According to PTL 2, the storage tube base made of a biodegradable resin not only does not swell with an aqueous ink and cause any dimensional change, but also biodegrades over time, which can thereby contribute to reducing the disposal amount of waste.

Citation List

Patent Literature

[0010]

PTL 1: JP S62-70097 A

PTL 2: JP 2001-146091 A

Summary of Invention

Technical Problem

[0011]

As described above, products using biodegradable resins and paper base materials can be suitable for less pollution. Especially, it is assumed that environment-friendly products as alternative materials for plastics can be provided by using materials including pulp and paper as base materials.

[0012]

Embodiments of the present invention seek to reduce plastics by substituting the liquid (e.g., ink) storage tubes made of plastics such as polypropylene with those made of paper base materials.

Solution to Problem

[0013]

A liquid storage member for coating tools according to an aspect of the present invention has at least three layers of: a paper base laminate composed of an inner layer made of paper base material and an intermediate layer of a metal layer or a silica vapor deposition layer formed on the outer surface side of the inner layer; and an outer layer made of the paper base material formed on the outer surface side of the intermediate layer. The liquid storage member for coating tools has structures in which the paper base laminate is spirally wound and the outer layer made of the paper base material is spirally wound around the outer surface side of the intermediate layer. A polyolefin resin-containing adhesive layer lies in between the inner layer and the intermediate layer or between the intermediate layer and the outer layer.

[0014]

The paper base laminate preferably has a length of 4 to 20 mm in the width direction.

The paper base material of the inner layer preferably has a density of 0.8 g/cm^3 or more.

Preferably, the paper base material of the inner layer is glassine paper, parchment paper, or vulcanized fiber.

[0015]

The liquid storage member for coating tools preferably has the following structure in the lengthwise direction: the paper base laminate is spirally wound for the adjacent portions to come into contact but not to be overlapped with each other, and the outer layer made of the paper base material is spirally wound for the adjacent portions to come into contact with each other.

The liquid storage member for coating tools preferably has two or more of the paper base laminates.

[0016]

The contact portion of the paper base laminate and the contact portion of the outer layer made of the paper base material are preferably arranged apart from each other by 1 mm or more and a half or less of the width of the paper base laminate or the outer layer made of the paper base material in the lengthwise direction of the liquid storage member for coating tools.

Preferably, the liquid storage member for coating tools is a paper refill for a writing tool.

Advantageous Effects of Invention

[0017]

In embodiments of the present invention, the inner layer and the intermediate layer and/or the intermediate layer and the outer layer of the paper base laminate are bonded with a polyolefin resin-containing adhesive or other adhesives containing the polyolefin resin and another resin, which

may make the layers adhere to each other and prevent ink from leaking out of the liquid storage member for coating tools. In order to suppress ink leakage, it may be effective to leave more spaces between seams 4 of each paper base laminate and between seams 4′ of each outer layer using a wider paper base laminate.

Embodiments of the present invention can provide a liquid storage member for coating tools which successfully reduces plastic consumption and reduce the environmental impact.

Brief Description of Drawings

[0018]

Fig. 1 shows an example of configuration for a refill including liquid storage member for coating tools of the present invention. Fig. 1a shows a front view of an appearance of the refill and Fig. 1b shows a cross section along line A-A of the refill.

Fig. 2 shows a three-layer structure of an inner layer, an intermediate layer and an outer layer constituting the liquid storage member for coating tools of the present invention: a form (2a) of an inner layer and an intermediate layer with an adhesive layer in-between, a form (2b) of an intermediate layer and an outer layer with an adhesive layer in-between, and a form (2c) of an inner layer, an intermediate layer and an outer layer each with adhesive layers in-between.

Fig. 3 shows a multilayer structure of a paper base