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(54) **APPARATUS FOR ATTACHING CONTROLS TO MANUAL AND POWER RECLINING CHAIRS**

(71) Applicant: **BILLY JOE GRIGGS, JR.**, PULASKI, TN (US)

(72) Inventor: **BILLY JOE GRIGGS, JR.**, PULASKI, TN (US)

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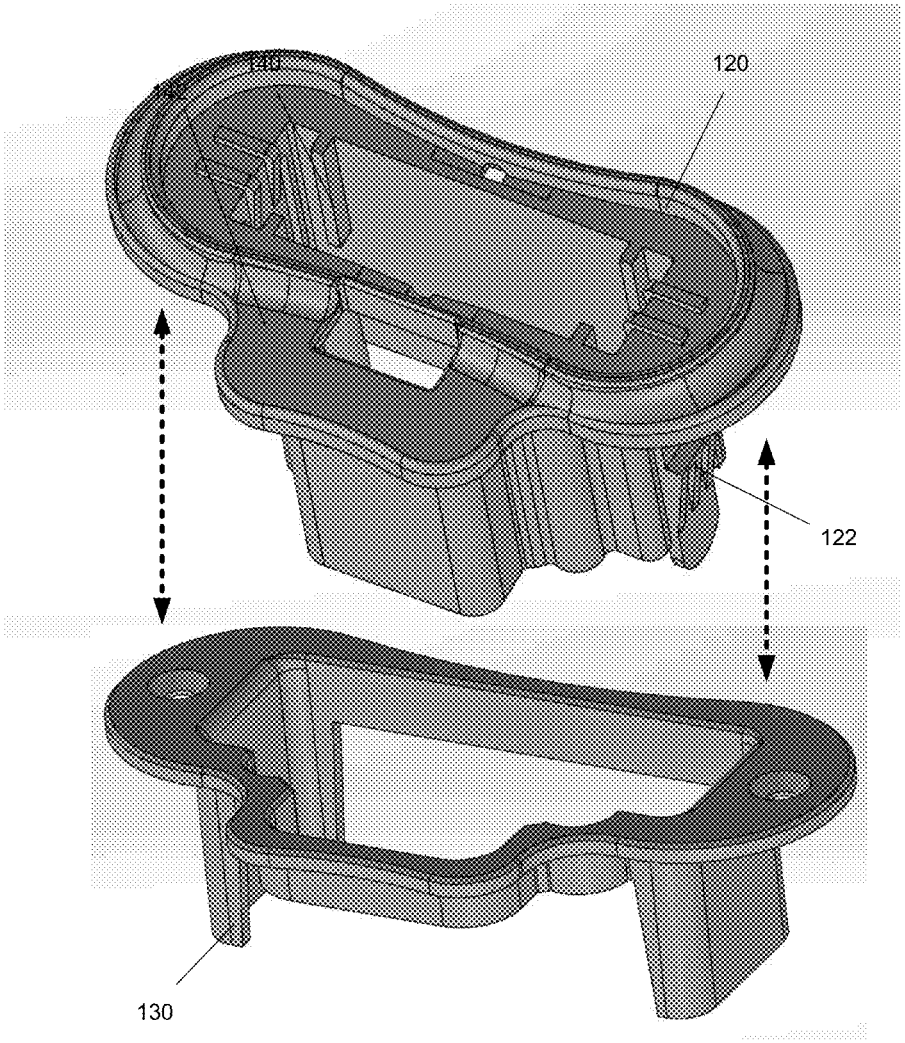
(57) **ABSTRACT**

A system and devices for easily converting a manually-operated reclining chair to a power-operated reclining chair, and vice-versa. A mounting plate or ring is installed on the chair which is adapted to removably attach a lever activator or other device for manual operation or powered electrical activation switch, as desired. The mounting plate in circular form is a ring, and the switch is slidingly and rotatably attached and removed by means of tabs on the switch inserted into slots on the mounting ring. Alternatively, the attachment means comprises one or more snap-fit tabs inserted into corresponding slots on the mounting plate or ring. The switch may include a USB or other power port.



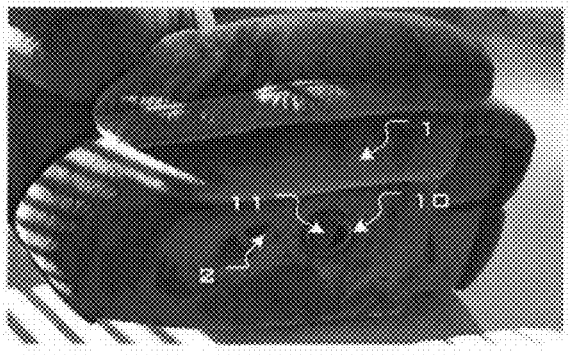


FIG. 1

FIG. 2

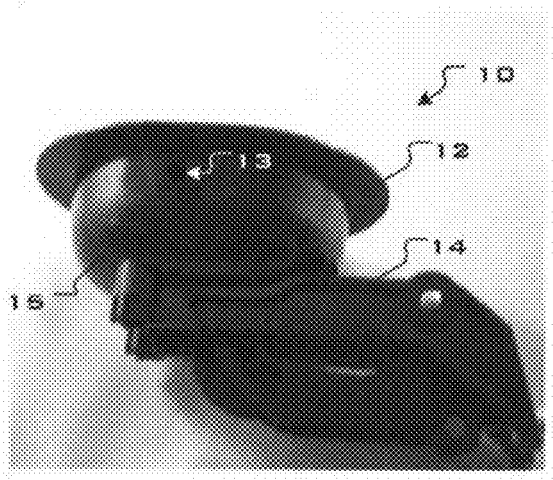


FIG. 3
(PRIOR ART)

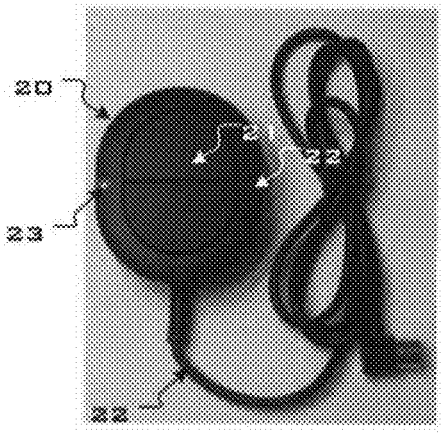


FIG. 4
(PRIOR ART)

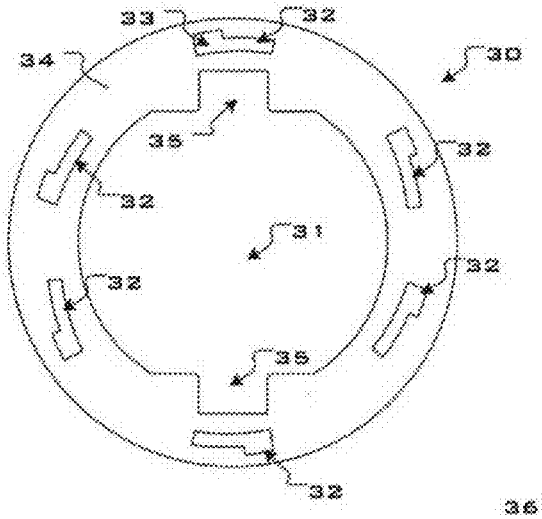


FIG. 5

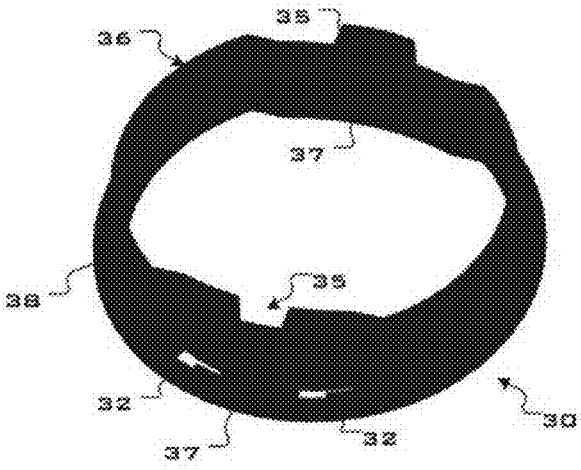


FIG. 6

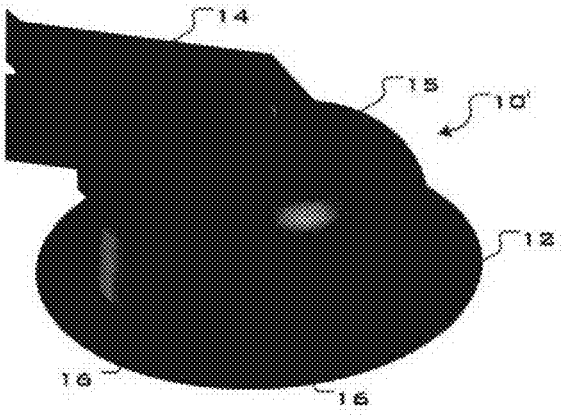


FIG. 7

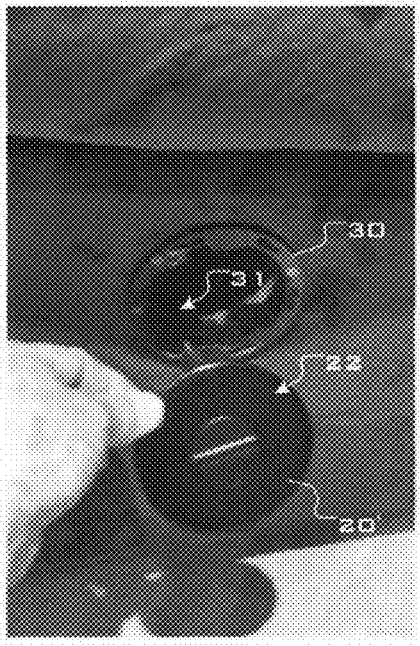


FIG. 8

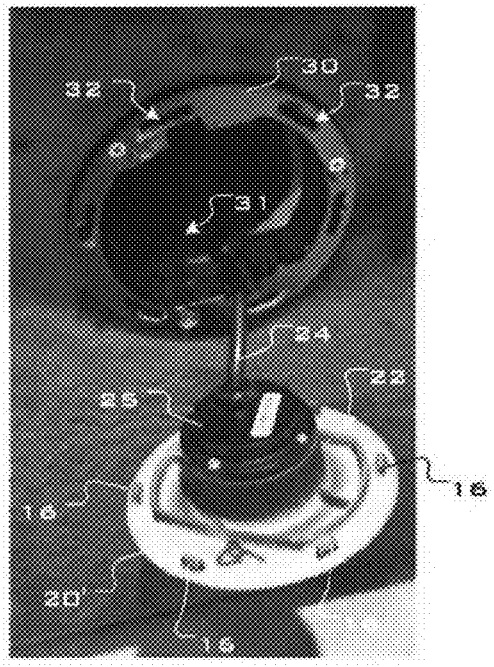


FIG. 9

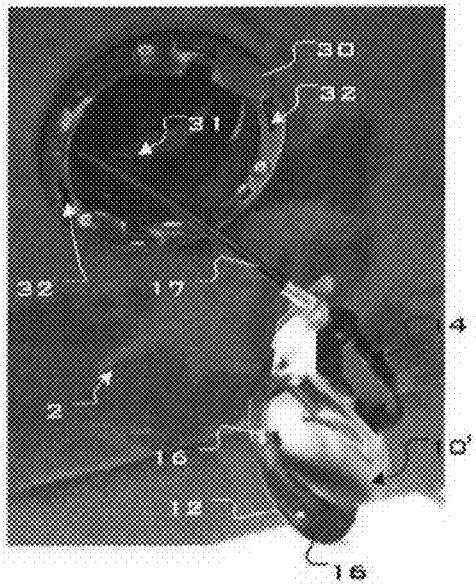
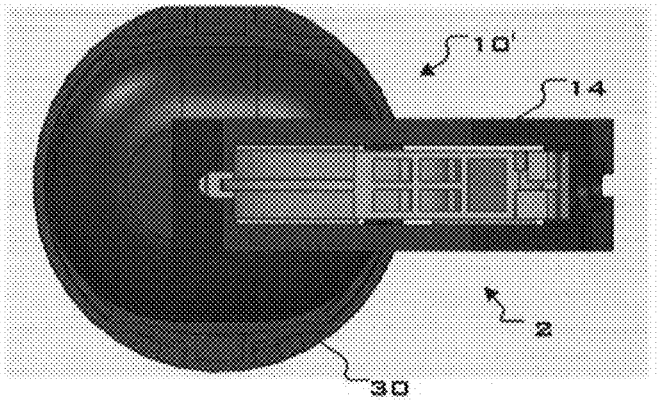


FIG. 10

FIG. 11



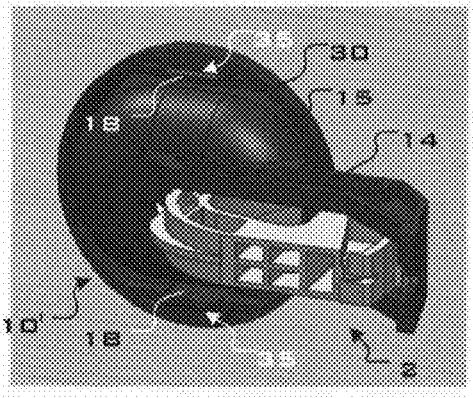
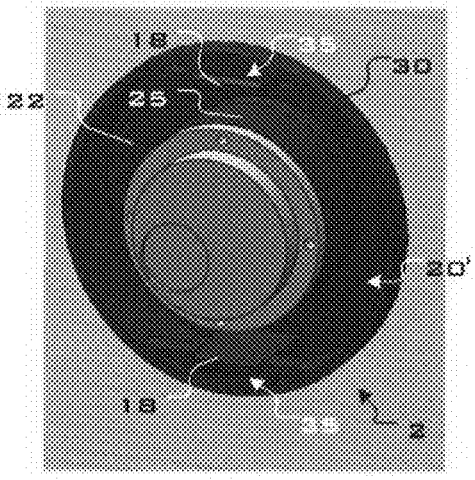


FIG. 12

FIG. 13



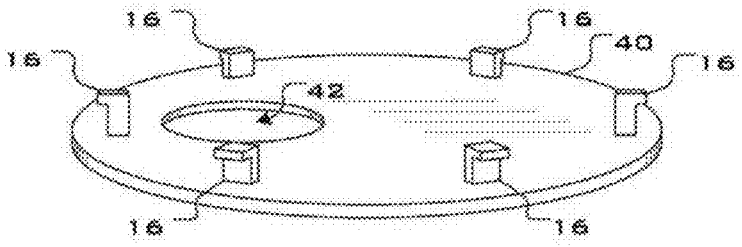


FIG. 14

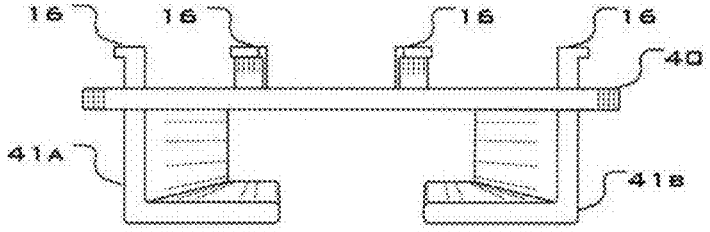


FIG. 15

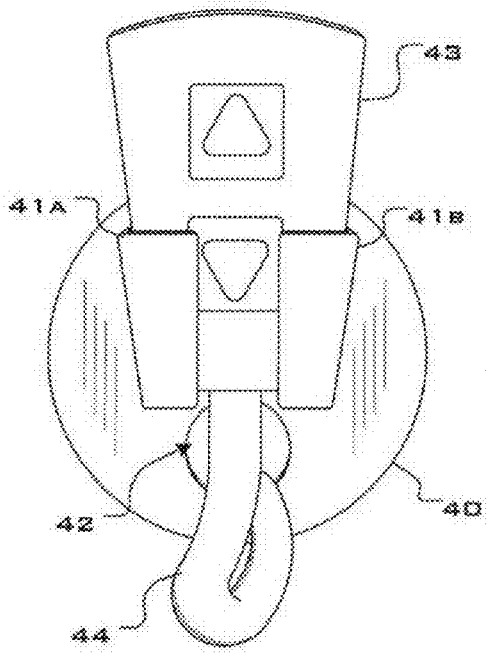


FIG. 16

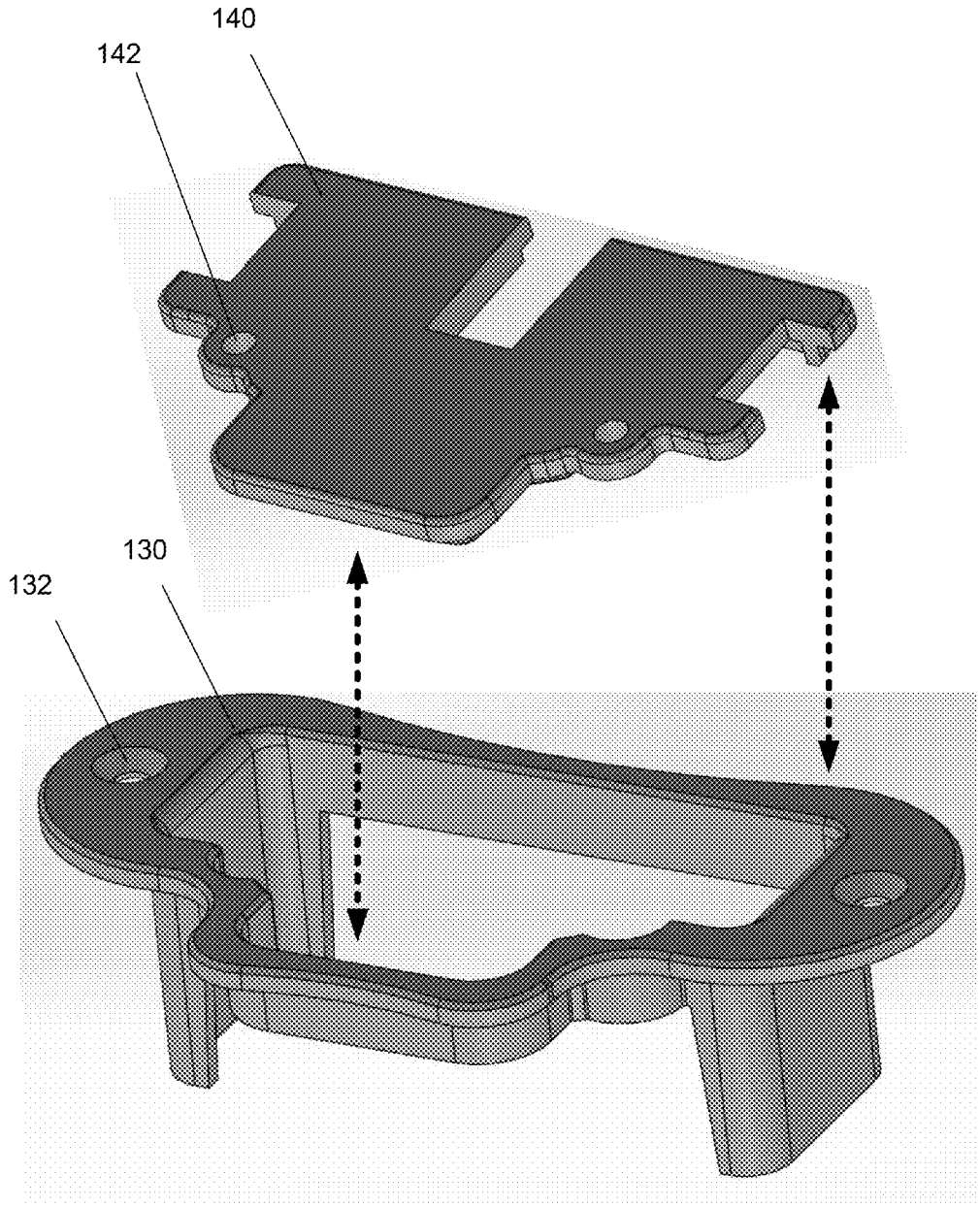


FIG. 17

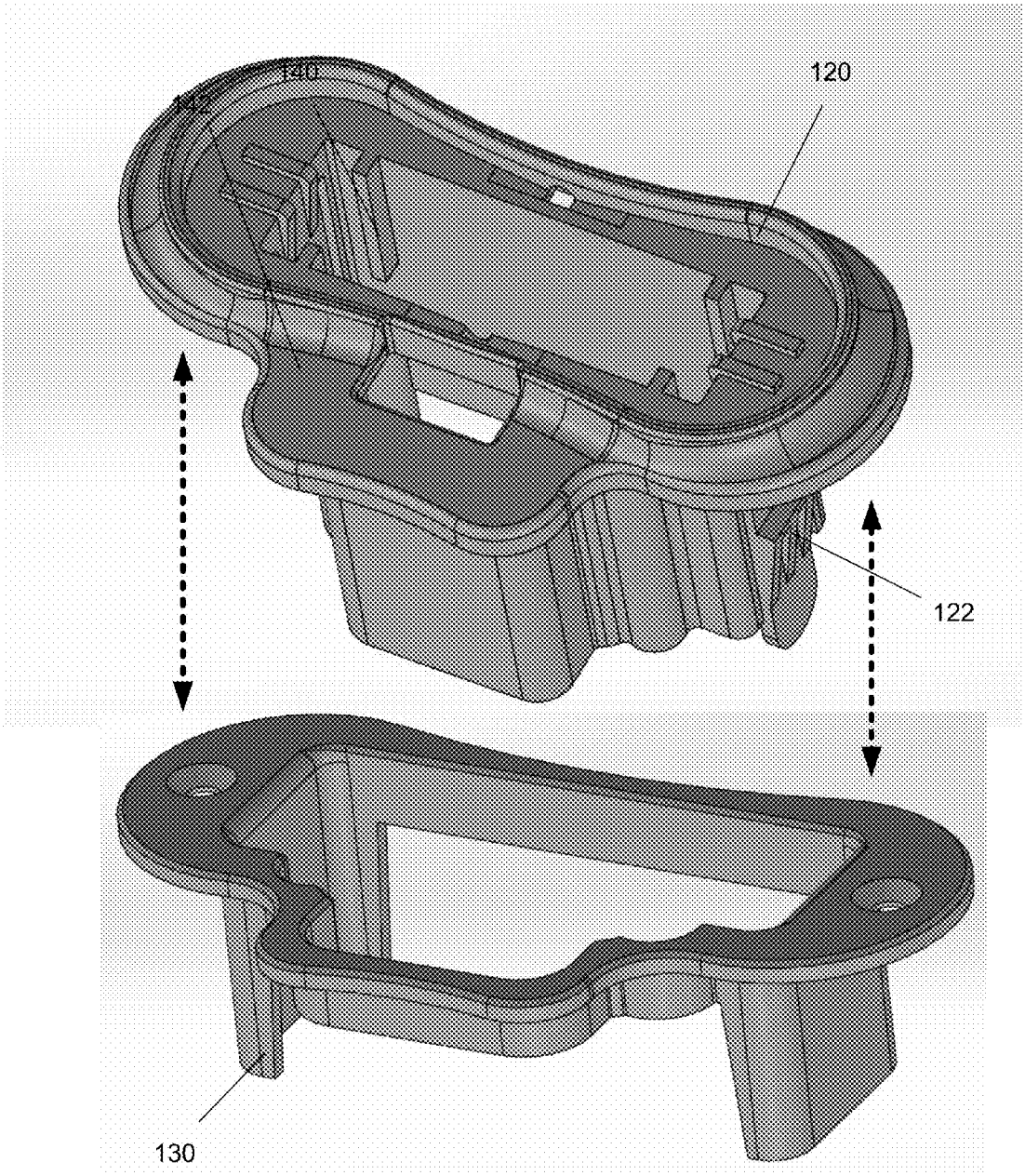


FIG. 18

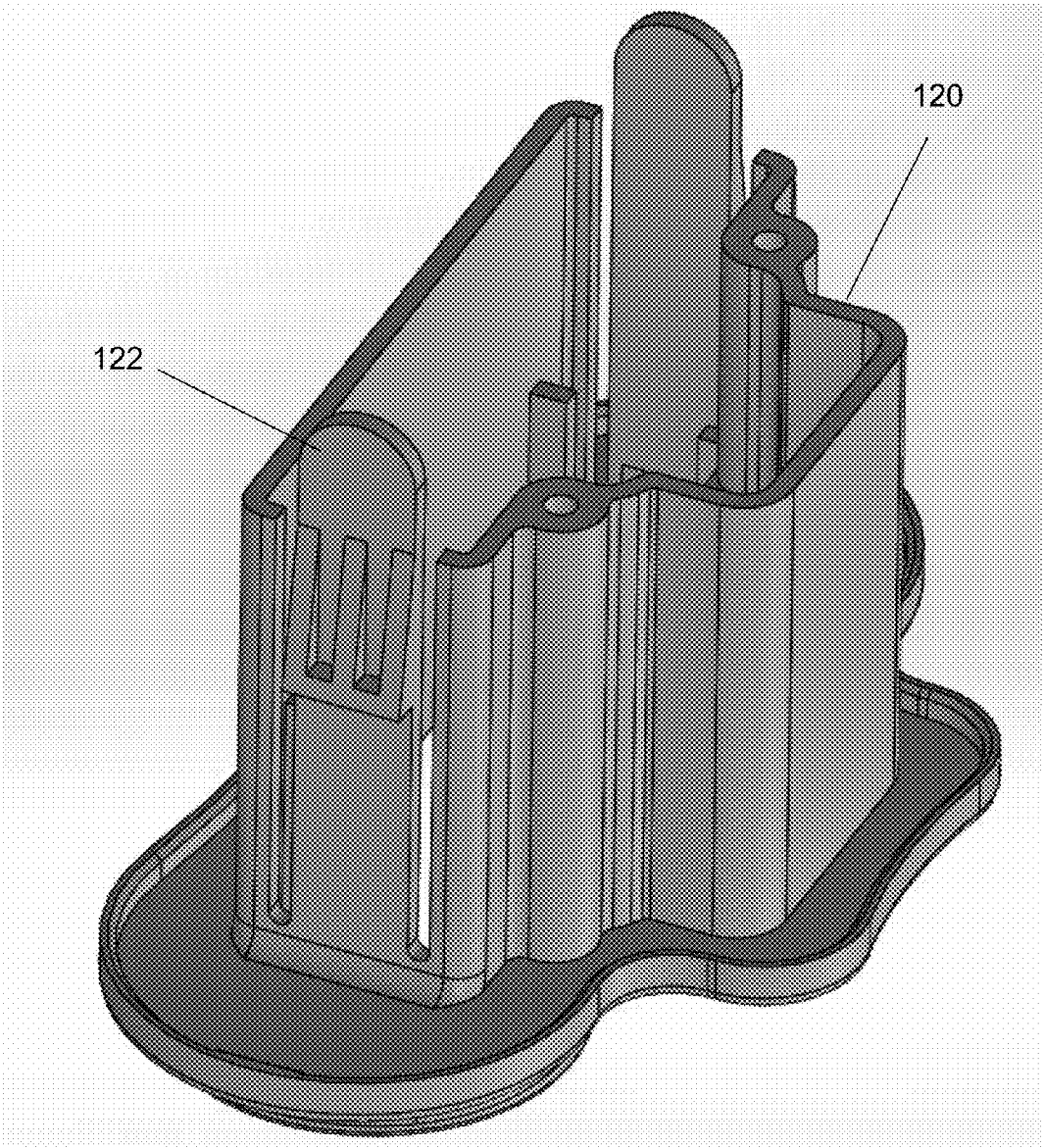


FIG. 19

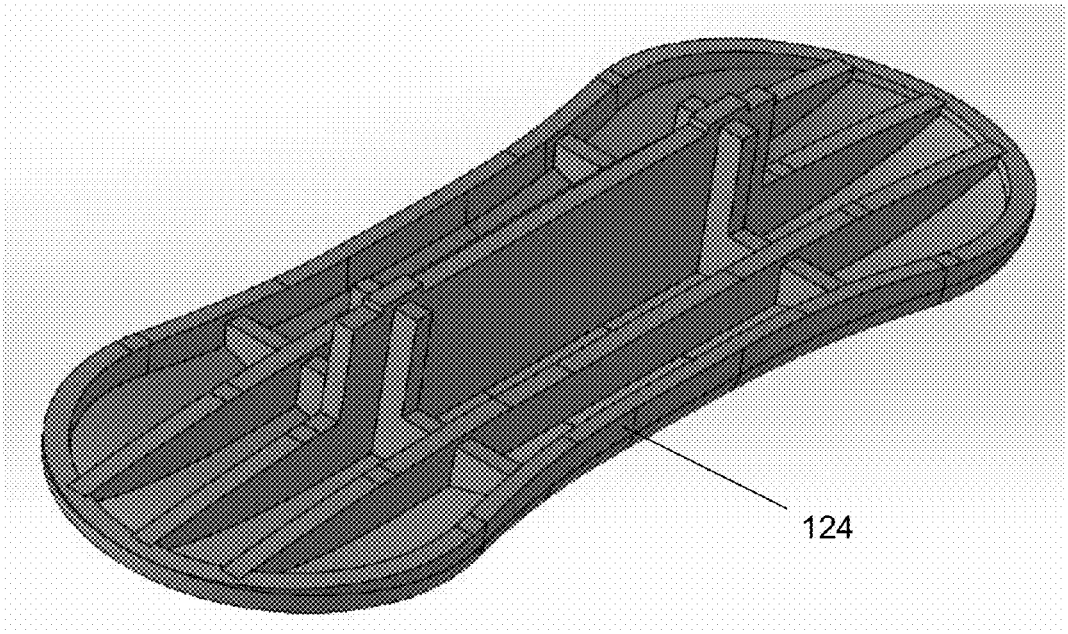


FIG. 20

FIG. 21

FIG. 22

FIG. 23

FIG. 24

APPARATUS FOR ATTACHING CONTROLS TO MANUAL AND POWER RECLINING CHAIRS

[0001] This application claims benefit of and priority to U.S. Provisional Application No. 62/382,803, filed Sep. 2, 2016, and is entitled to that filing date for priority. The specification, figures, and complete disclosure of U.S. Provisional Application No. 62/382,803 are incorporated herein in their entireties by specific reference for all purposes.

FIELD OF INVENTION

[0002] The present invention relates to an apparatus for interchangeably attaching power controls to manual and power reclining chairs. More particularly, the present invention relates to an apparatus for attaching power controls to a manually-operated reclining chair, and vice-versa.

SUMMARY OF INVENTION

[0003] In various embodiments, the present invention comprises a system and devices for easily converting a manually-operated reclining chair to a power-operated reclining chair, and vice-versa. The system comprises a mounting plate or ring installed on the chair which is adapted to removably attach a lever activator or other device for manual operation or powered electrical activation switch, as desired. In one embodiment, the mounting plate is circular (i.e., a ring), and the switch is slidingly and rotatably attached and removed by means of tabs on the switch inserted into slots on the mounting ring. In another embodiment, the attachment means comprises one or more snap-fit tabs inserted into corresponding slots on the mounting plate or ring. With the above-described apparatus, a recliner may be converted from a motorized recliner to a manual recliner, and vice-versa, more easily without the use of tools or fasteners.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. **1** is a view of an exemplary reclining chair having a two-button switch for activating a motorized reclining mechanism.

[0005] FIG. **2** is a view of an exemplary reclining chair having a flapper lever for operating a manually operated reclining mechanism.

[0006] FIG. **3** is a view of a prior art flapper lever mechanism for a manually operating recliner.

[0007] FIG. **4** is a view of a prior art two-button switch for a motorized reclining mechanism.

[0008] FIG. **5** illustrates an exemplary mounting ring for mounting either a flapper lever or a two button switch.

[0009] FIG. **6** is a perspective view of the opposite side of the mounting ring of FIG. **5**.

[0010] FIG. **7** is a flapper lever housing for use with the mounting ring of FIG. **5**.

[0011] FIG. **8** is a view of the mounting ring of FIG. **5** installed in the arm frame of a reclining chair with a two-button switch.

[0012] FIG. **9** is a view of the mounting ring of FIG. **5** installed in the arm frame of a reclining chair with a two-button switch, showing the interior side of the switch.

[0013] FIG. **10** is a view of the mounting ring of FIG. **5** installed in the arm frame of a reclining chair with a flapper lever.

[0014] FIG. **11** is a view from the interior side of a reclining chair arm frame showing a flapper lever activator installed.

[0015] FIG. **12** is a perspective view of the installed flapper lever activator of FIG. **11**.

[0016] FIG. **13** is a perspective view of the interior side of a reclining chair arm frame showing an electrical activation switch for a motorized reclining mechanism.

[0017] FIG. **14** shows the interior side of a mounting plate for a power recliner control wand holder.

[0018] FIG. **15** is a top plan view of the mounting plate of FIG. **14**.

[0019] FIG. **16** depicts the mounting plate of FIGS. **14** and **15** with a power recliner control wand in the holder.

[0020] FIG. **17** shows a perspective view of an alternative embodiment of a mounting plate with cover insert.

[0021] FIG. **18** shows a perspective view of the mounting plate of FIG. **17** with an alternative embodiment of an insertable electrical activation switch.

[0022] FIG. **19** is a bottom perspective view of the electrical activation switch of FIG. **18**.

[0023] FIG. **20** is a bottom perspective view of the switch paddle for the electrical activation switch of FIG. **18**.

[0024] FIG. **21** is a top perspective view of the electrical activation switch of FIG. **18** with the switch paddle installed.

[0025] FIG. **22** is a view of the electrical activation switch of FIG. **21** being inserted into the mounting plate of FIG. **17**.

[0026] FIG. **23** is a view of the electrical activation switch of FIG. **21** partially inserted into the mounting plate of FIG. **17**.

[0027] FIG. **24** is a view of the electrical activation switch of FIG. **21** fully inserted into the mounting plate of FIG. **17**.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0028] The various embodiments of the apparatus and their advantages are best understood by referring to FIGS. **1** through **16** of the drawings. The elements of the drawings are not necessarily to scale. Emphasis instead being placed upon clearly illustrating the novel features and principles of operation. Throughout the drawings, like numerals are used for like and corresponding parts of the various drawings.

[0029] Furthermore, reference in the specification to "an embodiment," "one embodiment," "various embodiments," or any variant thereof means that a particular feature or aspect described in conjunction with the particular embodiment is included in at least one embodiment. Thus, the appearance of the phrases "in one embodiment," "in another embodiment," or variations thereof in various places throughout the specification are not necessarily all referring to its respective embodiment.

[0030] FIG. **1** shows a reclining chair **1** having a flapper lever activator **10** installed in a side frame **2** of the chair **1**. Manually pulling the flapper lever **11** outward from the chair side **2** activates the reclining mechanism (not shown) inside the chair **1** to extend a footrest and recline the chair's seat back (not shown). Similarly, FIG. **2** shows a motorized reclining chair **1'** having an electrical activation switch **20** installed in the side frame **2**. Referring to FIGS. **3** and **4**, the flapper lever activator **10** of the prior art comprises a cup housing **15** with a circumferential flange **12** that supports the flapper lever **11** which is connected to lever mechanism **14**. When installed the cup housing **15** and lever mechanism **14** are disposed within the interior of the side frame **2**. One end

of a cable (FIG. **10**: **17**) is attached to the lever mechanism **14** and the opposite end of the cable **17** is attached to the recliner mechanism. The flapper lever activator **10** is installed in the side frame **2** by screws that are inserted through screw holes **13** defined in the wall of the cup housing **15**. Likewise, when the conventional electrical activation switch **20** of the prior art is installed it is also screwed into the side frame **2** of the chair **1** by inserting screws through screw holes **23** defined in a flange of the housing supporting the switches **21** and switch control mechanism housing (FIG. **13**: **25**) that, when the activation switch is installed, is disposed within the interior or the chair **1**. An electrical cord **22** leads from the control mechanism housing **25** to the motor actuator (not shown) that moves the reclining mechanism (not shown).

[0031] Referring now to FIGS. **5** and **6**, an exemplary mounting plate or ring **30** for installing either a flapper lever activator **10** or an electrical activation switch **20** is shown with a face plate **34** defining an opening **31**. The mounting plate may be circular, oval, rectilinear, oblong, polygonal, or other shape. The face plate **34** may be formed from a circular flange **38** that extends radially outward from a ring wall **36**. The face plate **34** includes a plurality of arcuate mounting s lots **32** defined through the plate **34** and are circumferentially disposed about the plate **34**. The slots **32** preferably include a notch portion **33**. In one embodiment, two or more screw holes **37** are defined through the ring wall **36** for mounting the ring **30** in a hole defined within the side frame **2**. In other embodiments, screw holes **37** for attached the mounting ring **30** to the side frame **2** may be defined through the face plate **34**.

[0032] An exemplary flapper lever activator **10'** for use with the mounting ring **30** is illustrated in FIG. **7**, where the cup housing **15** comprises a circular flange **12** extending radially outward from the cup housing **15**. The figure shows the interior side, with respect to the chair on which the activator is installed, of the activator **10'** and particularly the interiorly disposed face of the flange **12**. In this embodiment, the flapper lever activator **10'** includes a plurality of prongs **16** extending perpendicularly from the interior face of the flange **12** and disposed circumferentially about the interior face of the flange **12**. Preferably the number and positioning of the prongs **16** corresponds the number of positioning of the slots **32** in the face plate **34** of the mounting ring **30**. As seen in the figure, the prongs preferably are formed with a catch defining a ledge.

[0033] Referring to FIGS. **8** and **9**, an exemplary power or electrical activation switch **20'** for a motorized recliner is shown with a circular flange **24** that extends radially outward from a switch control mechanism housing **25**. The interior face of the circular flange **24** includes a plurality of prongs **16** disposed circumferentially about the interior face of the flange **24** and extending perpendicularly therefrom. The number and positioning of the prongs **16** correspond to the number and positioning of the arcuate slots in the face plate **34** of the mounting ring **30**.

[0034] The mounting ring **30** is attached to the side frame **2** of the chair **1** by first forming an opening within the side frame **2** that opens to the interior of the chair **1** and dimensioned to receive the ring wall portion **36** of the mounting ring **30** with the flange **38** seated against the exterior surface of the side frame **2**. The mounting ring **30** is secured to the side frame **2** with screws inserted through the screw holes **37**.

[0035] When installing either the flapper lever activator **10'** or the electrical activation switch **20'**, the respective housing structures **15**, **25** are then inserted into the opening **31** of the mounting ring **30**, and rotated such that the prongs **16** extending from the interior surfaces of the respective circular flanges **12**, **22** rotationally align with the notches **33** of the arcuate slots **32**. Corresponding prongs **16** are then inserted into corresponding notches **33** in the face plate **34** such that the catches of the prongs **16** extend beyond the interior surface of the face plate **34**. The activator/activation switch **10'**,**20'** is rotated so that the prongs **16** rotate away from the notches **33** within the arcuate slots **32** and the ledges formed by the catches engage the interior surface of the plate **34**, locking the activator **10'** or switch **20'** against the mounting ring **30**. The flapper lever activator **10'** or electrical switch **20'** may be removed by rotating the flange **12**, **22** in the opposite direction and disengaging the catches from the interior surface of the face plate **34** until the prongs **16** are disposed within the notches **33** freeing the catches and allowing the activator **10'** or switch **20'** to be withdrawn from the ring **30**.

[0036] In another embodiment, the mounting ring **30** is formed with two or more notches **35** defined in the face plate **34** and opening to the ring wall **36**. As shown in FIGS. **11** through **13**, flanges **12**, **22** include tabs **18** extending perpendicularly from the respective interior surfaces of the flanges **12**, **22**. The tabs are formed with radially outward-pointing catches that comprise ledges. In this embodiment, to install manual activator **10'** or an electrical activation switch **20'**, the tabs **18** are inserted into the notches **35**. The tabs **18** comprise a resilient member that may be slightly deformed radially inward but the catches are biased radially outward. When the catches travel past the edge of the ring wall **36** facing the interior of the chair **1**, the ledges engage the interior edges of the ring wall **36**, locking the respective manual activator **10'** or electrical switch **20'** to the mounting ring **30**. To remove, the tabs **18** may be pressed radially inwardly so that the catches disengage the ring wall **36** and the activator **10'** or switch **20'** may be withdrawn from the mounting ring **30**.

[0037] It will be appreciated that with the above-described apparatus, a recliner may be converted from a motorized recliner to a manual recliner more easily without the use of tools or fasteners.

[0038] FIG. **14** depicts yet another embodiment comprising a mounting plate **40** having a plurality of prongs **16** extending perpendicularly from an interior surface of the plate **40** and disposed circumferentially toward the periphery of the plate **40**. The number and positioning of the prongs **16** correspond to the number and positioning of the arcuate slots **32** in the face plate **34** of the mounting ring **30**. The plate **40** is configured with a hole defined through it. The exterior surface of the plate **40** is formed with a holder **41** dimensioned to receive a power recliner control wand **43**. The holder **41** may comprise two opposing brackets **41***a, b* extending outward from the exterior surface of the plate **40**.

[0039] It will be appreciated that a power recliner may then be easily converting from one with an electrical activation switch **10'** to one employing a control wand **43** by removing the switch assembly **10'** as discussed above, and disconnecting the switch lead **22**. The control wand lead **44** is inserted through the hole in the holder mounting plate **40** and then through the opening **31** in the mounting ring **30** and connected to power recliner motor. The mounting plate **40** is

installed in the same manner as discussed above and the control wand **43** may be seated in the holder **41**. It will also be appreciated that a manual recliner may also be easily converted to a power recliner controlled by a control wand **43** in a similar manner.

[0040] FIGS. **17-24** show an alternative embodiment of an electrical activation switch **120** (with a rocker switch paddle **124**) and mounting plate **130**. The switch may comprise one or more USB or power ports **150**. The mounting plate **132** is adapted to fit inside a corresponding opening in the side frame **2** that opens to the interior of the chair **1**, as described above. The mounting plate has a plurality of holes **132** for securing the plate to the chair by screws or other fastening means known in the art. A cover insert **140** may be removably affixed to the mounting plate (by snap fit or by screws or bolts inserted through mounting holes **142**).

[0041] The electrical activation switch **120** snap-fits into the mounting plate by means of two or more snap-fit tabs **122** along the sides of the switch, which snap into corresponding slots in the mounting plate. Conversely, the snap-fit tabs may be positioned on the mounting plate, with corresponding slots on the switch.

[0042] As described above and shown in the associated drawings, the present invention comprises an apparatus for attaching controls to manual and power reclining chairs. While particular embodiments have been described, it will be understood, however, that any invention appertaining to the apparatus described is not limited thereto, since modifications may be made by those skilled in the art, particularly in light of the foregoing teachings. Thus, it should be understood that the embodiments and examples described herein have been chosen and described in order to best illustrate the principles of the invention and its practical applications to thereby enable one of ordinary skill in the art to best utilize the invention in various embodiments and with various modifications as are suited for particular uses contemplated. Even though specific embodiments of this invention have been described, they are not to be taken as exhaustive. There are several variations that will be apparent to those skilled in the art.

What is claimed is:

1. A system for conversion of recliner chairs, comprising:

a mounting plate mounted on a side of a recliner chair;

an electrical activation switch;

attachment means to removably attach and detach the electrical activation switch from the mounting plate without the use of tools or separate fasteners;

an activation lever; and

attachment means to removably attach and detach the activation lever from the mounting plate without the use of tools or separate fasteners.

2. The system of claim **1**, wherein the mounting plate is a ring.

3. The system of claim **1**, wherein the mounting plate is an oval.

4. The system of claim **1**, wherein the mounting plate is rectilinear or oblong.

5. The system of claim **1**, wherein the electrical activation switch attachment means and the activation lever attachment means are the same.

6. The system of claim **5**, wherein the attachment means comprises a plurality of slots positioned circumferentially on the mounting plate, and a plurality of corresponding prongs positioned on the electrical activation switch or activation lever.

7. The system of claim **5**, wherein the attachment means comprises a plurality of prongs positioned circumferentially on the mounting plate, and a plurality of corresponding slots positioned on the electrical activation switch or activation lever.

8. The system of claim **5**, wherein the attachment means comprises at least one snap-fit slot positioned on the mounting plate, and at least one corresponding snap-fit tab positioned on a side or bottom of the electrical activation switch or activation lever.

9. The system of claim **5**, wherein the attachment means comprises at least one snap-fit tab positioned on the mounting plate, and at least one corresponding snap-fit slot positioned on a side or bottom of the electrical activation switch or activation lever.

10. The system of claim **5**, wherein the attachment means comprises two snap-fit slots positioned on the mounting plate, and two corresponding snap-fit tabs positioned on opposing sides of the electrical activation switch or activation lever.

11. The system of claim **1**, further comprising an electrical control cord adapted to be attached to the electrical activation switch.

12. The system of claim **1**, wherein said electrical activation switch further comprises a USB port.

13. The system of claim **1**, further comprising a power recliner control wand holder.

14. A system for conversion of recliner chairs, comprising:

a mounting plate mounted on a side of a recliner chair;

an electrical activation switch;

attachment means to removably attach and detach the electrical activation switch from the mounting plate without the use of tools or separate fasteners.

* * * * *