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JPH10172608A SHEET-LIKE LITHIUM SECONDARY BATTERY

Applicants: MITSUBISHI CABLE IND LTD

Inventors: IJIRI YASUO,ZUSHI TOSHIHIRO

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SHEET-LIKE LITHIUM SECONDARY BATTERY

Abstract

PROBLEM TO BE SOLVED: To reduce the weight and thickness of a battery by the quantity corresponding to the reduced quantity of a negative electrode active substance layer by setting the effective capacity of the negative electrode active substance layer consisting of graphite of a negative electrode sheet to be in the prescribed range smaller than the conventional relative to the effective capacity of a positive electrode active substance layer of a positive electrode sheet. SOLUTION: A negative electrode sheet 1 having a negative electrode active substance layer 11 and a positive electrode sheet 2 having a positive electrode active substance layer 22 are laminated through a separator 3 in which the nonaqueous liquid electrolyte is filled, and sealed in a housing body 4 to constitute a battery. When the effective capacity of the negative electrode active substance layer 11 is excessive relative to that of the positive electrode active substance layer 22, the weight and thickness of the battery is increased. While the it is excessively small, possibility of generation of dendrite is increased. Thus, the effective capacity of the negative electrode active substance layer 11 is 80-120, more preferably, 100-110 relative to the effective capacity of the positive electrode active substance layer 11. The battery more excellent in space factor, weight and safety than conventional ones can be provided.

Notice

CLAIMS JPH10172608A

1.

13 A negative electrode sheet having a negative electrode active material layer made of graphite and a positive electrode sheet are laminated with an electrolyte layer interposed therebetween. A sheet-shaped lithium secondary battery having a capacity of 80-120.

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17 黒鉛からなる負極活物質層を有する負極シートと正極シートとがその間に電解質の層を介在した状態にて積層されており、且つ正極活物質層の実効容量１００に対して負極活物質層の実効容量は８０～１２０であることを特徴とするシート状リチウム二次電池。

2.

25 The sheet-like lithium secondary battery according to claim 1, wherein the effective capacity of the negative electrode active material layer is 100-110 with respect to the effective capacity of 100 of the positive electrode active material layer.

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29 正極活物質層の実効容量１００に対して負極活物質層の実効容量は１００～１１０である請求項１記載のシート状リチウム二次電池。

3.

36 The sheet-like lithium secondary battery according to claim 1, wherein the electrolyte is a non-aqueous liquid electrolyte

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39 電解質が非水系の液体電解質である請求項１または２記載のシート状リチウム二次電池。

4.

45 The sheet-like lithium secondary battery according to any one of claims 1 to 3, wherein the positive electrode active material layer comprises a lithium-containing transition metal oxide.

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48 正極活物質層がリチウム含有遷移金属酸化物からなる請求項１～３のいずれかに記載のシート状リチウム二次電池。

Notice

DESCRIPTION JPH10172608A

[0001]

13 TECHNICAL FIELD The present invention relates to a lithium secondary battery, and more particularly to a sheet-like lithium secondary battery.

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16 【発明の属する技術分野】本発明は、リチウム二次電池に関し、特にシート状のリチウム二次電池に関する。

[0002]

23 2. Description of the Related Art Lithium secondary batteries having a large discharge capacity are attracting attention as batteries for electronic devices such as portable telephones and personal computers.

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27 【従来の技術】携帯型の電話やパソコンなどの電子機器用の電池として放電容量の大きいリチウム二次電池が脚光を浴びている。

31 Conventionally, three-dimensional batteries, such as columnar and box-shaped batteries, have mainly been used as lithium secondary batteries. Recently, however, interest in sheet-shaped lithium secondary batteries has increased because of their small discharge capacity compared to three-dimensional batteries, but their space factor and light weight. A sheet-like lithium secondary battery basically has a structure in which positive and negative electrode sheets are sealed with an appropriate exterior sheet without being wound with an electrolyte interposed therebetween. As for the electrolyte, solid and liquid electrolytes have been proposed, as in the

case of the three-dimensional battery. The liquid electrolyte is used in a state in which the separator is impregnated with it, as in the case of the three-dimensional battery.

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41 このリチウム二次電池として、従来は主として円柱状や箱型など、立体型電池が主流をなしてきた。 しかし近時、立体型電池と比較して放電容量が小さいがスペースファクター並びに軽量の点から、シート状のリチウム二次電池にも関心が高まっている。 シート状リチウム二次電池は、基本的には、正負両極シートの間に電解質を介在させた状態にて巻回されることなく適当な外装シートにて封止した構造を有する。 電解質については、立体型電池と同様に、固体のものと液体のものとが提案されている。 液体電解質は、立体型電池の場合と同様に、これをセパレータに含浸した状態で使用される。

[0003]

53 By the way, in recent years, the demand for further reduction in weight and thickness of sheet-like lithium secondary batteries has been increasing, but conventional products are practically unimproved in these respects.

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57 ところで、最近におけるシート状リチウム二次電池の一層の軽量化や薄化の要求は益々強くなっているにも拘らず、従来品はそれらの点において実際上未改良の状態にある。

61 The reason for this will be explained below.

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63 以下、その理由について説明する。

[0004]

69 In a three-dimensional lithium secondary battery such as a cylindrical or box-shaped battery, a negative electrode sheet and a positive electrode sheet are housed in an outer container in a state in which an electrolyte layer is interposed therebetween and the sheet is rolled many times. there is

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74 円柱状や箱型などの立体型のリチウム二次電池においては、負極シートと正極シートとがその間に電解質層を介在して、且つ多数回ロール巻きされた状態にて外装容器内に収容されている。

79 Due to the multi-roll winding structure, the inside of the battery has poor heat dissipation

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