PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	08 NOV 2018
Applicant's or agent's file reference 128404211PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2018/049402	04 September 2018	01 September 2017

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G05F 1/66; H01R 13/02; H01R 24/86; H01R 25/14; H01R 25/16 (2018.01)
CPC - G05F 1/66; G06F 1/32; H01R 13/02; H01R 24/86; H01R 25/14; H01R 25/147; H01R 25/16 (2018.08)

Applicant IDEAL INDUSTRIES, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	28 October 2018	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-20	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-20	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-20 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest:

Regarding claim 1, the prior art of record, individually or in combination, does not teach or fairly suggest a low voltage power distribution system comprising: wherein when a new connector module is connected to the electrical bus, the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power, and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is: the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power, in combination with the remaining aspects of the claim.

Claims 2-7 depend from claim 1, and therefore meet the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 1.

The prior art teaches some of the concepts and/or aspects of the claim limitations as shown below, but does not teach the claim limitations in their entirety and as specifically recited in each of the claims:

Ideal (US 2016/0268728 A1) discloses a low voltage power distribution system comprising: an electrical bus (an improved system that is able to distribute power, e.g., low voltage DC power or communication signals, into a given space, e.g., home, office, vehicle, or the like, via use of a buss and a corresponding connector, para 0006) comprising a carrier and an electrically conductive element linearly arranged along the carrier (electrical buss comprising a carrier, at least a pair of electrically conductive elements linearly arranged along the carrier, claim 1; a pair of electrically conductive elements extend linearly along a length of the carrier Abstract; see Fig. 8B [conductive elements 1284A and 1284B]); a connector module adapted to be releasably couplable to the carrier being in electrical communication with the electrical bus (connector adaptor adapted to be releasably couplable to the electrical buss, claim 7; a connector 4100 that is releasably positionable within a connector adaptor 3900', para 0075); a power supply unit; and a control module (the control device 434 may provide one or more control signals to a power supply 436, power source, and/or other devices that causes a mechanism such as a switch 438, for instance, to turn power on and/or off to one or more electrical busses, para 0055).
Ideal fails to disclose a plurality of connector modules with a base power setting and a maximum allowed power; the power supply unit with an amount used of the total power; the control module configured to monitor the available power and amount used of the total power of the low voltage bus system, the control module in communication with each of the connector modules and capable of retrieving the base power setting; wherein when a new connector module is connected to the electrical bus, the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power, and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is: the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

Robinson (US 2012/0151240 A1) discloses a voltage power distribution system (the power manager (190) operates to maximize the amount of usable power in the power network (100) by summing the power capabilities or power contribution attributable to all of the connected power or energy sources, and then by allocating this total available power to connected power loads in a prioritized fashion., para 0071) comprising: an electrical bus (power manager will recognize these changes and will adjust which power loads and power or energy sources are connected to the power bus and which power loads and power or
energy sources are disconnected from the power bus, para 0071); a plurality of connector modules with a base power setting and a maximum allowed power, the connector module adapted to be releasably couplable (The power manager then reads or otherwise ascertains the power characteristic data for each connected power load [plurality of connector modules/loads] and obtains average and peak power requirements [base and maximum allowed power]... devices of a lower priority that have not yet been assigned power are disconnected [releasably coupled] from the power bus., para 0072); a power supply unit with an amount used of the total power (The power sources (110, 120, 130, and 185) may provide a substantially continuous supply of generated power for as long as the power manager (190) is connected with the power source, e.g. a power grid, para 0061); and a control module (The power manager (400) preferably includes a data processing device... data processing devices include a central processing unit, (CPU), an integrated microprocessor, a microcontroller,, para 0115) configured to monitor the available power and amount used of the total power of the low voltage bus system, the control module in communication with each of the connector modules and capable of retrieving the base power setting; wherein when a new connector module is connected to the electrical bus (when the newly collected device is not a rechargeable battery, the power manager then determines if the newly collected device is a power source (step 10080). If no, (e.g. it is a load), then the energy management schema checks to determine if sufficient power is available to power the load (step 10090). If sufficient power is available, the device is connected to the power bus to provide power to the load (step 10095). If not, the device is not connected to the power bus and the load remains unpowered (step 10098, para 0180).

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Robinson does not disclose wherein a low voltage power distribution system; comprising a carrier and an electrically conductive element linearly arranged along the carrier; the connector modules being releasably coupled to the carrier being in electrical communication with the electrical bus; the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power, and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is: the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

Malackowski (US 6,184,655 B1) discloses a low voltage power distribution system (charging a plurality of batteries.. controller causes the current source to supply the charging current and adjusts the power available data for the charger downwards to reflect the dedication of power to the battery, Abstract; a low voltage signal suitable for charging the batteries, col 4, lines 58-59) comprising: an electrical bus; a plurality of connector modules with a base power setting and a maximum allowed power, the connector module adapted to be releasably couplable (Eight modules 26 are removably secured to the top of the base unit 24., col 3, lines 60-61; the memory integral with the main controller 56 stores power required data for the batteries charged by the charger 20., col 16, lines 55-63; module memory 34 also contains a power required field 110. Power required field 110 contains data indicating the maximum power the battery draws during its charging., col 8, lines 13-17); a power supply unit with an amount used of the total power; and a control module configured to monitor the available power and amount used of the total power of the low voltage bus system, the control module in communication with each of the connector modules and capable of retrieving the base power setting; when a new connector module is connected to the electrical bus (The charger 20 of this invention does more than cycle a battery 22 through a charging process that is specifically appropriate for that battery. Prior to initiating the charging process, the charger determines whether or not its power Supply has enough power available to charge the battery. Only if this power is available does the charger 20 cycle the battery 22 through the charging process., col 12, lines 23-29)
Malackowski fails to disclose comprising a carrier and an electrically conductive element linearly arranged along the carrier; wherein the connector module releasably coupled to the carrier being in electrical communication with the electrical bus, the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power, and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is: the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

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Regarding claim 8, the prior art of record, individually or in combination, does not teach or fairly suggest a low voltage power distribution system comprising: the connector module adapted to be releasably couplable in a plurality of orientations relative to the carrier; power supply unit with a total power; wherein the housing is releasably coupled to the carrier in each of the plurality of orientations relative to the carrier; wherein the magnetic field to cooperate with the ferromagnetic element to releasably couple the housing upon the carrier in at least each of the plurality of orientations relative to the carrier; the control module configured to monitor the available power and amount used of the total power of the low voltage bus system, the control module in communication with each of the connector modules and capable of retrieving the base power setting; wherein when a new connector module is connected to the electrical bus, the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module and a fraction of the base power setting if the base power setting of the new module exceeds the available power, in combination with the remaining aspects of the claim.

The prior art teaches some of the concepts and/or aspects of the claim limitations as shown below, but does not teach the claim limitations in their entirety and as specifically recited in each of the claims:

Ideal (US 2016/0268728 A1) discloses a low voltage power distribution system comprising: an electrical bus (an improved system that is able to distribute power, e.g., low voltage DC power or communication signals, into a given space, e.g., home, office, vehicle, or the like, via use of a buss and a corresponding connector, para 0006) comprising a carrier with at least a pair of electrically conductive elements linearly arranged along the carrier, and a linearly arranged ferromagnetic element carried by the carrier intermediate at the at least a pair of electrically conductive elements (electrical buss comprising a carrier, at least a pair of electrically conductive elements linearly arranged along the carrier, and a linearly arranged ferromagnetic element carried by the carrier, claim 1; conductive elements 1284A and 1284B... a ferromagnetic material 1283, para 0058; see Fig. 8B [conductive elements 1284A and 1284B and ferromagnetic element 1283 are arranged next to each other linearly on carrier]); a plurality of connector modules, the connector module adapted to be releasably couplable to the carrier, the carrier being in electrical communication with the electrical bus (connector adaptor adapted to be releasably couplable to the electrical buss, claim 7; a connector 4100 that is releasably positionable within a connector adaptor 3900', para 0075; The carrier elements 3504 are, in turn, mounted to a further carrier element 3506 which is formed from a ferromagnetic material to thereby allow one or more connectors to be magnetically attached thereto, para 0060); a power supply unit (the control device 434 may provide one or more control signals to a power supply 436, power source, and/or other devices that causes a mechanism such as a switch 438, for instance, to turn power on and/or off to one or more electrical busses, para 0055); a plurality of electrically conductive contacts carried by the housing wherein the plurality of electrically conductive contacts are arranged such that at least a first one of the plurality of electrically conductive contacts will engage one of the at least a pair of electrically conductive elements and at least a second one of the plurality of electrically conductive contacts will engage a different one of the at least a pair of electrically conductive elements when the housing is releasably coupled to the carrier (a connector 3600 [housing] having a magnet 3602, electrical contacts 3604 sized and arranged to engage with the conductor elements 3502 when the connector 3600 is magnetically coupled to the buss system 3500,, para 0060; also see Figs. 17A and 17B); at least one magnet carried by the housing and disposed intermediately the plurality of electrically conductive contacts wherein the at least one magnet is arranged to generate a magnetic field to magnetically cooperate with the ferromagnetic element of the carrier to releasably couple the housing upon the carrier (at least one magnet arranged to generate a single, linear magnetic field to magnetically cooperate with the ferromagnetic element., claim 1; a magnet 3602, electrical contacts 3604 sized and arranged to engage with the conductor elements 3502 when the connector 3600 is magnetically coupled to the buss system 3500, para 0060; lso see Figs. 17A and 17B); and a control module (the control device 434 may provide one or more control signals to a power supply 436, power source, and/or other devices that causes a mechanism such as a switch 438, for instance, to turn power on and/or off to one or more electrical busses, para 0055).
Ideal fails to disclose a plurality of connector modules with a base power setting and a maximum allowed power; the connector module adapted to be releasably couplable in a plurality of orientations relative to the carrier; power supply unit with a total power; wherein the housing is releasably coupled to the carrier in each of the plurality of orientations relative to the carrier; wherein the magnetic field to cooperate with the ferromagnetic element to releasably couple the housing upon the carrier in at least each of the plurality of orientations relative to the carrier; the control module configured to monitor the available power and amount used of the total power of the low voltage bus system, the control module in communication with each of the connector modules and capable of retrieving the base power setting; wherein when a new connector module is connected to the electrical bus, the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

Robinson (US 2012/0151240 A1) discloses voltage power distribution system (the power manager (190) operates to maximize the amount of usable power in the power network (100) by summing the power capabilities or power contribution attributable to all of the connected power or energy sources, and then by allocating this total available power to connected power loads in a prioritized fashion., para 0071) comprising: an electrical bus (power manager will recognize these changes and will adjust which power loads and power or energy sources are connected to the power bus and which power loads and power or energy sources are disconnected from the power bus, para 0071); a plurality of connector modules with a base power setting and a maximum allowed power, the connector module adapted to be releasably couplable (The power manager then reads or otherwise ascertains the power characteristic data for each connected power load [plurality of connector modules/loads] and obtains average and peak power requirements [base and maximum allowed power]... devices of a lower priority that have not yet been assigned power are disconnected [releasably coupled] from the power bus., para 0072) a power supply unit with a total power (The power sources (110, 120, 130, and 185) may provide a substantially continuous supply of generated power for as long as the power manager (190) is connected with the power source, e.g. a power grid, para 0061); and a control module (The power manager (400) preferably includes a data processing device... data processing devices include a central processing unit, (CPU), an integrated microprocessor, a microcontroller,, para 0115) configured to monitor the available power and amount used of the total power of the low voltage bus system, the control module in communication with each of the

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connector modules and capable of retrieving the base power setting; wherein when a new connector module is connected to the electrical bus (when the newly collected device is not a rechargeable battery, the power manager then determines if the newly collected device is a power source (step 10080). If no, (e.g. it is a load), then the energy management schema checks to determine if sufficient power is available to power the load (step 10090). If sufficient power is available, the device is connected to the power bus to provide power to the load (step 10095). If not, the device is not connected to the power bus and the load remains unpowered (step 10098, para 0180).
Robinson does not disclose wherein a low voltage power distribution system; comprising a carrier with at least a pair of electrically conductive elements linearly arranged along the carrier, and a linearly arranged ferromagnetic element carried by the carrier intermediate at the at least a pair of electrically conductive elements; the connector module adapted to be releasably couplable in a plurality of orientations relative to the carrier, the carrier being in electrical communication with the electrical bus; ; a plurality of electrically conductive contacts carried by the housing wherein the plurality of electrically conductive contacts are arranged such that at least a first one of the plurality of electrically conductive contacts will engage one of the at least a pair of electrically conductive elements and at least a second one of the plurality of electrically conductive contacts will engage a different one of the at least a pair of electrically conductive elements when the housing is releasably coupled to the carrier in each of the plurality of orientations relative to the carrier; at least one magnet carried by the housing and disposed intermediately the plurality of electrically conductive contacts wherein the at least one magnet is arranged to generate a magnetic field to magnetically cooperate with the ferromagnetic element of the carrier to releasably couple the housing upon the carrier in at least each of the plurality of orientations relative to the carrier, , the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

Malackowski (US 6,184,655 B1) discloses a low voltage power distribution system (charging a plurality of batteries.. controller causes the current source to supply the charging current and adjusts the power available data for the charger downwards to reflect the dedication of power to the battery, Abstract; a low voltage signal suitable for charging the batteries, col 4, lines 58-59) comprising: an electrical bus; a plurality of connector modules with a base power setting and a maximum allowed power, the connector module adapted to be releasably couplable (Eight modules 26 are removably secured to the top of the base unit 24., col 3, lines 60-61; the memory integral with the main controller 56 stores power required data for the batteries charged by the charger 20., col 16, lines 55-63; module memory 34 also contains a power required field 110. Power required field 110 contains data indicating the maximum power the battery draws during its charging., col 8, lines 13-17); a power supply unit with a total power; and a control module configured to monitor the available power and amount used of the total power of the low voltage bus system, the control module in communication with each of the connector modules and capable of retrieving the base power setting; wherein when a new connector module is connected to the electrical bus (The charger 20 of this invention does more than cycle a battery 22 through a charging process that is specifically appropriate for that battery. Prior to initiating the charging process, the charger determines whether or not its power Supply has enough power available to charge the battery. Only if this power is available does the charger 20 cycle the battery 22 through the charging process., col 12, lines 23-29).
Malackowski fails to disclose comprising a carrier with at least a pair of electrically conductive elements linearly arranged along the carrier, and a linearly arranged ferromagnetic element carried by the carrier intermediate at the at least a pair of electrically conductive elements; the connector module adapted to be releasably couplable in a plurality of orientations relative to the carrier, the carrier being in electrical communication with the electrical bus; ; a plurality of electrically conductive contacts carried by the housing wherein the plurality of electrically conductive contacts are arranged such that at least a first one of the plurality of electrically conductive contacts will engage one of the at least a pair of electrically conductive elements and at least a second one of the plurality of electrically conductive contacts will engage a different one of the at least a pair of electrically conductive elements when the housing is releasably coupled to the carrier in each of the plurality of orientations relative to the carrier; at least one magnet carried by the housing and disposed intermediately the plurality of electrically conductive contacts wherein the at least one magnet is arranged to generate a magnetic field to magnetically cooperate with the ferromagnetic element of the carrier to releasably couple the housing upon the carrier in at least each of the plurality of orientations relative to the carrier; , the control module: redistributes the maximum allowed power of each of the connected modules if the base power setting of the new module exceeds the available power and assigns a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

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Regarding claim 9, the prior art of record, individually or in combination, does not teach or fairly suggest a method of intelligently managing power load of a low voltage bus system including a plurality of connected modules comprising: comparing the base power setting of the new module to the available power; redistributing a maximum allowed power of the connected modules if the base power setting of the new module exceeds the remaining available power; and assigning a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power, in combination with the remaining aspects of the claim.

Claims 10-20 depend from claim 9, and therefore meet the criteria set out in PCT Article 33(2)-(3) for at least the same reasons as claim 9.

The prior art teaches some of the concepts and/or aspects of the claim limitations as shown below, but does not teach the claim limitations in their entirety and as specifically recited in each of the claims:

Robinson (US 2012/0151240 A1) discloses a method of intelligently managing power load of a low voltage bus system including a plurality of connected modules (Energy management schema operating on the power manager sums available power and allocates the available power to connected power loads [connected modules] according to power priority settings, Abstract; a low voltage sensor, described below, is disposed to measure a voltage on the power bus (410). para 0158) comprising: defining a marginal reserve of power as a portion of a total power of the low voltage bus system (the
energy management schema may calculate a remaining operating time of high priority devices given the total power available and reserve power to operate the higher priority devices for a desired operating time by denying power to lower priority devices., para 0164); monitoring the amount used of the total power of the low voltage bus system; connecting a new module to the low voltage bus system; retrieving a base power setting for the new module (The power manager then reads or otherwise ascertains the power characteristic data for each connected power load [newly connected module] and obtains average and peak power requirements [base power settings] as well as a device priority of each power load, para 0096); calculating remaining available power as the difference between total power and a marginal reserve of power (the energy management schema may calculate a remaining operating time of high priority devices given the total power available and reserve power to operate the higher priority devices for a desired operating time, para 0164).
Robinson fails to disclose comparing the base power setting of the new module to the available power; redistributing a maximum allowed power of the connected modules if the base power setting of the new module exceeds the remaining available power; and assigning a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

Nanda (US 2017/0012429 A1) discloses a method of intelligently managing power load of a voltage bus system including a plurality of connected modules (The power management system monitors electrical power demanded by the electrical loads and the aggregate amount of available power of the at least one source of electric power., Abstract) comprising: monitoring the amount used of the total power of the low voltage bus system; connecting a new module to the low voltage bus system (power management system is configured to monitor electrical power demanded by said electrical loads and to monitor the aggregate amount of available power by said at least one source of electric power, claim 1).
Nanda does not disclose wherein a low voltage bus system; wherein the defining a marginal reserve of power as a portion of a total power of the low voltage bus system; retrieving a base power setting for the new module; calculating remaining available power as the difference between total power and a marginal reserve of power; comparing the base power setting of the new module to the available power; redistributing a maximum allowed power of the connected modules if the base power setting of the new module exceeds the remaining available power; and assigning a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

Malackowski (US 6,184,655 B1) discloses a method of intelligently managing power load of a low voltage bus system including a plurality of connected modules (charging a plurality of batteries.. controller causes the current source to supply the charging current and adjusts the power available data for the charger downwards to reflect the dedication of power to the battery, Abstract; a low voltage signal suitable for charging the batteries, col 4, lines 58-59) comprising: monitoring the amount used of the total power of the low voltage bus system; connecting a new module to the low voltage bus system (The charger 20 of this invention does more than cycle a battery 22 through a charging process that is specifically appropriate for that battery. Prior to initiating the charging process, the charger determines whether or not its power Supply has enough power available to charge the battery. Only if this power is available does the charger 20 cycle the battery 22 through the charging process., col 12, lines 23-29); retrieving a base power setting for the new module (Eight modules 26 are removably secured to the top of the base unit 24., col 3, lines 60-61; the memory integral with the main controller 56 stores power required data for the batteries charged by the charger 20., col 16, lines 55-63; module memory 34 also contains a power required field 110. Power required field 110 contains data indicating the maximum power the battery draws during its charging., col 8, lines 13-17).
Malackowski fails to disclose defining a marginal reserve of power as a portion of a total power of the low voltage bus system; ; calculating remaining available power as the difference between total power and a marginal reserve of power; comparing the base power setting of the new module to the available power; redistributing a maximum allowed power of the connected modules if the base power setting of the new module exceeds the remaining available power; and assigning a new module allowed maximum power to the new module wherein the allowed maximum power is the base power setting if the available power exceeds the base power setting of the new module, and a fraction of the base power setting if the base power setting of the new module exceeds the available power.

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.