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Inventor(s)	VELDERMAN; Matthew J. et al.

BATTERY CHARGING SYSTEM

Abstract

A battery charging system including at least two conductors running parallel to one another, an AC/DC converter, the AC/DC converter configured to receive an AC input and to provide a DC output to the at least two conductors and a battery charger, the battery charger (**1**) including a battery pack receiving portion to receive a removable, rechargeable battery pack and (**2**) removably, electrically coupled to the at least two conductors to receive the DC output.

Inventors: **VELDERMAN; Matthew J. (Baltimore, MD), SERGYEYENKO; Oleksiy (Baldwin, MD), BAILEY; Sean (Baltimore, MD), PHILLIPS; Steven J. (Ellicott City, MD), WHITE; Daniel J. (Baltimore, MD), DELMONT; Thomas (Clarksville, MD), Seman, JR.; Andrew E. (Pylesville, MD), Olyansky; Julian (Festerville, PA), Chikhalkar; Shalin (Towson, MD)**

Applicant: **Black & Decker Inc.** (New Britain, CT)

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION [0001] This application is a divisional of and claims priority to U.S. patent application Ser. No. 18/219,996, filed Jul. 10, 2023, and titled, “Wall Hanging System,” which in turn is a continuation of and claims priority to U.S. patent application Ser. No. 17/859,145, filed Jul. 7, 2022, and titled, “Wall Hanging System,” now U.S. Pat. No. 11,737,587 which in turn is a continuation of and claims priority to U.S. patent application Ser. No. 17/150,295, filed Jan. 15, 2021, and titled, “Wall Hanging System,” now U.S. Pat. No. 11,406,203 which in turn is a continuation of and claims priority to U.S. patent application Ser. No. 16/668,988, filed Oct. 30, 2019, and titled, “Wall Hanging System,” now U.S. Pat. No. 10,925,412 which in turn is a continuation of and claims priority to U.S. patent application Ser. No. 15/946,248, filed Apr. 5, 2018, and titled, “Wall Hanging System,” now U.S. Pat. No. 10,492,631 which in turn claims the benefit of priority under 35 U.S.C. § 119 (e) to U.S. Provisional Application Ser. No. 62/544,962 filed on Aug. 14, 2017, entitled “Wall Hanging System;” U.S. Provisional Application Ser. No. 62/540,210 filed on Aug. 2, 2017, entitled “Wall Hanging System;” and U.S. Provisional Application No. 62/532,077 filed on Jul. 13, 2017, entitled “Wall Hanging System,” all of which are incorporated by reference in their entirety.

FIELD OF THE INVENTION
[0002] The present application relates to a system for charging a battery pack.
BACKGROUND
[0003] It is desired to provide a battery charging system which may be hung on a wall.
SUMMARY
[0004] According to an aspect of an exemplary embodiment, there is a battery charging system. The battery charging system includes at least two conductors running parallel to one another, an AC/DC converter, the AC/DC converter configured to receive an AC input and to provide a DC output to the at least two conductors, and a battery charger, the battery charger (**1**) including a battery pack receiving portion to receive a removable, rechargeable battery pack and (**2**) removably, electrically coupled to the at least two conductors to receive the DC output.
[0005] The battery charging system may include a power receiving connector, the power receiving connector may be configured to removably, electrically couple the battery charger to the at least two conductors.
[0006] The power receiving connector may include a housing, a pair of pins projecting out of the housing. A first pin of the pair of pins may be configured to engage a first of the at least two conductors and a second pin of the pair of pins may be configured to engage a second of the at least two conductors.

[0007] The battery charging system may include a wall panel and wherein the at least two conductors are affixed to the wall panel.
[0008] The battery charger may be removably, mechanically coupled to the wall panel.
[0009] The battery charging system may include a power receiving connector, the power receiving connector may be configured to removably, mechanically couple the battery charger to the wall panel.
[0010] The battery charging system may include a series of clips holding the at least two conductors to the wall panel.
[0011] The at least two conductors may be held fixed between the series of clips and a surface of the wall panel.
[0012] The at least two conductors may run parallel to one another along a horizontal axis of a wall to which the at least two conductors are coupled and the at least two conductors may be vertically spaced from one another.
[0013] According to another aspect, there is a method for providing a battery charging system. The method may include providing at least two conductors running parallel to one another, providing an AC/DC converter, providing an AC input to the AC/DC converter, providing a DC output from the AC/DC converter to the at least two conductors, providing a battery charger, the battery charger including a battery pack receiving portion to receive a removable, rechargeable battery pack, and removably, electrically coupling the battery charger to the at least two conductors and providing the DC output to the battery charger.
[0014] The method may include providing a power receiving connector and removably, electrically coupling the power receiving connector to the at least two conductors.
[0015] The power receiving connector may include a housing and a pair of pins projecting out of the housing and the method may include engaging a first pin of the pair of pins with a first of the at least two conductors and a second pin of the pair of pins with a second of the at least two conductors.
[0016] The method may include providing a wall panel and affixing the at least two conductors to the wall panel.
[0017] The method may include removably, mechanically coupling the battery charger to the wall panel.
[0018] The method may include providing a power receiving connector and removably, mechanically coupling the battery charger to the wall panel with the power receiving connector.
[0019] The method may include providing a series of clips and holding the at least two conductors to the wall panel with the series of clips.
[0020] The at least two conductors may be held fixed between the series of clips and a surface of the wall panel.
[0021] The at least two conductors may run parallel to one another along a horizontal axis of a wall to which the at least two conductors are coupled and the at least two conductors may be vertically spaced from one another.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
[0022] FIG. **1** is a perspective view of a wall hanging system according to an exemplary embodiment;
[0023] FIG. **2** is a perspective view of a wall hanging system and cabinet according to an exemplary embodiment;
[0024] FIG. **3** is a side view of a first wall panel according to an exemplary embodiment
[0025] FIG. **4** is a side view of a second wall panel according to an exemplary embodiment;

[0026] FIG. **5** is a side view of a third wall panel according to an exemplary embodiment;
[0027] FIG. **6** is a front view of first and second wall panels according to the exemplary embodiment;
[0028] FIG. **7** is a side perspective view of a wall panel and pegboard assembly according to the exemplary embodiment;
[0029] FIG. **8** is a side perspective view of a wall panel and pegboard assembly according to the exemplary embodiment;
[0030] FIG. **9** is a side perspective view of a wall panel and pegboard assembly according to the exemplary embodiment;
[0031] FIG. **10** is a top perspective view of a cabinet according to an exemplary embodiment;
[0032] FIG. **11** is a close up perspective view of the cabinet according to the exemplary embodiment;
[0033] FIG. **12** is a close up perspective view of a cabinet and wall panel assembly according to the exemplary embodiment;
[0034] FIG. **13** is a front view of a cabinet and wall panel assembly according to an exemplary embodiment;
[0035] FIG. **14** is a perspective view of a securing member and wall panel according to an exemplary embodiment;
[0036] FIG. **15** is a perspective view of the securing member according to the exemplary embodiment;
[0037] FIG. **16** is a side view of the securing member and a wall panel according to the exemplary embodiment;
[0038] FIG. **17** is another side view of the securing member and a wall panel according to the exemplary embodiment;
[0039] FIG. **18** is another side view of the securing member and a wall panel according to the exemplary embodiment;
[0040] FIG. **19** is another side view of the securing member and a wall panel according to the exemplary embodiment;
[0041] FIG. **20** is another side view of the securing member and a wall panel according to the exemplary embodiment;
[0042] FIG. **21** is a perspective view of a clip according to an exemplary embodiment;
[0043] FIG. **22** is a side view of the clip according to the exemplary embodiment;
[0044] FIG. **23** is a side view of a fourth panel according to an exemplary embodiment;
[0045] FIG. **24** is a perspective view of the clip and fourth panel according to the exemplary embodiment;
[0046] FIG. **25** is a front view of a power strip and wall panel assembly according to an exemplary embodiment;
[0047] FIG. **26** is a front view of a power strip and wall panel assembly according to an exemplary embodiment;
[0048] FIG. **27** is a perspective view of a the clips attached to a battery charger according to an exemplary embodiment;
[0049] FIG. **28** is a front view of a wall panel assembly according to an exemplary embodiment;
[0050] FIG. **29** is a perspective view of a wall panel assembly system according to another exemplary embodiment;
[0051] FIG. **30** is a perspective view of the wall panel assembly of the exemplary embodiment;
[0052] FIG. **31** is a close-up perspective view of an end of the wall panel assembly system of the exemplary embodiment;
[0053] FIG. **32** is a perspective view of a control box according to the exemplary embodiment;
[0054] FIG. **33** is another perspective view of a control box according to the exemplary embodiment;

[0055] FIG. **34** is a side view of the control box and wall panel according to the exemplary embodiment;
[0056] FIG. **35** is a rear perspective view of a portion of the control box according to the exemplary embodiment;
[0057] FIG. **36** is a perspective view of a power supply connector according to the exemplary embodiment;
[0058] FIG. **37** is a perspective view of a power receiving connector according to the exemplary embodiment;
[0059] FIG. **38** is a perspective view of a power supply connector engaged with an insert on a wall panel according to the exemplary embodiment;
[0060] FIG. **39** is a perspective view of an attachment connector according to an exemplary embodiment in a first orientation;
[0061] FIG. **40** is a perspective view of the attachment connector according to an exemplary embodiment in a second orientation;
[0062] FIG. **41** is a rear perspective view of the attachment connector according to an exemplary embodiment in a first orientation;
[0063] FIG. **42** is a rear perspective view of the attachment connector according to an exemplary embodiment in a second orientation;
[0064] FIG. **43** is an exploded view of the attachment connector according to an exemplary embodiment;
[0065] FIG. **44** is a perspective view of a battery charger and battery pack according to an exemplary embodiment;
[0066] FIG. **45** is another perspective view of a battery charger and battery pack according to an exemplary embodiment;
[0067] FIG. **46** is a perspective view of a light according to an exemplary embodiment;
[0068] FIG. **47** is a perspective view of a lantern portion of the light according to an exemplary embodiment;
[0069] FIG. **48** is another perspective view of a lantern portion of the light according to an exemplary embodiment;
[0070] FIG. **49** is a perspective view of a Wi-Fi router according to an exemplary embodiment;
[0071] FIG. **50** is a perspective view of a fan according to an exemplary embodiment;
[0072] FIG. **51** is a perspective view of a security system according to an exemplary embodiment;
[0073] FIG. **52** is a schematic of the control box according to an exemplary embodiment;
[0074] FIG. **53** is a perspective view of a portion of the wall panel and insert according to an exemplary embodiment;
[0075] FIG. **54** is another perspective view of a portion of the wall panel and insert according to an exemplary embodiment;
[0076] FIG. **55** is another perspective view of a portion of the wall panel and insert according to an exemplary embodiment;
[0077] FIG. **56** is a perspective view of a wall panel and hook according to another exemplary embodiment;
[0078] FIG. **57** is a side view of the wall panel and hook according to the exemplary embodiment;
[0079] FIG. **58** is a perspective view of a wall panel and hook assembly according to the exemplary embodiment;
[0080] FIG. **59** is a side view of the wall panel and hook assembly according to the exemplary embodiment;
[0081] FIG. **60** is a perspective view of the wall panel and hook assembly according to the exemplary embodiment; and
[0082] FIG. **61** is a side view of the wall panel and hook assembly according to the exemplary embodiment.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0083] FIG. **1** illustrates a perspective view of a wall hanging assembly **1**. The wall hanging assembly **1** includes a number of different panels of different design. Particularly, the wall hanging assembly **1** includes first panel **10**, second panel **20** and third panel **30**. As shown in FIG. **1**, each of these panels **10**, **20**, **30** may be connected to other panels of the same or different type. The panels **10**, **20**, **30** may also be connected to a pegboard **60** and a cabinet **70**, as shown in FIG. **2** and discussed in further depth below.

[0084] Details of the panels **10**, **20** and **30** will be discussed with reference to FIGS. **3-9** and FIG. **1**. FIG. **3** is a side view of the first panel **10**, FIG. **4** is a side view of the second panel **20** and FIG. **5** is a side view of the third panel **30**. Additionally, FIG. **6** illustrates front views of the first panel **10** and the second panel **20**. FIGS. **7-9** illustrate various assemblies including the panels **10**, **20**, **30**.

[0085] As shown in FIGS. **3-5**, each of the panels **10**, **20**, **30** include a connector portion **11** at their lower end. Each of the panels also include a connector receiving portion **12**. The connector receiving portions **12** are located at the top end of the panels **10**, **20**, **30**. The connector portions **11** and the connector receiving portions **12** are sized and shaped so that the connector portions **11** fit into the connector receiving portions **12**. This allows multiple panels to be connected together as shown in, for example, FIGS. **1** and **7-9**.

[0086] The panels **10**, **20**, **30** can be connected to other panels of the same type or to panels of a different type. That is, a first panel **10** can be connected to one or more other first panels **10**. The first panel **10** can also be connected to one or more of the second panels **20** and third panels **30**. For example, FIG. **7** illustrates two first panels **10** being connected in sequence. FIG. **9** illustrates a first panel **10** being connected to a second panel **20** and a third panel **30**. The panels **10**, **20**, **30** may also be connected to panels of the type shown in U.S. Pat. No. 8,528,871, which is hereby incorporated by reference.

[0087] The connector receiving portions **12** include two different width openings. The smaller width is a peg board opening **13** and the larger width is a panel opening **14**. As shown in FIGS. **7** and **8**, the peg board opening **13** has a width corresponding to a peg board **60** and can accommodate a peg board **60**. The panel opening **14** has a width corresponding to the width of the panel connector portions **11**.

[0088] With reference to FIG. **3**, the first panel **10** includes a lower panel hook **15** and an upper panel hook **16**. A space **17** is formed behind the lower panel hook **15** and a space **18** is formed behind the upper panel hook **16**. As shown in FIG. **4**, the second panel **20** is smaller than the first panel **10**. The second panel **20** only includes a lower panel hook **15** and the corresponding space **17**. The third panel **30**, shown in FIG. **5**, includes a lower panel hook **15** and the corresponding space **17**. As with the second panel **20**, the third panel **30** does not include an upper panel hook **16**. As shown in FIGS. **1** and **5**, for example, the third panel **30** includes a slot **31** for receiving a power strip **40**. The power strip **40** includes a number of outlets for receiving plugs, as is well known. The power strip **40** may be a removable part which can be inserted or removed from the slot **31** or it may be integral or fixedly connected in the third panel **30**.

[0089] As shown in FIGS. **7-9**, the panels can receive a hook **90** or **95**. As shown in FIGS. **7-9**, the hooks **90** fit over the lower panel hooks **15** of the panels. The hook **95** is an extended hook. As shown in FIG. **7**, an upper end of hook **95** fits over a lower panel hook **15** and a lower end of the hook **95** fits under an upper panel hook **16**.

[0090] Each of the panels have rear surfaces, as shown in FIGS. **3-5**. The first panel **10** has a rear surface **19**, the second panel **20** has a rear surface **29** and the third panel **30** has a rear surface **39**. The rear surfaces are intended to abut against a wall. The panels **10**, **20**, **30** can be attached to walls through the use of a screw or other fastener or attachment means. Typically, the panels **10**, **20 30** would be screwed to a wall at a stud, however, other attachment means or locations are possible. For example, in an assembly with a cabinet **70**, the wall panels may connect with the cabinet **70** and simply rest against a wall.

[0091] As shown in FIGS. **10-13**, the cabinet **70** of the exemplary embodiment is configured to be integrated with the panels **10**, **20**, **30**. The cabinet **70** has a pair of side receivers **71** and a rear slot **72**. As shown in FIG. **11**, the side receiver **71** has a cabinet hook **75** with the same dimensions as the lower panel hook **15**, described above. The cabinet hook **75** can receive the hook **90**, as shown. Additionally, as shown in FIG. **12**, the side receiver **71** can also receive a panel, such as the third panel **30**. This allows a power strip **40** to be attached to the cabinet **70**. As also shown in FIGS. **12** and **13**, the rear slot **72** is able to receive one or more panels **10**, **20**, **30**. Accordingly, as shown in FIG. **13**, a combination cabinet **70**, wall panel and peg board system can be provided. As shown in FIG. **13**, multiple power strips **40** may be plugged into one another so that only a single power strip **40** needs to be plugged into the wall.
[0092] FIGS. **14-20** illustrate a securing member **100** which can be used with the first panel **10** to hang a tool or other device on the wall. The securing member **100** is able to be secured to or removed from the panel **10** and a variety of different hooks may be secured to the securing member **100** to hold tools of various types. A tool holding hook **130** is shown in FIG. **18**. In other embodiments, the multiple hooks, projections or other types of holders may be used with the securing member **100**. The hooks, projections or other holders may be integrally formed with the securing member **100** or may be attached to the securing member **100** by any of a variety of means, such as an adhesive, welding or fasteners. The securing member **100** may also be attached directly to tools or other objects. For example, a light may be directly attached to the securing member **100** so that the light can be secured to one of the first panels **10**.
[0093] FIG. **14** is a perspective view of the securing member **100** attached to a panel **10** and FIG. **15** illustrates the securing member **100** alone. The securing member **100** of the exemplary embodiment is made of two main parts. The first part is a panel abutting member **110**. The panel abutting member **110** is relatively rigid and abuts portions of the panel **10**. The second part is the latch member **120**. The latch member **120** pivots and latches to the panel **10**, as will be explained in further detail below.
[0094] The panel abutting member **110** includes an upper section **111**, a central section **112** and a lower section **113**. The latch member **120** includes a gripping member **121**, a central member **112** a spring member **123** and a lower/attachment member **124**. The spring member **123** includes a latching portion **125**, which latches over the lower channel hook **15**.
[0095] The latch member **120** is attached to the panel abutting member **110** at the panel abutting member lower section **113**. In particular, the attachment member **124** of the latch member **120** is attached to the lower section **113**. In the exemplary embodiment, the attachment member **124** is welded to the lower section **113** of the abutting member **110**. Other attachment methods including, but not limited to, adhesives, fasteners or crimping could also be used.
[0096] Operation of the securing member **100** can be seen in FIGS. **17-20**. In FIG. **17**, the securing member **100** is inserted into the panel **10**. As shown, the upper section **111** is inserted behind the upper panel hook **16** into the space **17** such that the latching portion **125** abuts against the lower panel hook **15**. The user then pushes the securing member **100** towards the rear **19** of the panel **10** (i.e., to the left in FIG. **17**). The latching portion **125** is able to deflect and slides over the lower panel hook **15** until the securing member **100** reaches the position shown in FIG. **18**.
[0097] FIG. **18** shows the securing member **100** in an attached position where it is attached to the panel **10** and including a hook **130** which holds a tool **140**. The tool may be a screwdriver, wrench, power tool or other tool, for example.
[0098] As shown in FIG. **18**, the latching portion **125** wraps around a rear side of the lower panel hook **15**. Additionally, the central portion **112** of the abutting member **110** is on a top surface of the abutting member and the lower section **113** of the abutting member **110** is on the front side of the lower panel hook **15**. This sandwiches the lower panel hook **15** between the latching portion **125** and lower section **113**.
[0099] The upper section **111** of the abutting member **110** serves to further secure the securing

member **100** to the panel **10**. As shown in FIG. **18**, when the securing member **100** is inserted into the panel **10**, the upper section **111** contacts a rear side of the upper panel hook **16**. This secures the securing member **100** in a second direction and helps the securing member **100** resist being pulled away from the panel **10** by, for example, the force of the tool **140** being held.

[0100] FIGS. **19** and **20** illustrate the securing member **100** being removed from the panel **10**. As shown in FIG. **19**, a user pulls on the gripping member **121**. That moves the latching portion **125** up above a top of the lower panel hook **15**. This unlocks the securing member **100** from the panel **10**. As shown in FIG. **20**, the upper section **111** is pivoted inward, towards the rear **19** of the panel **10**, and the securing member **100** can be slid out in a downward and frontward direction.

[0101] FIGS. **21** and **22** illustrate a clip **200** for use with the panels. FIG. **21** is a perspective view of the clip **200** and FIG. **22** is a side view of the clip **200**. The clip **200** includes two leg members **201**. The leg members **201** are made up of a base portion **202** and a finger portion **203**. There is an abutting surface **204** at one end of the finger portion **203**, which secures the clip on a panel, as discussed in further detail below.

[0102] The leg members **201** are configured to fit over a lower panel hook **15** and an upper panel hook **16**. In particular, the leg member **201** at the upper end of the clip **200** fits over a lower panel hook **15** and the leg member **201** at the lower end of the clip **200** fits over an upper panel hook **16**. This requires either that multiple of the panels **10**, **20**, **30** be configured together or that there be a different panel design. For example, a fourth panel **50**, shown in FIG. **23**.

[0103] As shown in FIG. **23**, the fourth panel **50** includes a lower panel hook **15** and an upper panel hook **16** as well as the accompanying spaces **17** and **18**. As shown, the panel hooks **15** and **16** are in different locations in the fourth panel **50**. The fourth panel **50** also includes a connector portion **11** which can be connected with another fourth panel **50** or other panels **10**, **20**, **30**. The fourth panel **50** includes a modified connector receiving portion **12′**. The modified connector receiving portion **12′** is still configured to receive connector portions **11** and peg board **60**. However, the peg board **60** is received forward of the location in the previously discussed connector receiving portion **12**. Additionally, the modified connector receiving portion **12′** includes a circular groove **56** which may receive a wire or the like. The fourth panel **55** also includes a central groove **150**

[0104] FIGS. **24-27** show the clip **200** in use. One leg **201** of the clip **200** fits over a lower panel hook **15** and the other leg **201** of the clip **200** fits over the upper panel hook **16**. Legs **201** have some flexibility. The flexibility allows the legs **201** to snap over the panel hooks **15** and **16** and the abutting surface **204** to snap behind the panel hooks **15**, **16**. This secures the clip **200** in place on the fourth panel **55**. In order to remove the clip **200**, again the legs flex so that the abutting surfaces **204** travel over the panel hooks **15**, **16** and the clip **200** is removed from the panel **55**. The base **205** of the clip **200** may also have some flexibility to aid in the securing and removal of the clip **200** to the panel **55**.

[0105] As shown in FIG. **24**, when the clip **200** is secured to the panel **55**, the clip **200** covers the central groove **150** at the location of the clip **200**. In particular, the clip base **205** covers the central groove **150**. This may be used to secure items in the central groove **150**, such as the power cord **42** shown in FIG. **24**.

[0106] The clips **200** may be secured to items such as the power strip **41** shown in FIGS. **25** and **26**, a battery charger **300**, as shown in FIG. **27**, or other tools or items so that the items can be secured to the panel **55** (or an appropriate combination of panels **10**, **20**, **30**). As shown in FIG. **27**, the clips **200** may be secured to an item such as a battery charger **300**. In FIG. **27**, the clips are secured to the base of the battery charger **300** by screws **206**. Other fasteners or attachment methods may be used or the clips **200** could be integrally formed with the item. In some instances, only the legs **201** may be joined with or integrally formed with the item and the legs **201** will allow the item to snap onto the panel **55** or a combination of panels.

[0107] FIGS. **25** and **26** illustrate a second power strip **41**. The second power strip **41** has a number of outlets, like the first power strip **40** and also includes posts for wrapping power cords **42**. The

power strip **41** may be attached to the panel **55** through the use of the clips **200**. As discussed above, the clips **200** may be attached to the power strip **41** in any of a number of ways and, in some instances, it may be suitable only to include the legs **21** of the clips **200**. The power strip **41** may include a light bar **45**, as shown in FIG. **26**. The light bar **45** includes a number of light emitting diodes (LEDs) and serves as an illumination device. The light bar **45** may have a separate switch to turn on and off the LEDs or the LEDs may turn on with the power strip **42**.

[0108] In combination, the panel **55** and clips **200** described above, in combination with other clips and hooks, may be used to make the wall storage hanging arrangement of FIG. **28**. As shown in FIG. **28**, there is a battery charger **300**, hedge trimmer **310**, rake **320**, blower-vac **330** and string trimmer **340** all hanging on the panel **55** along with the power strip **41**. The power strip **41** may be plugged into a wall power outlet **43**. Items that require power, such as the battery charger **300**, may then be plugged into the power strip **41** to provide power to the battery charger **300**. Additionally, as discussed above, power cords **42** may be routed through the central groove **150** and may be secured in the groove by clips **200**.

[0109] FIGS. **29-51** illustrate another exemplary embodiment. Features of the exemplary embodiment of FIGS. **29-51** may be used with the exemplary embodiments shown in FIGS. **1-28**.

[0110] FIGS. **29** and **30** are perspective view of a powered wall panel system **400**. The powered wall panel system **400** includes the fourth wall panel **50** and an insert **450**. The insert **450** includes three conductors **451**, **452** and **453**, which conduct power along the wall panel **50**. As shown in FIG. **29**, the panel **50** supports a power supply and control box **500**. The power supply and control box **500** provides power to the insert **450**. The insert **450** conducts power along the wall panel **50** to any of a variety accessories/attachments **550** shown thereon. The attachments include a battery charger **560**, a light **570**, a Wi-Fi router **580**, a fan **585** and a security system **590**. The attachments **550** may be able to directly connect to the wall panel **50** and the insert **450**. For example, the battery charger **560** and the security system **590** each attach directly to the wall panel **50**. Other attachments may be powered through an attachment connector **760**, described in detail below.

[0111] FIGS. **30**, **31** and **53-55** illustrate the mechanical features of the insert **450** with the panel **50**. FIG. **30** is a perspective view of the wall panel **50** with the insert **450** attached to the panel **50**. FIG. **31** is a perspective view of one end of the panel **50** with the insert **450**. FIG. **53** is a close-up view of a central section of the panel **50** with the insert **450**. FIG. **54** is an end perspective view of the panel **50** with the insert **450** with one of the clips **455** shown unassembled from the panel **50**. FIG. **55** illustrates an end perspective view of the panel **50** with the insert **450** not assembled with the panel **50**.

[0112] As noted above, the insert **450** includes three conductors **451**, **452**, **453**. The three conductors **451**, **452**, **453** run parallel to one another along a horizontal axis of the wall panel **50**, the wall panel **50** being configured to hang horizontally on a wall. The conductors **451**, **452**, **453** are vertically spaced apart from one another and do not contact one another. A series of clips **455** hold the conductors **451**, **452**, **453** in place along the wall panel **50**. Additionally, the clips **455** are designed to fit into the groove **150** of the wall panel **50** and are held in place there. In this way, the insert **450** can be inserted into an existing panel. As shown, the conductors **451**, **452**, **453** are held fixed between the clips and a surface of the panel **50**. In the exemplary embodiment, the conductors **451**, **452**, **453** are not secured to the clips **455** independently. That is, the conductors **451**, **452**, **453** are separate from the clips **455** before insertion and are held by being sandwiched between the clips **455** and the panel. The clips **455** are shaped to snap into and be secured by the wall panel **50**. In other embodiments the conductors and clips could be formed as one part, or the conductors could clip into the clips **455** or wall panel **50**. Additionally, in other embodiments, conductors may be formed along with the wall panel, such that the conductors are not part of an insertable and removable insert.

[0113] The control box **500** is shown in further detail in FIGS. **32-35**. As shown in FIG. **32**, the control box **500** receives a battery pack **600**. The control box **500** includes a battery pack receiving

portion **505**. The battery pack receiving portion **505** includes rails for guiding the battery pack **600** into place as well as electrical connectors for connecting with the battery pack **600**. The battery pack **600** connected to the control box **500** serves as a ballast battery. The battery pack **600** may be a power tool battery pack that can be used to power a variety of power tools, such as drills, saws, sanders and the like. The battery pack receiving portion **505** may be the same as the receiving portion for power tools which the battery pack **600** may receive. The battery pack **600** may be one of the battery packs shown in U.S. Pat. No. 9,406,915.

[0114] The control box **500** includes a pair of hooks **501** on a front side. The hooks **501** may be used to hold a screwdriver, phone or other item. The control box **500** also includes an input jack **502** which receives a cord with a power input, such as an AC input or a DC input provided by solar panels, as will be discussed later. Also shown in FIG. **53**, the control box **500** may include USB ports **503**. The USB ports **503** can be used to charge or power phones or other devices from the power input through the jack **502** or the battery pack **600**.

[0115] As shown in FIGS. **34** and **35**, the control box **500** includes a pair of legs **201** on its rear side. The legs **201** are the same as the legs **201** described for the clip above. In this case, the legs **201** are integrated into the control box **500**. In other embodiments, a separate clip **200** could be attached to the rear of the control box **500**. The legs **201** include base portions **202**, finger portions **203** and an abutting surface **204** and allow the control box **500** to latch onto the panel wall **50** in the manner shown in FIG. **34** and discussed above with respect to the legs **201**.

[0116] As shown in FIGS. **33-35**, the control box **500** has a power supply connector **510** which connects it to the conductors **451**, **452** and **453**. The power supply connector **510** is shown by itself in FIG. **36**. As shown in FIGS. **34** and **35**, part of the power supply connector **510** projects out of the rear of the control box **500**. That portion includes three pins **511**, **512** and **513**. Pin **512** is a ground pin and pins **511** and **513** are positive pins. The three pins **511**, **512**, **513** contact the three conductors **451**, **452**, **453**.

[0117] As shown in FIG. **36**, the pins **511**, **512**, **513** are part of larger connectors **514**, **516**, **518**. Specifically, pin **511** is an end of connector **514** which is attached with a screw **515** to the rest of the power supply connector **510**. Pin **512** is part of connector **516** attached by a screw **517**. Pin **513** (not shown in FIG. **36**) is part of pin **518** attached by screw **519**. The connectors **514**, **516**, **518** are made of metal and have elasticity such that they act as a spring. In particular, the pins **511**, **512**, **513** are biased downwardly towards the conductors **451**, **451**, **453** when the power supply connector **510** is on the wall panel **50** with the insert **450**. The pins **511**, **512**, **513** may retract upwards into the housing **520** of the power supply connector **510** in response to being pressed on the conductors **451**, **452**, **453**. That is, the pins **511**, **512**, **513** are able to move some and may be pressed upwardly when the power supply connector **510** is in contact with the conductors **451**, **452**, **453**, as is shown in FIGS. **34** and **38**. In this way, the pins **511**, **512**, **513** are biased against the conductors **451**, **452**, **453** to provide good contact between the pins **511**, **512**, **513** and conductors **451**, **452**, **453**. The shape of the connectors **514**, **516**, **518** allows the pins to move in a generally linear fashion when they retract.

[0118] A schematic diagram of the control box **500** is shown in FIG. **52**. As shown in FIG. **32**, the control box **500** includes an input jack **502** for receiving power. In the schematic of FIG. **52**, the power comes from either solar panels **701** or AC power from an electric wall outlet which is converted to DC power with an AC/DC converter **702**. When a user has a wall outlet available, the user may simply run a plug from the wall outlet to the input jack **502**. The AC/DC converter **702** is housed in a block, as is well known, and converts the AC power from the electric wall outlet to **24**V DC power which is provided to the control box **500** at input jack **502**.

[0119] In other instances, solar power from solar panels **701** may be available. The user may choose to use the solar power instead of power from an electrical wall outlet or an electrical wall outlet may not be available. In this instance, a cord provides power from the solar panels **701** to the control box **500** through the input jack **502**. The solar panels **701** are a DC power source.

Accordingly, there is no need for an AC/DC converter **702**, as there is when using power from an AC power source. In the exemplary embodiment, there is only one input jack **502** and only one power source is input to the control box **500** at one time. This is represented by the OR block **703** in the schematic of FIG. **52**.

[0120] Depending upon the number of solar panels and the weather, the solar panels **701** may provide power at different voltage and current levels. As discussed later, the system may operate differently under different power conditions. Accordingly, there is a solar voltage and current measuring circuit **704** which reads the voltage and current from the solar panel and provides that information to the microcontroller **750**.

[0121] The ballast battery **600** is also shown in FIG. **52**. The ballast battery **600** operates at a maximum initial battery voltage of **20** volts. As shown in FIG. **52**, the control box **500** includes a battery voltage measuring circuit **705** for measuring the voltage of the ballast battery **600** and a battery current measuring circuit **706** for measuring the current of the ballast battery **600**. The ballast battery **600** can output power to the system. Additionally, there is charge control circuitry **707** which allows the ballast battery **600** to charge.

[0122] The ballast battery **600** provides a ballast for the system. When the solar panels **701** are producing more power than is needed by the system, excess power can be stored in the ballast battery **600**. That is, the ballast battery **600** can be charged. In instances where the solar panels **701** provide insufficient power for the system, the ballast battery **600** can assist. When no power is provided through the input jack **502** by either an AC power source, solar power source or otherwise, the ballast battery **600** can itself provide DC power to the conductors **451**, **452**, **453** of the wall panel **50** with insert **450**. Typically, the AC power source provides sufficient power for the system that the ballast battery **600** is not needed to provide supplemental power. Additionally, the AC power source typically provides sufficient power to charge the ballast battery **600**. Accordingly, when the AC power source is inputted through the input jack **502**, typically the battery **600** charges. However, it is possible to utilize the AC power source in other ways. For example, the system may be designed to use the ballast battery **600** as a supplemental power source if the AC power source is insufficient. Additionally, AC power source may be used only for powering the insert **450**, and not charging the battery **600**, if there is sufficient load on the insert **450**.

[0123] The control box **500** also includes a SEPIC regulator **710**. As discussed, the power provided by the solar panels **701** is variable. On the other hand, the power provided to the conductors **451**, **452**, **453** needed to run the accessories **550** must be at least a certain voltage. For example, the accessories **550** such as the fan **585** and the light **570** may need **18**V or higher to operate, or operate effectively. Accordingly, if the solar panels **701** are producing power with a voltage of only **10**V, that is insufficient for running the accessories **550** on the wall panel **50** with insert **450**.

[0124] The SEPIC regulator **710** can adjust the power input from the solar panels **701** to adjust the voltage to a suitable level. For example, the SEPIC regulator **710** can adjust the power so that a voltage of **18**V, **20**V, **22**V or **24**V is provided, depending upon the particular need. Since power is the product of voltage and current, increasing the voltage decreases the amount of current that can be provided to the conductors **451**, **452**, **453** by the solar panels **701**. Conversely, decreasing the voltage, increases the amount of current that can be provided to the conductors **451**, **452**, **453**.

[0125] The schematic of FIG. **52** shows the output of power to the conductors **451**, **452**, **453** through the connectors **514**, **516**, **518** and pins **511**, **512**, **513**. In the exemplary embodiment, this connection is provided by wires which attach to the connectors **514**, **516**, **518** at the screws **515**, **517**, **519** and are held in place by the screws **515**, **517**, **519**. In particular, line **716** provides a ground feed and connects with connector **516** to provide a ground input at pin **512**, which makes conductor **453** a ground conductor. Line **715** outputs a positive voltage signal to pins **511** and **513** through connectors **514**, **518**, which make conductors **451** and **452** positive rails.

[0126] The control box **500** also includes a 3V coin cell **718** and a measurement circuit **719** for measuring a voltage of the coin cell **718**. The coin cell **718** may be used to power the

microcontroller **750**. Switching regulator **720** has inputs from the ballast battery **600**, coin cell **718** and either the solar panels **701** or the converted AC power source **702** and can provide power to the microprocessor **750** from any of the sources, as appropriate. The coin cell **718** can provide power when power from the ballast battery **600** or other power sources **701**, **702** are unavailable so that the microprocessor **750** can operate.

[0127] USB port **503** is also shown schematically in FIG. **52**. The USB port **503** outputs at 5V to charge phones, tablets or the like when they are plugged into the port **503**.

[0128] Finally, the control box **500** includes a rail voltage and current measurement circuit **725** which measures the voltage and current on the conductors **451**, **452**, **453**.

[0129] The accessories which receive power through the conductors **451**, **452**, **453** use a power receiving connector **810**, shown in FIG. **37**. The power receiving connector **810** includes a housing **820**. A pair of pins **811** and **812** project out of the housing **820**. The pin **812** is a ground pin which is configured to engage the ground conductor **453**. The pin **811** is a positive pin which is configured to engage one of the positive conductors **451**, **452**. As shown, the power receiving connector **810** includes only two pins. The pin **812** is located so as to always engage the ground conductor **453**. On the other hand, the pin **811** is located so that it can engage either of the positive conductors **451**, **452** depending upon the orientation of the connector **810**. This allows for different orientations of the connector **810** and, thus, the accessories **850**.

[0130] The pins **811** and **812** of the connector **810** have the same structure as the pins of the connector **510**. Pin **811** is an end of a connector **814** which is secured to the connector housing **820** with a screw **815**. Pin **812** is an end of a connector **816** which is secured to the connector housing **820** with screw **817**. The connectors **814** and **816** are made of metal and have elasticity such that they act as a spring. The pins **811**, **812** are biased downwardly towards the conductors **451**, **451**, **453** when the connector **810** is on the wall panel **50** with the insert **450**. The pins **811**, **812** may retract upwards into the housing **820** of the power supply connector **810** in response to being pressed on the conductors **451**, **452**, **453**. That is, the pins **811**, **812** are able to move some and may be pressed upwardly when the connector **810** is in contact with the conductors **451**, **452**, **453**. In this way, the pins **811**, **812** are biased against the conductors **453** and one of **451** and **452** to provide good contact between the pins **811**, **812** and selected conductors **451**, **452**, **453**. The shape of the connectors **814**, **816** allows the pins **811**, **812** to move in a generally linear fashion when they retract.

[0131] FIGS. **39-43** illustrate an attachment connector **760**. As shown in FIGS. **41** and **42**, the attachment connector **760** includes a pair of clips **201**. The clips **201** slidingly attach the connector **760** to the wall panel **50**, as has been discussed. The attachment connector **760** also includes the previously discussed power receiving connector **810**. As shown in FIGS. **41** and **42**, part of the power receiving connector **810** projects out of the attachment connector **760** and the pins **811**, **812** project out of the connector **810** for engagement with the conductors **451**, **452**, **453**.

[0132] As shown in FIGS. **39** and **40**, the attachment connector **760** includes a pair of rails **770** and slots **771** adjacent to the rails **770**. The slots **771** are configured to accept rails from various previously discussed attachments **550** to connect the attachments with the attachment connector **760**. The slots **771** and rails **770** are also configured so that they are identical to rails and slots of a power tool battery pack system, particularly, a power tool battery pack system including the battery pack **600**. In this way, various accessories **550** which can attach to the connector **760** and be provided with electric power through the connector **760** may also be attached directly to a battery pack and powered directly by the battery pack. The battery pack may be a battery pack **600**. Additionally, there may be other battery packs in the system.

[0133] FIG. **43** is an exploded view of the attachment connector **760**. As shown, the attachment connector **760** includes a bottom housing part **761** and a top housing part **762**. As shown in FIGS. **39**, **40** and **43**, the attachment connector **760** additionally has a latch **763** with a latch actuator **764** and a latching portion **765**. The latching portion **765** is configured to latch onto one of the

accessories **550** when the accessory **550** is slid onto the rails **770**. The latching portion **765** thus secures the accessory **550** on the attachment connector **760**. The latch **763** projects out of the top housing part **762** and is biased in a direction towards projecting out of the housing part **762** by a spring or other biasing member (not shown). When a user slides an attachment **550** onto the attachment connector **760**, the latch **763** depresses towards the inside of the connector housing and then snaps back after the attachment **550** reaches a fully engaged position to secure the accessory **550** in place. A user releases the attachment **550** by depressing the latch actuator **764** to depress the latching portion **765**.

[0134] A power receiving connector **810** is housed in the attachment connector **760**. An electrical connector **775** is attached to the power receiving connector **810** through wires **776** and **777**. The electrical connector **775** can be engaged through an electrical connector engagement portion **778**. Thus, electricity can be provided from the power receiving connector **810** out through the attachment connector **760** to an attachment **550**. A holding piece **774** helps to hold the receiving connector **810** in place.

[0135] As shown in FIG. **29**, the attachment connector **760** is attachable to the panel **50** in two orientations. In one orientation, pin **811** engages the lower conductor **452** and in the second orientation the pin **811** engages upper conductor **541**. In either case, pin **812** engages the central ground conductor **450**.

[0136] As shown in FIGS. **44** and **45**, similar to the control box **500**, the battery charger **560** receives a battery pack **600**. The battery charger **560** includes a battery pack receiving portion **505**. The battery pack receiving portion **505** includes rails for guiding the battery pack **600** into place as well as electrical connectors for connecting with the battery pack **600**. The battery pack **600** may be a power tool battery pack that can be used to power a variety of power tools, such as drills, saws, sanders and the like. The battery pack receiving portion **505** may be the same as the receiving portion for power tools which the battery pack **600** may power. The battery pack **600** may be one of the battery packs shown in U.S. Pat. No. 9,406,915.

[0137] As shown in FIG. **44**, similar to the attachment connector **760**, the battery charger **560** includes a pair of clips **201**. The clips **201** slidingly attach the battery charger **560** to the wall panel **50**, as has been discussed. The battery charger **560** also includes the previously discussed power receiving connector **810**. As shown in FIG. **44**, part of the power receiving connector **810** projects out of the battery charger **560** and the pins **811**, **812** project out of the connector **810** for engagement with the conductors **451**, **452**, **453**.

[0138] Similar to the attachment connector **760**, as described above, the battery charger **560** shown in FIG. **44**, is attachable to the panel **50** in two orientations. The light attachment **570** is shown in FIGS. **46-48**. As shown in those

[0139] Figs., the light attachment **570** includes an engagement connector **571**. The engagement connector **571** is configured to engage an attachment connector **760**, as shown in FIG. **29**. When attached to the attachment connector **760**, the light **570** is provided with power through the conductors **451**, **452**, **453**, through the previously discussed mechanisms. The engagement connector **571** is attached to a lantern **573**. The lantern **573** includes a number of LED panels **574** which includes light emitting diodes (LEDs). The lantern **573** also includes a hook **575** for hanging the lantern **573**. The engagement connector **571** could also be engaged with a battery pack such as battery pack **600** to provide power to the light **570** directly from the battery pack **600**.

[0140] The Wi-Fi router **580** is illustrated in FIG. **49**. The Wi-Fi router **580** is configured so that the body **581** of the router **580** engages with the attachment connector **760** so that power is provided to the router **580**. The router **580** includes a pair of antennae **582**. As with the light attachment **570**, the Wi-Fi router **580** may also be also be engaged with a battery pack such as battery pack **600** to provide power to the light **580** directly from the battery pack **600**.

[0141] The fan **585** is shown in FIG. **50**. The fan **585** has a body **586** which engages with the attachment connector **760** to provide power therethrough to the fan **585**. The fan **585** also has an

operating portion **587** which includes enclosed fan blades. The power supplied to the fan **585** powers a motor which rotates fan blades to produce airflow. The fan **585** may also be also be engaged with a battery pack such as battery pack **600** to provide power to the fan **585** directly from the battery pack **600**.

[0142] The security system **590** is shown in FIG. **51**. The security system **590** is provided to prevent theft from the wall panel **50**. The security system **590** includes a pair of clips **200** and a power receiving connector **810** so that it engages directly onto the wall panel **50** rather than through the attachment connector **760**. When the security system **590** is attached to the wall panel **50** via the clips **200** the connector **810** engages the conductors **451**, **452**, **453**, as is previously discussed, to provide power to the security system **590**. The security system **590** includes a motion detector **591**, a key pad **592**, a speaker **593** and a light **594**. It may also include a back-up battery (not shown) so that the security system **590** can operate even if there is no power provided by the control box **500**. A user may set the security system **590** so that it sounds an alarm via the speaker **593** if the motion detector **591** detects motion. The key pad **592** allows a user to enter a code to disable or enable the system **590**. The light **594** may be used an additional alarm indication or for illuminating the key pad **592**.

[0143] In the exemplary embodiment shown in FIG. **29**, the battery charger **560** and the security system **590** are connected directly to the conductors of the insert **450** and the light **570**, Wi-Fi router **580** and fan **590** are connected through the attachment connector **760**. In other embodiments, the different attachments could be directly connected or connected through the attachment connector **760**. For example, in another exemplary embodiment a light could be configured to attached directly to the conductors **451**, **452**, **453**. The light may have a similar design to the light **570** or be a different type of light. Similarly, there may be a security system which attaches to the wall panel **50** and conductors **451**, **452**, **453** through an attachment connector **760**. There may also be additional attachments **550**. For example, there may be attachments which provide a USB or standard electrical outlet. There could be a clock attachment or a heater attachment. All of these attachments **550** may be configured to be attached directly or through an attachment connector **760**.

[0144] FIGS. **56-61** illustrate a fifth wall panel **80**. The fifth wall panel **80** may work with any of the other wall panels **10**, **20**, **30**, **50**. FIGS. **56** and **57** illustrate a perspective view of the fifth wall panel **80** with a hook **85** and latch member **86**. FIGS. **58-61** illustrate various views of the wall panel **80** and hook **85**.

[0145] The wall panel **80** includes a connector portion **11**. The connector portion **11** is able to fit into the connector receiving portions **12**, **12′** previously described in order to connect the wall panel **80** with the various other wall panels. The connector portion **11** also allows the wall panel **80** to connect with other wall panels **80** of the same type, as is shown in FIGS. **58-61**.

[0146] The fifth wall panel **80** also includes a modified connector receiving portion **12″**. The connector receiving portion **12″** is configured to accept both peg boards **60** and the connector portion **11**, as with the other connector receiving portions. As shown, the connector receiving portion **12″** has a peg board opening **13** for receiving a peg board **60** and a panel opening **14″** for receiving the connector portions **11**.

[0147] The fifth wall panel **80** includes a rear side **89** which can be placed against a wall. On the front side the fifth wall panel **80** includes an upper panel hook **16** and a modified lower panel hook **15″**. These panel hooks **15″** and **16** allow for a hook **85** to be attached to the fifth wall panel **80**. The other various hooks described previously may also be attached to the fifth wall panel **80**. The hook **85** includes a latch member **86** with a latch projection **87**. The latch member **86**, along with the latch projection **87**, is rotatable to move from a locking position shown in FIG. **54** to an unlocked position (not shown). In the unlocked position, the latch projection **87** is rotated ninety degrees or more so that it does not overlap with the panel hook **16**. The hook **85** and latch member **86** may be similar to the brackets and retaining members of U.S. Pat. No. 8,528,871, which is incorporated by reference.

[0148] As shown in FIG. **57**, the panel hook **15**″ overlaps with the connector receiving portion **12**″ in a horizontal plane when the fifth wall panel **80** is vertical (e.g., rear surface **89** placed against a vertical wall). In particular, it overlaps with the panel opening **14**″. When a connector portion **11** is in the panel opening **14**″, as shown in FIG. **59**, the panel hook **15**″ overlaps with the connector portion **11**. This provides for a compact design with the features of multiple hooks **15**″, a connector portion **11**, and a connector receiving portion **12**″.
[0149] The wall panel **80** also includes a spacing projection **81**. The spacing projection **81** is adjacent to the connector portion **11** and projects generally perpendicularly to the connector portion **11**. The spacing projection **81** is on the rear side **89** of the panel **80** and abuts a wall when the wall panel **80** is placed against a vertical wall. As shown in FIG. **59**, the spacing projection **81** also serves to abut a portion of an adjacent wall panel **80** when multiple wall panels **80** are connected to one another.
[0150] As shown in FIGS. **58** and **59**, more than one fifth wall panel **80** may be engaged to form a wall panel assembly. Additionally, multiple hooks **85** may be used in the assembly. As shown in FIG. **60**, the fifth wall panels **80** may be flipped so that the connector portions **11** are at the bottom of the wall panels **80**, as shown in FIGS. **58** and **59**, or at the top of the wall panels **80**, as shown in FIGS. **60** and **61**.
[0151] While the invention has been described by way of exemplary embodiments, it is understood that the words which have been used herein are words of description, rather than words of limitation. Changes may be made within the purview of the appended claims, without departing from the scope and spirit of the invention in its broader aspects.

Claims

1. A battery charging system, comprising: at least two conductors running parallel to one another; an AC/DC converter, the AC/DC converter configured to receive an AC input and to provide a DC output to the at least two conductors; and a battery charger, the battery charger (**1**) including a battery pack receiving portion to receive a removable, rechargeable battery pack and (**2**) removably, electrically coupled to the at least two conductors to receive the DC output.
2. The battery charging system, as recited in claim 1, further comprising a power receiving connector, the power receiving connector configured to removably, electrically couple the battery charger to the at least two conductors.
3. The battery charging system, as recited in claim 2, wherein the power receiving connector includes a housing, a pair of pins projecting out of the housing, a first pin of the pair of pins configured to engage a first of the at least two conductors and a second pin of the pair of pins configured to engage a second of the at least two conductors.
4. The battery charging system, as recited in claim 1, further comprising a wall panel and wherein the at least two conductors are affixed to the wall panel.
5. The battery charging system, as recited in claim 4, wherein the battery charger is removably, mechanically coupled to the wall panel.
6. The battery charging system, as recited in claim 5, further comprising a power receiving connector, the power receiving connector configured to removably, mechanically couple the battery charger to the wall panel.
7. The battery charging system, as recited in claim 4, further comprising a series of clips holding the at least two conductors to the wall panel.
8. The battery charging system, as recited in claim 7, wherein the at least two conductors are held fixed between the series of clips and a surface of the wall panel.
9. The battery charging system, as recited in claim 1, wherein the at least two conductors run parallel to one another along a horizontal axis of a wall to which the at least two conductors are coupled and the at least two conductors are vertically spaced from one another.

10. A method of providing a battery charging system, comprising: providing at least two conductors running parallel to one another; providing an AC/DC converter; providing an AC input to the AC/DC converter; providing a DC output from the AC/DC converter to the at least two conductors; providing a battery charger, the battery charger including a battery pack receiving portion to receive a removable, rechargeable battery pack; and removably, electrically coupling the battery charger to the at least two conductors and providing the DC output to the battery charger.

11. The method, as recited in claim 10, further comprising providing a power receiving connector and removably, electrically coupling the power receiving connector to the at least two conductors.

12. The method, as recited in claim 11, wherein the power receiving connector includes a housing and a pair of pins projecting out of the housing and engaging a first pin of the pair of pins with a first of the at least two conductors and a second pin of the pair of pins with a second of the at least two conductors.

13. The method, as recited in claim 12, further comprising providing a wall panel and affixing the at least two conductors to the wall panel.

14. The method, as recited in claim 13, further comprising removably, mechanically coupling the battery charger to the wall panel.

15. The method, as recited in claim 14, further comprising providing a power receiving connector and removably, mechanically coupling the battery charger to the wall panel with the power receiving connector.

16. The method, as recited in claim 13, further comprising providing a series of clips and holding the at least two conductors to the wall panel with the series of clips.

17. The method, as recited in claim 16, wherein the at least two conductors are held fixed between the series of clips and a surface of the wall panel.

18. The method, as recited in claim 10, wherein the at least two conductors are run parallel to one another along a horizontal axis of a wall to which the at least two conductors are coupled and the at least two conductors are vertically spaced from one another.