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Electrode assembly and battery

Abstract

An electrode assembly formed by winding a first electrode plate, a separator and a second electrode plate. The first electrode plate comprises a first current collector and a first active material layer arranged on a surface of the first current collector. A winding terminating end of the first electrode plate is positioned on an outer side of a winding terminating end of the second electrode plate facing away from a winding core. The first active material layer on the winding terminating end of the first electrode plate covers one surface of the first current collector facing toward the second electrode plate. The electrode assembly further comprises a first adhesive member arranged on an outer surface of the electrode assembly. The electrode assembly takes the winding terminating end of the first electrode plate as the tail end. The application further provides a battery having the same.

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATION

(1) This application is a National Stage of the PCT international application Serial No. PCT/CN2020/091385, filed on May 20, 2020, and the entire content of which is incorporated herein by reference.

TECHNICAL FIELD

(2) The application relates to the field of batteries, in particular to an electrode assembly and a battery having the same.

BACKGROUND

(3) Generally, when wound batteries come to the end of manufacturing, the tail of an outer electrode plate of a battery core comprises part of plain aluminum foil (without an active material coating on both sides). The battery core is usually packaged in a sealing way using an aluminum-plastic film, and a clearance exists between the battery core and a housing which packages the battery core in a sealing way. When such battery core suffers from an impact from an heavy object,

the housing made of the aluminum-plastic film usually does not break or breaks incompletely due to its relatively high ductility, but the battery core itself breaks, and broken chips, in particular those generated by the plain aluminum foil in the outer ring, packaged and bound by the housing, contact the broken electrode plate of the battery core to cause a short-circuit heating and even fire explosion.

SUMMARY

(4) In view of the foregoing situation, it is necessary to provide an electrode assembly without an outer plain aluminum foil and with high safety and a battery having the same.

(5) An embodiment of the application provides an electrode assembly, which comprises a first electrode plate, a second electrode plate and n separator, the first electrode plate and the second electrode plate are opposite in polarity, the separator is arranged between the first electrode plate and the second electrode plate, and the electrode assembly is formed by winding the first electrode plate, the separator and the second electrode plate. The first electrode plate comprises a first current collector and a first active material layer; the first active material layer is arranged on a surface of the first current collector; a winding terminating end of the first electrode plate is positioned on the outer side of a winding terminating end of the second electrode plate facing away from a wound core; the first active material layer on the winding terminating end of the first electrode plate covers one surface of the first current collector facing toward the second electrode plate, and the other surface of the first current collector on the winding terminating end of the first electrode plate facing away from the second electrode plate is not coated with the first active material layer. The electrode assembly further comprises a first adhesive member, and the first adhesive member is arranged on an outer surface of the electrode assembly.

(6) In an optional embodiment, the first adhesive member is a semi-liquid viscous material, arranged on the outer surface of the electrode assembly by means of spot coating or coating.

(7) In an optional embodiment, the first adhesive member has a thickness of smaller or equal to 20 μm .

(8) In an optional embodiment, the electrode assembly further comprises a second adhesive member; the first adhesive member is connected to the second adhesive member; and the second adhesive member is connected to the winding terminating end of the first electrode plate and covers part of the outer surface of the electrode assembly.

(9) Further, the second adhesive member has a thickness of 15 μm -25 μm .

(10) In an optional embodiment, the winding terminating end of the second electrode plate extends out of the winding terminating end of the first electrode plate along a winding direction.

(11) Further, the winding terminating end of the separator extends out of the winding terminating end of the second electrode plate along the winding direction.

(12) In an optional embodiment, the electrode assembly further comprises a first tab and a second tab, wherein the first tab is connected to the first electrode plate, the second tab is connected to the second electrode plate, and along the thickness direction of the electrode assembly, the projections of the first tab and the second tab are not overlapped.

(13) Further, a winding starting end of the first electrode plate is provided with a first plain foil area; a winding starting end of the second electrode plate is provided with a second plain foil area; the first tab is arranged in the first plain foil area; and the second tab is arranged in the second plain foil area.

(14) Further, the electrode assembly further comprises a first insulating member, and the first insulating member is arranged in the first plain foil area and covers the first tab.

(15) In an optional embodiment, the first adhesive member has a bonding force of 100-1000 N/m, and a tensile breaking stress of smaller than or equal to 4000 N/m.

(16) An embodiment of the application further provides a battery, which comprises an electrode assembly and a package, wherein the electrode assembly is any one of the foregoing electrode assemblies, the electrode assembly is accommodated in the package, and the tabs of the electrode

assembly extend out of the package.

(17) The electrode assembly takes a first cutout portion as the tail end, such that the electrode plate at the outermost ring of an battery core assembly is of a design without the plain aluminum foil, which saves aluminum foil consumables of a single battery core and greatly lowers the possibility of generating aluminum chips, thereby greatly eliminating the risk of short circuits caused by chips, avoiding the risk of fire explosion of the battery core, and enhancing the safety of the battery core used in extreme conditions. A first adhesive member is further provided on a surface of the electrode assembly, and when the electrode assembly is accommodated in the package, the first adhesive member can bond the outer surface of the electrode assembly and the package together. When suffering from external impacts because of drop, collision, etc., the electrode assembly and the outside package can be tightly connected together and do not generate relative displacement, thereby reducing shear damage.

Description

BRIEF DESCRIPTION OF DRAWINGS

- (1) FIG. 1 is a winding structural diagram of an electrode assembly in an embodiment.
- (2) FIG. 2 is a winding structural diagram of an electrode assembly in an embodiment.
- (3) FIG. 3 is a structural diagram of an electrode assembly in an embodiment.
- (4) FIG. 4 is an unfolded structural diagram of a first electrode plate in a comparative embodiment.
- (5) FIG. 5 is an unfolded structural diagram of a first electrode plate in an embodiment.
- (6) FIG. 6 is an unfolded structural diagram of a first electrode plate in a comparative embodiment.
- (7) FIG. 7 is an unfolded structural diagram of a first electrode plate in an embodiment.
- (8) FIG. 8 is a winding structural diagram of an electrode assembly in a comparative embodiment.
- (9) FIG. 9 is a structural diagram of a battery in an embodiment.

REFERENCE NUMERALS OF MAIN ELEMENTS

(10) TABLE-US-00001 Electrode assembly 100 First plane 101 Second plane 102 First arc surface 103 Second arc surface 104 Plain aluminum foil 105 Insulating tape 106 First electrode plate 10 First current collector 11 First active material layer 12 Winding terminating end 13 First plain foil area 14 Second electrode plate 20 Second current collector 21 Second active material layer 22 Second plain foil area 23 Separator 30 Winding terminating end 31 First adhesive member 41 Second adhesive member 42 First tab 50 Second tab 60 First insulating member 70 Second insulating member 80 Battery 200 Package 201

DETAILED DESCRIPTION OF EMBODIMENTS

- (11) The following clearly and fully describes the technical solutions in the embodiments of the application by reference to the accompanying drawings in the embodiments of the application. Apparently, the described embodiments are merely a part of but not all of the embodiments of the application. Based on the embodiments in the application, all other embodiments made by an ordinarily skilled in the art without creative labor fall within the protective scope of the application.
- (12) It needs to be noted that when an element is described to be “fixed to” another element, it can be directly on another element or an intermediate element may exist. When an element is deemed to be “connected to” another element, it can be directly connected to another element or it is possible that an intermediate element exists at the same time. When an element is deemed to be “arranged on” another element, it can be directly arranged on another element or it is possible that an intermediate element exists at the same time. Terms, “perpendicular”, “horizontal”, “left”, “right” and similar expressions, used herein are for the purpose of illustration only.
- (13) Unless otherwise defined, all technical and scientific terms used herein have the same meanings as usually understood by a person skilled in the technical field of this application. The terms used in the description of the application herein are merely intended for describing specific

embodiments but are not intended to limit this application. The term “or/and” used herein comprises one or any one of and all of combinations of a plurality of relevant listed items.

(14) An embodiment of the application provides an electrode assembly, which comprises a first electrode plate, a second electrode plate and a separator, wherein the first electrode plate and the second electrode plate are opposite in polarity, the separator is arranged between the first electrode plate and the second electrode plate, and the electrode assembly is formed by winding the first electrode plate, the separator and the second electrode plate. The first electrode plate comprises a first current collector and a first active material layer; the first active material layer is arranged on the surface of the first current collector; a winding terminating end of the first electrode plate is positioned on an outer side of a winding terminating end of the second facing away from a winding core electrode plate, the first active material layer on the winding terminating end of the first electrode plate covers one surface of the first current collector facing toward the second electrode plate, and the other surface of the first current collector on the winding terminating end of the first electrode plate facing away from the second electrode plate is not coated with the first active material layer. The electrode assembly further comprises a first adhesive member, and the first adhesive member is arranged on an outer surface of the electrode assembly.

(15) The electrode assembly takes the winding terminating end of the first electrode plate as the tail end, such that the electrode plate at the outermost ring of an battery core assembly is of a design without the plain aluminum foil, which saves aluminum foil consumables of a single battery core and greatly lowers the possibility of generating aluminum chips, thereby greatly eliminating the risk of short circuits caused by chips, greatly eliminating the risk of fire explosion of the battery core, and enhancing the safety of the battery core used in extreme conditions. A first adhesive member is further provided on the surface of the electrode assembly, and when the electrode assembly is accommodated in the package, the first adhesive member can bond the outer surface of the electrode assembly and the package together. When suffering from external impacts because of drop, collision, etc., the electrode assembly and the outside package can be tightly connected together and do not generate relative displacement, thereby reducing shear damage.

(16) The following describes some embodiments of the application in detail. To the extent that no conflict occurs, the following embodiments/implementations and the features in the embodiments/implementations may be combined with each other.

(17) Referring to FIG. 1, in an embodiment of the application, an electrode assembly **100** comprises a first electrode plate **10**, a second electrode plate **20** and a separator **30**. The first electrode plate **10** and the second electrode plate **20** are opposite in polarity. The separator **30** is arranged between the first electrode plate **10** and the second electrode plate **20**. The electrode assembly **100** is formed by winding the first electrode plate **10**, the separator **30** and the second electrode plate **20** around a winding needle, and after the winding process is finished, the winding needle is taken out of the electrode assembly **100**. The first electrode plate **10** comprises a first current collector **11** and a first active material layer **12**. The first active material layer **12** is arranged on a surface of the first current collector **11**. A winding terminating end of the first electrode plate **10** is positioned on an outer side of a winding terminating end of the second electrode plate **20** facing away from a winding core.

(18) In an embodiment of the application, the first electrode plate **10** is a cathode electrode plate; the first current collector **11** may be an aluminum foil layer; and the first active material layer **12** is a cathode active material layer, which may be selected from electrochemical active materials that enable reversible intercalation and deintercalation of lithium ions such as LiCoO_2 and LiFePO_4 . The second electrode plate **20** is an anode electrode plate, which comprises a second current collector **21** and a second active material layer **22**, wherein the second current collector may be a copper foil layer, and the second active material layer **22** may be selected from electrochemical active materials that enable intercalation of lithium ions such as graphite, soft carbon, hard carbon and $\text{Li}_{0.4}\text{Ti}_{0.5}\text{O}_{1.2}$.

(19) The winding terminating end **13** of the first electrode plate **10** is a structure of the outermost electrode plate of the electrode assembly **100**. The first active material layer **12** on the winding terminating end **13** of the first electrode plate **10** covers one surface of the first current collector **11** facing toward the second electrode plate **20**. The other surface of the first current collector **11** on the winding terminating end **13** of the first electrode plate **10** facing away from the second electrode plate **20** is not coated with the first active material layer **12**.

(20) The electrode assembly **100** further comprises a first adhesive member **41** and a second adhesive member **42**, wherein the first adhesive member **41** is arranged on the outer surface of the electrode assembly **100** to bond the electrode assembly **100** and a package so as to narrow or eliminate the fitting clearance between them, and the second adhesive member **42** is connected to the winding terminating end of the first electrode plate **10** and covers part of the outer surface of the electrode assembly **100**.

(21) In an embodiment of the application, the first adhesive member **41** is a semi-liquid viscous material, arranged on the outer surface of the electrode assembly **100** by means of spot coating and coating. When a battery suffers from impacts because of drop, collision, etc., the electrode assembly **100** and the outside package can be tightly connected together and do not generate relative displacement, thereby reducing shear damage. The first adhesive member **41** may be a hot melt layer, and the material of the first adhesive member may be a rubber binder, an acrylic binder, etc., which can become viscous under certain pressure (3 MPa) and temperature ($\leq 120^{\circ}\text{C}$.) conditions so as to firmly bond the outer surface of the electrode assembly **100** and the package together. The first adhesive member **41** has a thickness of less than or equal to 20 μm , a bonding force of 100-1000 N/m, and a tensile breaking stress of smaller than or equal to 4000 N/m.

(22) In an optional embodiment, the second adhesive member **42** is hot melt adhesive or insulating adhesive, optionally super-thin hot melt adhesive with a thickness of 15 μm -25 μm , and the material of the second adhesive member **42** may be a rubber binder, used in combination with PET. Under certain pressure ($\leq 3\text{ MPa}$) and temperature ($\leq 120^{\circ}\text{C}$.) conditions, the second adhesive member **42** can become viscous. In another word, the hot melting temperature of the second adhesive member **42** is smaller than or equal to 120°C ., and the hot melting pressure is smaller than or equal to 3 MPa.

(23) Referring to FIG. 1 again, the outer surface of the electrode assembly **100** includes a first plane **101**, a second plane **102**, a first arc surface **103** and a second arc surface **104**. Along the thickness direction (a direction pointed at by arrow A in FIG. 1) of the electrode assembly **100**, the first plane **101** and the second plane **102** are arranged opposite to each other. Along the width direction (a direction pointed at by arrow B in FIG. 1) of the electrode assembly **100**, the first arc surface **103** and the second arc surface **104** are arranged opposite to each other, and the first arc surface **103** and the second arc surface **104** are connected between the first plane **101** and the second plane **102**, respectively.

(24) The winding terminating end of the first electrode plate **10** is approximately positioned at the boundary between the first plane **101** and the first arc surface **103**. The second adhesive member **42** is connected to the winding terminating end of the first electrode plate **10** and attached to the first arc surface **103**, preventing the second adhesive member **42** from increasing the thickness of the electrode assembly **100**. The first adhesive member **41** is connected to the second adhesive member **42** and covers the first plane **101**, the second plane **102** and the second arc surface **104**. In another word, the area on the outer surface of the electrode assembly **100** is covered by the first adhesive member **41**, wherein the area is not attached with the second adhesive member **42**. In other embodiments, the winding terminating end of the first electrode plate can further be positioned in the first plane **101** or the second plane **102**, and correspondingly, the second adhesive member **42** can further be attached to the first plane **101** or the second plane **102**.

(25) Further, to prevent burrs generated by lithium separation at an end portion of the second electrode plate **20** from resulting in short circuits when the burrs penetrate through the separator **30**

and connect the first electrode plate **10**, the winding terminating end of the second electrode plate **20** extends out of the winding terminating end **13** of the first electrode plate **10** along a winding direction of the electrode plate. The extension length **L1** is greater than or equal to 2 mm. The winding terminating end **31** of the separator **30** extends out of the winding terminating end of the second electrode plate **20** along the winding direction and is attached to the inner surface of the second adhesive member **42**. The length **L2** of the winding terminating end **31** of the separator **30** is greater than or equal to 4 mm. The winding terminating end of the second electrode plate **20** is covered by the winding terminating end **31** of the separator **30** so as to protect and insulate the winding terminating end of the second electrode plate **20**.

(26) Referring to FIG. 1 and FIG. 3, the electrode assembly **100** further comprises a first tab **50** and a second tab **60**, wherein the first tab **50** is connected to the first electrode plate **10**, and the second tab **60** is connected to the second electrode plate **20**. Along the thickness direction of the electrode assembly **100**, the projections of the first tab **50** and the second tab **60** are not overlapped. Along the length direction (a direction pointed at by arrow C in FIG. 3) of the electrode assembly **100**, the first tab **50** and the second tab **60** extend out of the same end of the electrode assembly **100**. In other embodiments, the first tab **50** and the second tab **60** can extend out of different ends of the electrode assembly **100**. The application is not limited to such way.

(27) Further, a winding starting end of the first electrode plate **10** is provided with a first plain foil area **14**; a winding starting end of the second electrode plate **20** is provided with a second plain foil area **23**; the first tab **50** is arranged in the first plain foil area **14**; and the second tab **60** is arranged in the second plain foil area **23**. The electrode assembly **100** comprises a first insulating member **70**. The first insulating member **70** is arranged in the first plain foil area **14** and covers the first tab **50**, preventing the burrs on the first tab **50** from resulting in short circuits when the burrs penetrate through the separator **30** and contact the second electrode plate **20**. In an alternative embodiment, the first insulating member **70** can be an insulating tape, which extends from the first tab **50** to a starting end of the first active material layer **12** and almost covers the entire first plain foil area **14**, or another insulating member **70** is arranged between the first tab **50** and the starting end of the first active material layer **12**, such that the first plain foil area **14** is well protected against incidents such as breakage and short circuits.

(28) In an optional embodiment, the second plain foil area **23** extends out of the first plain foil area **14**; and the second tab **60** is arranged in an area of the second plain foil area **23**, wherein the area extends out of the first plain foil area **14**. Even if the burrs on the second tab **60** penetrate through the separator **30**, the second tab **60** contacts the second electrode plate **20** instead of contacting the first electrode plate **10** so as to avoid the short circuit. The electrode assembly **100** further comprises a second insulating member **80**. The second insulating member **80** covers an end portion of the first plain foil area **14**, preventing the burrs on the end portion of the first plain foil area **14** from penetrating through the separator **30** and contacting the second electrode plate **20**.

(29) Referring to FIG. 2, in one of the embodiments of the application, the first tab **50** is arranged in an area coated with the first active material layer **12** on the first current collector **11**, and the second tab **60** is arranged in an area coated with the second active material layer **22** on the second current collector **21**. The first insulating member **70** is arranged at both the first tab **50** and the second tab **60** to avoid the problem of short circuits. To connect the first tab **50** to the first current collector **11**, it needs to remove part of the first active material layer **12** first, such that part of the first current collector **11** is exposed out of the first active material layer **12**, and then the first tab **50** is welded on the exposed part of the first current collector **11**. The second tab **60** is connected to the second current collector **21** in the similar way, which is not described repeatedly here. In other embodiments, the first tab **50** and the second tab **60** can further be separately arranged in either the plain foil area at the winding core of the electrode assembly **100** or other position of the electrode plate. The application is not limited to such way.

(30) Referring to FIG. 4 and FIG. 5, the position shown by the dotted line in the figures is the

cutout position of two adjacent first electrode plates **10** during manufacturing. When the first tab **50** is arranged in the first plain foil area **14**, since the electrode assembly in the comparative embodiment is provided with a section of plain aluminum foil at the outermost ring, and in the comparative embodiment as shown by FIG. **4** the length **L3** of the plain aluminum foil area is apparently greater than the length **L4** of the plain aluminum foil area in the embodiment of the application as shown in FIG. **5**, the length **L4** of the plain aluminum foil area in the embodiment of the application only needs to meet the parameter requirement of the winding starting end of the electrode assembly **100**, which not only saves the aluminum foil consumables, but also removes the plain aluminum foil at the outermost ring. Under extreme breakage conditions, the possibility of generating aluminum chips is greatly reduced, thereby greatly eliminating dangerous short circuits caused by chips, avoiding the risk of fire explosion of the electrode assembly **100**, and enhancing the safety of the electrode assembly **100** used under extreme conditions.

(31) Referring to FIG. **6** and FIG. **7**, when the first tab **50** is arranged in the area coated with the first active material layer **12** on the first current collector **11**, the electrode assembly in the comparative embodiment is provided with a section of plain aluminum foil at the outermost ring, in the comparative embodiment as shown in FIG. **6** a section of single-coated area and a section of plain aluminum foil exist between two adjacent first electrode plates **10** and the single-coated area is the winding terminating end **13** of the first electrode plate **10**, while in the embodiment of the application as shown in FIG. **7** the plain aluminum foil between two adjacent first electrode plates **10** is removed and there is only a section of single-coated area (the winding terminating end **13** of the first electrode plate **10**), such that the first active material layer **12** on a lower surface of the first current collector **11** can be continuous, thereby simplifying the manufacturing process of the first electrode plate **10** and improving the production efficiency.

(32) Referring to FIG. **8**, in a comparative embodiment, part of plain aluminum foil **105** (without the active material coating on both sides) exists in the outside tail of the electrode assembly, and the tail plain aluminum foil and a coating edge at the tail are attached with one layer of insulating tape **106**. The plain aluminum foil **105** and the insulating tape **106** are both positioned in the first plane **101** or the second plane **102** of the electrode assembly.

(33) The specific content of the impact test of the electrode assembly **100** in the comparative embodiment and in the embodiment of the application is as follows: The fully charged electrode assembly was placed on a plat iron sheet. A round rod with a diameter ϕ of 15.8 ± 0.1 mm and a length of at least 6 cm was perpendicular to a test sample (at the position of the tab). A heavy hammer with a mass of 9.1 ± 0.1 Kg perpendicularly fell down in a free state from a position 61 ± 2.5 cm away from the cross point of the round rod and the test piece. The pass rates of the electrode assemblies were compared. The pass criterion is that the electrode assembly does not fire and explode after the test is finished.

(34) The impact test data of the electrode assemblies **100** in the comparative embodiment and in the embodiment of the application can be seen in the table below.

(35) TABLE-US-00002 Type Impact pass number Pass ratio Embodiment 9/10 pass 90% comparative 0/10 pass 0% embodiment

(36) The specific content of the drop test of the electrode assembly **100** in the comparative embodiment and in the embodiment of the application is as follows: The electrode assembly was half charged, placed in a special fixture and properly fixed. Then, the fixture was placed at a 1 m high position for drop test. There were a total of four rounds of drops, each round including a drop of each of six faces and four corners. The pass rate of the battery core was compared. The judgment criteria includes breakage of a top seal, liquid leak, 24-hour pressure drop of greater than 30 mV, and a breaking of the aluminum foils.

(37) The thickness of the electrode assembly in the first test group was 3 mm (11-layer winding). The test results can be seen in the table below.

(38) TABLE-US-00003 Drop test ED Top seal Liquid 24 h pressure- Aluminum foil Pass Loss

Group breakage leak drop > 30 mV breaking ratio ratio Embodiment 0/10 5/10 0/10 8/10 67.5%
0% comparative 0/10 10/10 5/10 10/10 37.5% -2.33% embodiment

(39) The thickness of the electrode assembly in the second test group is 5 mm (19-layer winding). The test results can be seen in the table below.

(40) TABLE-US-00004 Drop test ED Top seal Liquid 24 h pressure- Aluminum foil Pass Loss
Group breakage leak drop > 30 mV breaking ratio ratio Embodiment 0/10 6/10 0/10 8/10 65.0%
0% comparative 0/10 10/10 6/10 10/10 35.0% -1.40% embodiment

(41) In conjunction with FIGS. 4-8 and data in table above, in the embodiments of the applications, comparing with the comparative embodiments, the design of no plain aluminum foil at the outermost circle of the electrode assembly **100**, lowers the possibility of generating aluminum chips, thereby eliminating dangerous short circuits caused by chips, avoiding the risk of fire explosion of the electrode assembly **100**, and enhancing safety of the electrode assembly **100** used under extreme conditions. Moreover, the first adhesive member **41** arranged on the outer surface of the electrode assembly **100** can tightly bond the electrode assembly **100** and the outside package together to prevent the two from generating relative displacement, thereby reducing shear damage.

(42) Referring to FIG. 9, an embodiment of the present application further discloses a battery **200** which comprises a package **201** and the electrode assembly **100** in the foregoing embodiments, wherein the electrode assembly **100** is accommodated in the package **201**, and the tabs of the electrode assembly **100** extend out of the package **201**.

(43) The foregoing embodiments are merely used to describe the technical solution of the application, and not to limit the application. Despite of detailed description of the application by reference to the foregoing preferable embodiments, an ordinarily skilled in the art should understand that, various modifications and equivalent substitutions may be made to the technical solutions of the application, and all such modifications and equivalent substitutions fall within the technical conception and scope of the technical solution of the application.

Claims

1. An electrode assembly, comprising: a first electrode plate; a second electrode plate, with a polarity opposite to the polarity of the first electrode plate; a separator, being arranged between the first electrode plate and the second electrode plate, the electrode assembly being formed by winding the first electrode plate, the separator and the second electrode plate; wherein the first electrode plate comprises a first current collector and a first active material layer; the first active material layer is arranged on a surface of the first current collector; and a winding terminating end of the first electrode plate is positioned on an outer side of a winding terminating end of the second electrode plate facing away from a winding core; the first active material layer on the winding terminating end of the first electrode plate covers one surface of the first current collector facing toward the second electrode plate, the other surface on the winding terminating end of the first electrode plate facing away from the second electrode plate is not coated with the first active material layer; an outer surface of the electrode assembly includes a first plane, a second plane, a first arc surface and a second arc surface; the first plane, the second arc surface, the second plane, and the first arc surface are arranged along a winding direction of the electrode assembly; along a thickness direction of the electrode assembly, the first plane and the second plane are arranged opposite to each other; along a width direction of the electrode assembly, the first arc surface and the second arc surface are arranged opposite to each other; a thickness of the electrode assembly, defined between the first plane and the second plane, is less than a distance along the width direction of the electrode assembly between the first arc surface and the second arc surface; the electrode assembly further comprising a first adhesive member, the first adhesive member is arranged on the outer surface of the electrode assembly, wherein the electrode assembly further comprises a second adhesive member; the first adhesive member consists of portions that cover the

first plane, the second arc surface, and the second plane of the electrode assembly; the first adhesive member is connected to and overlaps with the second adhesive member, and the second adhesive member is connected to the winding terminating end of the first electrode plate and covers the first arc surface of the electrode assembly, wherein the second adhesive member further extends to overlap with both the winding terminating end of the first electrode plate and the winding terminating end of the second electrode plate.

2. The electrode assembly according to claim 1, wherein the first adhesive member is a semi-liquid viscous material, arranged on the outer surface of the electrode assembly in a form of spot coating or coating.

3. The electrode assembly according to claim 1, wherein the first adhesive member has a thickness of less than or equal to 20 μm .

4. The electrode assembly according to claim 1, wherein the second adhesive member has a thickness of 15 μm -25 μm .

5. The electrode assembly according to claim 1, wherein the winding terminating end of the second electrode plate extends out of the winding terminating end of the first electrode plate along a winding direction of the electrode assembly.

6. The electrode assembly according to claim 5, wherein a winding terminating end of the separator extends out of the winding terminating end of the second electrode plate along the winding direction of the electrode assembly.

7. The electrode assembly according to claim 1, wherein the electrode assembly further comprises a first tab and a second tab, the first tab is connected to the first electrode plate; the second tab is connected to the second electrode plate; and along the thickness direction of the electrode assembly, projections of the first tab and the second tab are not overlapped.

8. The electrode assembly according to claim 7, wherein a winding starting end of the first electrode plate is provided with a first plain foil area; a winding starting end of the second electrode plate is provided with a second plain foil area; the first tab is arranged in the first plain foil area; and the second tab is arranged in the second plain foil area.

9. The electrode assembly according to claim 8, wherein the electrode assembly further comprises a first insulating member, the first insulating member is arranged in the first plain foil area and covers the first tab.

10. The electrode assembly according to claim 1, wherein the first adhesive member has a bonding force of 100-1000 N/m, and a tensile breaking stress of smaller than or equal to 4000 N/m.

11. A battery comprising an electrode assembly according to claim 1 and a package, wherein the electrode assembly is accommodated in the package; and tabs of the electrode assembly extend out of the package; wherein the first adhesive member is bonded with the outer surface of the electrode assembly and the package together.

12. The battery according to claim 11, wherein the first adhesive member is a semi-liquid viscous material, arranged on the outer surface of the electrode assembly in a form of spot coating or coating.

13. The battery according to claim 11, wherein the first adhesive member has a thickness of smaller than or equal to 20 μm .

14. The battery according to claim 11, wherein the second adhesive member has a thickness of 15 μm -25 μm .

15. The battery according to claim 11, wherein the winding terminating end of the second electrode plate extends out of the winding terminating end of the first electrode plate along a winding direction of the electrode assembly.

16. The battery according to claim 15, wherein a winding terminating end of the separator extends out of the winding terminating end of the second electrode plate along the winding direction of the electrode assembly.

17. The battery according to claim 11, wherein the electrode assembly further comprises a first tab

and a second tab, the first tab is connected to the electrode plate; the second tab is connected to the second electrode plate; and along the thickness direction of the electrode assembly, the projections of the first tab and the second tab are not overlapped.

18. The battery according to claim 17, wherein a winding starting end of the first electrode plate is provided with a first plain foil area; a winding starting end of the second electrode plate is provided with a second plain foil area; the first tab is arranged in the first plain foil area; and the second tab is arranged in the second plain foil area.

19. The electrode assembly according to claim 1 wherein an area on the outer surface of the electrode assembly which is not attached with the second adhesive member is covered by the first adhesive member.
