

Description

Field of the Invention

This invention relates to multi-cell rechargeable batteries and, more particularly, to sealed batteries employing a mono-block container for housing a plurality of cells. Specifically, the present invention relates to a multi-purpose, integral spacer and cover for multi-cell rechargeable batteries.

Description of the Prior Art

A variety of configurations are well known for multi-cell rechargeable battery housings. Such housings have taken a number of different shapes and have included housing structures for cylindrically shaped cells. Typically, the cells are fitted into mono-block containers having an outer parallelepiped shape, such as illustrated in U.S. Patent Nos. 2,543,106, 2,836,642, 4,346,151 and 4,592,972. In such mono-block housings adapted for cylindrical cells, the housing top or lid is generally positioned after the cells and electrolyte are introduced into the housing. The lid is then sealed, and the underside of the lid has appropriate inter-connecting members for the various cells contained within the housing. These inter-connecting members are introduced to the outside through two top terminal posts which protrude through the lid. The above mentioned U.S. Patents as well as U.S. Patent No. 4,383,011 illustrate a variety of lid structures available for such battery housings.

Certain battery applications require that the battery terminals preferably be positioned along the side portion of the battery. In order to avoid the necessity of having to utilize special adapters to use a top terminal battery in such side terminal applications, certain battery designs have become available which include a pair of top terminal posts as well as a pair of side terminal posts, thereby enabling the battery to be readily utilized in either type of connection application. This is particularly true in automobile battery applications. Unfortunately, existing battery designs do not include any type of device to protect the top terminal posts from damage during transportation or inadvertent shorting when the side terminal posts are being utilized. Moreover, it is not infrequent to require the elevation of batteries when placed within certain automobile applications. Such applications constantly require on-the-spot adjustments with whatever materials are available to raise or elevate the battery relative to the housing holder within the automobile. Thus, there is a need for battery housing structures which include some sort of terminal protection as well as some sort of spacing device as optional features.

Summary of the Invention

The present invention refers to a device for covering a multi-cell rechargeable battery and to a combination

spacer/cover device, a cover assembly, a battery housing and a handle mechanism for a multi-cell rechargeable battery as claimed in appended claims 1, 9, 16, 28 and 33.

A device is disclosed for covering a multi-cell rechargeable battery having top and bottom surfaces and upper terminal connections projecting from the top surface, and for use as a mounting spacer for the battery. The device includes a cover sized and shaped to shield the top surface of the battery when attached thereto including a plate having upper and lower surfaces with apertures disposed therein to provide limited access to the upper terminal connections. A mechanism is provided for spacing the plate from the battery top surface to recess the upper terminal connections relative to the surface of the plate for protection against surface contact and electrical shorting, the spacing mechanism being integral with the plate. Apparatus is further provided for selectively attaching the cover to the battery to protect the battery top surface and upper terminal connections from damage from objects placed on the plate. The attachment apparatus is further adapted for selectively securing the cover to the bottom surface of the battery to function as a spacer for battery mounting. Finally, a mechanism is provided for permitting testing of the electrical condition of the battery without removing the cover.

Brief Description of the Drawings

The accompanying drawings which are incorporated in and form a part of the specification illustrate preferred embodiments of the present invention and together with the description, serve to explain the principles of the invention. In the drawings:

Fig. 1 is a top plan view of a battery cover member constructed in accordance with the present invention;

Fig. 2 is a bottom plan view of the cover member of Fig. 1;

Fig. 3 is a side plan view taken substantially along line 3-3 of Fig. 1;

Fig. 4 is a front perspective view, with some parts exploded, of a battery including the cover assembly constructed in accordance with the present invention;

Fig. 5 is a front perspective view, with one part exploded, of the battery illustrated in Fig. 4 having the lid portion attached to the battery housing;

Fig. 6 is a front perspective view of the battery illustrated in Fig. 4 with all components assembled and the cover member positioned over the top surface of the battery;

Fig. 7 is a front perspective view of the battery similar to that illustrated in Fig. 6 but illustrating the cover member positioned as a spacer at the bottom surface of the battery;

Fig. 8 is a side plan view, with some parts in section, of the battery illustrated in Fig. 6;

Fig. 9 is a front perspective view of the battery illustrated in Fig. 6 with a handle assembly positioned for attachment thereto;

Fig. 10 is a front perspective view similar to that of Fig. 9 but illustrating the handle assembly in a fully assembled position for carrying; and

Fig. 11 is a front perspective view of the battery illustrated in Fig. 10 but showing the handle assembly in a partially disengaged position for removal or attachment of the handle assembly to the battery.

Detailed Description of the Preferred Embodiments

Rechargeable batteries are generally stacked during shipment and are therefore subject to battery terminal damage unless some sort of protector or spacer device is utilized between stacked batteries. Moreover, rechargeable, sealed batteries are being designed having both top terminal connections as well as side terminal connections to meet multiple use requirements. Such design arrangements, however, can lead to an electrical shorting problem during use of the battery when one set of terminals is being used and the other is not, unless the unused terminals are somehow protected. The present invention is a multi-purpose, integral spacer and cover for such a battery, which cover/spacer acts as a spacer member in certain battery mounting applications as well as a protector for the battery top terminals during shipment and in certain battery applications.

Referring now to Figs. 1-4, a preferred unitary body 10 is preferably in the form of a cover member 12 having a top plate 13 with an upper planer surface 14, a bottom planer surface 16, oppositely disposed end portions 18, 20, and oppositely disposed side portions 22, 24. A plurality of structural support members 26 are preferably in the form of a web of interconnected ribs projecting downwardly from the bottom surface 16 of the plate 13 and are interconnected with each other as well as connected to the end members 18, 20 and the side members 22, 24. The web of structural support members 26 provide support and strength to the cover member 12 when in position on top of or beneath a battery housing as discussed in greater detail below.

The cover member 12 and components thereof may be constructed from any desired material, preferably nonconductive, and more preferably a plastic polyvinyl chloride-type of material. Moreover, the cover member 12 and components thereof are preferably comprised of

a unitary, single molded article of manufacture for reduced cost and increased strength, although cover member 12 may alternatively be constructed from various component parts joined together into one structure.

The cover member 12 preferably includes an elongated recessed area 28 disposed along the top surface 14 of the plate 13. The recessed area 28 is preferably positioned along the entire length of the plate 13 substantially along the center line thereof and also defines end recess portions 30 along the end surfaces 18, 20 of the cover 12. This arrangement is more clearly illustrated in Figs. 4-6. An enlarged opening 31 is also preferably provided in the plate 13 adjacent a section of the recessed portion 28 to define part of the below mentioned nesting area as well as to permit viewing of the battery lid and to form a reinforced side member 29. The recessed portion 28 and opening 31 are provided for the nesting of a handle during stacking of the battery housings as described in greater detail below.

The plate 13 also includes a pair of apertures 32, 34 which are positioned for alignment with the top terminal portions of the battery housing assembly to be described below. Slots or channels 33, 35 are also provided in the plate 13 extending outwardly from the circumferential edge of the apertures 30, 32, respectively. The apertures 32, 34 and channels 33, 35 are sized so as to provide limited access, if desired, to the terminals. For easy identification, lettering indicating positive and negative are provided on the top surface 14 proximate each of the apertures 32, 34. Small apertures 36, 38 are also optionally provided as air vents to the venting devices which may be present in the lid structure of the battery housing.

The attachment of the cover 12 to the top of a battery assembly housing 40 is preferably provided by two sets of releasable attachment mechanisms 42, 44 and 46, 48. The attachment mechanisms 42, 44 and 46, 48 are arranged to secure the cover to the battery housing 40 whether the cover 12 is in its top cover position as shown in Fig. 6 or its bottom spacer position as shown in Fig. 7. While any appropriate and desired releasable attachment mechanism may be utilized, each of the attachment mechanisms 42, 44 and 46, 48 are preferably in the form of a pair of hook or catch members 42, 44 and 46, 48. Each of the hook members 42, 44 includes a resilient arm member 50 extending from the cover 12 and an end clip or catch 52 cantilevered at the end of the arm member 50. Likewise, each of the attachment members 46, 48 includes a resilient arm member 54 extending downwardly from the cover 12 and an end clip or catch 56 cantilevered from the free end of the arm 54. Each of the attachment members 42, 44 are spaced from each other along the side 24 of the cover 12, and each of the attachment members 46, 48 are likewise spaced from each other along the side 22 of the cover 12 so as to provide for a plurality of releasable attachment points between the cover 12 and the housing 40.

The plate 13 of the cover 12 includes a plurality of paired openings 58, 60, 62, 64 in the surface 14 thereof

immediately above and in vertical alignment with the attachment members 42, 44 and 46, 48. The openings 58-64 permit access to the catches 52, 56 of the paired attachment members 42, 44 and 46, 48 in order to release them from their latched position as described below.

Referring more particularly, now, to Figs. 4-8, a typical battery housing 40 is preferably in the form of a mono-block container 66 having sidewall portions 68, 70 and end wall portions 72, 74. In a preferred form, the housing in 66 is sized and shaped to receive a plurality of cylindrical cells 76 which merge together at the sidewall portions 68, 70 and end wall portion 72, 74 along vertically aligned, tangential contact points between respective cells to perform a plurality of nip areas 78 along the exterior side walls 68, 70 and end walls 72, 74 of the battery casing 66. A bottom plate or portion 80 is provided to the casing 66, and a housing lid 82 is also provided for forming the top of the housing 66.

The lid 82 is preferably in the form of a single, molded member 84 having top terminal connection posts 86, 88 projecting upwardly therefrom. In addition, vent members 90, 92 are provided for assisting in venting the housing 66. Side terminal posts 94, 96 are provided and preferably project vertically downwardly from the edge of the singular member 84 so as to nest in the nip areas 78 in the sidewall 68 of the housing 66 when the lid 82 is positioned on the housing 66. The positive side terminal 94 is connected to the positive top terminal post 86 by way of a metal connection member (not illustrated) which is embedded within a protective lid cover portion 98 which is preferably integrally molded into the member 84. Likewise, the negative side terminal connection post 96 is connected to the negative top terminal post 88 by way of a conductive member (not illustrated) which is embedded within a protective lid connection member 100 integrally molded into the member 84. In this manner, shorting of the battery assembly 40 is prevented due to the non-conductive covering of the innerconnection members between the side terminal posts 94, 96 and the top terminal posts 86, 88.

In addition, an exposed or open area in the form of an electrical contact 102 is provided along the base of the positive top terminal post 86, and a similar exposed or open area in the form of an electrical contact 104 is provided along the base of the top negative terminal post 88 in order to permit selective electrical testing of the battery assembly 40 without removal of the cover 12 by access through the aperture extensions 33, 35 of the apertures 32, 34 in the cover 12. In order to achieve such testing, a probe (not illustrated) of standard design may be inserted through the extensions 33, 35 and brought into contact with the electrical contact areas 102, 104, yet access to the terminal posts 86, 88 and the contacts 102, 104 is limited by the cover 12 to prevent inadvertent contact and electrical shorting.

Referring particularly to Fig. 5, the positioning and placement of the lid 82 onto the battery housing assem-

bly 40 is illustrated more clearly. In a preferred form, top terminal post caps 106 and 108 may be placed over the terminal posts 86, 88 prior to attachment of the cover 12 for storage or transportation purposes and whenever the side terminal posts 94, 96 are utilized. The caps 106, 108 are sized and shaped to permit access to the electrical contacts 102, 104 when in position over the posts 86, 88. Likewise, side terminal post caps 110, 112 are removably securable to the side terminal posts 94, 96 in order to prevent inadvertent shorting of the battery housing 40 during use of top terminal posts 86, 88 as well as to prevent damage during transportation of the housing 40.

Referring to Figs. 5, 6 and 8, the lid 82 includes a pair of spaced openings 114, 116 which are sized and shaped to receive the attachment members 46, 48 when the cover 12 is placed in its cover position on top of the lid 82. The positioning of the attachment members 46, 48 relative to the apertures 114, 116 can be more clearly seen at Fig. 8. In addition, connector members 118 and 120 are molded into position relative to the apertures 114, 116 to receive the attachment members 46, 48. By way of example, and looking particularly at Fig. 8, the connector member 118 includes a lower extending ledge or lip portion 122 which depends downwardly past the bottom surface 123 of the lid 82 adjacent the opening 114 so as to provide a ledge or a lip to which the catch 56 of the attachment member 46 may engage. As can be further seen from Fig. 8, the purpose of the aperture 62 in the cover 12 is to permit the insertion of a tool or some other object to be able to force the arm 54 of the attachment member 46 away from the ledge 122 to disengage the catch 56 for the removal of the cover 12 from the housing 40. It should be understood that the attachment member 48 functions in like manner with the connector member 120.

The lid 82 further includes a pair of notched shoulders 124, 126 positioned adjacent the depending portions of the members 98, 100 on the edge of the lid 82 opposite from the apertures 114, 116. The notched shoulders 124, 126 are created for alignment with the attachment members 42, 44, with the arm portions 50 of the attachment members 42, 44 abutting the shoulders 124, 126. Each of the shoulders 124, 126 creates a ledge 128 at the bottom portion thereof, as illustrated in Fig. 8. The ledge 128 is adapted to engage the catch 52 of the attachment members 42, 44 so as to engage the attachment members 42, 44 with the lid 82. The apertures 58, 60 are designed to permit a tool or other elongated object for insertion therein to press against the arm member 50 in order to disengage the catch 52 from the ledge 128. In this manner, the cover 12 may be securely fastened to the lid 82 and readily removed therefrom as clearly illustrated in Figs. 5 and 6.

The cover member 12, when installed on top of the battery assembly 40, provides protection for the upright top terminal posts 86 and 88 during shipping and storage. Batteries may be stacked one on top of each other without damaging the terminals 86, 88 or without apply-

ing undue stress to the terminals 86, 88 of the battery beneath it, since the posts 86, 88 even with their caps 106, 108 are recessed relative to the top surface 14 of the cover 12. The aperture extension slots 33, 35 are provided in the areas above the exposed electrical contacts 102, 104 such that the electrical condition of the battery 40 may be tested at any time while the cover 12 and caps 106, 108 are in place. The cover 12 and caps 106, 108 may be left in place on top of the battery assembly 40 to protect the upright terminals 86, 88 in applications that utilize the side terminal posts 94, 96 in order to prevent shorting of the battery by unnecessary exposure of additional, yet unused terminals. Moreover, the positioning and attachment of the cover 12 on top of the battery assembly 40 does not depend on the upright top terminal post 86, 88 as in some prior battery arrangement but rather depends entirely upon the arrangement of the attachment members 42, 44 and 46, 48 relative to the battery lid 82. In this manner, damage is also prevented to the upright terminals 86, 88. Unlike some existing battery spacers or covers, if a stack of batteries positioned one on top of each other with the cover 12 in place should shift during transit, no stress would be applied to the upright terminal posts 86, 88.

Referring now to Figs. 6, 7, and 8, the cover member 12 may also be utilized as a mounting spacer. The bottom plate or member 80 of the battery assembly 40 includes a pair of apertures 130, 132 positioned proximate the nip areas 78. The apertures 130, 132 may be on just one side 68 of the battery assembly 40 or they may be positioned on both sides 68, 70 thereof. In addition, a flange 134 is provided along the edge of the bottom portion 80 on either one side 68 or both sides 68, 70, depending upon preference. The flange 134 includes a pair of slots 136, 138 therein, and again such slots may occur on the flange 134 of one or both sides of the battery housing 40. The apertures 130, 132 are spaced and sized so as to receive the catch 56 of the attachment members 46, 48 when the cover 12 is positioned beneath the battery housing 40 in an inverted position as illustrated in Fig. 7. Moreover, the slots 136, 138 are spaced apart so that the catches 52 of the attachment members 42, 44 will engage the flange 134 with the arms 50 of the attachment members 42, 44 passing through the slots 136, 138. The arrangement of the apertures 130, 132 and the slots 136, 138 may be such that only one set of apertures 130, 132 is disposed on one side 68 of the battery 40 while only one pair of the slots 136, 138 are disposed on the opposite side 70 of the battery housing 40 so as to enable or permit the positioning of the cover member 12 in only one arrangement relative to the housing 40. In an alternative embodiment, two pairs of apertures 130, 132 and two pairs of slots 136, 138 may be positioned, one of each pair on each side 68 and 70 of the housing 40, so as to permit the cover 12 to be placed beneath the battery housing 40 in one of two different orientations.

The cover assembly 12 may be removed from its spacer position beneath the housing 40 by simply press-

ing the catches 52, 56 of both of the attachment members 42, 44 and 46, 48, the catches 52 and 56 being fully exposed for such removal. The cover member 12 in its mounting spacer position beneath the battery 40 is utilized in applications where the battery assembly 40 is shorter in height than the old battery it is replacing. The cover 12 as a spacer is removable and may be discarded from those applications that do not require the additional overall battery height and do not require side terminal connections, so that the cover 12 is required neither as a spacer beneath the battery assembly 40 or as a permanent cover 12 on top of the battery assembly 40, since the top terminal posts in such applications would need to be accessed.

Referring now in particular to Figs. 9-11, a handle or carrying assembly 140 is provided and is preferably in the form of a strap 142 that is shaped in the form of a "U". The strap 142 is preferably constructed from any known material which has some flexibility yet has the resiliency to snap back to its U-shaped form. In preferred form, the strap 142 is manufactured from a PVC type flexible plastic material. In a preferred form, a hand grip 144 having finger notches 146 therein may be provided to assist in carrying the battery assembly 40. The strap 142 terminates at each end thereof in a stop member or bar 148 which is aligned transversely relative to the length of the strap 142. Projecting downwardly from each stop member 148 is a flange 150 at one end of the strap 142 and a somewhat longer, larger flange member 152 at the opposite end of the strap member 142.

Each end portion 72, 74 of the battery housing 66 includes an end channel 154 that extends from the bottom of the housing 66 toward the top portion of the housing 66. The bottom plate 80 of the housing 66 has an opening 156 that permits the channel 154 to be open at the bottom thereof. The channel 154 terminates at its uppermost end against a shoulder 158 which is spaced from the lid 82. The channel 154 overlaps the nip area 78 (see Fig. 8) in the end 72 equidistantly. An elongated opening 160 is provided in the end portions 72, 74 of the housing 66 along the longitudinal axis of the channel 154, the opening 160 being preferably flared outwardly toward the open end 156 yet narrower than the channel 154. In this manner, a grooved slot 162 is defined in the channel 154 as a result of overlapping side members 164, 166. The opening 160 terminates along a point closer to lid 82 as compared to the shoulder 158. The area 168 between the end of the opening 160 and the shoulder 158 is preferably in the form of a slanted or sloped member aligned with the recess 28 and the recessed end portion 30 in cover 12 so as to cooperate with each other relative to the handle 140 as described below.

During normal use of the battery assembly 40, and referring particularly to Fig. 10, the handle assembly 140 is positioned and connected to the housing 66 so that the flanges 150 and 152 are disposed within the grooved slot 162 as in a tongue-in-groove arrangement, with the stop members 148 being abutted against the shoulder

158. Thus, when the battery 40 is carried by the handle grip 144, the stop members 148 about the shoulders 158 and provide firm attachment for the handle assembly 140 to the battery housing 40. When it is desired to stack batteries 40 one atop the other, the handle grip 144 is pressed downwardly toward the cover 12 so as to slide the flanges 150 and 152 along the channel 154 to the extent wherein the handle grip 144 is then positioned within the opening 31 with the strap 142 being nested in the recessed portion 28 and end portions 30. In this manner, the entire handle assembly 140 may be nested down into the cover 12 and be substantially flush with the surface 14 of the cover member 12 to permit stacking of the battery assemblies 40 one atop the other without damaging the handle assembly 140 or causing the stack of batteries to be unstable.

When it is desired to place the battery assembly 40 in operating position, the handle assembly 140 may be entirely removed and discarded. This is performed by placing the end flange 150 with its stop 148 at the very uppermost portion of the channel 154 in the side portion 74 of the housing 66, and then extending the end flange 152 with its stop 148 downwardly along its channel 154 so as to clear the end stop 148 beyond the opening 156 and remove the flange 152 and end stop 148 from the channel 154 as illustrated in Fig. 11. Once the flange 152 and end stop 148 is removed, the remaining flange 150 with its end stop 148 may likewise be removed from its channel 154 in housing end portion 74 so as to totally disengage the handle assembly 140. In this manner, a handle assembly is provided which does not interfere with the stacking of the batteries and yet is readily available for transportation of the battery. Moreover, the handle assembly may be totally removed in easy fashion for operation of the battery and may be reused or discarded. In this manner, a battery hold down in actual battery applications or with other batteries during shipping and storage can rest firmly on the cover 12 of the battery 40 without damage to or interference by the handle assembly 140.

As can be seen from the above, a combination cover and mounting spacer member for use with multi-cell rechargeable batteries is provided. This particular cover functions to protect the battery terminal posts from damage during shipping and stacking of the battery as well as to protect the battery from electrical shorting when side terminal posts are utilized during certain battery applications. Moreover, the side terminal posts are arranged so as to not interfere with shipping and stacking during storage and transportation. The cover/spacer combination member may also be utilized as a spacer either on top of the battery or beneath the battery for storage or application use. Finally, a handle assembly is provided which may be nested for transportation and storage purposes and may be entirely removed for certain battery applications if desired, yet provides firm gripping and handling of the battery during transportation and carrying thereof. As a result, the combination spacer/cover

assembly of the present invention provides multiple uses to both protect rechargeable batteries during transportation and storage as well as to provide protection or spacing appropriate during battery usage in a manner unknown to the prior art. Moreover, this may be done with a single device which is inexpensive to manufacture and is readily adaptable for any type or shape of rechargeable battery.

The foregoing description and the illustrative embodiments of the present invention have been shown in the drawings and described in detail in varying modifications and alternate embodiments. It should be understood, however, that the foregoing description of the invention is exemplary only, and that the scope of the invention is to be limited only to the claims as interpreted in view of the prior art.

Claims

1. A device for covering a multi-cell rechargeable battery having top and bottom surfaces and upper terminal connections projecting from said top surface, and for use as a mounting spacer for said battery, said device comprising:

cover means sized and shaped to shield the top surface of said battery when attached thereto including a plate having upper and lower surfaces with apertures disposed therein to provide limited access to said upper terminal connections;

means for spacing said plate from said battery top surface to recess said upper terminal connections relative to the upper surface of said plate for protection against surface contact and electrical shorting, said spacing means being integral with said plate;

means for selectively attaching said cover means to said battery to protect said battery top surface and upper terminal connections from damage from objects placed on said plate, said attaching means being further adapted for selectively securing said cover means to the bottom surface of said battery to function as a spacer for battery mounting; and

means for permitting testing of the electrical condition of said battery without removing said cover means.

2. The device as claimed in Claim 1, wherein said battery further includes handle means for carrying said battery, and wherein said cover means includes a recess in the upper surface of said plate sized and shaped to receive said handle means substantially



158. Thus, when the battery 40 is carried by the handle grip 144, the stop members 148 abut the shoulders 158 and provide firm attachment for the handle assembly 140 to the battery housing 40. When it is desired to stack batteries 40 one atop the other, the handle grip 144 is pressed downwardly toward the cover 12 so as to slide the flanges 150 and 152 along the channel 154 to the extent wherein the handle grip 144 is then positioned within the opening 31 with the strap 142 being nested in the recessed portion 28 and end portions 30. In this manner, the entire handle assembly 140 may be nested down into the cover 12 and be substantially flush with the surface 14 of the cover member 12 to permit stacking of the battery assemblies 40 one atop the other without damaging the handle assembly 140 or causing the stack of batteries to be unstable.

When it is desired to place the battery assembly 40 in operating position, the handle assembly 140 may be entirely removed and discarded. This is performed by placing the end flange 150 with its stop 148 at the very uppermost portion of the channel 154 in the side portion 74 of the housing 66, and then extending the end flange 152 with its stop 148 downwardly along its channel 154 so as to clear the end stop 148 beyond the opening 156 and remove the flange 152 and end stop 148 from the channel 154 as illustrated in Fig. 11. Once the flange 152 and end stop 148 is removed, the remaining flange 150 with its end stop 148 may likewise be removed from its channel 154 in housing end portion 74 so as to totally disengage the handle assembly 140. In this manner, a handle assembly is provided which does not interfere with the stacking of the batteries and yet is readily available for transportation of the battery. Moreover, the handle assembly may be totally removed in easy fashion for operation of the battery and may be reused or discarded. In this manner, a battery hold down in actual battery applications or with other batteries during shipping and storage can rest firmly on the cover 12 of the battery 40 without damage to or interference by the handle assembly 140.

As can be seen from the above, a combination cover and mounting spacer member for use with multi-cell rechargeable batteries is provided. This particular cover functions to protect the battery terminal posts from damage during shipping and stacking of the battery as well as to protect the battery from electrical shorting when side terminal posts are utilized during certain battery applications. Moreover, the side terminal posts are arranged so as to not interfere with shipping and stacking during storage and transportation. The cover/spacer combination member may also be utilized as a spacer either on top of the battery or beneath the battery for storage or application use. Finally, a handle assembly is provided which may be nested for transportation and storage purposes and may be entirely removed for certain battery applications if desired, yet provides firm gripping and handling of the battery during transportation and carrying thereof. As a result, the combination spacer/cover

assembly of the present invention provides multiple uses to both protect rechargeable batteries during transportation and storage as well as to provide protection or spacing appropriate during battery usage in a manner unknown to the prior art. Moreover, this may be done with a single device which is inexpensive to manufacture and is readily adaptable for any type or shape of rechargeable battery.

The foregoing description and the illustrative embodiments of the present invention have been shown in the drawings and described in detail in varying modifications and alternate embodiments. It should be understood, however, that the foregoing description of the invention is exemplary only, and that the scope of the invention is to be limited only to the claims as interpreted in view of the prior art.

Claims

1. A device for covering a multi-cell rechargeable battery having top and bottom surfaces and upper terminal connections projecting from said top surface, and for use as a mounting spacer for said battery, said device comprising:

cover means sized and shaped to shield the top surface of said battery when attached thereto including a plate having upper and lower surfaces with apertures disposed therein to provide limited access to said upper terminal connections;

means for spacing said plate from said battery top surface to recess said upper terminal connections relative to the upper surface of said plate for protection against surface contact and electrical shorting, said spacing means being integral with said plate;

means for selectively attaching said cover means to said battery to protect said battery top surface and upper terminal connections from damage from objects placed on said plate, said attaching means being further adapted for selectively securing said cover means to the bottom surface of said battery to function as a spacer for battery mounting; and

means for permitting testing of the electrical condition of said battery without removing said cover means.

2. The device as claimed in Claim 1, wherein said battery further includes handle means for carrying said battery, and wherein said cover means includes a recess in the upper surface of said plate sized and shaped to receive said handle means substantially



flush with said plate upper surface for storage and transportation purposes.

3. The device as claimed in Claim 1, wherein said spacing means comprise structural support members depending from the bottom surface of said plate for contact with the top surface of said battery. 5
4. The device as claimed in Claim 3, wherein said spacing means further includes peripheral side members depending from the outer edges of said plate, said structural support members being interconnected to each other and to said peripheral side members to provide structural strength for said cover means. 10 15
5. The device as claimed in Claim 1, wherein said plate further defines a central opening to permit access to a portion of said battery top surface without access to said upper terminal connections, and wherein said spacing means includes a reinforced side member disposed along one outer edge adjacent to and defining a portion of said central opening. 20
6. The device as claimed in Claim 1, wherein said battery testing means comprises an exposed base area adjacent each said terminal connection and a channel disposed in said plate extending outwardly from the circumference of each said aperture in said plate to permit access to the base area of said terminal connections with a probe insertable through said channel. 25 30
7. The device as claimed in Claim 1, wherein said attaching means comprises at least two sets of resilient attaching members disposed on opposite edges of said plate, each said set including at least one resilient clip member depending from said plate and adapted for releasable connection with an attachment lip disposed on said battery. 35 40
8. The device as claimed in Claim 7, wherein each said set of attaching members include a pair of said resilient clip members oriented for spring engagement with respective attachment lips when said cover means is positioned to shield either top or bottom surface of said battery. 45
9. A combination spacer/cover device for a multi-cell rechargeable battery having top and bottom surfaces and both upper and side terminal connection posts, the combination device comprising:

a cover shell sized and shaped to substantially encase the battery top surface and upper terminal connection posts when secured to said battery to protect said upper terminal connection posts from damage as well as to prevent ready

access to said upper connection posts when said side terminal connection posts are exposed, said shell having an upper platform with top and bottom surfaces and a pair of apertures disposed therein for alignment substantially with said upper terminal connection posts;

means for spacing said upper platform from said battery top surface to recess said upper terminal connection posts relative to said platform in alignment with the apertures in said platform;

resilient attachment means for removably securing said shell to the top surface of said battery in its covered position as well as for removably securing said shell to the bottom surface of said battery in a spacer position to provide elevated spacing of said battery for mounting purposes; and

access means for permitting the electrical testing of said battery without removal of said shell from its cover position thereon.

10. The combination device as claimed in Claim 9, wherein said attachment means are arranged such that said shell in its spacer position is oriented inversely relative to the orientation of said shell in its cover position. 25 30
11. The combination device as claimed in Claim 9, wherein said attachment means comprise resilient members disposed opposite each other along the side portions of said shell. 35
12. The combination device as claimed in Claim 11, wherein each said resilient member comprises a pair of resilient arms depending from said shell, each said arm having a catch disposed on the cantilevered end thereof for engagement with a ledge member on said battery. 40
13. The combination device as claimed in Claim 9, wherein each said electrical testing access means comprises a channel disposed in said platform and interconnected with one said aperture. 45
14. The combination device as claimed in Claim 9, wherein said spacing means comprises an interconnected web of support members projecting downwardly from the bottom surface of said platform an effective amount to recess said top terminal posts relative to the upper surface of said platform. 50
15. The combination device as claimed in Claim 9, wherein said battery further includes handle means for carrying said battery, and wherein said shell includes a recess in the upper surface of said plat-



form sized and shaped to receive said handle means substantially flush with the upper surface of said platform for storage and transportation purposes.

16. A cover assembly for a multi-cell rechargeable battery including a battery casing having end and sidewall portions and a bottom plate secured to said end and sidewall portions, said cover assembly comprising:

a casing lid interconnecting said end and sidewall portions opposite said bottom plate to form a top for said battery casing;

a pair of positive and negative top terminal connection posts projecting upwardly from the top surface of said lid;

a pair of positive and negative side terminal connection members projecting from said lid downwardly along one side wall portion of said casing;

means for electrically interconnecting said positive top connection post with said positive side connection member and for electrically interconnecting said negative top connection post with said negative side connection member;

a cover member sized and shaped to fit over said casing lid to protect said top terminal connection posts as well as to prevent ready access to said top terminal connection posts when said side terminal connection members are exposed, said cover member having an upper surface with apertures disposed therein aligned substantially with said top terminal connection posts;

means for spacing the upper surface of said cover member from said lid to recess said top terminal connection posts relative to said cover member upper surface for protection against surface contact and electrical shorting; and

means for selectively attaching the cover member to said lid in its cover position as well as for selectively securing said cover member to said bottom plate to function as a spacer member for battery mounting.

17. The cover assembly as claimed in Claim 16, wherein each said electrical interconnection means is at least partially embedded in said lid to inhibit electrical shorting of said battery.

18. The cover assembly as claimed in Claim 17, wherein each said interconnection means comprises a con-

ductive member interconnecting its respective upper terminal post and side terminal member.

19. The cover assembly as claimed in Claim 18, wherein each said conductor member includes an exposed portion adjacent the base area of its respective top terminal connection post to provide a contact area accessible for the testing of the electrical condition of said battery with said cover member in its cover position over said lid.

20. The cover assembly as claimed in Claim 16, wherein said assembly further includes insulative cap members covering said top terminal connection posts and said side terminal connection members when not in use.

21. The cover assembly as claimed in Claim 16, wherein said cover member upper surface further includes access means in the form of a channel extending from each said aperture for permitting the electrical testing of said battery without removal of said cover member from its cover position on said lid.

22. The cover assembly of Claim 16, wherein said attachment means are arranged to orient said cover member in an inverse position relative to its cover position when secured to said bottom plate as a spacer member.

23. The cover assembly as claimed in Claim 22, wherein said attachment means comprise resilient members disposed on both sides of said cover member, each said resilient member including as least one resilient armature projecting downwardly from the edge of said cover member and having a catch disposed at the cantilevered end thereof.

24. The cover assembly as claimed in Claim 23, wherein said attachment means further includes a plurality of ledge members disposed in said bottom plate aligned to receive the end catch of each said attachment armature to maintain said cover member in its inverted spacer orientation.

25. The cover assembly as claimed in Claim 23, wherein said attachment means further includes a plurality of ledge members disposed in said lid adapted and oriented to receive the end catch portions of said armatures from said cover member when positioned over said lid in said cover position.

26. The cover assembly as claimed in Claim 16, wherein said battery casing further includes handle means for carrying said battery, and wherein said cover member includes a recess disposed in the upper surface thereof sized and shaped to receive said handle means substantially flush with said upper



surface for battery storage and transportation purposes.

27. The cover assembly as claimed in Claim 16, wherein said battery casing comprises a monobloc jar container with cylindrical cell components merging together at tangential contact points between respective cells to form a plurality of nip areas along the exterior of said battery casing end and sidewall portions, and wherein said side terminal connection members project downwardly from said lid along one side wall portion recessed into said nip areas along said sidewall portion to minimize the projection of said side terminal connection members outwardly from said sidewall portion of said battery casing.

28. A battery housing for a multi-cell rechargeable battery having a battery casing in the form of a monobloc jar container with a plurality of integrally molded cylindrical cell compartments which merge together at tangential contact points therebetween to form the exterior sidewalls and end portions of said casing, and a bottom portion integrally molded with said cell compartments to form the bottom surfaces of said compartments as well as the bottom portion of said casing comprising:

a casing lid to form a top for said monobloc container and including a pair of positive and negative top terminal connection posts projecting upwardly from the top surface of said lid and a pair of positive and negative side terminal connection members depending from one side edge of said lid downwardly along one sidewall portion of said casing recessed into said tangential contact points between said cell compartments;

means for electrically interconnecting said positive top and side connection members and for electrically interconnecting said negative top and side connection members;

a cover sized and shaped to fit over said lid to protect said top terminal connection posts and prevent ready access to said posts when said side terminal connection members are exposed for operational use, said cover having an upper surface with apertures disposed therein aligned substantially with said top terminal connection posts;

means for spacing the upper surface of said cover from said lid to recess the top terminal connection posts relative to the upper surface of the cover for protection against surface contact and electrical shorting;

means for removably attaching said cover to said lid in a cover position over said lid as well as for removably securing said cover member to said battery casing bottom portion to selectively function as a spacer when mounting said battery; and

means for carrying said battery in an upright position, said cover including a recess in the upper surface thereof sized and shaped to receive said carrying means substantially flush with the upper surface of said cover for storage and transportation purposes, said carrying means being adapted for selective movement between a storage position recessed in said cover and a carrying position positioned substantially above said cover.

29. The battery housing of Claim 28, wherein each said electrically interconnecting means comprises a conductive member extending from each upper terminal connection post to its respective side terminal connection member, at least a portion of said conductive member being embedded in said lid, said positive and negative side terminal connection members being positioned in adjacent tangential contact areas between cylindrical cell compartments.

30. The battery housing of Claim 29, wherein said carrying means comprises a looped strap member connected at each end to oppositely disposed casing end portions and extending and looping over said lid, said strap member having end connection members vertically movable along their respective end portions to permit movement of said carrying means between its storage position in the recessed area within said cover and a carrying position disposed above said cover.

31. The battery housing of Claim 30, wherein each said end connection area for said strap on each end portion thereof comprises an elongated vertical channel disposed along said end portion and including a slot along the length thereof through which said strap passes, and wherein each strap end area comprises an elongated portion sized and shaped to vertically move within said channel without being removable through said slot.

32. The battery housing of Claim 31, wherein each said channel is open at its bottom end, and wherein said strap is of sufficient length such that one end portion thereof is disengagable from the open end of one channel while the opposite end of said strap is positioned at the upper end of its channel adjacent said cover.

33. A handle mechanism for a battery casing having a



top cover, a bottom portion, oppositely disposed sidewall portions, and oppositely disposed end wall portions, said handle mechanism comprising an elongated strap member connected at each end to said battery end wall portions and extending over said cover, said strap member ends being adapted for separate vertical movement along said battery end wall portions to permit strap member movement between a stored position substantially flush with said cover and a carrying position extending over said cover.

34. The handle mechanism as claimed in Claim 33, wherein each battery end wall portion includes an elongated vertical channel having a slot disposed along the vertical length thereof, and wherein each strap member end comprises an enlarged end piece sized and shaped to move within said vertical channel without being removable through said slot in said channel.
35. The handle mechanism as claimed in Claim 34, wherein the bottom end portion of each said channel adjacent said battery casing bottom portion is open to permit removal of said strap end piece there-through, and wherein said strap member is of sufficient length such that one end piece of said strap member is disengagable from the open bottom end of its respective channel while the opposite end piece is lodged at the upper end of its respective channel proximate said battery casing cover.
36. The handle mechanism as claimed in Claim 35, wherein the slot of each said channel is tapered from its bottom to its top proximate said battery top cover to permit ease of removal of said strap end piece at the open bottom portion of said channel as well as to secure the interface of said end piece at the top of said channel when said strap is its carrying position.

Patentansprüche

1. Vorrichtung zum Bedecken einer wiederaufladbaren, mehrzelligen Batterie, mit einer oberen und einer unteren Oberfläche, und oberen Klemmenanschlüssen, die auf der oberen Oberfläche vorspringen, und zur Verwendung als Montageabstandselement für die Batterie, wobei die Vorrichtung aufweist:

ein Deckelmittel, das so dimensioniert und geformt ist, daß es die obere Oberfläche der Batterie abschirmt, wenn es daran befestigt ist, umfassend eine Platte, die eine obere und eine untere Oberfläche mit darin angeordneten Öffnungen hat, um begrenzten Zugang zu den

oberen Klemmenanschlüssen zu geben;

ein Mittel, um diese Platte in einem gewissen Abstand von der oberen Oberfläche der Batterie zu halten, um die oberen Klemmenanschlüsse zum Schutze vor Oberflächenkontakten und elektrischen Kurzschlüssen relativ zu der oberen Oberfläche der Platte zurückzusetzen, wobei das Abstandsmittel mit der Platte ein Ganzes bildet;

ein Mittel, um das Deckelmittel in selektiver Weise an der Batterie zu befestigen, um die obere Oberfläche der Batterie und die oberen Klemmenanschlüsse vor einer Beschädigung durch auf diese Platte gelegte Gegenstände zu schützen, wobei das Befestigungsmittel weiterhin ausgelegt ist, um das Deckelmittel in selektiver Weise an der unteren Oberfläche der Batterie zu befestigen, damit es bei der Montage der Batterie als Abstandselement dient; und

ein Mittel, um den elektrischen Zustand der Batterie testen zu können, ohne das Deckelmittel zu entfernen.

2. Vorrichtung gemäß Anspruch 1, wobei die Batterie weiterhin ein Griffmittel umfaßt, um die Batterie zu tragen, und wobei das Deckelmittel eine Aussparung in der oberen Oberfläche der Platte umfaßt, die so dimensioniert und geformt ist, daß sie dieses Griffmittel zum Zwecke der Aufbewahrung und des Transports im wesentlichen bündig mit der oberen Oberfläche der Platte aufnehmen kann.
3. Vorrichtung gemäß Anspruch 1, wobei das Abstandsmittel strukturelle Tragelemente aufweist, die zwecks Kontakt mit der oberen Oberfläche der Batterie von der unteren Oberfläche der Platte herabhängen.
4. Vorrichtung gemäß Anspruch 3, wobei das Abstandsmittel weiterhin periphere Seitenelemente umfaßt, die von den äußeren Rändern der Platte herabhängen, wobei die strukturellen Tragelemente miteinander und mit den peripheren Seitenelementen verbunden sind, um dem Deckelmittel eine strukturelle Festigkeit zu geben.
5. Vorrichtung gemäß Anspruch 1, wobei die Platte weiterhin eine zentrale Öffnung aufweist, um Zugang zu einem Bereich der oberen Oberfläche der Batterie, aber nicht zu den oberen Klemmenanschlüssen zu geben, und wobei das Abstandsmittel ein verstärktes Seitenelement umfaßt, das längs eines daran angrenzenden, äußeren Randes angeordnet ist, und einen Bereich der zentralen Öffnung bildet.



6. Vorrichtung gemäß Anspruch 1, wobei das Batterie-Testmittel eine freiliegende Basisfläche aufweist, die an jeden Klemmenanschluß angrenzt, und einen in der Platte angeordneten Kanal aufweist, der sich von dem Umfang jeder Öffnung in der Platte nach außen erstreckt, um mit einer durch den Kanal einführbaren Sonde Zugang zu der Basisfläche der Batterieanschlüsse zu erhalten.

7. Vorrichtung gemäß Anspruch 1, wobei das Befestigungsmittel mindestens zwei Sätze elastische Befestigungselemente aufweist, die an entgegengesetzten Rändern der Platte angeordnet sind, wobei jeder Satz mindestens ein elastisches Clipelement umfaßt, das von der Platte herabhängt und für eine freigebbare Verbindung mit einer auf der Batterie angeordneten Befestigungslippe ausgelegt ist.

8. Vorrichtung gemäß Anspruch 7, wobei jeder Satz Befestigungselemente zwei elastische Clipelemente umfaßt, die für einen Federeingriff mit den jeweiligen Befestigungslippen orientiert sind, wenn das Deckelmittel so positioniert ist, daß es entweder die obere oder die untere Oberfläche der Batterie abschirmt.

9. Kombinierte Vorrichtung aus Abstandselement und Deckel, für eine wiederaufladbare, mehrzellige Batterie, mit einer oberen und einer unteren Oberfläche, und sowohl oberen, als auch seitlichen Klemmenanschluß-Pfosten, wobei die kombinierte Vorrichtung aufweist:

eine Deckelschale, die so dimensioniert und geformt ist, daß sie, wenn sie an der Batterie befestigt ist, im wesentlichen die obere Oberfläche der Batterie und die oberen Klemmenanschluß-Pfosten umhüllt, um die oberen Klemmenanschluß-Pfosten vor einer Beschädigung zu schützen, und um einen leichten Zugang zu den oberen Klemmenanschluß-Pfosten zu verhindern, wenn die seitlichen Klemmenanschluß-Pfosten freiliegen, wobei die Schale eine obere Plattform mit einer oberen und einer unteren Oberfläche hat, und zwei darin angeordnete Öffnungen hat, um die Schale im wesentlichen entsprechend den oberen Klemmenanschluß-Pfosten auszurichten.

ein Mittel, um die obere Plattform in einem gewissen Abstand von der oberen Oberfläche der Batterie zu halten, um die oberen Klemmenanschluß-Pfosten bei Ausrichtung entsprechend den Öffnungen in der Plattform relativ zu der Plattform zurückzusetzen.

elastische Befestigungsmittel, um die Schale an der oberen Oberfläche der Batterie in ihrer

bedeckten Position abnehmbar zu befestigen, sowie um die Schale an der unteren Oberfläche der Batterie in einer Abstandsposition zu befestigen, um einen vergrößerten Abstand der Batterie für Montagezwecke zu erhalten; und

ein Zugangsmittel, um die Batterie elektrisch testen zu können, ohne die Schale aus ihrer Deckelposition auf der Batterie zu entfernen.

10. Kombinierte Vorrichtung gemäß Anspruch 9, wobei die Befestigungsmittel so angeordnet sind, daß die Schale in ihrer Abstandsposition bezüglich der Orientierung der Schale in ihrer Deckelposition umgekehrt orientiert ist.

11. Kombinierte Vorrichtung gemäß Anspruch 9, wobei die Befestigungsmittel elastische Elemente aufweisen, die längs der Seitenbereiche der Schale einander gegenüber angeordnet sind.

12. Kombinierte Vorrichtung gemäß Anspruch 11, wobei jedes elastische Element zwei elastische Arme aufweist, die von der Schale herabhängen, wobei jeder Arm einen an seinem freitragenden Ende angeordneten Haken hat für den Eingriff in ein Randelement auf der Batterie.

13. Kombinierte Vorrichtung gemäß Anspruch 9, wobei jedes Zugangsmittel für den elektrischen Test einen Kanal aufweist, der in der Plattform angeordnet ist und mit einer Öffnung verbunden ist.

14. Kombinierte Vorrichtung gemäß Anspruch 9, wobei das Abstandsmittel ein Netz aus Tragelementen aufweist, die von der unteren Oberfläche der Plattform so weit nach unten vorspringen, daß die oberen Klemmenanschluß-Pfosten relativ zu der oberen Oberfläche der Plattform zurückgesetzt sind.

15. Kombinierte Vorrichtung gemäß Anspruch 9, wobei die Batterie weiterhin ein Griffmittel zum Tragen der Batterie umfaßt, und wobei die Schale eine Aussparung in der oberen Oberfläche der Plattform umfaßt, die so dimensioniert und geformt ist, daß sie das Griffmittel zum Zwecke der Aufbewahrung und des Transports im wesentlichen bündig mit der oberen Oberfläche der Plattform aufnehmen kann.

16. Deckelanordnung für eine wiederaufladbare, mehrzellige Batterie, umfassend eine Batteriehülle, die Stirnwand- und Seitenwandbereiche, und eine an den Stirnwand- und Seitenwandbereichen befestigte, untere Platte hat, wobei die Deckelanordnung aufweist:

eine Hüllen-Deckplatte, die die Stirnwand- und Seitenwandbereiche gegenüber der unteren



Platte miteinander verbindet, um eine obere Platte für die Batteriehülle zu bilden;

einen positiven und einen negativen, oberen Klemmenanschluß-Pfosten, die von der oberen Oberfläche der Deckplatte nach oben vorspringen;

ein positives und ein negatives, seitliches Klemmenanschluß-Element, das längs eines Seitenwandbereichs der Hülle von der Deckplatte nach unten vorspringt;

Mittel, um den positiven oberen Klemmenanschluß-Pfosten und das positive seitliche Klemmenanschluß-Element elektrisch miteinander zu verbinden, und um den negativen oberen Klemmenanschluß-Pfosten und das negative seitliche Klemmenanschluß-Element elektrisch miteinander zu verbinden;

ein Deckelement, das so dimensioniert und geformt ist, daß es über die Hüllen-Deckplatte paßt, und das vorgesehen ist, um die oberen Klemmenanschluß-Pfosten zu schützen, und um einen leichten Zugang zu den oberen Klemmenanschluß-Pfosten zu verhindern, wenn die seitlichen Klemmenanschluß-Elemente freiliegen, wobei das Deckelement eine obere Oberfläche mit darin angeordneten Öffnungen hat, die im wesentlichen entsprechend den oberen Klemmenanschluß-Pfosten ausgerichtet sind;

ein Mittel, um die obere Oberfläche des Deckelements in einem gewissen Abstand von der Deckplatte zu halten, um die oberen Klemmenanschluß-Pfosten bezüglich der oberen Oberfläche des Deckelements zurückzusetzen, um diese Pfosten vor Oberflächenkontakten und elektrischen Kurzschlüssen zu schützen; und

Mittel, um das Deckelement in seiner Deckposition in selektiver Weise an der Deckplatte zu befestigen, und um das Deckelement in selektiver Weise an der unteren Platte zu befestigen, damit es bei der Batteriemontage als Abstandselement dient.

17. Deckelanordnung gemäß Anspruch 16, wobei jedes elektrische Verbindungsmittel zumindest teilweise in die Deckplatte eingebettet ist, um einen elektrischen Kurzschluß der Batterie zu verhindern.

18. Deckelanordnung gemäß Anspruch 17, wobei jedes elektrische Verbindungsmittel ein leitendes Element aufweist, das seinen jeweiligen oberen Klemmenan-

schluß-Pfosten und sein seitliches Klemmenanschluß-Element miteinander verbindet.

19. Deckelanordnung gemäß Anspruch 18, wobei jedes leitende Element einen an die Basisfläche seines jeweiligen oberen Klemmenanschluß-Pfostens angrenzenden, freiliegenden Bereich umfaßt, um eine Kontaktfläche zu haben, die zum Testen des elektrischen Zustandes der Batterie zugänglich ist, während das Deckelement in seiner Deckposition über der Deckplatte ist.

20. Deckelanordnung gemäß Anspruch 16, wobei die Anordnung weiterhin isolierende Kappenelemente umfaßt, die die oberen Klemmenanschluß-Pfosten und die seitlichen Klemmenanschluß-Elemente bedecken, wenn diese nicht benutzt werden.

21. Deckelanordnung gemäß Anspruch 16, wobei die obere Oberfläche des Deckelements weiterhin Zugangsmittel in Form eines von jeder Öffnung ausgehenden Kanals umfaßt, um die Batterie elektrisch testen zu können, ohne das Deckelement aus seiner Deckposition auf der Deckplatte zu entfernen.

22. Deckelanordnung gemäß Anspruch 16, wobei die Befestigungsmittel so angeordnet sind, daß das Deckelement in einer umgekehrten Position bezüglich seiner Deckposition orientiert ist, wenn es an der unteren Platte als Abstandselement befestigt ist.

23. Deckelanordnung gemäß Anspruch 22, wobei die Befestigungsmittel elastische Elemente aufweisen, die auf beiden Seiten des Deckelements angeordnet sind, wobei jedes elastische Element mindestens eine elastische Armierung umfaßt, die von dem Rand des Deckelements nach unten vorspringt und einen Haken hat, der an ihrem freitragenden Ende angeordnet ist.

24. Deckelanordnung gemäß Anspruch 23, wobei die Befestigungsmittel weiterhin eine Vielzahl von in der unteren Platte angeordneten Randelementen umfaßt, die ausgerichtet sind, um den Endhaken jeder Befestigungsarmierung aufzunehmen, damit das Deckelement in seiner umgekehrten Abstandsorientierung festgehalten wird.

25. Deckelanordnung gemäß Anspruch 23, wobei das Befestigungsmittel weiterhin eine Vielzahl von in der Deckplatte angeordneten Randelementen umfaßt, die ausgelegt und orientiert sind, um die Hakenbereiche der Armierungen des Deckelements aufzunehmen, wenn dieses Deckelement in der Deckposition über der Deckplatte positioniert ist.

26. Deckelanordnung gemäß Anspruch 16, wobei die



Batteriegehäuse weiterhin ein Griffmittel umfaßt, um die Batterie zu tragen, und wobei das Deckelement eine in seiner oberen Oberfläche angeordnete Aussparung umfaßt, die dimensioniert und geformt ist, um das Griffmittel zum Zwecke der Aufbewahrung und des Transports der Batterie im wesentlichen bündig mit der oberen Oberfläche aufzunehmen.

27. Deckelanordnung gemäß Anspruch 16, wobei die Batteriegehäuse einen einteiligen Behälter mit zylindrischen Zellkomponenten aufweist, die bei tangentialen Kontaktpunkten zwischen den jeweiligen Zellen ineinander übergehen, um eine Vielzahl von Berührungsgebieten längs der äußeren Stirnwand- und Seitenwandbereiche der Batteriegehäuse zu bilden, und wobei die seitlichen Klemmenanschluß-Elemente von der Deckplatte längs eines Seitenwandbereichs nach unten vorspringen, wobei sie längs des Seitenwandbereichs in die Berührungsgebiete versenkt sind, damit sie über den Seitenwandbereich der Batteriegehäuse möglichst wenig nach außen vorspringen.

28. Batteriegehäuse für eine wiederaufladbare, mehrzellige Batterie, das ein Batteriegehäuse in Form eines einteiligen Behälters hat, mit einer Vielzahl von integral gegossenen, zylindrischen Zellkammern, die bei dazwischen liegenden, tangentialen Kontaktpunkten ineinander übergehen, um die äußeren Seitenwand und Stirnwandbereiche der Hülle zu bilden, und einem mit den Zellkammern integral gegossenen, unteren Bereich, um die unteren Flächen der Kammern, sowie den unteren Bereich der Hülle zu bilden, aufweisend:

eine Hüllen-Deckplatte, um eine obere Platte für den einteiligen Behälter zu bilden, wobei diese Deckplatte einen positiven und einen negativen, oberen Klemmenanschluß-Pfosten umfaßt, die auf der oberen Oberfläche des Deckels nach oben vorspringen, und ein positives und ein negatives, seitliches Klemmenanschluß-Element umfaßt, die von einem Seitenrand der Deckplatte längs eines Seitenwandbereichs der Hülle herabhängen, wobei sie in die tangentialen Kontaktpunkte zwischen den Zellkammern hinein versenkt sind;

Mittel, um das positive obere und seitliche Anschlußelement elektrisch miteinander zu verbinden, und um das negative obere und seitliche Anschlußelement elektrisch miteinander zu verbinden;

einen Deckel, der so dimensioniert und geformt ist, daß er über die Deckplatte paßt, um die oberen Klemmenanschluß-Pfosten zu schützen, und einen leichten Zugang zu den Pfosten zu

verhindern, wenn die seitlichen Klemmenanschluß-Elemente für den Gebrauch freiliegen, wobei der Deckel eine obere Oberfläche mit darin angeordneten Öffnungen hat, die im wesentlichen entsprechend den oberen Klemmenanschluß-Pfosten ausgerichtet sind;

ein Mittel, um die obere Oberfläche des Deckels in einem gewissen Abstand von der Deckplatte zu halten, um die oberen Klemmenanschluß-Pfosten zum Schutze vor Oberflächenkontakten und elektrischen Kurzschlüssen relativ zu der oberen Oberfläche des Deckels zurückzusetzen;

Mittel, um den Deckel in einer Deckelposition über der Deckplatte an der Deckplatte abnehmbar zu befestigen, sowie um das Deckelement an dem unteren Bereich der Batteriegehäuse abnehmbar zu befestigen, damit das Deckelement bei der Montage der Batterie in selektiver Weise als Abstandselement dient; und

ein Mittel, um die Batterie in einer aufrechten Position zu tragen, wobei der Deckel in seiner oberen Oberfläche eine Aussparung umfaßt, die so dimensioniert und geformt ist, daß sie die Tragmittel zum Zwecke der Aufbewahrung und des Transports im wesentlichen bündig mit der oberen Oberfläche des Deckels aufnimmt, wobei die Tragmittel für eine selektive Verschiebung zwischen einer in dem Deckel eingelassenen Aufbewahrungsposition und einer im wesentlichen über dem Deckel angeordneten Tragposition ausgelegt sind.

29. Batteriegehäuse gemäß Anspruch 28, wobei jedes elektrische Verbindungsmittel ein leitendes Element aufweist, das sich von jedem oberen Klemmenanschluß-Pfosten bis zu seinem jeweiligen seitlichen Klemmenanschluß-Element erstreckt, wobei mindestens ein Bereich des leitenden Elements in die Deckplatte eingebettet ist, und wobei das positive und das negative seitliche Klemmenanschluß-Element in angrenzenden tangentialen Kontaktgebieten zwischen den zylindrischen Zellkammern positioniert sind.

30. Batteriegehäuse gemäß Anspruch 29, wobei das Tragmittel ein schleifenförmiges Tragriemen-Element aufweist, das an jedem Ende mit entgegengesetzt angeordneten Hüllen-Stirnwandbereichen verbunden ist, und sich schleifenförmig über den Deckel erstreckt, wobei das Tragriemen-Element Endverbindungs-Elemente hat, die längs ihres jeweiligen Stirnwandbereichs vertikal verschiebbar sind, um eine Verschiebung des Tragmittels zwischen seiner Aufbewahrungsposition in dem eingelasse-



nen Gebiet innerhalb des Deckels und einer über dem Deckel angeordneten Tragposition zu ermöglichen.

31. Batteriegehäuse gemäß Anspruch 30, wobei jedes Stirnwand-Verbindungsgebiet für den Tragriemen in jedem Stirnwandbereich einen länglichen, vertikalen Kanal aufweist, der längs des Stirnwandbereichs angeordnet ist und eine Nut umfaßt, durch die der Tragriemen geschoben wird, und wobei jedes Tragriemen-Endgebiet einen länglichen Bereich aufweist, der so dimensioniert und geformt ist, daß er innerhalb des Kanals in der Nut vertikal verschoben werden kann, ohne daß er durch die Nut herausnehmbar ist.

32. Batteriegehäuse gemäß Anspruch 31, wobei jeder Kanal an seinem unteren Ende offen ist, und wobei der Tragriemen eine genügende Länge hat, um einen Endbereich des Tragriemens aus dem offenen Ende eines Kanals herausnehmen zu können, während das entgegengesetzte Ende des Tragriemens bei dem an den Deckel angrenzenden, oberen Ende seines Kanals positioniert ist.

33. Griffmechanismus für eine Batteriehülle, die einen oberen Deckel, einen unteren Bereich, entgegengesetzt angeordnete Seitenwandbereiche, und entgegengesetzt angeordnete Stirnwandbereiche hat, wobei der Griffmechanismus ein längliches Tragriemen-Element aufweist, das an jedem Ende mit den Batterie-Stirnwandbereichen verbunden ist und sich über den Deckel erstreckt, wobei die Enden des Tragriemen-Elements für eine getrennte vertikale Verschiebung längs der Batterie-Stirnwandbereiche ausgelegt sind, um eine Verschiebung des Tragriemen-Elements zwischen einer Aufbewahrungsposition, die im wesentlichen mit dem Deckel bündig abschließt, und einer Tragposition, die sich über den Deckel erstreckt, zu ermöglichen.

34. Griffmechanismus gemäß Anspruch 33, wobei jeder Batterie-Stirnwandbereich einen länglichen, vertikalen Kanal umfaßt, der eine längs seiner vertikalen Länge angeordnete Nut aufweist, und wobei jedes Ende des Tragriemen-Elements ein vergrößertes Endstück aufweist, das so dimensioniert und geformt ist, daß es innerhalb des vertikalen Kanals in der Nut verschiebbar ist, ohne daß es durch die Nut herausnehmbar ist.

35. Griffmechanismus gemäß Anspruch 34, wobei der an den unteren Bereich der Batteriehülle angrenzende, untere Endbereich jedes Kanals offen ist, um die Herausnahme des Tragriemen-Endstücks zu ermöglichen, und wobei das Tragriemen-Element eine genügende Länge hat, um ein Endstück des Tragriemen-Elements aus dem offenen unteren

Ende seines Kanals herausnehmen zu können, während das entgegengesetzte Endstück bei dem nahe bei der Batteriedeckel gelegenen, oberen Ende seines Kanals angeordnet ist.

36. Griffmechanismus gemäß Anspruch 35, wobei die Nut jedes Kanals von ihrem unteren Ende bis zu ihrem nahe bei dem oberen Batteriedeckel gelegenen, oberen Ende konisch ist, um das Tragriemen-Endstück bei dem offenen, unteren Bereich des Kanals leicht herausnehmen zu können, sowie um die Verbindungsstelle des Endstücks an dem oberen Ende des Kanals zu sichern, wenn der Tragriemen in seiner Tragposition ist.

Revendications

1. Dispositif destiné à couvrir une batterie rechargeable à plusieurs piles ayant des surfaces supérieure et inférieure et des bornes de connexion supérieures faisant saillie depuis ladite surface supérieure, et destiné à une utilisation en tant que pièce intercalaire de montage pour ladite batterie, ledit dispositif comprenant :

un moyen formant couvercle dimensionné et élaboré pour écraner la surface supérieure de ladite batterie lorsqu'elle y est attachée comportant une plaque ayant des surfaces supérieure et inférieure avec des ouvertures disposées dedans pour fournir un accès limité auxdites bornes de connexion supérieures; des moyens pour écarter ladite plaque de ladite surface supérieure de batterie pour ménager lesdites bornes de connexion supérieures par rapport à la surface supérieure de ladite plaque pour préserver d'un contact de surface et d'une mise en court-circuit électrique, lesdits moyens d'écartement faisant partie intégrante de ladite plaque ;

des moyens destinés à attacher de façon sélective ledit moyen formant couvercle à ladite batterie pour préserver ladite surface supérieure de batterie et les bornes de connexion supérieures de détériorations causées par des objets placés sur ladite plaque, lesdits moyens de fixation étant en outre adaptés pour fixer de façon sélective ledit moyen formant couvercle à la surface inférieure de ladite batterie pour agir en tant que pièce intercalaire pour le montage de la batterie ; et des moyens pour permettre de tester l'état électrique de ladite batterie sans enlever ledit moyen formant couvercle.

2. Dispositif selon la revendication 1, dans lequel ladite batterie comporte en outre un moyen formant poi-



- gnée destiné à porter ladite batterie, et dans lequel ledit moyen formant couvercle comporte un évidement dans la surface supérieure de ladite plaque, dimensionné et élaboré pour loger ledit moyen formant poignée sensiblement en affleurement avec ladite surface supérieure de la plaque à des fins de stockage et de transport.
3. Dispositif selon la revendication 1, dans lequel lesdits moyens d'écartement comprennent des éléments de construction porteurs dépendant de la surface inférieure de ladite plaque destinés au contact avec la surface supérieure de ladite batterie. 10
 4. Dispositif selon la revendication 3, dans lequel ledit moyen d'écartement comporte en outre des éléments latéraux périphériques dépendant des bords extérieurs de ladite plaque, lesdits éléments de construction porteurs étant interconnectés les uns aux autres et auxdits éléments latéraux périphériques pour réaliser une résistance de construction pour ledit moyen formant couvercle. 15 20
 5. Dispositif selon la revendication 1, dans lequel ladite plaque définit en outre une ouverture centrale pour permettre l'accès à une partie de ladite surface supérieure de batterie sans accès aux bornes de connexion supérieures, et dans lequel ledit moyen d'écartement comporte un élément latéral renforcé disposé le long d'un bord extérieur adjacent à, et définissant une partie de ladite ouverture centrale. 25 30
 6. Dispositif selon la revendication 1, dans lequel ledit moyen testant la batterie comprend une zone de base exposée adjacente à chacune desdites bornes de connexion et une gorge disposée dans ladite plaque s'étendant à l'extérieur de la circonférence de chacune desdites ouvertures situées dans ladite plaque pour permettre d'accéder à la zone de base desdites bornes de connexion avec un capteur pouvant être inséré au travers de ladite gorge. 35 40
 7. Dispositif selon la revendication 1, dans lequel ledit moyen de fixation comprend au moins deux jeux d'éléments de fixation faisant ressort disposés sur des bords opposés de ladite plaque, chacun desdits jeux comportant au moins un élément de pince faisant ressort dépendant de ladite plaque et adapté pour être raccordé de façon détachable avec une lèvre de fixation disposée sur ladite batterie. 45
 8. Dispositif selon la revendication 7, dans lequel chacun desdits jeux d'éléments de fixation comporte une paire desdits éléments de pince faisant ressort orientés pour un engagement par ressort avec des lèvres de fixation respectives quand ledit moyen formant couvercle est positionné pour écraner la surface supérieure ou inférieure de ladite batterie. 50 55
 9. Dispositif de combinaison de pièce intercalaire/de couvercle destiné à une batterie rechargeable à plusieurs piles ayant des surfaces supérieure et inférieure et à la fois des postes de borne de connexion supérieurs et latéraux, le dispositif de combinaison comprenant :

une coque de recouvrement dimensionnée et élaborée pour sensiblement encastrer la surface supérieure et les postes de borne de connexion supérieurs de la batterie quand ils sont fixés à ladite batterie pour préserver lesdits postes de borne de connexion de détériorations ainsi que pour empêcher un accès facile auxdits postes de borne de connexion latéraux sont exposés, ladite coque ayant une plate-forme supérieure comportant des surfaces supérieure et inférieure et une paire d'ouvertures disposées dedans destinées à l'alignement sensiblement avec lesdits postes de borne de connexion supérieurs ;

des moyens pour écarter ladite plate-forme supérieure de ladite surface supérieure de batterie pour ménager lesdits postes de borne de connexion supérieurs par rapport à ladite plate-forme en alignement avec les ouvertures situées dans ladite plate-forme ;

des moyens de fixation faisant ressort pour fixer de façon amovible ladite coque à la surface supérieure de ladite batterie dans sa position couverte ainsi que pour fixer de façon amovible ladite coque à la surface inférieure de ladite batterie dans une position d'intercalation pour réaliser un écartement élevé de ladite batterie à des fins de montage ; et des moyens d'accès pour permettre de tester électriquement ladite batterie sans retirer ladite coque de sa position de recouvrement dessus.
 10. Dispositif de combinaison selon la revendication 9, dans lequel lesdits moyens de fixation sont disposés de telle sorte que ladite coque est orientée, dans sa position d'intercalation, de façon inversée par rapport à l'orientation de ladite coque dans sa position de recouvrement.
 11. Dispositif de combinaison selon la revendication 9, dans lequel lesdits moyens de fixation comprennent des éléments faisant ressort disposés de façon opposée l'un par rapport à l'autre le long des parties latérales de ladite coque.
 12. Dispositif de combinaison selon la revendication 11, dans lequel chaque élément faisant ressort comprend une paire de bras faisant ressort dépendant



de ladite coque, chacun desdits bras ayant une encoche disposée sur son extrémité en porte-à-faux, destinée à l'engagement avec un élément de renforcement sur ladite batterie.

13. Dispositif de combinaison selon la revendication 9, dans lequel chacun desdits moyens formant accès pour test électrique comprend une gorge disposée dans ladite plate-forme et interconnectée avec une desdites ouvertures.

14. Dispositif de combinaison selon la revendication 9, dans lequel ledit moyen d'écartement comprend un tissu interconnecté d'éléments porteurs faisant saillie vers le bas depuis la surface inférieure de ladite plate-forme, en quantité suffisante pour ménager lesdits postes de borne de connexion supérieurs par rapport à la surface supérieure de ladite plate-forme.

15. Dispositif de combinaison selon la revendication 9, dans lequel ladite batterie comporte en outre un moyen formant poignée pour porter ladite batterie, et dans lequel ladite coque comporte un évidement dans la surface supérieure de ladite plate-forme, dimensionné et élaboré pour loger ledit moyen formant poignée sensiblement en affleurement avec la surface supérieure de ladite plate-forme, à des fins de stockage et de transport.

16. Ensemble de couvercle destiné à une batterie rechargeable à plusieurs piles comportant un boîtier de batterie ayant des parties d'extrémité et de paroi latérale et une plaque inférieure fixée auxdites parties d'extrémité et de paroi latérale, ledit ensemble de couvercle comprenant : un sous-couvercle de boîtier interconnectant lesdites parties d'extrémité et de paroi latérale à l'opposé de ladite plaque inférieure pour former un sommet audit boîtier de batterie ;

une paire de postes de borne de connexion supérieurs positif et négatif faisant saillie vers le haut depuis la surface supérieure dudit sous-couvercle ; une paire d'éléments de borne de connexion latéraux positif et négatif faisant saillie vers le bas depuis ledit sous-couvercle le long d'une partie de paroi latérale dudit boîtier ;

des moyens destinés à interconnecter électriquement ledit poste de connexion supérieur positif avec ledit élément de connexion latéral positif et destinés à interconnecter électriquement ledit poste de connexion supérieur négatif avec ledit élément de connexion latéral négatif ;

un élément formant couvercle dimensionné et élaboré pour s'ajuster sur ledit sous-couvercle

de boîtier afin de protéger lesdits postes de borne de connexion supérieurs et d'empêcher également un accès facile auxdits postes de borne de connexion supérieurs lorsque lesdits éléments de borne de connexion latéraux sont exposés, ledit élément formant couvercle ayant une surface supérieure comportant des ouvertures disposées dedans, alignées sensiblement avec lesdits postes de borne de connexion supérieurs ;

des moyens pour écarter la surface supérieure dudit élément formant couvercle dudit sous-couvercle pour ménager lesdits postes de borne de connexion supérieurs par rapport à ladite surface supérieure de l'élément formant couvercle, destinés à préserver d'un contact de surface et d'une mise en court-circuit électrique ; et

des moyens destinés à attacher de façon sélective l'élément formant couvercle audit sous-couvercle dans sa position de recouvrement ainsi qu'à fixer de façon sélective ledit élément formant couvercle à ladite plaque inférieure pour agir en tant qu'élément d'intercalation destiné au montage de la batterie.

17. Ensemble de couvercle selon la revendication 16, dans lequel chacun desdits moyens d'interconnexion électrique est au moins partiellement encasté dans ledit sous-couvercle pour empêcher une mise en court-circuit électrique de ladite batterie.

18. Ensemble de couvercle selon la revendication 17, dans lequel chacun desdits moyens d'interconnexion comprend un élément conducteur interconnectant son poste de connexion supérieur respectif et l'élément de connexion latéral.

19. Ensemble de couvercle selon la revendication 18, dans lequel chacun desdits éléments conducteurs comporte une partie exposée adjacente à la zone de base de son poste de connexion supérieur respectif pour fournir une zone de contact accessible pour le test de l'état électrique de ladite batterie avec ledit élément formant couvercle dans sa position de recouvrement au-dessus dudit sous-couvercle.

20. Ensemble de couvercle selon la revendication 16, dans lequel ledit ensemble comporte en outre des éléments formant capuchons isolants recouvrant lesdits postes de borne de connexion supérieurs et lesdits éléments de connexion latéraux lorsqu'ils ne sont pas utilisés.

21. Ensemble de couvercle selon la revendication 16 dans lequel ladite surface supérieure de l'élément



- formant couvercle comporte en outre des moyens accès en forme de gorge s'étendant depuis chacune desdites ouvertures, destinés à permettre le test électrique de ladite batterie sans retirer ledit élément formant couvercle de sa position de recouvrement sur ledit sous-couvercle. 5
22. Ensemble de couvercle de la revendication 16, dans lequel lesdits moyens de fixation sont disposés pour orienter ledit élément formant couvercle dans une position inverse par rapport à sa position de recouvrement lorsqu'il est fixé à ladite plaque inférieure en tant qu'élément d'intercalation. 10
23. Ensemble de couvercle selon la revendication 22, dans lequel lesdits moyens de fixation comprennent des éléments faisant ressort disposés sur les deux côtés dudit élément formant couvercle, chacun desdits éléments faisant ressort comportant au moins un induit faisant ressort et faisant saillie vers le bas depuis le bord dudit élément formant couvercle et ayant une encoche disposée sur son extrémité en porte-à-faux. 15 20
24. Ensemble de couvercle selon la revendication 23, dans lequel ledit moyen de fixation comporte en outre une pluralité d'éléments de renforcement disposés dans ladite plaque inférieure de façon alignée pour loger l'encoche d'extrémité de chaque induit de fixation pour maintenir ledit élément formant couvercle dans son orientation d'intercalation inversée. 25 30
25. Ensemble de couvercle selon la revendication 23, dans lequel ledit moyen de fixation comporte en outre une pluralité d'éléments de renforcement disposés dans ledit sous-couvercle, adaptés et orientés pour loger les parties d'encoche d'extrémité desdits induits depuis ledit élément formant couvercle lorsqu'il est positionné au-dessus dudit sous-couvercle dans ladite position de recouvrement. 35 40
26. Ensemble de couvercle selon la revendication 16, dans lequel ledit boîtier de batterie comporte en outre un moyen formant poignée destiné à porter ladite batterie, et dans lequel l'élément formant couvercle comporte un évidement disposé dans sa surface supérieure, dimensionné et élaboré pour loger ledit moyen formant poignée sensiblement en affleurement avec ladite surface supérieure à des fins de stockage et de transport de la batterie. 45 50
27. Ensemble de couvercle selon la revendication 16, dans lequel ledit boîtier de batterie comprend un conteneur-réceptacle monobloc comportant des composants de pile cylindrique fusionnant ensemble aux points de contact tangentiels situés entre des piles respectives pour former une pluralité de zones d'emprise le long de l'extérieur des parties de paroi latérale et d'extrémité du boîtier de batterie, et dans lequel lesdits éléments de borne de connexion latéraux font saillie vers le bas, depuis ledit sous-couvercle, le long d'une partie de paroi latérale ménagée dans lesdites zones d'emprise le long de ladite partie de paroi latérale pour minimiser la saillie vers l'extérieur desdits éléments de borne de connexion latéraux depuis ladite partie de paroi latérale dudit boîtier de batterie. 55
28. Boîtier de batterie destiné à une batterie rechargeable à plusieurs piles ayant un boîtier de batterie en forme de conteneur-réceptacle monobloc comportant une pluralité de compartiments pour pile cylindrique moulés intégralement qui fusionnent ensemble aux points de contact tangentiels situés entre eux pour former les parties de parois latérales et d'extrémité extérieures dudit boîtier, et une partie inférieure moulée intégralement avec lesdits compartiments pour pile pour former les surfaces inférieures desdits compartiments ainsi que la partie inférieure dudit boîtier comprenant :
- un sous-couvercle de boîtier pour former un sommet pour ledit conteneur monobloc et comportant une paire de postes de borne de connexion positif et négatif faisant saillie vers le haut depuis la surface supérieure dudit sous-couvercle et une paire d'éléments de borne de connexion latéraux positif et négatif dépendant d'un bord latéral dudit sous-couvercle vers le bas le long d'une partie de paroi latérale dudit boîtier ménagée dans lesdits points de contact tangentiels situés entre lesdits compartiments pour pile ;
- des moyens pour interconnecter électriquement lesdits éléments de connexion supérieurs et latéraux positifs et pour interconnecter électriquement lesdits éléments de connexion supérieurs et latéraux négatifs ;
- un couvercle dimensionné et élaboré pour s'adapter sur ledit sous-couvercle afin de protéger lesdits postes de borne de connexion supérieurs et d'empêcher un accès facile auxdits postes lorsque lesdits éléments de borne de connexion latéraux sont exposés pour une mise en service pratique, ledit couvercle ayant une surface supérieure comportant des ouvertures disposées dedans alignées essentiellement avec lesdits postes de borne de connexion supérieurs ;
- des moyens destinés à écarter la surface supérieure dudit couvercle du sous-couvercle pour ménager les postes de borne de connexion supérieurs par rapport à la surface supérieure



du couvercle afin de préserver d'un contact en surface et d'une mise en court-circuit électrique ;

des moyens destinés à attacher de façon amovible ledit couvercle audit sous-couvercle dans une position de recouvrement par-dessus ledit sous-couvercle ainsi qu'à fixer de façon amovible ledit élément formant couvercle à ladite partie inférieure du boîtier de batterie pour agir de façon sélective comme une pièce intercalaire lors du montage de ladite batterie ; et des moyens destinés à porter ladite batterie en position verticale, ledit couvercle comportant un évidement dans sa surface supérieure, dimensionné et élaboré pour loger lesdits moyens porteurs sensiblement en affleurement avec la surface supérieure dudit couvercle à des fins de stockage et de transport, lesdits moyens porteurs étant adaptés pour un mouvement sélectif s'effectuant entre une position de stockage ménagée dans ledit couvercle et une position de transport positionnée sensiblement au-dessus dudit couvercle.

29. Boîtier de batterie de la revendication 28, dans lequel chacun desdits moyens d'interconnexion électrique comprend un élément conducteur s'étendant depuis chaque poste de borne de connexion supérieur vers son élément de borne de connexion latéral respectif, au moins une partie dudit élément conducteur étant encastrée dans ledit sous-couvercle, lesdits éléments de borne de connexion latéraux positif et négatif étant positionnés dans des zones de contact tangentiel adjacentes situées entre des compartiments pour pile cylindrique.

30. Boîtier de batterie de la revendication 29, dans lequel ledit moyen porteur comprend un élément d'attache recourbé relié à chaque extrémité à des parties d'extrémité de boîtier disposées de façon opposée et s'étendant et se recourbant au-dessus dudit sous-couvercle, ledit élément d'attache ayant des éléments de liaison d'extrémité pouvant se déplacer verticalement le long de leurs parties d'extrémité respectives pour permettre un mouvement dudit moyen porteur entre sa position de stockage dans la zone ménagée à l'intérieur dudit couvercle et une position de transport disposée au-dessus dudit couvercle.

31. Boîtier de batterie de la revendication 30, dans lequel chacune desdites zones de connexion d'extrémité pour ladite attache sur chaque partie d'extrémité de celle-ci comprend une gorge verticale allongée disposée le long de ladite partie d'extrémité et comportant une fente située sur sa longueur au travers de laquelle passe ladite attache, et dans

lequel chaque zone d'extrémité d'attache comprend une partie allongée dimensionnée et élaborée pour se déplacer verticalement à l'intérieur de ladite gorge sans être amovible au travers de ladite fente.

32. Boîtier de batterie de la revendication 31, dans lequel chaque gorge est ouverte à son extrémité inférieure, et dans lequel ladite attache est de longueur suffisante de telle sorte qu'une partie d'extrémité de celle-ci peut se dégager de l'extrémité ouverte d'une gorge pendant que l'extrémité opposée de ladite attache est positionnée à l'extrémité supérieure de sa gorge adjacente audit couvercle.

33. Mécanisme de poignée destiné à un boîtier de batterie ayant un couvercle supérieur, une partie inférieure, des parties de paroi latérale disposées de façon opposée, et des parties de paroi d'extrémité disposées de façon opposée, ledit mécanisme de poignée comprenant un élément d'attache allongé relié à chaque extrémité auxdites parties de paroi d'extrémité de batterie et s'étendant au-dessus dudit couvercle, lesdites extrémités de l'élément d'attache étant adaptées pour un mouvement vertical séparé le long desdites parties de paroi d'extrémité de batterie pour permettre un mouvement de l'élément d'attache entre une position de stockage sensiblement en affleurement avec ledit couvercle et une position de transport s'étendant au-dessus dudit couvercle.

34. Mécanisme de poignée selon la revendication 33, dans lequel chaque partie de paroi d'extrémité de batterie comporte une gorge verticale allongée ayant une fente disposée sur sa longueur verticale, et dans laquelle chaque extrémité d'élément d'attache comprend un morceau d'extrémité élargi, dimensionné et élaboré pour se déplacer à l'intérieur de ladite gorge verticale sans être amovible au travers de ladite fente dans ladite gorge.

35. Mécanisme de poignée selon la revendication 34, dans lequel la partie d'extrémité de base de chacune desdites gorges adjacentes à ladite partie inférieure du boîtier de batterie est ouverte pour permettre le retrait dudit morceau d'extrémité d'attache au travers elle, et dans lequel ledit élément d'attache est d'une longueur suffisante de telle sorte qu'un morceau d'extrémité dudit élément d'attache peut se dégager depuis l'extrémité inférieure ouverte de sa gorge respective tandis que le morceau d'extrémité opposé est mis en place sur l'extrémité supérieure de sa gorge respective à proximité dudit couvercle de boîtier de batterie.

36. Mécanisme de poignée selon la revendication 35, dans lequel la fente de chacune desdites gorges est conique à partir de sa base jusqu'à son sommet pro-



che dudit couvercle supérieur de batterie pour permettre une facilité de retrait dudit morceau d'extrémité d'attache au niveau de la partie inférieure ouverte de ladite gorge ainsi que pour fixer l'interface dudit morceau d'extrémité au sommet de ladite gorge lorsque ladite attache est dans sa position de transport.

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