Appeal decision

Appeal No. 2014-9519

Yamanashi, Japan
Appellant JM ENERGY CORPORATION

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2011-547444, entitled "Electrical Storage Device" (International Publication No. WO 2011/080988, published on July 7, 2011) has resulted in the following appeal decision.

Conclusion

The appeal of the case was groundless.

Reason

1. History of the procedures

The present application was filed on December 3, 2010 as an international filing date (Priority Date: December 28, 2009, Japan (JP)), and an outline of procedures is as follows.

Notice of reasons for refusal : December 17, 2013 (drafting date)
Written opinion : February 14, 2014
Amendment : February 14, 2014
Decision of refusal : March 31, 2014 (drafting date)
Request for appeal against the examiner's decision of refusal : May 22, 2014
Notice of reasons for refusal (body) : January 6, 2015 (drafting date)

Regarding Notice of reasons for refusal dated on January 6, 2015, the appellant has not responded within a specified period.

2. The Invention

It is acknowledged that the invention according to claims 1 to 7 of the present application is specified by the matters described in claims 1 to 7 according to the scope of claims for patent amended by the amendment submitted on February 14, 2014. Therefore, the invention according to claim 1 (hereinafter referred to as "the Invention") is as follows.

"[Claim 1]

An electrical storage device comprising:

a metal outer case configured to include a one end wall and another end wall made of aluminum and integrally formed on both ends of a tube-shaped peripheral wall;

a tubular electrode winding unit configured to be formed by winding one electrode sheet and another electrode sheet, in which electrode layers are formed on respective collectors, laminated via a separator and to be arranged in an axial direction in the outer case;

one electrode terminal configured to be provided on the one end wall while being insulated from the one end wall; and

another electrode terminal configured to be provided on the one end wall while being electrically connected to the one end wall, wherein

one side edge positioned close to the one end wall in the collector of the one electrode sheet is electrically connected to the one electrode terminal, and

another side edge positioned close to the other end wall in the collector of the other electrode sheet is electrically connected to the other end wall so that the other electrode terminal is electrically connected to the other side edge in the collector of the other electrode sheet via the outer case."

3. Cited Documents

Japanese Unexamined Patent Application Publication No. 2003-297413 (published on October 17, 2003, hereinafter referred to as "Cited Document 1") cited in Notice of Reasons for Refusal of the body discloses as follows with the accompanying drawings (the underlines are applied by the body).

(1) "[0001]

[Technical Field] The present invention relates to a battery, and more particularly, to a battery configured in such a manner that an electrode plate group, which is formed by winding a positive electrode plate and a negative electrode plate with a separator interposed therebetween, is housed in a battery case together with an electrolyte solution."

(2) "[0005]
[Technical problem] However, in the structure of the battery 30 shown in FIG. 7, a large force acts on the electrode plate group 32 when vibration is applied to the battery 30. Accordingly, the low-strength electrode plate group 32 suffers damage such as falling of electrode mixtures originally applied to the positive electrode plate 34 or the negative electrode plate 35 of the electrode plate group 32, whereby battery characteristics may be suddenly deteriorated. Such a problem is critical to any battery other than a cylindrical battery that houses a roundly wound electrode plate group in a cylindrical battery case."

(3) "[0015] In FIGS. 1 to 5, reference numeral 1 denotes a battery. The battery 1 is configured in such as a manner that an electrode plate group 3, which is formed by winding a positive electrode plate and a negative electrode plate with a separator interposed therebetween, is housed in a battery case 2 together with an electrolyte solution. The battery case 2 includes a container 2a with an opening at a bottom end, and a lid plate 2b for closing the opening. The container 2a is formed into a flat block shape or an approximately prismatic shape with a transverse cross section of an oblong or rounded rectangle. An outer periphery of the lid plate 2b is hermetically fixed to an edge of the opening of the container 2a at a welded part 2c."

(4) "[0016] The electrode plate group 3 is formed by winding the positive electrode plate and the negative electrode plate around a roll core 4 made of synthetic resin and having a flat plate shape such that a core member of the positive electrode plate is exposed at one end portion of the electrode plate group 3 and a core member of the negative electrode plate is exposed at the other end portion thereof. Both ends of the roll core 4 corresponding to the exposed core members of the respective electrode plates of the electrode plate group 3 are severally formed into enlarged portions 4a with triangular cross sections, and a connective protrusion 5 with an oblong cross section is provided at a side portion of each end surface of the roll core 4."

(5) "[0017] Current collectors 6a and 6b are disposed close to both end surfaces of the electrode plate group 3 so as to abut on the exposed core members of the positive and negative electrode plates. The current collectors 6a and 6b are welded to the core members of the respective electrode plates at a plurality of points by laser beam welding, electron beam welding, or the like. In the illustrated example, the core member of the negative electrode plate is exposed at the upper end portion of the electrode plate group 3 so that the upper current collector 6a constitutes a negative current collector. Meanwhile, the core member of the positive electrode plate is exposed at the lower end portion of the electrode plate group 3 so that the lower current collector 6b constitutes a positive current collector."

(6) "[0019] Further, shapes of outer peripheral edges of the current collectors 6a and 6b are formed into proper shapes so as to be fitted to the inner periphery of the battery case 2, and annular collars 8 protrude out of the outer peripheral edges while surrounding the outer peripheries at the end portions of the electrode plate group 3. Meanwhile, an outer periphery separator 9 is interposed between the outer peripheries of the upper negative current collector 6a as well as the electrode plate group 3, and the inner periphery of the battery case 2 for the purpose of insulation. Meanwhile, the outer periphery of the lower positive current collectors 6b and the inner periphery of the battery case 2 contact each other and are welded together at a plurality of welded parts 10, whereby the positive current collector 6b and the battery case 2 are fixed and electrically connected to each other."

(7) "[0020] A connection cap 12, which is fixed to the lower end of the negative connection terminal 11, covers the upper end and the outer periphery of the oblong tube 7 of the negative current collector 6a, and a peripheral wall of the connection cap 12 and the tube 7 are joined together at welded parts 13. In this way, the cap 12 and the tube 7 are fixed and electrically connected to each other. Meanwhile, a lower end of a holder tube 14, which allows penetration of the negative connection terminal 11 for retention, is fitted and fixed to one side part of an upper end wall of the battery case 2 through an insulator 15 by caulking. Reference numeral 14a denotes such a caulking portion."

(8) "[0022] Reference numeral 20 denotes a detent plate for supporting the connection terminal 11 by the battery case 2 against torque to be applied upon connection setting. The detent plate 20 includes a through hole for allowing penetration of the connection terminal 11, and a concave portion to be provided on a lower surface so as to allow

insertion and engagement of the connection cap 12. Moreover, the detent plate 20 is formed such that an outer periphery thereof is tightly engaged with the inner surface of the battery case 2. Reference numeral 21 denotes a positive connection terminal which is fixed to the other side part of the upper end wall of the battery case 2."

The above indicated matters and the description in the drawings indicate the following points.

(a) Cited Document 1 discloses a battery configured in such a manner that an electrode plate group, which is formed by winding a positive electrode plate and a negative electrode plate with a separator interposed therebetween, is housed in a battery case together with an electrolyte solution (indicated matter (1)).

(b) The battery 1 is configured in such as a manner that an electrode plate group 3, which is formed by winding a positive electrode plate and a negative electrode plate with a separator interposed therebetween, is housed in a battery case 2 together with an electrolyte solution. The battery case 2 includes a container 2a with an opening at a bottom end, and a lid plate 2b for closing the opening. The container 2a is formed into a flat block shape or an approximately prismatic shape with a transverse cross section of an oblong or rounded rectangle. An outer periphery of the lid plate 2b is hermetically fixed to an edge of the opening of the container 2a at a welded part 2c (indicated matter (3)).

(c) It is obvious that electrode mixtures are applied to the positive electrode plate or the negative electrode plate of the electrode plate group 3 similarly to the conventional battery (indicated matter (2)).

(d) The electrode plate group 3 is formed by winding the positive electrode plate and the negative electrode plate around a roll core 4 made of synthetic resin and having a flat plate shape such that a core member of the positive electrode plate is exposed at one end portion of the electrode plate group 3 and a core member of the negative electrode plate is exposed at the other end portion thereof (indicated matter (4)).

(e) Current collectors 6a and 6b are disposed close to the both end surfaces of the electrode plate group 3 so as to abut on the exposed core members of the positive and negative electrode plates. The current collectors 6a and 6b are welded to the core

members of the respective electrode plates at a plurality of points by laser beam welding, electron beam welding, or the like. The core member of the negative electrode plate is exposed at the upper end portion of the electrode plate group 3 so that the upper current collector 6a constitutes a negative current collector. Meanwhile, the core member of the positive electrode plate is exposed at the lower end portion of the electrode plate group 3 so that the lower current collector 6b constitutes a positive current collector (indicated matter (5)).

(f) The outer periphery of the lower positive current collectors 6b and the inner periphery of the battery case 2 contact each other and are welded together at a plurality of welded parts 10, whereby the positive current collector 6b and the battery case 2 are fixed and electrically connected to each other (indicated matter (6)).

(g) A connection cap 12, which is fixed to the lower end of the negative connection terminal 11, covers the upper end and the outer periphery of the oblong tube 7 of the negative current collector 6a, and a peripheral wall of the connection cap 12 and the tube 7 are joined together at welded parts 13. In this way, the cap 12 and the tube 7 are fixed and electrically connected to each other. A lower end of a holder tube 14, which allows penetration of the negative connection terminal 11 for retention, is fitted and fixed to one side part of an upper end wall of the battery case 2 through an insulator 15 by caulking (indicated matter (7)).

(h) A positive connection terminal 21 is fixed to the other side part of the upper end wall of the battery case 2 (indicated matter (8)).

By comprehensively taking the above into consideration, it is recognized that the following invention (hereinafter referred to as "the cited invention") is described in Cited Document 1.

"A battery 1 configured in such as a manner that an electrode plate group 3, which is formed by winding a positive electrode plate and a negative electrode plate with a separator interposed therebetween, is housed in a battery case 2 together with an electrolyte solution, wherein

the battery case 2 includes a container 2a with an opening at a bottom end, and a lid plate 2b for closing the opening, and the container 2a is formed into a flat block shape or an approximately prismatic shape with a transverse cross section of an oblong

or rounded rectangle, and an outer periphery of the lid plate 2b is hermetically fixed to an edge of the opening of the container 2a at a welded part 2c,

electrode mixtures are applied to the positive electrode plate or the negative electrode plate of the electrode plate group 3,

the electrode plate group 3 is formed by winding the positive electrode plate and the negative electrode plate around a roll core 4 made of synthetic resin and having a flat plate shape such that a core member of the positive electrode plate is exposed at one end portion of the electrode plate group 3 and a core member of the negative electrode plate is exposed at the other end portion thereof,

current collectors 6a and 6b are disposed close to both end surfaces of the electrode plate group 3 so as to abut on the exposed core members of the positive and negative electrode plates, and the current collectors 6a and 6b are welded to the core members of the respective electrode plates at a plurality of points by laser beam welding, electron beam welding, and the like, and the core member of the negative electrode plate is exposed at the upper end portion of the electrode plate group 3 so that the upper current collector 6a constitutes a negative current collector, and meanwhile, the core member of the positive electrode plate is exposed at the lower end portion of the electrode plate group 3 so that the lower current collector 6b constitutes a positive current collector,

the outer periphery of the lower positive current collectors 6b and the inner periphery of the battery case 2 contact each other and are welded together at a plurality of welded parts 10, whereby the positive current collector 6b and the battery case 2 are fixed and electrically connected to each other,

a connection cap 12, which is fixed to the lower end of the negative connection terminal 11, covers the upper end and the outer periphery of the oblong tube 7 of the negative current collector 6a, and a peripheral wall of the connection cap 12 and the tube 7 are joined together at welded parts 13, and in this way, the cap 12 and the tube 7 are fixed and electrically connected to each other, and a lower end of a holder tube 14, which allows penetration of the negative connection terminal 11 for retention, is fitted and fixed to one side part of an upper end wall of the battery case 2 through an insulator 15 by caulking, and

a positive connection terminal 21 is fixed to the other side part of the upper end wall of the battery case 2."

Similarly, Japanese Unexamined Patent Application Publication No. 2005-340610 (published on December 8, 2005, hereinafter referred to as "Cited

Document 2") cited in Notice of reasons for refusal of the body discloses as follows with the accompanying drawings (the underlines are applied by the body).

(9) "[0011]
As described above, since the capacitor according the present invention takes out an anode/cathode from a capacitor element without using a lead member and the like directly from an end surface of the element, the resistance of the capacitor is reduced. Also, since the anode/cathode can be taken out to the outside from a single direction, connection spaces between the capacitors can be reduced by half when the plurality of capacitors are coupled and a capacitor unit is formed, and a remarkable effect of easy miniaturization can be obtained."

(10) "[0023]
The capacitor 1 according to the present embodiment configured in this way is connected to an anode terminal 5a provided on a terminal board 4 by joining an end surface on the side of the anode of the capacitor element 2 to a rib 5b of an anode terminal piece 5 provided on the terminal board 4 (generally referred to as end surface current collecting). An end surface on the side of the cathode is joined to an inner bottom surface of a metal case 3 (generally referred to as end surface current collecting) and joints 6b provided on the metal case 3 and the terminal board 4 are joined to an inner periphery of the metal case 3 so as to be connected to the cathode terminal 6a provided on the terminal board 4 via the metal case 3. Accordingly, since the capacitor element 2 basically takes out the anode/cathode by the end surface current collecting and the anode side is connected to the anode terminal 5a via the anode terminal piece 5 at the shortest distance, the capacitor 1 with low resistance which reduces generation of unnecessary resistance as possible can be realized."

4. Comparison

The Invention is compared with the cited invention.

(1) Electrical storage device
"The battery 1" in the cited invention can be considered the "electrical storage device."

(2) Outer case

"The battery case 2" according to the cited invention includes a container 2a with an opening at a bottom end, and a lid plate 2b for closing the opening. The container 2a is formed into a flat block shape or an approximately prismatic shape with a transverse cross section of an oblong or rounded rectangle. An outer periphery of the lid plate 2b is hermetically fixed to an edge of the opening of the container 2a at a welded part 2c.

Therefore, the Invention and the cited invention correspond to each other in a point that both of them include "a metal outer case in which one end wall and other end wall are integrally formed on both ends of a tube-shaped peripheral wall."

"The one end wall" in the Invention is "made of aluminum". Whereas, in the cited invention, the material is not specified as aluminum. In this point, the Invention is different from the cited invention.

(3) Electrode winding unit

The battery 1 according to the cited invention is configured in such as a manner that an "electrode plate group 3," which is formed by winding a positive electrode plate and a negative electrode plate with a separator interposed therebetween, is housed in a battery case 2 together with an electrolyte solution.

Electrode mixtures are originally applied to the positive electrode plate or the negative electrode plate of the electrode plate group 3. The electrode plate group 3 is formed by winding the positive electrode plate and the negative electrode plate around a roll core 4 made of synthetic resin and having a flat plate shape such that a core member of the positive electrode plate is exposed at one end portion of the electrode plate group 3 and a core member of the negative electrode plate is exposed at the other end portion thereof. It is natural that the wound electrode plate group 3 is arranged along the axis of the battery case 2.

Therefore, the Invention and the cited invention correspond to each other in a point that both of them include "a tubular electrode winding unit which is formed by winding one electrode sheet and other electrode sheet, in which electrode layers are formed on respective collectors, laminated via a separator and which is arranged in an axial direction in the outer case."

(4) One electrode terminal

A lower end of a holder tube 14, which allows penetration of the "negative connection terminal 11" for retention, is fitted and fixed to one side part of an upper end wall of the battery case 2 according to the cited invention through an insulator 15 by

caulking.

Therefore, the Invention and the cited invention correspond to each other in a point that both of them include "the one electrode terminal provided on the one end wall while being insulated from the one end wall."

(5) Other electrode terminal

"A positive connection terminal 21" according to the cited invention is fixed to the other side part of the upper end wall of the battery case 2.

Therefore, the Invention and the cited invention correspond to each other in a point that both of them include "the other electrode terminal provided on the one end wall while being electrically connected to the one end wall."

(6) Connection between one electrode sheet and one electrode terminal

A negative current collector 6a is disposed close to the upper surface of the electrode plate group 3 according to the cited invention so as to abut on the exposed core member of the negative electrode plate. The negative current collector 6a is welded to the core member of the negative electrode plate at a plurality of points by laser beam welding, electron beam welding, or the like. A connection cap 12, which is fixed to the lower end of the negative connection terminal 11, covers the upper end and the outer periphery of the oblong tube 7 of the negative current collector 6a, and a peripheral wall of the connection cap 12 and the tube 7 are joined together at welded parts 13. In this way, the cap 12 and the tube 7 are fixed and electrically connected to each other.

Therefore, the Invention and the cited invention correspond to each other in a point that "one edge positioned close to the one end wall in the collector of the one electrode sheet is electrically connected to the one electrode terminal." Here, "the core member" in the cited invention corresponds to "the collector" in the Invention.

(7) Connection between other electrode sheet and other electrode terminal

A positive current collector 6b is disposed close to the lower surface of the electrode plate group 3 according to the cited invention so as to abut on the exposed core member of the positive electrode plate. The positive current collector 6b is welded to the core member of the positive electrode plate at a plurality of points by laser beam welding, electron beam welding, or the like. The outer periphery of the positive current collector 6b and the inner periphery of the battery case 2 contact each other and are welded together at a plurality of welded parts 10, whereby the positive current

collector 6b and the battery case 2 are fixed and electrically connected to each other.

Therefore, the Invention and the cited invention correspond to each other in a point that "other side edge positioned close to the other end wall in the collector of the other electrode sheet is electrically connected to the outer case so that the other electrode terminal is electrically connected to the other side edge in the collector of the other electrode sheet via the outer case."

However, "a part of the outer case electrically connected to the other side edge of the collector of the other electrode sheet" corresponds to "the other end wall" in the Invention. Whereas, the above part corresponds to "the inner periphery of the battery case 2" in the cited invention. The Invention is different from the cited invention in this point.

Therefore, the Invention corresponds to the cited invention in the following points

<Corresponding features>

A point that "an electrical storage device, comprising

a metal outer case in which a one end wall and another end wall are integrally formed on both ends of a tube-shaped peripheral wall,

a tubular electrode winding unit which is formed by winding one electrode sheet and other electrode sheet, in which electrode layers are formed on respective collectors, laminated via a separator and which is arranged in an axial direction in the outer case,

one electrode terminal which is provided on the one end wall while being insulated from the one end wall, and

another electrode terminal which is provided on the one end wall while being electrically to the one end wall, wherein

One side edge positioned close to the one end wall in the collector of the one electrode sheet is electrically connected to the one electrode terminal, and

another side edge positioned close to the other end wall in the collector of the other electrode sheet is electrically connected to the outer case so that the other electrode terminal is electrically connected to the other side edge in the collector of the other electrode sheet via the outer case."

The Invention is different from the cited invention in the following points.

<The different features>

(1) A point that "the one end wall" is "made of aluminum" in the Invention, and on the other hand, the material is not specified as above in the cited invention.

(2) A point that "a part of the outer case electrically connected to the other side edge of the collector of the other electrode sheet" corresponds to "the other end wall" in the Invention, and on the other hand, the above part corresponds to "the inner periphery of the battery case 2" in the cited invention.

5. Judgment

Therefore, the different features will be considered.

Regarding different feature (1)

In the electrical storage device, a matter that the outer case includes a metal case and lid made of aluminum has been known as disclosed in Cited Document 2 ([0003], [0004]), Japanese Unexamined Patent Application Publication No. H11-167903 ([0028]), Japanese Unexamined Patent Application Publication No. 2003-132857 ([0007]), and the like.

Accordingly, a person ordinarily skilled in the art would have easily arrived at applying the well-known art to the outer case and the outer case is formed as indicated in the different feature (1) in the cited invention.

Regarding different feature (2)

Cited Document 2 discloses a structure in which an end surface on the side of the cathode of the capacitor element is joined to an inner bottom surface of a metal case so as to be connected to a cathode terminal via the metal case ([0023]) to take out a cathode from a capacitor element without using a lead member and the like and directly take out it from an end surface of the capacitor element ([0011]). Here, "an end surface on the side of the cathode" and "an inner bottom surface" in Cited Document 2 respectively correspond to "other side edge" and "other side wall" in the Invention.

Accordingly, a person ordinarily skilled in the art would have easily arrived at forming the cited invention as described in the different feature (2) by applying the technique in Cited Document 2 when the exposed core member of the negative

electrode plate is electrically connected to the outer case.

Also, the effect can be naturally predicted according to the above change of the structure, and it cannot be recognized that a remarkable effect is obtained.

6. Conclusion

As described above, the invention according to claim 1 of the present application can be easily made by a person ordinarily skilled in the art based on the invention described in Cited Document 1, the well-known art, and technical matters described in Cited Document 2. Therefore, the appellant should not be granted a patent for the invention in accordance with the provisions of Article 29(2) of the Patent Act.

Therefore, the present application should be rejected without mentioning other claims.

Therefore, the appeal decision shall be made as described in the conclusion.

May 19, 2015

Chief administrative judge: SAKAI, Tomohiro
Administrative judge: SEKIYA, Ryuichi
Administrative judge: INOUE, Shinichi