~~	
	A342	4,814,965	1989-03-21	~~SPECTRA PHYSICS~~	Petersen
	A343	4,823,249	1989-04-18	~~AMERICAN TELEPHONE AND TELEGRAPH COMPANY AT&T BELL LABORATORIES~~	Garcia, II
	A344	4,825,348	1989-04-25	~~GENERAL ELECTRIC COMPANY~~	Steigerwald et al.
	A345	4,829,216	1989-05-09	~~RCA Licensing Corporation~~	Rodriguez-Cavazos
	A346	4,841,160	1989-06-20	~~NCR CO~~	Yon et al.
	A347	4,853,832	1989-08-01	~~UNIVERSITY OF TOLEDO~~	Stuart
	A348	4,853,837	1989-08-01	GULCZYNSKI ZDZISLAW	
	A349	4,855,858	1989-08-08	~~International Business Machines Corporation~~	Boertzel et al.
	A350	4,855,888	1989-08-08	~~UNISYS CORPORATION~~	Henze et al.
	A351	4,860,184	1989-08-22	~~VIRGINIA TECH INTELL PROP~~	Tabisz et al.
	A352	4,860,185	1989-08-22	~~ELECTRONIC RESEARCH GROUP INC~~	Brewer et al.
	A353	4,860,188	1989-08-22	~~TEXAS INSTRUMENTS INC~~	Bailey et al.
	A354	4,860,189	1989-08-22	~~INTERNATIONAL BUSINESS MACHINES CORP.~~	Hitchcock
	A355	4,864,479	1989-09-05	~~General Electric Company~~	Steigerwald et al.
	A356	4,864,483	1989-09-05	~~WISCONSIN ALUMNI RESEARCH FOUNDATION~~	Divan
	A357	4,866,588	1989-09-12	~~American Telephone and Telegraph Company AT&T Bell Laboratories~~	Rene
	A358	4,866,589	1989-09-12	~~HITACHI, LTD.~~	Satoo et al.
	A359	4,868,729	1989-09-19	~~CANON KK~~	Suzuki
	A360	4,870,555	1989-09-26	~~COMPAQ COMPUTER CORP~~	White
	A361	4,873,616	1989-10-10	~~CAMERA PLATFORMS INTERNATIONAL~~	Fredrick et al.
	A362	4,873,618	1989-10-10	~~CAMERA PLATFORMS INTERNATIONAL~~	Fredrick et al.
	A363	4,877,972	1989-10-31	~~BOEING CO~~	Sobhani et al.

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Change(s) applied to document, /J.H./ 2/23/2018				~~TELEGRAPH~~	
	A317	4,745,538	1988-05-17	~~Coutant Electronics Limited~~	Cross et al.
	A318	4,747,034	1988-05-24	DICKEY; DAVID V.	
	A319	4,748,550	1988-05-31	~~KABUSHIKI KAISHA TOSHIBA~~	Okado
	A320	4,754,160	1988-06-28	~~INTERSIL INC~~	Ely
	A321	4,754,161	1988-06-28	~~WESTINGHOUSE ELECTRIC CORP~~	Fox
	A322	4,760,276	1988-07-26	~~UNISYS CORP~~	Lethellier
	A323	4,763,237	1988-08-09	WIECZOREK JOHN P	
	A324	4,768,141	1988-08-30	HUBERTUS; GUIDO	
	A325	4,772,994	1988-09-20	~~Nishimu Electronics Industries, Co., Ltd~~.	Harada et al.
	A326	4,777,382	1988-10-11	~~ALLIED SIGNAL INC~~	Reingold
	A327	4,777,575	1988-10-11	~~HITACHI LTD~~.	Yamato et al.
	A328	4,779,185	1988-10-18	~~SIEMENS AKTIENGESELLSCHAFT~~	Musil
	A329	4,782,241	1988-11-01	~~LIEBERT CORP~~	Baker et al.
	A330	4,783,728	1988-11-08	~~MODULAR POWER CORP~~	Hoffman
	A331	4,785,387	1988-11-15	~~VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.~~	Lee et al.
	A332	4,788,450	1988-11-29	~~GEN ELECTRIC~~	Wagner
	A333	4,788,634	1988-11-29	~~MASSACHUSETTS INST TECHNOLOGY~~	Schlecht et al.
	A334	4,794,506	1988-12-27	~~HITACHI MEDICAL CORPORATION~~	Hino et al.
	A335	4,796,173	1989-01-03	~~GENERAL ELECTRIC COMPANY~~	Steigerwald
	A336	4,800,479	1989-01-24	~~Prime Computer, Inc.~~	Bupp
	A337	4,805,078	1989-02-14	~~Siemens Aktiengesellschaft~~	Munz
	A338	4,809,148	1989-02-28	~~BRITISH COLUMBIA TELEPHONE~~	Barn
	A339	4,811,191	1989-03-07	~~Catalyst Semiconductor~~, ~~Inc~~.	Miller
	A340	4,812,672	1989-03-14	~~NORTHERN TELECOM LTD~~	Cowan et al.
	A341	4,814,962	1989-03-21	~~AMERICAN TELEPHONE~~	Magalhaes et al.

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Change(s) applied to documents /J.H./ 3/16/2018	A488	5,305,192	1994-04-19	~~LINEAR TECHNOLOGY CORPORATION~~	Bonte et al.
	A489	5,343,383	1994-08-30	~~NEC CORP~~	Shinada et al.
	A490	5,353,212	1994-10-04	~~AT & T BELL LAB~~	Loftus, Jr.
	A491	5,355,077	1994-10-11	~~DELL USA LP~~	Kates
	A492	5,355,293	1994-10-11	~~CARLSTEDT ELEKTRONIK AB~~	Carlstedt
	A493	5,355,294	1994-10-11	~~GEN ELECTRIC~~	De Doncker et al.
	A494	5,363,323	1994-11-08	~~International Business Machines Corporation~~	Lange
	A495	5,377,090	1994-12-27	~~MARTIN MARIETTA CORP~~	Steigerwald
	A496	5,383,858	~~1996-10-29~~ 01/1995	~~MEDRAD INC~~	Reilly et al.
	A497	5,386,359	1995-01-31	~~NEC CORP~~	Nochi
	A498	5,396,412	1995-03-07	~~ALLIED SIGNAL INC~~	Barlage
	A499	5,398,182	1995-03-14	~~NAMCO CONTROLS CORP~~	Crosby
	A500	5,400,239	1995-03-21	~~Northern Telecom Limited~~	Caine
	A501	5,410,467	1995-04-25	~~Astec International Limited~~	Smith et al.
	A502	5,412,308	1995-05-02	~~HEWLETT PACKARD CORP~~	Brown
	A503	5,412,557	1995-05-02	~~Electronic Power Conditioning, Inc.~~	Lauw
	A504	5,424,932	1995-06-13	~~Yokogawa Electric Corporation~~	Inou et al.
	A505	5,428,523	1995-06-27	~~RO ASSOCIATES~~	McDonnal
	A506	5,430,632	1995-07-04	~~POWERPAQ TECH INC~~	Meszlenyi
	A507	5,430,633	1995-07-04	~~ASTEC INT LTD~~	Smith
	A508	5,434,770	1995-07-18	~~United States Department of Energy~~	Dreifuerst et al.
	A509	5,438,499	1995-08-01	~~LINEAR TECHNOLOGY CORP.~~	Bonte et al.
	A510	5,442,534	1995-08-15	~~California Institute of Technology~~	Cuk et al.
	A511	5,448,469	1995-09-05	~~THOMSON-BRANDT GMBH~~	Rilly et al.
	A512	5,461,301	1995-10-24	~~Qualidyne Systems~~	Truong
	A513	5,477,091	1995-12-19	~~MERLIN GERIN~~	Fiorina et al.
	A514	5,481,178	1996-01-02	~~LINEAR TECHN INC~~	Wilcox et al.
	A515	5,481,449	1996-01-02	~~GEN ELECTRIC~~	Kheraluwala et al.
	A516	5,500,791	1996-03-19	~~GENERAL ELECTRIC~~	Kheraluwala et al.

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Change(s) applied to document, /J.H./ 3/16/2018	A457	5,161,241	1992-11-03	~~Matsushita Electric Industrial Co., Ltd.~~	Kanai
	A458	5,162,663	1992-11-10	~~NCR CO~~	Combs et al.
	A459	5,164,609	1992-11-17	~~DONNELLY CORP~~	Poppe et al.
	A460	5,168,435	1992-12-01	~~NEC CORP~~	Kobayashi et al.
	A461	5,173,846	1992-12-22	~~Astec International Ltd.~~	Smith
	A462	5,177,675	1993-01-05	~~SHINDENGEN ARCHER CORP~~	Archer
	A463	5,179,512	1993-01-12	~~GEN ELECTRIC~~	Fisher et al.
	A464	5,206,800	1993-04-27	~~ASTEC INTERNATIONAL, LTD.~~	Smith
	A465	5,208,740	1993-05-04	~~The Texas A & M University System~~	Ehsani
	A466	5,216,351	1993-06-01	~~Seiko Instruments Inc.~~	Shimoda
	A467	5,218,522	1993-06-08	~~Hughes Aircraft Company~~	Phelps et al.
	A468	5,221,887	1993-06-22	GULCZYNSKI; ZDZISLAW	
	A469	5,224,025	1993-06-29	~~WISCONSIN ALUMNI RES FOUND~~	Divan et al.
	A470	5,233,509	1993-08-03	~~INTERNATIONAL BUSINESS MACHINES CORPORATION~~	Ghotbi
	A471	5,235,502	1993-08-10	~~VLT Corporation~~	Vinciarelli et al.
	A472	5,237,208	1993-08-17	~~NISHIMU DENSHI KOGYO KK~~	Tominaga et al.
	A473	5,237,606	1993-08-17	~~CHARLES IND LTD~~	Ziermann
	A474	5,254,930	1993-10-19	~~DIGITAL EQUIPMENT CORP~~	Daly
	A475	5,255,174	1993-10-19	~~Allied-Signal Inc.~~	Murugan
	A476	5,264,736	1993-11-23	~~RAYTHEON COMPANY~~	Jacobson
	A477	5,267,135	1993-11-30	~~NEC CORP~~	Tezuka et al.
	A478	5,267,137	1993-11-30	~~Kohler, Schmid Partner~~	Goebel
	A479	5,268,830	1993-12-07	~~AT&T BELL LABORATORIES~~	Loftus, Jr.
	A480	5,272,612	1993-12-21	~~Kabushiki Kaisha Toshiba~~	Harada et al.
	A481	5,272,613	1993-12-21	~~PHILIPS CORP~~	Buthker
	A482	5,274,539	1993-12-28	~~GEN ELECTRIC~~	Steigerwald et al.
	A483	5,274,543	1993-12-28	~~AT & T BELL LAB~~	Loftus, Jr.
	A484	5,289,364	1994-02-22	~~HITACHI LTD~~	Sakurai
	A485	5,303,138	1994-04-12	~~AT & T BELL LAB~~	Rozman
	A486	5,304,875	1994-04-19	~~ASTEC INT LTD~~	Smith
	A487	5,305,191	1994-04-19	~~AT & T BELL LAB~~	Loftus, Jr.

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Changes) applied to document, /J.H./ 3/16/2018	A423	5,063,338	1991-11-05	~~ALCATEL ESPACE~~	Capel et al.
	A424	5,063,489	1991-11-05	~~NEC CORP~~	Inaba
	A425	5,066,900	1991-11-19	~~COMPUTER PRODUCTS INC~~	Bassett
	A426	5,073,848	1991-12-17	~~GEN ELECTRIC~~	Steigerwald et al.
	A427	5,077,486	1991-12-31	MARSON GARY	
	A428	5,079,686	1992-01-07	~~VLT Corporation~~	Vinciarelli
	A429	5,097,403	1992-03-17	~~ASTEC INT LTD~~	Smith
	A430	5,099,406	1992-03-24	~~UNIV KYUSHU~~	Harada et al.
	A431	5,101,336	1992-03-31	~~Alcatel N.V.~~	Willocx et al.
	A432	5,103,110	1992-04-07	~~KELTRONICS CORP~~	Housworth et al.
	A433	5,103,387	1992-04-07	~~NORTHERN TELECOM LTD~~	Rosenbaum et al.
	A434	5,105,351	1992-04-14	~~Kabushiki Kaisha Toshiba~~	Harada et al.
	A435	5,111,372	1992-05-05	~~TOKO INC~~	Kameyama et al.
	A436	5,111,374	1992-05-05	~~The University of Tennessee Research Corp.~~	Lai et al.
	A437	5,113,334	1992-05-12	~~Rifala Pty. Ltd.~~	Tuson et al.
	A438	5,113,337	1992-05-12	~~GEN ELECTRIC~~	Steigerwald
	A439	5,119,013	1992-06-02	~~SQUARE D COMPANY~~	Sabroff
	A440	5,119,283	1992-06-02	~~GEN ELECTRIC~~	Steigerwald et al.
	A441	5,119,284	1992-06-02	~~GEN ELECTRIC~~	Fisher et al.
	A442	5,122,726	1992-06-16	~~Alcatel Network Systems, Inc.~~	Elliott et al.
	A443	5,122,945	1992-06-16	~~Reliance Comm/Tec Corporation~~	Marawi
	A444	5,126,651	1992-06-30	~~Motorola, Inc.~~	Gauen
	A445	5,128,603	1992-07-07	~~ALCATEL NV~~	Wolfel
	A446	5,132,888	1992-07-21	~~UNISYS CORPORATION~~	Lo et al.
	A447	5,132,889	1992-07-21	~~IBM CORPORATION~~	Hitchcock et al.
	A448	5,138,184	1992-08-11	~~POWERTROL INC~~	Keefe
	A449	5,138,249	1992-08-11	~~Alcatel Espace~~	Capel
	A450	5,140,509	1992-08-18	~~Allied Signal Inc.~~	Murugan
	A451	5,140,512	1992-08-18	O'SULLIVAN; DERMOT	
	A452	5,140,514	1992-08-18	~~Kone Elevator GmbH~~	Tuusa et al.
	A453	5,144,547	1992-09-01	~~NEC CORP~~	Masamoto
	A454	5,146,394	1992-09-08	~~MATSUSHITA ELECTRIC IND CO LTD~~	Ishii et al.
	A455	5,157,269	1992-10-20	~~UNITRODE CORP~~	Jordan et al.
	A456	5,159,541	1992-10-27	~~NORTHERN TELECOM LTD~~	Jain

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				~~INC~~	
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	A571	5,880,949	1999-03-09	~~ALCATEL ALSTHOM COMPAGNIE GENERALE D'ELECTRICITE~~	Melhem et al.
	A572	5,894,412	1999-04-13	~~COMPAQ COMPUTER CORP~~	Faulk
	A573	5,901,052	1999-05-04	~~U.S. Philips Corporation~~	Strijker
	A574	5,903,452	1999-05-11	~~SYSTEM GENERAL CORPORATION~~	Yang
	A575	5,907,481	1999-05-25	~~ERICSSON TELEFON AB L M~~	Svardsjo
	A576	5,916,313	1999-06-29	~~DELL USA LP~~	Brown
	A577	5,929,692	1999-07-27	~~COMPUTER PRODUCTS INC~~	Carsten
	A578	5,946,202	1999-08-31	~~BAKER HUGHES INCORPORATED~~	Balogh
	A579	5,946,207	1999-08-31	~~PHILIPS CORP~~	Schoofs
	A580	5,949,658	1999-09-07	~~Lucent Technologies, Inc.~~	Thottuvelil et al.
	A581	5,956,242	1999-09-21	~~PHILIPS ELECTRONICS NA~~	Majid et al.
	A582	5,956,245	1999-09-21	~~LUCENT TECHNOLOGIES INC~~	Rozman
	A583	5,959,370	1999-09-28	PARDO; HERBERT	
	A584	5,991,167	1999-11-23	~~PHILIPS CORP~~	Van Lerberghe
	A585	5,999,417	1999-12-07	~~FISCHE LLC~~	Schlecht
	A586	6,002,597	1999-12-14	~~LUCENT TECHNOLOGIES INC~~	Rozman
	A587	6,005,773	1999-12-21	~~LUCENT TECHNOLOGIES INC.~~	Rozman et al.
	A588	6,011,703	2000-01-04	~~LUCENT TECHNOLOGIES INC~~	Boylan et al.
	A589	6,016,258	2000-01-18	~~Nortel Networks Corporation~~	Jain et al.
	A590	6,016,261	2000-01-18	~~PHILIPS CORP~~	De Wit et al.
	A591	6,026,005	2000-02-15	~~INT RECTIFIER CORP~~	Abdoulin
	A592	6,038,148	2000-03-14	~~ERICSSON INC~~	Farrington et al.
	A593	6,046,920	2000-04-04	~~Alcatel~~	Cazabat et al.
	A594	6,058,026	2000-05-02	~~Lucent Technologies, Inc.~~	Rozman
	A595	6,066,943	2000-05-23	~~Texas Instruments~~	Hastings et al.

Examiner Signature		Date Considered	

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PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
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	A546	5,719,754	1998-02-17	~~LUCENT TECHNOLOGIES INC~~	Fraidlin et al.
	A547	5,726,869	1998-03-10	~~FUJITSU LTD~~	Yamashita et al.
	A548	5,729,444	1998-03-17	~~AGENCE SPATIALE EUROPEENNE~~	Perol
	A549	5,734,563	1998-03-31	~~NEC CORP~~	Shinada
	A550	5,736,843	1998-04-07	~~Silicon Graphics, Inc~~.	Amin
	A551	5,742,491	1998-04-21	~~LUCENT TECHNOLOGIES INC~~	Bowman et al.
	A552	5,745,359	1998-04-28	~~COMPAQ COMPUTER CORP~~	Faulk
	A553	5,754,414	1998-05-19	HANINGTON; GARY J.	
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	A556	5,768,118	1998-06-16	~~Compaq Computer Corporation~~	Faulk et al.
	A557	5,771,160	1998-06-23	~~SAMSUNG ELECTRONICS CO LTD~~	Seong
	A558	5,774,350	1998-06-30	~~SGS THOMSON MICROELECTRONICS~~	Notaro et al.
	A559	5,781,420	1998-07-14	~~INT POWER DEVICES INC~~	Xia et al.
	A560	5,781,421	1998-07-14	~~GENERAL ELECTRIC COMPANY~~	Steigerwald et al.
	A561	5,784,266	1998-07-21	~~Virginia Power Technologies, Inc~~	Chen
	A562	5,805,432	1998-09-08	~~NEC CORP~~	Zaitsu et al.
	A563	5,818,704	1998-10-06	~~INT RECTIFIER CORP~~	Martinez
	A564	5,831,839	1998-11-03	~~PHILIPS CORP~~	Pansier
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	A569	5,872,705	1999-02-16	~~LUCENT TECHNOLOGIES~~	Loftus, Jr. et al.

Examiner Signature		Date Considered	

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				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
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	A518	5,514,921	1996-05-07	~~GEN ELECTRIC~~	Steigerwald
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	A523	5,534,768	1996-07-09	~~HARRIS CORP~~	Chavannes et al.
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	A525	5,537,021	1996-07-16	~~ALCATEL BELL SDT S.A.~~	Weinberg et al.
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	A529	5,552,695	1996-09-03	~~LINEAR TECHN INC~~	Schwartz
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	A533	5,576,940	1996-11-19	~~GEN ELECTRIC~~	Steigerwald et al.
	A534	5,590,032	1996-12-31	~~LUCENT TECHNOLOGIES INC~~	Bowman et al.
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	A536	5,621,621	1997-04-15	~~Lindmark Electric AB~~	Lilliestrale
	A537	5,625,541	1997-04-29	~~LUCENT TECHNOLOGIES INC~~	Rozman
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	A539	5,636,107	1997-06-03	~~INTERNATIONAL POWER DEVICES, INC.~~	Lu et al.
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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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Change(s) applied to document, /J.H./ 4/6/2018	A684	6,862,198 B2	2005-03-01	~~iWatt, Inc.~~	Muegge et al.
	A685	6,927,987 B2	2005-08-09	~~SynQor, Inc.~~	Farrington et al.
	A686	6,930,893 B2	2005-08-16	~~VLT, Inc.~~	Vinciarelli
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	A688	7,050,309 B2	2006-05-23	~~SynQor, Inc.~~	Farrington
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Examiner Signature		Date Considered	

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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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	A665	2010-0091526	2010-04-15	SCHLECHT MARTIN F	
	A666	2011-0176333	2011-07-21	~~SynQor, Inc.~~	Schlecht et al.
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	A670	6,208,535 B1	2001-03-27	~~Texas Instruments Incorporated~~	Parks
	A671	6,222,742 B1	2001-04-24	~~SynQor, Inc.~~	Schlecht
	A672	6,246,592 B1	2001-06-12	~~Texas Instruments Incorporated~~	Balogh et al.
	A673	6,278,621 B1	2001-08-21	~~International Power Devices, Inc.~~	Xia et al.
	A674	6,385,059 B1	2002-05-07	~~Iwatt, Inc.~~	Telefus et al.
	A675	6,477,065 B2	2002-11-05	~~Texas Instruments Incorporated~~	Parks
	A676	6,535,407 B1	2003-03-18	~~NEC Corporation~~	Zaitsu
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Examiner Signature		Date Considered	

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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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	A625	6,696,882	2004-02-24	~~Artesyn Technologies, Inc.~~	Markowski et al.
	A626	6,700,365	2004-03-02	~~Intersil Americas Inc.~~	Isham et al.
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				Examiner Name	Chang, Joseph
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13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 08/06/2018

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CHANG, JOSEPH

ART UNIT	PAPER NUMBER
2842	

NOTIFICATION DATE	DELIVERY MODE
08/06/2018	ELECTRONIC

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/933,252	02 July, 2013	VINCIARELLI ET AL.	111664-0123 (VA1078)

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3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
JOSEPH CHANG	
ART UNIT	PAPER
2842	20180720

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

On the PTO 1449 dated 6/5/2017, undated publication documents have not been considered and the missing data on Cite No. C114, 153 and 213 have been supplied with corrected ones.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

PTO-90C (Rev.04-03)

PTO/SB/08 (modified)

Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	1	of	54	Attorney Docket Number	111664-0123 (VA1078)

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A1	443,441	1890-12-23	HANSON, M.	
	A2	1,181,803	1916-05-02	GEN ELECTRIC	
	A3	2,042,274	1936-05-26	STANDARD OIL DEV CO	
	A4	2,497,534	1950-02-14	GEN ELECTRIC	
	A5	2,852,730	1958-09-16	MOTOROLA INC	
	A6	2,902,862	1959-09-08	TWIFORD HARRY G	
	A7	2,953,738	1960-09-20	WESTINGHOUSE ELECTRIC CORP	
	A8	3,008,068	1961-11-07	PHILIPS CORP	
	A9	3,008,506	1961-11-14	LED BALLAST INC	
	A10	3,029,398	1962-04-10	THOMPSON RAMO WOOLDRIDGE INC	
	A11	3,083,328	1963-03-26	BELL TELEPHONE LABOR INC	
	A12	3,141,140	1964-07-14	ACOUSTICA ASSOCIATES INC	
	A13	3,146,406	1964-08-25	PHILIPS CORP	
	A14	3,161,837	1964-12-15	DAVEN COMPANY	
	A15	3,174,042	1965-03-16	EFFNER WHITE RALPH	
	A16	3,229,111	1966-01-11	ELECTRO SEAL CORP	
	A17	3,241,035	1966-03-15	WARREN MFG COMPANY INC	
	A18	3,295,042	1966-12-27	ROBERTSHAW CONTROLS CO	
	A19	3,307,073	1967-02-28	MOTOROLA INC	
	A20	3,313,996	1967-04-11	HONEYWELL INC	
	A21	3,343,073	1967-09-19	LORAIN PROD CORP	
	A22	3,400,325	1968-09-03	RCA CORP	
	A23	3,435,375	1969-03-25	MOTOROLA, INC.	
	A24	3,443,194	1969-05-06	IBM	
	A25	3,448,370	1969-06-03	AT&T CORP.	
	A26	3,454,853	1969-07-08	HONEYWELL INC.	
	A27	3,458,798	1969-07-29	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A28	3,459,957	1969-08-05	ITE IMPERIAL CORP	
	A29	3,471,747	1969-10-07	GEN MOTORS CORP	
	A30	3,495,157	1970-02-10	FORBRO DESIGN CORP.	
	A31	3,506,908	1970-04-14	TRW INC.	

Examiner Signature		Date Considered	

4840-7798-1255.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.C/

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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A32	3,514,692	1970-05-26	HONEYWELL INC.	
	A33	3,517,301	1970-06-23	BUNKER RAMO CORPORATION	
	A34	3,553,428	1971-01-05	DU PONT	
	A35	3,564,393	1971-02-16	NORTH AMERICAN ROCKWELL	
	A36	3,569,818	1971-03-09	HUGHES AIRCRAFT CO	
	A37	3,573,483	1971-04-06	ESSEX INTERNATIONAL INC	
	A38	3,573,494	1971-04-06	AUTOMATIC TIMING AND CONTROLS, INC.	
	A39	3,573,508	1971-04-06	BELL TELEPHONE LABOR INC	
	A40	3,573,544	1971-04-06	ENERGY ELECTRONICS	
	A41	3,573,597	1971-04-06	GENERAL ELECTRIC COMPANY	
	A42	3,579,026	1971-05-18	SYLVANIA ELECTRIC PROD	
	A43	3,581,186	1971-05-25	MOTOROLA, INC.	
	A44	3,582,754	1971-06-01	WANDEL U. GOLTERMANN ELEKTRONISCHE PRAZISIONSMESSGERATE	
	A45	3,582,758	1971-06-01	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A46	3,584,289	1971-06-08	BELL TELEPHONE LABOR INC	
	A47	3,588,595	1971-06-28	KIDDE, INC.	
	A48	3,599,073	1971-08-10	TEXAS INSTRUMENTS INC	
	A49	3,604,920	1971-09-14	DONALD M NILES	
	A50	3,619,713	1971-11-09	SOLA BASIC IND INC	
	A51	3,629,648	1971-12-21	BRENT W BROWN	
	A52	3,629,725	1971-12-21	AT&T CORP.	
	A53	3,638,099	1972-01-25	COLLINS RADIO COMPANY	
	A54	3,643,152	1972-02-15	HITACHI, LTD	
	A55	3,646,395	1972-02-29	AMERICAN OPTICAL CORPORATION	
	A56	3,657,631	1972-04-18	INTERNATIONAL STANDARD ELECTRIC CORPORATION (ITTC)	

Examiner Signature		Date Considered	

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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A57	3,660,672	1972-05-02	PIONEER MAGNETICS INC	
	A58	3,663,941	1972-05-16	UNITED STATES OF AMERICA, NATIONAL AERONAUTICS AND	
	A59	3,665,203	1972-05-23	JERRY D HOGG	
	A60	3,668,508	1972-06-06	ACME ELECTRIC CORP.	
	A61	3,684,891	1972-08-15	DUAL LITE CO	
	A62	3,696,286	1972-10-03	NORTH AMERICAN ROCKWELL	
	A63	3,704,381	1972-11-28	FORBRO DESIGN CORP	
	A64	3,710,231	1973-01-09	WESTINGHOUSE ELECTRIC CORP.	
	A65	3,714,545	1973-01-30	COMTEURS SCHLUMBERGER MONTROAGE	
	A66	3,733,538	1973-05-15	WESTINGHOUSE ELECTRIC CORP.	
	A67	3,735,235	1973-05-22	AT&T CORP.	
	A68	3,737,755	1973-06-05	AT&T CORP.	
	A69	3,742,242	1973-06-26	SONY CORP	
	A70	3,743,861	1973-07-03	HONEYWELL INC.	
	A71	3,751,676	1973-08-07	MATSUSHITA ELECTRIC IND CO LTD	
	A72	3,753,071	1973-08-14	WESTINGHOUSE ELECTRIC CORP	
	A73	3,753,076	1973-08-14	LIGHTING SYSTEMS INC	
	A74	3,754,177	1973-08-21	LECTRON CORPORATION	
	A75	3,757,195	1973-09-04	HONEYWELL INC.	
	A76	3,769,545	1973-10-30	KODAN INC	
	A77	3,771,040	1973-11-06	NASA	
	A78	3,781,505	1973-12-25	GENERAL ELECTRIC COMPANY	
	A79	3,781,638	1973-12-25	GENERAL ELECTRIC COMPANY	
	A80	3,787,730	1974-01-22	UNITED AIRCRAFT CORP	
	A81	3,805,094	1974-04-16	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A82	3,816,810	1974-06-11	HONEYWELL	

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				INFORMATION SYSTEMS INC.	
	A83	3,818,237	1974-06-18	HUGHES AIRCRAFT CO	
	A84	3,818,312	1974-06-18	U.S. PHILIPS CORPORATION	
	A85	3,820,008	1974-06-25	HONEYWELL INFORMATION SYSTEMS ITALIA	
	A86	3,824,450	1974-07-16	RCA CORPORATION	
	A87	3,845,404	1974-10-29	TRILLING T	
	A88	3,848,175	1974-11-12	GEN ELECTRIC	
	A89	3,851,240	1974-11-26	GENERAL ELECTRIC COMPANY	
	A90	3,851,278	1974-11-26	BELL + HOWELL JAPAN, LTD.	
	A91	3,859,638	1975-01-07	INTERSIL INC	
	A92	3,873,846	1975-03-25	SONY CORP	
	A93	3,879,647	1975-04-22	AT&T CORP.	
	A94	3,879,652	1975-04-22	WESTINGHOUSE ELECTRIC CORP.	
	A95	3,904,950	1975-09-09	AT&T CORP.	
	A96	3,909,695	1975-09-30	HEWLETT PACKARD COMPANY	
	A97	3,909,700	1975-09-30	GENERAL ELECTRIC COMPANY	
	A98	3,912,940	1975-10-14	HONEYWELL INC	
	A99	3,913,002	1975-10-14	GENERAL ELECTRIC COMPANY	
	A100	3,913,036	1975-10-14	VICTOR COMPTOMETER CORPORATION	
	A101	3,916,289	1975-10-28	UNITED STATES OF AMERICA, AIR FORCE	
	A102	3,919,656	1975-11-11	SOKAL NATHAN O; SOKAL ALAN D	
	A103	3,927,363	1975-12-16	ROCKWELL INTERNATIONAL CORPORATION	
	A104	3,930,196	1975-12-30	GENERAL ELECTRIC COMPANY	

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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A105	3,932,764	1976-01-13	ESB INC	
	A106	3,938,024	1976-02-10	Bell Telephone Laboratories, Incorporated	
	A107	3,940,682	1976-02-24	General Electric Company	
	A108	3,949,238	1976-04-06	NORTHERN ELECTRIC CO	
	A109	3,959,716	1976-05-25	The Bendix Corporation	
	A110	3,974,397	1976-08-10	S & C ELECTRIC CO	
	A111	3,976,932	1976-08-24	General Electric Company	
	A112	3,986,052	1976-10-12	North Electric Company	
	A113	3,986,097	1976-10-12	Bell Telephone Laboratories, Incorporated	
	A114	3,989,995	1976-11-02	Bell Telephone Laboratories, Incorporated	
	A115	3,991,319	1976-11-09	INSTRUMENTATION & CONTROL SYST	
	A116	4,005,335	1977-01-25	IOTA ENGINEERING INC	
	A117	4,007,413	1977-02-08	BELL TELEPHONE LABOR INC	
	A118	4,010,381	1977-03-01	BELL TELEPHONE LABOR INC	
	A119	4,011,518	1977-03-08	The United States of America as represented by the Secretary of the Navy	
	A120	4,017,746	1977-04-12	Nartron Corporation	
	A121	4,017,783	1977-04-12	Telefonaktiebolaget L M Ericsson	
	A122	4,017,784	1977-04-12	Litton Systems, Inc.	
	A123	4,027,228	1977-05-31	GEN ELECTRIC	
	A124	4,037,271	1977-07-19	BOSCHERT ASSOCIATES	
	A125	4,044,268	1977-08-23	GATES RUBBER CO	
	A126	4,051,445	1977-09-27	Boschert Assoc.	
	A127	4,058,369	1977-11-15	BENTLEY LAB	
	A128	4,060,757	1977-11-29	General Electric Co.	
	A129	4,066,945	1978-01-03	BENDIX CORP	
	A130	4,074,182	1978-02-14	GEN ELECTRIC	
	A131	4,078,247	1978-03-07	RCA Corporation	

Examiner Signature		Date Considered	

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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A132	4,104,539	1978-08-01	HASE A M	
	A133	4,106,084	1978-08-08	Societe Nationale des Petroles d'Aquitaine	
	A134	4,109,192	1978-08-22	Hughes Aircraft Company	
	A135	4,114,048	1978-09-12	WESTINGHOUSE ELECTRIC CORP	
	A136	4,115,704	1978-09-19	US NAVY	
	A137	4,122,359	1978-10-24	HONEYWELL INC	
	A138	4,126,793	1978-11-21	ZELLWEGER USTER AG	
	A139	4,128,868	1978-12-05	RCA CORPORATION	
	A140	4,131,860	1978-12-26	THOMSON-CSF	
	A141	4,140,959	1979-02-20	POWELL WILLIAM S	
	A142	4,150,423	1979-04-17	Boschert Associates	
	A143	4,177,389	1979-12-04	SIEMENS AG	
	A144	4,184,197	1980-01-15	California Institute of Technology	
	A145	4,187,458	1980-02-05	The United States of America as represented by the Secretary of the Army	
	A146	4,194,147	1980-03-18	BURR BROWN RES CORP	
	A147	4,205,368	1980-05-27	SIEMENS AG	
	A148	4,207,475	1980-06-10	KEPCO INC	
	A149	4,208,594	1980-06-17	HONEYWELL INC	
	A150	4,208,706	1980-06-17	Sony Corporation	
	A151	4,209,710	1980-06-24	HONEYWELL INC	
	A152	4,210,858	1980-07-01	International Business Machines Corporation	
	A153	4,210,958	1980-07-01	Ikenoue, Tsuneo	
	A154	4,238,690	1980-12-09	BELL TELEPHONE LABOR INC	
	A155	4,238,691	1980-12-09	BELL TELEPHONE LABOR INC	
	A156	4,241,261	1980-12-23	BELL TELEPHONE LABOR INC	
	A157	4,245,194	1981-01-13	GTE Products Corporation	
	A158	4,245,286	1981-01-13	NASA	
	A159	4,251,857	1981-02-17	Sperry Corporation	
	A160	4,253,136	1981-02-24	SANYO ELECTRIC CO	

Examiner Signature		Date Considered	

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	A161	4,254,459	1981-03-03	JMJ Electronics Corp.	
	A162	4,257,087	1981-03-17	California Institute of Technology	
	A163	4,257,089	1981-03-17	The United States of America as represented by the Secretary of the Army	
	A164	4,262,214	1981-04-14	FOXBORO CO	
	A165	4,268,476	1981-05-19	BENTLEY LAB	
	A166	4,270,164	1981-05-26	Contraves Goerz Corporation	
	A167	4,270,165	1981-05-26	QUALIDYNE SYSTEMS INC	
	A168	4,272,806	1981-06-09	EASTMAN KODAK CO	
	A169	4,274,133	1981-06-16	California Institute of Technology	
	A170	4,275,317	1981-06-23	FROSCH; ROBERT A. ADMINISTRATOR OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WITH RESPECT TO AN INVENTION OF	
	A171	4,276,594	1981-06-30	Gould Inc. Modicon Division	
	A172	4,277,726	1981-07-07	LITTON SYSTEMS INC	
	A173	4,277,728	1981-07-07	STEVENS LUMINOPTICS	
	A174	4,288,739	1981-09-08	Kepco, Inc.	
	A175	4,288,865	1981-09-08	MOSTEK CORP	
	A176	4,292,581	1981-09-29	TAN; TAT S.	
	A177	4,293,902	1981-10-06	AEL Mirrotel, Ltd.	
	A178	4,293,904	1981-10-06	The United States of America as represented by the Secretary of the Navy	
	A179	4,297,590	1981-10-27	VAIL ANDE	
	A180	4,300,191	1981-11-10	POWERCUBE CORPORATION	
	A181	4,301,496	1981-11-17	ITT	
	A182	4,302,803	1981-11-24	Sperry Corporation	
	A183	4,307,441	1981-12-22	United Technologies Corporation	

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	A184	4,310,771	1982-01-12	BECKWITH ELECTRIC CO INC	
	A185	4,313,060	1982-01-26	BELL TELEPHONE LABOR INC	
	A186	4,315,207	1982-02-09	Advanced Micro Devices, Inc.	
	A187	4,316,097	1982-02-16	REYNOLDS WILLIAM R	
	A188	4,317,056	1982-02-23	GTE PROD CORP	
	A189	4,318,007	1982-03-02	SITS SOC IT TELECOM SIEMENS	
	A190	4,318,164	1982-03-02	TOKYO SHIBAURA DENKI KABUSHIKI KAISHA	
	A191	4,322,817	1982-03-30	Gte Automatic Electric Labs Inc.	
	A192	4,323,787	1982-04-06	CLARION CO LTD	
	A193	4,323,788	1982-04-06	BORG WARNER	
	A194	4,323,962	1982-04-06	GEN ELECTRIC	
	A195	4,325,017	1982-04-13	RCA CORP	
	A196	4,327,298	1982-04-27	BORG WARNER	
	A197	4,328,482	1982-05-04	CONSUMER ELEC PROD	
	A198	4,330,816	1982-05-18	Fujitsu Fanuc Limited	
	A199	4,334,263	1982-06-08	Pioneer Electronic Corporation	
	A200	4,336,587	1982-06-22	BOETTCHER, JR.; CHARLES W.	
	A201	4,344,122	1982-08-10	General Electric Company	
	A202	4,344,124	1982-08-10	Motorola, Inc.	
	A203	4,346,342	1982-08-24	Rockwell International Corporation	
	A204	4,347,558	1982-08-31	Rockwell International Corporation	
	A205	4,353,113	1982-10-05	Electrotech Instruments Limited	
	A206	4,355,884	1982-10-26	CANON KK	
	A207	4,356,541	1982-10-26	IKENOUE TSUNEO	
	A208	4,357,654	1982-11-02	IKENOUE TSUNEO	
	A209	4,368,409	1983-01-11	Thomson-Brandt	
	A210	4,371,919	1983-02-01	Bell Telephone Laboratories,	

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				Incorporated	
	A211	4,381,457	1983-04-26	LADCO DEV CO INC	
	A212	4,386,394	1983-05-31	GEN ELECTRIC	
	A213	4,393,316	1983-07-12	Reliance Electric Co.	
	A214	4,395,639	1983-07-26	SAB NIFE AB	
	A215	4,398,156	1983-08-09	AALAND; KRISTIAN	
	A216	4,399,499	1983-08-16	GTE AUTOMATIC ELECTRIC LAB INC	
	A217	4,403,269	1983-09-06	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A218	4,415,960	1983-11-15	Sperry Corporation	
	A219	4,423,341	1983-12-27	Sperry Corporation	
	A220	4,427,899	1984-01-24	SIEMENS AG	
	A221	4,438,411	1984-03-20	Ford Aerospace & Communications Corporation	
	A222	4,441,070	1984-04-03	Motorola, Inc.	
	A223	4,442,339	1984-04-10	Mitsubishi Denki Kabushiki Kaisha	
	A224	4,443,840	1984-04-17	LICENTIA GMBH	
	A225	4,449,173	1984-05-15	Tohoku Metal Industries, Inc.	
	A226	4,449,174	1984-05-15	Bell Telephone Laboratories, Incorporated	
	A227	4,449,175	1984-05-15	Toko, Inc.	
	A228	4,451,743	1984-05-29	Citizen Watch Company Limited	
	A229	4,451,876	1984-05-29	Hitachi Metals, Ltd.	
	A230	4,465,966	1984-08-14	Motorola, Inc.	
	A231	4,471,289	1984-09-11	NCR CORPORATION	
	A232	4,473,756	1984-09-25	CALOYERAS INC	
	A233	4,476,399	1984-10-09	FUJI ELECTRIC CO LTD	
	A234	4,479,175	1984-10-23	Honeywell Inc.	
	A235	4,484,084	1984-11-20	NCR CO	
	A236	4,499,531	1985-02-12	501 Gateway Technology, Inc.	
	A237	4,504,895	1985-03-12	GENERAL ELECTRIC COMPANY	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
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				First Named Inventor	Patrizio Vinciarelli
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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A238	4,519,024	1985-05-21	AT&T Bell Laboratories	
	A239	4,520,296	1985-05-28	Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH	
	A240	4,523,265	1985-06-11	Compagnie de Signaux et D'Entreprises Electriques	
	A241	4,524,411	1985-06-18	RCA Corporation	
	A242	4,524,413	1985-06-18	IKENOUE TSUNEO	
	A243	4,527,228	1985-07-02	CHI YU; SIMON S.	
	A244	4,528,459	1985-07-09	ROCKWELL INTERNATIONAL CORP	
	A245	4,533,986	1985-08-06	GENERAL ELECTRIC COMPANY	
	A246	4,535,399	1985-08-13	National Semiconductor Corporation	
	A247	4,536,700	1985-08-20	United Technologies Corporation	
	A248	4,538,073	1985-08-27	CONVERGENT TECHNOLOGIES INC	
	A249	4,538,101	1985-08-27	Nippon Chemi-Con Corporation	
	A250	4,539,487	1985-09-03	MITSUBISHI ELECTRIC CORP	
	A251	4,546,421	1985-10-08	United Technologies Corporation	
	A252	4,553,039	1985-11-12	STIFTER FRANCIS J	
	A253	4,556,802	1985-12-03	NISHIMU DENSHI KOGYO KK	
	A254	4,561,046	1985-12-24	GTE Automatic Electric Incorporated	
	A255	4,562,522	1985-12-31	HONEYWELL INC	
	A256	4,564,800	1986-01-14	Jetronic Industries, Inc.	
	A257	4,566,059	1986-01-21	VENUS SCIENTIFIC INC.	
	A258	4,571,551	1986-02-18	WASHINGTON INNOVATIVE TECHNOLOGY, INC.	
	A259	4,575,640	1986-03-11	GEN ELECTRIC	
	A260	4,578,631	1986-03-25	SMITH; STEVE	
	A261	4,584,635	1986-04-22	International Business	

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				Machines Corp.	
	A262	4,586,119	1986-04-29	ITT Corporation	
	A263	4,587,604	1986-05-06	RELIANCE ELECTRIC CO	
	A264	4,591,782	1986-05-27	General Electric Company	
	A265	4,593,213	1986-06-03	United Technologies Corporation	
	A266	4,605,999	1986-08-12	AT&T BELL LABORATORIES	
	A267	4,607,195	1986-08-19	U.S. Philips Corporation	
	A268	4,607,323	1986-08-19	SOKAL; NATHAN O.	
	A269	4,618,919	1986-10-21	SPERRY CORP	
	A270	4,621,313	1986-11-04	ZENITH ELECTRONICS CORP	
	A271	4,622,511	1986-11-11	Raytheon Company	
	A272	4,622,629	1986-11-11	Sundstrand Corporation	
	A273	4,626,982	1986-12-02	General Electric Company	
	A274	4,628,426	1986-12-09	GENERAL ELECTRIC COMPANY	
	A275	4,635,179	1987-01-06	ELDEC CORP	
	A276	4,638,175	1987-01-20	UNITED TECHNOLOGIES CORP	
	A277	4,642,475	1987-02-10	SIEMENS AG	
	A278	4,642,743	1987-02-10	International Business Machines Corp.	
	A279	4,644,440	1987-02-17	WESTINGHOUSE ELECTRIC CORP	
	A280	4,648,017	1987-03-03	RELIANCE ELECTRIC COMPANY	
	A281	4,651,020	1987-03-17	WESTINGHOUSE ELECTRIC CORP	
	A282	4,652,769	1987-03-24	ION TECH INC	
	A283	4,659,942	1987-04-21	DRAPER LAB CHARLES S	
	A284	4,663,699	1987-05-05	PIONEER MAGNETICS INC	
	A285	4,670,661	1987-06-02	TOKYO ELECTRIC CO LTD	
	A286	4,672,517	1987-06-09	Pioneer Magnetics, Inc.	
	A287	4,672,518	1987-06-09	American Telephone and Telegraph Co., AT&T Bell Labs	
	A288	4,672,528	1987-06-09	GENERAL ELECTRIC COMPANY	

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	A289	4,674,019	1987-06-16	Keller-Mullett Technology	
	A290	4,675,796	1987-06-23	VEECO INSTRUMENTS, INC.	
	A291	4,677,311	1987-06-30	HITACHI LTD	
	A292	4,677,534	1987-06-30	KABUSHIKI KAISHA TOSHIBA	
	A293	4,680,688	1987-07-14	YOKOGAWA HOKUSHIN ELECTRIC CORPORATION	
	A294	4,680,689	1987-07-14	PAYNE; DONALD W.	
	A295	4,683,528	1987-07-28	INTERSIL INC	
	A296	4,685,039	1987-08-04	YOKOGAWA HOKUSHIN ELECTRIC	
	A297	4,688,160	1987-08-18	AMERICAN TELEPHONE AND TELEGRAPH CO., AT&T BELL LABS	
	A298	4,691,273	1987-09-01	NIPPON TELEGRAPH & TELEPHONE CORP.	
	A299	4,694,384	1987-09-15	GEN ELECTRIC	
	A300	4,694,386	1987-09-15	THOMSON CSF	
	A301	4,695,935	1987-09-22	ALCATEL NV	
	A302	4,697,136	1987-09-29	SHIKOKU ELEC POWER	
	A303	4,698,738	1987-10-06	UNISYS CORP	
	A304	4,706,177	1987-11-10	JOSEPHSON ELLIOT	
	A305	4,709,316	1987-11-24	GENERAL ELECTRIC COMPANY	
	A306	4,709,318	1987-11-24	LIEBERT CORP	
	A307	4,716,514	1987-12-29	UNITRODE CORP	
	A308	4,717,833	1988-01-05	BOSCHERT INC	
	A309	4,727,308	1988-02-23	IBM	
	A310	4,727,469	1988-02-23	RELIANCE COMM/TEC CORPORATION	
	A311	4,730,242	1988-03-08	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A312	4,733,102	1988-03-22	Mitsubishi Jukogyo Kabushiki Kaisha	
	A313	4,734,839	1988-03-29	BARTHOLD; FRED O.	
	A314	4,734,844	1988-03-29	NCR Corporation	
	A315	4,734,924	1988-03-29	Kabushiki Kaisha Toshiba	
	A316	4,745,299	1988-05-17	AMERICAN TELEPHONE &	

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				TELEGRAPH	
	A317	4,745,538	1988-05-17	Coutant Electronics Limited	
	A318	4,747,034	1988-05-24	DICKEY; DAVID V.	
	A319	4,748,550	1988-05-31	KABUSHIKI KAISHA TOSHIBA	
	A320	4,754,160	1988-06-28	INTERSIL INC	
	A321	4,754,161	1988-06-28	WESTINGHOUSE ELECTRIC CORP	
	A322	4,760,276	1988-07-26	UNISYS CORP	
	A323	4,763,237	1988-08-09	WIECZOREK JOHN P	
	A324	4,768,141	1988-08-30	HUBERTUS; GUIDO	
	A325	4,772,994	1988-09-20	Nishimu Electronics Industries, Co., Ltd.	
	A326	4,777,382	1988-10-11	ALLIED SIGNAL INC	
	A327	4,777,575	1988-10-11	HITACHI LTD.	
	A328	4,779,185	1988-10-18	SIEMENS AKTIENGESELLSCHAFT	
	A329	4,782,241	1988-11-01	LIEBERT CORP	
	A330	4,783,728	1988-11-08	MODULAR POWER CORP	
	A331	4,785,387	1988-11-15	VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.	
	A332	4,788,450	1988-11-29	GEN ELECTRIC	
	A333	4,788,634	1988-11-29	MASSACHUSETTS INST TECHNOLOGY	
	A334	4,794,506	1988-12-27	HITACHI MEDICAL CORPORATION	
	A335	4,796,173	1989-01-03	GENERAL ELECTRIC COMPANY	
	A336	4,800,479	1989-01-24	Prime Computer, Inc.	
	A337	4,805,078	1989-02-14	Siemens Aktiengesellschaft	
	A338	4,809,148	1989-02-28	BRITISH COLUMBIA TELEPHONE	
	A339	4,811,191	1989-03-07	Catalyst Semiconductor, Inc.	
	A340	4,812,672	1989-03-14	NORTHERN TELECOM LTD	
	A341	4,814,962	1989-03-21	AMERICAN TELEPHONE	

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				AND TELEGRAPH COMPANY, AT&T BELL LABORATORIES	
	A342	4,814,965	1989-03-21	SPECTRA PHYSICS	
	A343	4,823,249	1989-04-18	AMERICAN TELEPHONE AND TELEGRAPH COMPANY AT&T BELL LABORATORIES	
	A344	4,825,348	1989-04-25	GENERAL ELECTRIC COMPANY	
	A345	4,829,216	1989-05-09	RCA Licensing Corporation	
	A346	4,841,160	1989-06-20	NCR CO	
	A347	4,853,832	1989-08-01	UNIVERSITY OF TOLEDO	
	A348	4,853,837	1989-08-01	GULCZYNSKI ZDZISLAW	
	A349	4,855,858	1989-08-08	International Business Machines Corporation	
	A350	4,855,888	1989-08-08	UNISYS CORPORATION	
	A351	4,860,184	1989-08-22	VIRGINIA TECH INTELL PROP	
	A352	4,860,185	1989-08-22	ELECTRONIC RESEARCH GROUP INC	
	A353	4,860,188	1989-08-22	TEXAS INSTRUMENTS INC	
	A354	4,860,189	1989-08-22	INTERNATIONAL BUSINESS MACHINES CORP.	
	A355	4,864,479	1989-09-05	General Electric Company	
	A356	4,864,483	1989-09-05	WISCONSIN ALUMNI RESEARCH FOUNDATION	
	A357	4,866,588	1989-09-12	American Telephone and Telegraph Company AT&T Bell Laboratories	
	A358	4,866,589	1989-09-12	HITACHI, LTD.	
	A359	4,868,729	1989-09-19	CANON KK	
	A360	4,870,555	1989-09-26	COMPAQ COMPUTER CORP	
	A361	4,873,616	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A362	4,873,618	1989-10-10	CAMERA PLATFORMS INTERNATIONAL	
	A363	4,877,972	1989-10-31	BOEING CO	

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	A364	4,881,014	1989-11-14	TOSHIBA KK	
	A365	4,882,646	1989-11-21	Honeywell Bull Inc.	
	A366	4,882,664	1989-11-21	Rane Corporation	
	A367	4,882,665	1989-11-21	CHOI; KEH-KUN	
	A368	4,885,674	1989-12-05	VARGA; LJUBOMIR D.	
	A369	4,890,210	1989-12-26	GILBARCO, INC.	
	A370	4,890,214	1989-12-26	NEC Corporation	
	A371	4,893,227	1990-01-09	VENUS SCIENTIFIC, INC.	
	A372	4,893,228	1990-01-09	Hewlett Packard Company	
	A373	4,896,092	1990-01-23	Power Distribution, Inc.	
	A374	4,899,271	1990-02-06	Scanpower	
	A375	4,900,885	1990-02-13	Kabushiki Kaisha Toshiba	
	A376	4,902,508	1990-02-20	PURDUE RESEARCH FOUNDATION	
	A377	4,903,183	1990-02-20	Hitachi, Ltd.	
	A378	4,903,189	1990-02-20	GEN ELECTRIC	
	A379	4,908,857	1990-03-13	Siemens Transmission Systems, Inc.	
	A380	4,916,599	1990-04-10	HyperPower, Inc.	
	A381	4,920,470	1990-04-24	ZIRCO, INC.	
	A382	4,922,397	1990-05-01	DIGITAL EQUIPMENT CORPORATION	
	A383	4,922,404	1990-05-01	General Electric Company	
	A384	4,924,170	1990-05-08	Unisys Corporation	
	A385	4,926,303	1990-05-15	Qualitron, Inc.	
	A386	4,929,605	1990-05-29	MERRELL DOW PHARMA	
	A387	4,931,918	1990-06-05	Yokogawa Electric Corporation	
	A388	4,935,857	1990-06-19	SUNDSTRAND CORPORATION	
	A389	4,937,468	1990-06-26	Sundstrand Corporation	
	A390	4,952,849	1990-08-28	PHILIPS CORP	
	A391	4,953,068	1990-08-28	UNISYS CORPORATION	
	A392	4,958,268	1990-09-18	Matsushita Electric Industrial Co., Ltd.	
	A393	4,959,764	1990-09-25	COMPUTER PRODUCTS INC	
	A394	4,959,766	1990-09-25	CA NAT RESEARCH COUNCIL	

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	A395	4,961,128	1990-10-02	ZENITH ELECTRONICS CORPORATION	
	A396	4,975,823	1990-12-04	DEUTSCHE THOMSON-BRANDT GMBH	
	A397	4,982,149	1991-01-01	TOSHIBA KK	
	A398	5,001,318	1991-03-19	Kabushiki Kaisha Toshiba	
	A399	5,006,782	1991-04-09	INTERNATIONAL RECTIFIER CORPORATION	
	A400	5,008,795	1991-04-16	Unisys Corporation	
	A401	5,010,261	1991-04-23	GENERAL ELECTRIC COMPANY	
	A402	5,012,401	1991-04-30	Allied-Signal Inc.	
	A403	5,013,980	1991-05-07	Thomson Consumer Electronics, Inc.	
	A404	5,016,245	1991-05-14	SIEMENS AG	
	A405	5,017,800	1991-05-21	WISCONSIN ALUMNI RES FOUND	
	A406	5,019,717	1991-05-28	ELEGANT DESIGN SOLUTIONS INC	
	A407	5,019,719	1991-05-28	International Rectifier Corporation	
	A408	5,019,954	1991-05-28	ALLIED SIGNAL INC	
	A409	5,023,766	1991-06-11	BRITISH TELECOMM	
	A410	5,027,002	1991-06-25	WESTINGHOUSE ELECTRIC CORP	
	A411	5,027,264	1991-06-25	Wisconsin Alumni Research Foundation	
	A412	5,029,062	1991-07-02	Alcatel Espace	
	A413	5,036,452	1991-07-30	AT & T BELL LAB	
	A414	5,038,264	1991-08-06	GENERAL ELECTRIC COMPANY	
	A415	5,038,265	1991-08-06	BULL SA	
	A416	5,038,266	1991-08-06	General Electric Company	
	A417	5,041,777	1991-08-20	PHILIPS CORP	
	A418	5,043,859	1991-08-27	GEN ELECTRIC	
	A419	5,047,911	1991-09-10	Leybold Aktiengesellschaft	
	A420	5,055,722	1992-12-01	THOMAS S LATOS	
	A421	5,057,698	1991-10-15	EXIDE ELECTRONICS	
	A422	5,057,986	1991-10-15	UNISYS CORPORATION	

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	A423	5,063,338	1991-11-05	ALCATEL ESPACE	
	A424	5,063,489	1991-11-05	NEC CORP	
	A425	5,066,900	1991-11-19	COMPUTER PRODUCTS INC	
	A426	5,073,848	1991-12-17	GEN ELECTRIC	
	A427	5,077,486	1991-12-31	MARSON GARY	
	A428	5,079,686	1992-01-07	VLT Corporation	
	A429	5,097,403	1992-03-17	ASTEC INT LTD	
	A430	5,099,406	1992-03-24	UNIV KYUSHU	
	A431	5,101,336	1992-03-31	Alcatel N.V.	
	A432	5,103,110	1992-04-07	KELTRONICS CORP	
	A433	5,103,387	1992-04-07	NORTHERN TELECOM LTD	
	A434	5,105,351	1992-04-14	Kabushiki Kaisha Toshiba	
	A435	5,111,372	1992-05-05	TOKO INC	
	A436	5,111,374	1992-05-05	The University of Tennessee Research Corp.	
	A437	5,113,334	1992-05-12	Rifala Pty. Ltd.	
	A438	5,113,337	1992-05-12	GEN ELECTRIC	
	A439	5,119,013	1992-06-02	SQUARE D COMPANY	
	A440	5,119,283	1992-06-02	GEN ELECTRIC	
	A441	5,119,284	1992-06-02	GEN ELECTRIC	
	A442	5,122,726	1992-06-16	Alcatel Network Systems, Inc.	
	A443	5,122,945	1992-06-16	Reliance Comm/Tec Corporation	
	A444	5,126,651	1992-06-30	Motorola, Inc.	
	A445	5,128,603	1992-07-07	ALCATEL NV	
	A446	5,132,888	1992-07-21	UNISYS CORPORATION	
	A447	5,132,889	1992-07-21	IBM CORPORATION	
	A448	5,138,184	1992-08-11	POWERTROL INC	
	A449	5,138,249	1992-08-11	Alcatel Espace	
	A450	5,140,509	1992-08-18	Allied-Signal Inc.	
	A451	5,140,512	1992-08-18	O'SULLIVAN; DERMOT	
	A452	5,140,514	1992-08-18	Kone Elevator GmbH	
	A453	5,144,547	1992-09-01	NEC CORP	
	A454	5,146,394	1992-09-08	MATSUSHITA ELECTRIC IND CO LTD	
	A455	5,157,269	1992-10-20	UNITRODE CORP	
	A456	5,159,541	1992-10-27	NORTHERN TELECOM LTD	

Examiner Signature		Date Considered	

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Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A457	5,161,241	1992-11-03	Matsushita Electric Industrial Co., Ltd.	
	A458	5,162,663	1992-11-10	NCR CO	
	A459	5,164,609	1992-11-17	DONNELLY CORP	
	A460	5,168,435	1992-12-01	NEC CORP	
	A461	5,173,846	1992-12-22	Astec International Ltd.	
	A462	5,177,675	1993-01-05	SHINDENGEN ARCHER CORP	
	A463	5,179,512	1993-01-12	GEN ELECTRIC	
	A464	5,206,800	1993-04-27	ASTEC INTERNATIONAL, LTD.	
	A465	5,208,740	1993-05-04	The Texas A & M University System	
	A466	5,216,351	1993-06-01	Seiko Instruments Inc.	
	A467	5,218,522	1993-06-08	Hughes Aircraft Company	
	A468	5,221,887	1993-06-22	GULCZYNSKI; ZDZISLAW	
	A469	5,224,025	1993-06-29	WISCONSIN ALUMNI RES FOUND	
	A470	5,233,509	1993-08-03	INTERNATIONAL BUSINESS MACHINES CORPORATION	
	A471	5,235,502	1993-08-10	VLT Corporation	
	A472	5,237,208	1993-08-17	NISHIMU DENSHI KOGYO KK	
	A473	5,237,606	1993-08-17	CHARLES IND LTD	
	A474	5,254,930	1993-10-19	DIGITAL EQUIPMENT CORP	
	A475	5,255,174	1993-10-19	Allied-Signal Inc.	
	A476	5,264,736	1993-11-23	RAYTHEON COMPANY	
	A477	5,267,135	1993-11-30	NEC CORP	
	A478	5,267,137	1993-11-30	Kohler, Schmid Partner	
	A479	5,268,830	1993-12-07	AT&T BELL LABORATORIES	
	A480	5,272,612	1993-12-21	Kabushiki Kaisha Toshiba	
	A481	5,272,613	1993-12-21	PHILIPS CORP	
	A482	5,274,539	1993-12-28	GEN ELECTRIC	
	A483	5,274,543	1993-12-28	AT & T BELL LAB	
	A484	5,289,364	1994-02-22	HITACHI LTD	
	A485	5,303,138	1994-04-12	AT & T BELL LAB	
	A486	5,304,875	1994-04-19	ASTEC INT LTD	
	A487	5,305,191	1994-04-19	AT & T BELL LAB	

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Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A488	5,305,192	1994-04-19	LINEAR TECHNOLOGY CORPORATION	
	A489	5,343,383	1994-08-30	NEC CORP	
	A490	5,353,212	1994-10-04	AT & T BELL LAB	
	A491	5,355,077	1994-10-11	DELL USA LP	
	A492	5,355,293	1994-10-11	CARLSTEDT ELEKTRONIK AB	
	A493	5,355,294	1994-10-11	GEN ELECTRIC	
	A494	5,363,323	1994-11-08	International Business Machines Corporation	
	A495	5,377,090	1994-12-27	MARTIN MARIETTA CORP	
	A496	5,383,858	1996-10-29	MEDRAD INC	
	A497	5,386,359	1995-01-31	NEC CORP	
	A498	5,396,412	1995-03-07	ALLIED SIGNAL INC	
	A499	5,398,182	1995-03-14	NAMCO CONTROLS CORP	
	A500	5,400,239	1995-03-21	Northern Telecom Limited	
	A501	5,410,467	1995-04-25	Astec International Limited	
	A502	5,412,308	1995-05-02	HEWLETT PACKARD CORP	
	A503	5,412,557	1995-05-02	Electronic Power Conditioning, Inc.	
	A504	5,424,932	1995-06-13	Yokogawa Electric Corporation	
	A505	5,428,523	1995-06-27	RO ASSOCIATES	
	A506	5,430,632	1995-07-04	POWERPAQ TECH INC	
	A507	5,430,633	1995-07-04	ASTEC INT LTD	
	A508	5,434,770	1995-07-18	United States Department of Energy	
	A509	5,438,499	1995-08-01	LINEAR TECHNOLOGY CORP.	
	A510	5,442,534	1995-08-15	California Institute of Technology	
	A511	5,448,469	1995-09-05	THOMSON BRANDT GMBH	
	A512	5,461,301	1995-10-24	Qualidyne Systems	
	A513	5,477,091	1995-12-19	MERLIN GERIN	
	A514	5,481,178	1996-01-02	LINEAR TECHN INC	
	A515	5,481,449	1996-01-02	GEN ELECTRIC	
	A516	5,500,791	1996-03-19	GENERAL ELECTRIC	

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				First Named Inventor	Patrizio Vinciarelli
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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				COMPANY	
	A517	5,513,092	1996-04-30	Bruker Analytische Messtechnik GmbH	
	A518	5,514,921	1996-05-07	GEN ELECTRIC	
	A519	5,519,599	1996-05-21	NEC CORP	
	A520	5,528,480	1996-06-18	Elonex Technologies, Inc.	
	A521	5,528,482	1996-06-18	AT & T CORP	
	A522	5,530,635	1996-06-25	Nemic-Lambda Kabushiki Kaisha	
	A523	5,534,768	1996-07-09	HARRIS CORP	
	A524	5,535,112	1996-07-09	ALCATEL NV	
	A525	5,537,021	1996-07-16	ALCATEL BELL-SDT S.A.	
	A526	5,539,630	1996-07-23	California Institute of Technology	
	A527	5,539,631	1996-07-23	Ion Systems Incorporated	
	A528	5,541,827	1996-07-30	DOBLE ENG	
	A529	5,552,695	1996-09-03	LINEAR TECHN INC	
	A530	5,559,423	1996-09-24	Norhtern Telecom Limited	
	A531	5,559,682	1996-09-24	HITACHI LTD	
	A532	5,570,276	1996-10-29	OPTIMUN POWER CONVERSION INC	
	A533	5,576,940	1996-11-19	GEN ELECTRIC	
	A534	5,590,032	1996-12-31	LUCENT TECHNOLOGIES INC	
	A535	5,594,629	1997-01-14	General Electric Company	
	A536	5,621,621	1997-04-15	Lindmark Electric AB	
	A537	5,625,541	1997-04-29	LUCENT TECHNOLOGIES INC	
	A538	5,635,826	1997-06-03	Chiyoda Corporation	
	A539	5,636,107	1997-06-03	INTERNATIONAL POWER DEVICES, INC.	
	A540	5,636,116	1997-06-03	MELCHER AG	
	A541	5,663,876	1997-09-02	Lucent Technologies Inc.	
	A542	5,663,877	1997-09-02	MELCHER AG	
	A543	5,663,887	1997-09-02	PROGRESSIVE INTERNATIONAL ELECTRONICS	
	A544	5,691,870	1997-11-25	COMPAQ COMPUTER CORP	

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				First Named Inventor	Patrizio Vinciarelli
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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
	A545	5,708,571	1998-01-13	NEC CORP	
	A546	5,719,754	1998-02-17	LUCENT TECHNOLOGIES INC	
	A547	5,726,869	1998-03-10	FUJITSU LTD	
	A548	5,729,444	1998-03-17	AGENCE SPATIALE EUROPEENNE	
	A549	5,734,563	1998-03-31	NEC CORP	
	A550	5,736,843	1998-04-07	Silicon Graphics, Inc.	
	A551	5,742,491	1998-04-21	LUCENT TECHNOLOGIES INC	
	A552	5,745,359	1998-04-28	COMPAQ COMPUTER CORP	
	A553	5,754,414	1998-05-19	HANINGTON; GARY J.	
	A554	5,757,625	1998-05-26	PHILIPS CORP	
	A555	5,757,627	1998-05-26	Compaq Computer Corporation	
	A556	5,768,118	1998-06-16	Compaq Computer Corporation	
	A557	5,771,160	1998-06-23	SAMSUNG ELECTRONICS CO LTD	
	A558	5,774,350	1998-06-30	SGS THOMSON MICROELECTRONICS	
	A559	5,781,420	1998-07-14	INT POWER DEVICES INC	
	A560	5,781,421	1998-07-14	GENERAL ELECTRIC COMPANY	
	A561	5,784,266	1998-07-21	Virginia Power Technologies, Inc	
	A562	5,805,432	1998-09-08	NEC CORP	
	A563	5,818,704	1998-10-06	INT RECTIFIER CORP	
	A564	5,831,839	1998-11-03	PHILIPS CORP	
	A565	5,841,641	1998-11-24	COMPAQ COMPUTER CORPORATION	
	A566	5,841,643	1998-11-24	LINEAR TECHNOLOGY CORPORATION	
	A567	5,862,042	1999-01-19	LUCENT TECHNOLOGIES INC	
	A568	5,870,299	1999-02-09	LUCENT TECHNOLOGIES INC	
	A569	5,872,705	1999-02-16	LUCENT TECHNOLOGIES	

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Examiner Initials*	Cite No [1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				INC	
	A570	5,880,939	1999-03-09	SINFOR	
	A571	5,880,949	1999-03-09	ALCATEL ALSTHOM COMPAGNIE GENERALE D'ELECTRICITE	
	A572	5,894,412	1999-04-13	COMPAQ COMPUTER CORP	
	A573	5,901,052	1999-05-04	U.S. Philips Corporation	
	A574	5,903,452	1999-05-11	SYSTEM GENERAL CORPORATION	
	A575	5,907,481	1999-05-25	ERICSSON TELEFON AB L M	
	A576	5,916,313	1999-06-29	DELL USA LP	
	A577	5,929,692	1999-07-27	COMPUTER PRODUCTS INC	
	A578	5,946,202	1999-08-31	BAKER HUGHES INCORPORATED	
	A579	5,946,207	1999-08-31	PHILIPS CORP	
	A580	5,949,658	1999-09-07	Lucent Technologies, Inc.	
	A581	5,956,242	1999-09-21	PHILIPS ELECTRONICS NA	
	A582	5,956,245	1999-09-21	LUCENT TECHNOLOGIES INC	
	A583	5,959,370	1999-09-28	PARDO; HERBERT	
	A584	5,991,167	1999-11-23	PHILIPS CORP	
	A585	5,999,417	1999-12-07	FISCHE LLC	
	A586	6,002,597	1999-12-14	LUCENT TECHNOLOGIES INC	
	A587	6,005,773	1999-12-21	LUCENT TECHNOLOGIES INC.	
	A588	6,011,703	2000-01-04	LUCENT TECHNOLOGIES INC	
	A589	6,016,258	2000-01-18	Nortel Networks Corporation	
	A590	6,016,261	2000-01-18	PHILIPS CORP	
	A591	6,026,005	2000-02-15	INT RECTIFIER CORP	
	A592	6,038,148	2000-03-14	ERICSSON INC	
	A593	6,046,920	2000-04-04	Alcatel	
	A594	6,058,026	2000-05-02	Lucent Technologies, Inc.	
	A595	6,066,943	2000-05-23	Texas Instruments	

Examiner Signature		Date Considered	

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U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant
				Incorporated	
	A596	6,069,799	2000-05-30	LUCENT TECHNOLOGIES INC	
	A597	6,069,804	2000-05-30	CONDOR D C POWER SUPPLIES INC	
	A598	6,084,792	2000-07-04	VPT INC	
	A599	6,087,817	2000-07-11	LINEAR TECHN INC	
	A600	6,088,329	2000-07-11	TELEFONAKTIEBOLAGET LM ERICSSON	
	A601	6,091,616	2000-07-18	LUCENT TECHNOLOGIES INC	
	A602	6,137,697	2000-10-24	CIT ALCATEL	
	A603	6,137,698	2000-10-24	SHINDENGEN ELECTRIC MFG	
	A604	6,141,224	2000-10-31	INTERNAT POWER DEVICES INC	
	A605	6,169,675	2001-01-02	Fujitsu Limited	
	A606	6,191,964	2001-02-20	Lucent Technologies Inc.	
	A607	6,208,535	2001-03-27	Texas Instruments Incorporated	
	A608	6,211,657	2001-04-03	Communications & Power Industries, Inc.	
	A609	6,222,742	2001-04-24	SynQor, Inc.	
	A610	6,246,592	2001-06-12	Texas Instruments Incorporated	
	A611	6,252,781	2001-06-26	Artesyn Technologies, Inc.	
	A612	6,278,621	2001-08-21	International Power Devices, Inc.	
	A613	6,385,059	2002-05-07	Iwatt, Inc.	
	A614	6,417,653	2002-07-09	Intel Corporation	
	A615	6,421,262	2002-07-16	VLT Corporation	
	A616	6,430,071	2002-08-06	NTT Data Corporation	
	A617	6,477,065	2002-11-05	Texas Instruments Incorporated	
	A618	6,487,093	2002-11-26	Intel Corporation	
	A619	6,504,267	2003-01-07	Koninklijke Philips Electronics N.V.	
	A620	6,535,407	2003-03-18	NEC Corporation	
	A621	6,552,917	2003-04-22	Koninklijke Philips	

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				Electronics N.V.	
	A622	6,580,258	2003-06-17	Linear Technology Corporation	
	A623	6,594,159	2003-07-15	SynQor, Inc.	
	A624	6,608,768	2003-08-19	Salcomp Oy	
	A625	6,696,882	2004-02-24	Artesyn Technologies, Inc.	
	A626	6,700,365	2004-03-02	Intersil Americas Inc.	
	A627	6,721,192	2004-04-13	System General Corp.	
	A628	6,728,118	2004-04-27	Innoveta Technologies, Inc.	
	A629	6,731,520	2004-05-04	SynQor, Inc.	
	A630	6,735,094	2004-05-11	General Electric Company	
	A631	6,804,125	2004-10-12	di/dt Inc.	
	A632	6,836,415	2004-12-28	Systems General Corp.	
	A633	6,845,019	2005-01-18	Fairchild Korea Semiconductor Ltd.	
	A634	6,853,563	2005-02-08	System General Corp.	
	A635	6,853,568	2005-02-08	Delta Electronics, Inc.	
	A636	6,862,194	2005-03-01	System General Corp.	
	A637	6,862,198	2005-03-01	iWatt, Inc.	
	A638	6,927,987	2005-08-09	SynQor, Inc.	
	A639	6,930,893	2005-08-16	VLT, Inc.	
	A640	6,970,366	2005-11-29	Power-One AS	
	A641	6,987,679	2006-01-17	Delta Electronics, Inc.	
	A642	7,019,997	2006-03-28	Matsushita Electric Industrial Co., Ltd.	
	A643	7,031,128	2006-04-18	Samsung Electronics Co., Ltd.	
	A644	7,035,120	2006-04-25	Shindengen Electric Manufacturing Co., Ltd.	
	A645	7,050,309	2006-05-23	SynQor, Inc.	
	A646	7,055,309	2006-06-06	Robert Bosch GmbH	
	A647	7,072,190	2006-07-04	SynQor, Inc.	
	A648	7,187,562	2007-03-06	International Rectifier Corporation	
	A649	7,269,034	2007-09-11	SynQor, Inc.	
	A650	7,272,023	2007-09-18	SynQor, Inc.	
	A651	7,501,715	2009-03-10	Delta Electronics, Inc.	
	A652	7,558,083	2009-07-07	SynQor, Inc.	

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	A653	7,564,702	2009-07-21	SynQor, Inc.	
	A654	7,727,021	2010-06-01	OMRON Corporation	
	A655	7,768,801	2010-08-03	Sanken Electric Co., Ltd.	
	A656	8,023,290	2011-09-20	SynQor, Inc.	
	A657	8,493,751	2013-07-23	Synqor, Inc.	
	A658	2003/0174522	2003-09-18	XU MING	
	A659	2005/0047177	2005-03-03	TOBITA ATSUHIRO	
	A660	2006/0209572	2006-09-21	SCHLECHT MARTIN F	
	A661	2006/0262575	2006-11-23	SCHLECHT MARTIN F	
	A662	2006/0285368	2006-12-21	SCHLECHT MARTIN F	
	A663	2008/0175024	2008-07-24	SCHLECHT MARTIN F	
	A664	2009-0051221	2009-02-26	INNOCOM TECHNOLOGY (SHENZHEN) CO., LTD.; INNOLUX DISPLAY CORP.	
	A665	2010-0091526	2010-04-15	SCHLECHT MARTIN F	
	A666	2011-0176333	2011-07-21	SynQor, Inc.	
	A667	2014-0085939	2014-03-27	SynQor, Inc.	
	A668	6,169,675 B1	2001-01-02	Fujitsu Limited	
	A669	6,191,964 B1	2001-02-20	Lucent Technologies Inc.	
	A670	6,208,535 B1	2001-03-27	Texas Instruments Incorporated	
	A671	6,222,742 B1	2001-04-24	SynQor, Inc.	
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Substitute for form 1449/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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				Examiner Name	Chang, Joseph
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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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NON PATENT LITERATURE DOCUMENTS			
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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
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NON PATENT LITERATURE DOCUMENTS			
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				Examiner Name	Chang, Joseph
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
Date Submitted: May 2, 2017				**Filing Date**	7/2/2013
				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	51	of	54	Attorney Docket Number	111664-0123 (VA1078)

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				First Named Inventor	Patrizio Vinciarelli
(use as many sheets as necessary)				Art Unit	2842
				Examiner Name	Chang, Joseph
Sheet	52	of	54	Attorney Docket Number	111664-0123 (VA1078)

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				Examiner Name	Chang, Joseph
Sheet	26	of	54	Attorney Docket Number	111664-0123 (VA1078)

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	A1	8,582,333	11-12-2013	~~INTEL CORP~~. Oraw et al.	

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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112754 7590 08/29/2018

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ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 858 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

VLT, INC., Sunnyvale, CA
Patrizio VINCIARELLI, Boston, MA;
Andrew D'Amico, Marina Del Rey, CA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Appl. Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114 of the above-identified application. This RCE and the enclosed items listed below are being filed prior to the earliest of: (1) payment of the issue fee (unless a petition under 37 C.F.R. § 1.313 is granted); (2) abandonment of the application; or (3) the filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. §141, or the commencement of a civil action under 35 U.S.C. §145 or §146 (unless the appeal or civil action is terminated).

1. Submission **required** under 37 C.F.R. §1.114: (check items that apply)

a. Enclosed are:

[**X**] Information Disclosure Statement.

[**X**] Form PTO/SB/08.

The RCE fee of$1,900.00 is being paid by credit card via EFS-Web.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Please direct all correspondence to the undersigned attorney or agent at the address indicated below.

Respectfully submitted,

Date September 12, 2018

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Application No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation No.:	5889

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR §1.56

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Applicant submits herewith documents for the Examiner's consideration in accordance with 37 CFR §§1.56, 1.97 and 1.98.

Applicant respectfully requests that each listed document be considered by the Examiner and be made of record in the present application and that an initialed copy of Form PTO/SB/08 be returned in accordance with MPEP §609.

The submission of any document herewith is not an admission that such document constitutes prior art against the claims of the present application or that such document is considered material to patentability as defined in 37 CFR §1.56(b). Applicant does not waive any rights to take any action which would be appropriate to antedate or otherwise remove as a competent reference any document submitted herewith.

TIMING OF THE DISCLOSURE

The listed documents are being submitted in compliance with 37 CFR §1.97(b), before the mailing of a first Office action after the filing of a RCE.

Although Applicant believes that no fee is required, the Commissioner is hereby authorized to charge any additional fees which may be due to Deposit Account No. 19-0741.

Respectfully submitted,

Date September 12, 2018

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: September 11, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	1	of	1	Attorney Docket Number	111664-0123 (0198-US-1)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
	A1	Kester, W., et al., "Section 3, Switching Regulators," pp. 3.1-3.71, (2015)	

Examiner Signature		Date Considered	

Doc Code: PET.AUTO Document Description: Petition automatically granted by EFS-Web	PTO/SB/140 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**PETITION TO WITHDRAW AN APPLICATION FROM ISSUE AFTER PAYMENT OF THE ISSUE FEE UNDER 37 CFR 1.313(c)**
Application Number	13933252
Filing Date	02-Jul-2013
First Named Inventor	Patrizio VINCIARELLI
Art Unit	2842
Examiner Name	JOSEPH CHANG
Attorney Docket Number	111664-0123 (VA1078)
Title	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

An application may be withdrawn from issue for further action upon petition by the applicant. To request that the Office withdraw an application from issue, applicant must file a petition under this section including the fee set forth in § 1.17(h) and a showing of good and sufficient reasons why withdrawal of the application from issue is necessary.

APPLICANT HEREBY PETITIONS TO WITHDRAW THIS APPLICATION FROM ISSUE UNDER 37 CFR 1.313(c).

A grantable petition requires the following items:
(1) Petition fee; and
(2) One of the following reasons:
(a) Unpatentability of one or more claims, which must be accompanied by an unequivocal statement that one or more claims are unpatentable, an amendment to such claim or claims, and an explanation as to how the amendment causes such claim or claims to be patentable;
(b) Consideration of a request for continued examination in compliance with § 1.114 (for a utility or plant application only); or
(c) Express abandonment of the application. Such express abandonment may be in favor of a continuing application, but not a CPA under 37 CFR 1.53(d).

Petition Fee

- ○ Small Entity
- ○ Micro Entity
- ◉ Regular Undiscounted

Reason for withdrawal from issue

◯ One or more claims are unpatentable ◉ Consideration of a request for continued examination (RCE) (List of Required Documents and Fees) ◯ Applicant hereby expressly abandons the instant application (any attorney/agent signing for this reason must have power of attorney pursuant to 37 CFR 1.32(b)).
RCE request,submission, and fee. ☐ I certify, in accordance with 37 CFR 1.4(d)(4) that : The RCE request ,submission, and fee have already been filed in the above-identified application on ☒ Are attached.
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application. ◯ An attorney or agent registered to practice before the Patent and Trademark Office, acting in a representative capacity. ◯ A sole inventor ◯ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ◯ A joint inventor; all of whom are signing this e-petition

Signature	/Brett P. Belden/
Name	Brett P. Belden
Registration Number	57705

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2040**

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : September 12, 2018

In re Application of :

Patrizio VINCIARELLI

DECISION ON PETITION
UNDER CFR 1.313(c)(2)

Application No : 13933252

Filed : 02-Jul-2013

Attorney Docket No : 111664-0123 (VA1078)

This is an electronic decision on the petition under 37 CFR 1.313(c)(2), filed September 12, 2018, to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED.**

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid in this application cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being referred to Technology Center AU 2842 for processing of the request for continuing examination under 37 CFR 1.114 .

Office of Petitions

Electronic Acknowledgement Receipt	
EFS ID:	33677403
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	12-SEP-2018
Filing Date:	02-JUL-2013
Time Stamp:	16:56:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$2040
RAM confirmation Number	091318INTEFSW16564200
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE_Transmittal.pdf	101207 d44343ac3ce8117780949087d6f4fe51357c9ca4	no	2
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Transmittal Letter	IDS_Transmittal.pdf	99640 f6e480fc34d732193a7349f9a41b45cce2ba6f60	no	2
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	IDS_SB08.pdf	85947 ac2db46bbd7d9f423b6f11f1f5cae92de4d490a4	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Non Patent Literature	Kester.pdf	7158404 5dfe3c9a2e169896427139b012ebd9a0ddb0f92e	no	71
Warnings:					
Information:					
5	Petition automatically granted by EFS	petition-request.pdf	31600 0a47cb9bc86937d1d98de543d9c99291f3e75ab6	no	2
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	32116 fe2e35fe9efcf7ec4a90760e01972fba05a9ced3	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	7508914

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

112754 7590 10/04/2018

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 10/04/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$1000.00	$0	01/04/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 10/04/2018
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$1000.00	$0	01/04/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

DELTA ELECTRONICS EX. 1002
Page 790

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

112754 7590 10/04/2018

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

EXAMINER	
CHANG, JOSEPH	
ART UNIT	PAPER NUMBER
2842	

DATE MAILED: 10/04/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/933,252	Applicant(s) VINCIARELLI et al.	
	Examiner Joseph Chang	Art Unit 2842	AIA Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the RCE of 9/12/2018.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-40 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 9/12/18.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/JOSEPH CHANG/
Primary Examiner, Art Unit 2842

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/933,252	VINCIARELLI et al.
	Examiner	**Art Unit**
	Joseph Chang	2842

CPC - Searched*		
Symbol	**Date**	**Examiner**
M02M3/33576; H02M3/33561	5/4/16	JC

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
307	82	5/4/16	JC

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
EAST Search History attached	5/4/16	JC
updated	9/2/16	JC
updated	1/19/17	JC
IDS of 5/2/17 has been considered.	5/26/17	JC
updated	9/14/17	JC
updated	1/26/18	JC
IDS of 4/2/18 has been considered and the searches have been updated .	4/19/18	JC
The IDS of 9/12/18 has been considered and searches have been updated.	09/21/2018	JC

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/933,252	VINCIARELLI et al.
	Examiner	Art Unit
	Joseph Chang	2842

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	PGPUB text search - Sep. 2, 2016 see interference search printout	9/2/16	JC
	updated	1/19/17	JC
	updated	5/26/17	JC
	updated	9/14/17	JC
	updated	1/26/18	JC
	updated	4/19/18	JC
	updated	09/21/2018	JC

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/933,252	VINCIARELLI et al.
	Examiner	**Art Unit**
	Joseph Chang	2842

CPC							
Symbol						**Type**	**Version**
H02M	/	3	/	33576		F	2013-01-01
H02M	/	3	/	33561		I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	40	
/JOSEPH CHANG/ Primary Examiner, Art Unit 2842	21 September 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

U.S. Patent and Trademark Office — Part of Paper No.: 20180921

DELTA ELECTRONICS EX. 1002
Page 796

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/933,252	VINCIARELLI et al.
	Examiner	Art Unit
	Joseph Chang	2842

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H02M	/	3	/	335	
NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
307	82

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					
307	31					

NONE (Assistant Examiner)	(Date)	Total Claims Allowed: 40	
/JOSEPH CHANG/ Primary Examiner, Art Unit 2842 (Primary Examiner)	21 September 2018 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2

U.S. Patent and Trademark Office — Part of Paper No.: 20180921

DELTA ELECTRONICS EX. 1002
Page 797

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/933,252	VINCIARELLI et al.
	Examiner	**Art Unit**
	Joseph Chang	2842

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	12	10	22	19	10	28	39	37						
2	2	13	11	23	20	31	29	40	38						
3	3	14	12	24	21	32	30	29	39						
4	4	15	13	26	22	33	31	30	40						
5	5	16	14	27	23	34	32								
6	6	17	15	28	24	35	33								
7	7	19	16	9	25	36	34								
8	8	20	17	18	26	37	35								
11	9	21	18	25	27	38	36								

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	40	
/JOSEPH CHANG/ Primary Examiner, Art Unit 2842	21 September 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2

U.S. Patent and Trademark Office Part of Paper No.: 20180921

DELTA ELECTRONICS EX. 1002
Page 798

PTO/SB/08 (modified)

Substitute for form 1449/PTO				*Complete if Known*	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	13/933,252
				Filing Date	7/2/2013
Date Submitted: September 11, 2018				**First Named Inventor**	Patrizio Vinciarelli
				Art Unit	2842
(use as many sheets as necessary)				Examiner Name	Chang, Joseph
Sheet	1	of	1	Attorney Docket Number	111664-0123 (0198-US-1)

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[6]
/J.C/	A1	Kester, W., et al., "Section 3, Switching Regulators," pp. 3.1-3.71, (2015)	

Examiner Signature	/JOSEPH CHANG/	Date Considered	09/21/2018

4850-3148-6578.1

Bibliographic Data

Application No: 13/933,252

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: _____ (Examiner's Signature) _____ (Initials)

Title: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
07/02/2013	307	2842	111664-0123 (VA1078)
RULE			

APPLICANTS

VLT, INC., Sunnyvale, CA, UNITED STATES

INVENTORS

Patrizio VINCIARELLI Boston, MA, UNITED STATES

Andrew D'Amico Marina Del Rey, CA, UNITED STATES

CONTINUING DATA

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/24/2013

STATE OR COUNTRY

UNITED STATES

ADDRESS

Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109
UNITED STATES

FILING FEE RECEIVED

$2,480

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 10/04/2018
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109



Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPL.N. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$1000.00	$0	01/04/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Foley & Lardner LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: **VLT, Inc.**

(B) RESIDENCE: (CITY and STATE OR COUNTRY): **Sunnyvale, California**

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☒ Advance Order - # of Copies 5

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 19-0741 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Brett P. Belden/ Date December 26, 2018

Typed or printed name **Brett P. Belden** Registration No. 57,705

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

- Sales Receipt -

Adjustment date: 12/31/2018 ZJUHAR2

06/29/2018 INTEFSW 00006562 13933252

01 FC:1501 -1000.00 OP

United States Patent and Trademark Office

- Sales Receipt -

12/31/2018 ZJUHAR2 00000004 13933252

01 FC:1501 1000.00 OP

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor Name:	Patrizio Vinciarelli
Title:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
Appl. No.:	13/933,252
Filing Date:	7/2/2013
Examiner:	Chang, Joseph
Art Unit:	2842
Confirmation Number:	5889

ISSUE FEE TRANSMITTAL

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Enclosed herewith please find Issue Fee Transmittal Form PTOL-85(B).

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

While Applicant agrees that the allowed claims include a combination of subject matter that is patentable over the cited references, Applicant does not necessarily agree with or acquiesce in the reasoning of the Examiner. Moreover, Applicant notes that various other subject matter and/or combinations of subject matter may be patentable for other reasons than those given by the Examiner. Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance in connection with the present Application or any future proceeding.

REMARKS

These comments on Statement of Reasons for Allowance under 37 C.F.R. § 1.104 are intended to be responsive to the Notice of Allowance dated January 31, 2018 and the Notice of Allowance dated September 21, 2017.

Fees in the amount of $1,000.00 for payment of the Issue Fee were previously paid to the USPTO and therefore no fees are believed to be currently due.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

Respectfully submitted,

Date December 26, 2018

By /Brett P. Belden/

FOLEY & LARDNER LLP
Customer Number: 112754
Telephone: (414) 319-7319
Facsimile: (414) 297-4900

Brett P. Belden
Attorney for Applicant
Registration No. 57,705

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

112754 7590 10/04/2018
Foley & Lardner LLP
3000 K Street N.W.
Suite 600
Washington, DC 20007-5109

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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	07/02/2013	Patrizio VINCIARELLI	111664-0123 (VA1078)	5889

TITLE OF INVENTION: POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$1000.00	$0	01/04/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHANG, JOSEPH	2842	307-082000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 **Foley & Lardner LLP**
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

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(B) RESIDENCE: (CITY and STATE OR COUNTRY): **Sunnyvale, California**

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☒ Advance Order - # of Copies 5

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 19-0741 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Brett P. Belden/ Date December 26, 2018

Typed or printed name **Brett P. Belden** Registration No. **57,705**

DELTA ELECTRONICS EX. 1002
Page 806

Electronic Patent Application Fee Transmittal

Application Number:	13933252
Filing Date:	02-Jul-2013
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Filer:	Brett P. Belden/George Gray
Attorney Docket Number:	111664-0123 (VA1078)

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
PRINTED COPY OF PATENT - NO COLOR	8001	5	3	15
		Total in USD ($)		**15**

Electronic Acknowledgement Receipt	
EFS ID:	34690002
Application Number:	13933252
International Application Number:	
Confirmation Number:	5889
Title of Invention:	POWER DISTRIBUTION ARCHITECTURE WITH SERIES-CONNECTED BUS CONVERTER
First Named Inventor/Applicant Name:	Patrizio VINCIARELLI
Customer Number:	112754
Filer:	Brett P. Belden/George Gray
Filer Authorized By:	Brett P. Belden
Attorney Docket Number:	111664-0123 (VA1078)
Receipt Date:	26-DEC-2018
Filing Date:	02-JUL-2013
Time Stamp:	11:54:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$15
RAM confirmation Number	122618INTEFSW11551300
Deposit Account	190741
Authorized User	George Gray
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.17 (Patent application and reexamination processing fees) 37 CFR 1.20 (Post Issuance fees)	

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	111664-0123_IF_Transmittal.pdf	116852 5b8f682345ca2d10b42ce2925c7d79e3de43641d	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	111664-0123_PTOL85.pdf	1640476 84b6ae5e9f894d7a66622e9911937f869001b088	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30383 0159c4b31cb17c8851cf30d552f1557121b56121	no	2
Warnings:					
Information:					
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/933,252	02/05/2019	10199950	111664-0123 (VA1078)	5889

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ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 850 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

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