Filed on behalf of: Eve Energy Co., Ltd..

**UNITED STATES PATENT AND TRADEMARK OFFICE**

---

**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

---

**INTER PARTES REVIEW**

U.S. Patent Nos.
9,153,835
9,496,581
9,799,913

Eve Energy Co., Ltd.
Petitioner

v.

VARTA MICROBATTERY GMBH
Patent Owner

---

Case Nos.
IPR2022- 01484
IPR2022- 01486
IPR2022- 01487

DECLARATION OF MARC JUZKOW

144. Kobayashi further discloses various compositions for the insulating members, such as "polyethylene or polypropylene resin, a film made of PET or polyimide, or the like." *Id.* A POSITA would further understand that, beyond the specific materials disclosed by Kobayashi, a variety of materials can be used as this insulating member, including plastic polymers, such as polyolefin (such as polypropylene or polyethylene), polyester, polyimide (such as Kapton), and fluoropolymers, as discussed in §IX.A.1.d.

145. I further note that this claim is directed to an insulating means arranged "between the end faces of the spiral winding and the housing cup ***and*** the housing top." (Emphasis added). This suggests that the insulating means according to the '835 patent is the same on the top end face of the spiral winding and the bottom face of the spiral winding. Kobayashi still discloses this configuration, as the insulating plates disclosed are made of the same material, are in the same shape, and are arranged between ***both*** the housing cup and the housing top.

**k. Combining Kobayashi, Kaun, and Brenner would have been obvious to the POSITA**

146. A POSITA would have been motivated to combine the teachings of Kobayashi and Kaun. Kobayashi and Kaun both share the common objective of improving button cells and related types of batteries without sacrificing longevity or efficiency. For example, Kaun provides:

> a button-type cell enclosure. Consisting of two opposing shallow cups, which are electrically isolated from each other with a polymeric "U"

shaped gasket at the outer edge. The gasket further forms a gas-tight seal for the interior contents of the cell. These cup members interface with the perpendicular electrode member of another electrochemical cell to serve as both an output conductor and a cell terminal. The positive electrode substrate is essentially of the same material as the positive terminal surface and the negative electrode substrate is essentially of the same material as the negative terminal surface. The positive is generally aluminum and the negative is generally copper. The Rolled-Ribbon cell assembly is a disc that is slightly wider that the distance between the parallel surfaces of the assembled current-collector cups to assure contact with the electrode foil substrates.

Ex. 1023 (Kaun) at [0072]. Similarly, Kobayashi is directed

> to provid[ing] a small battery capable of improving a heavy load characteristic without impairing productivity. . . . The present inventors have found a method of safely and highly productively storing a wound electrode group in a case of a small battery such as a button shape or a coin shape.
>
> [A] container having a sealing structure is used in which a metallic negative electrode case serving as a negative electrode terminal and a

metallic positive electrode case serving as a positive electrode terminal are fitted via an insulating gasket.

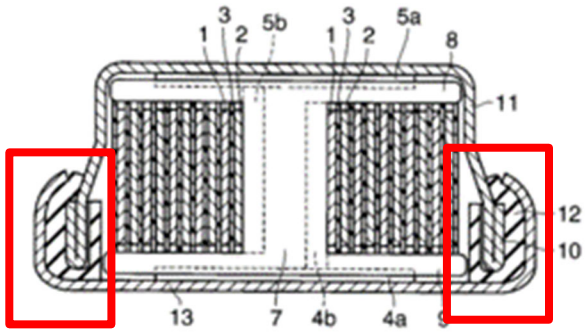
Ex. 1004 (Kobayashi) at [0012]-[0013].

147. Based on my review of these references, Kobayashi is directed to the same subject matter disclosed in Kaun – Button-cell batteries with spiral wound electrode assemblies enclosed within a cell housing. *Compare* Ex. 1004 (Kobayashi) at [0013] ("It has been found that a small battery excellent in heavy load characteristics can be provided by housing an electrode group in which a laminate including a positive electrode and a negative electrode is wound spirally in the container.") *with* Ex. 1023 (Kaun) at [0048] ("This basic laminate cell preassembly is layered on itself, such as by winding or coiling it in a spiral to form an electrode assembly in the general shape of a flat disc (wherein the diameter is preferably greater than twice the thickness of the disk). The cell membrane is sandwiched between plate-like current collectors with the electrode interfaces primarily perpendicular to the current collectors to make up an electrochemical cell.").

148. Instead of beading, Kaun uses an insert molded gasket placed between housing top 28p and cup 28n to provide a gas-tight seal. Ex. 1023, [0116]. As discussed above, Kaun provides a sealing mechanism that closes the button cell without being beaded over. *Supra* §IX.A.1.f. Using insulator/gasket 32 allows for sealing of the button cell using a housing cup whose edge remains essentially perpendicular to its flat bottom area. Ex. 1023, FIG. 7.

149. As can be seen clearly in FIG. 1 of Kobayashi (annotated below), a significant portion of the available space within the cell is reduced by the process of crimping the cell closed. The process of crimping the cell closed can require significant extra space for the cell housing, but such space cannot be used for active materials, thus reducing the overall volumetric energy density of the cell.

FIG. 1¶




150. A POSITA would have been motivated to alter the housing of Kobayashi so as to incorporate the non-beaded over sealing features of the Kaun cell housing. A benefit is that the button cell of Kaun, which is sealed without being beaded over, allows for greater internal space to contain the electrode assembly, meaning that more electrode layers can be included in a button cell of a given diameter that is closed without being beaded over (i.e., according to Kaun) than one that is closed by being beaded over (i.e. according to Kobayashi).

151. A POSITA would have also understood that it would be preferred to have the inner lateral side of the housing flat from top to bottom to absorb uniform radial forces from the expansion of the electrodes in the spiral winding, as provided by Kaun.