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(54) CONTAINER

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(57) **ABSTRACT**

A vessel is separated into at least two compartments by an easy-open peelable seal. At least one of the separated compartments is constituted of a laminate material. A gas barrier layer is provided to part of the laminate material so that the gas barrier layer may cover the entire surface of that compartment. An example of the vessel includes a vessel in which a laminate material comprised of at least an easy-open peelable material layer and a gas barrier layer is formed into a pouch shape, such that the easy-open peelable material layer is located on the inside of the vessel.

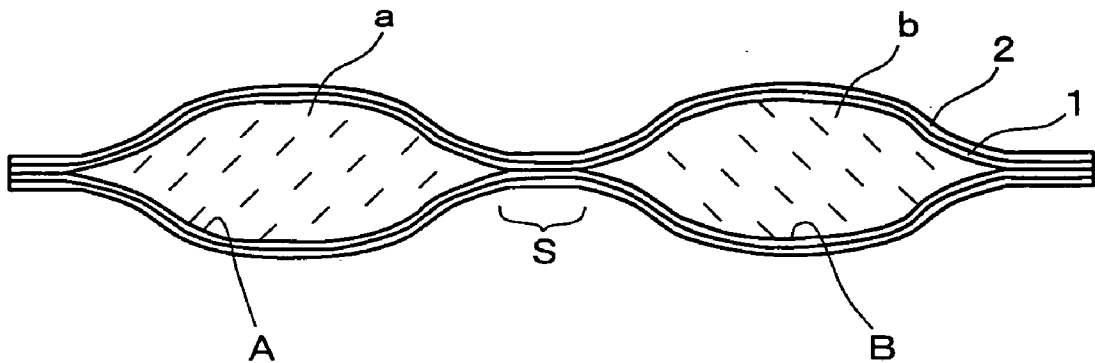


Fig. 1

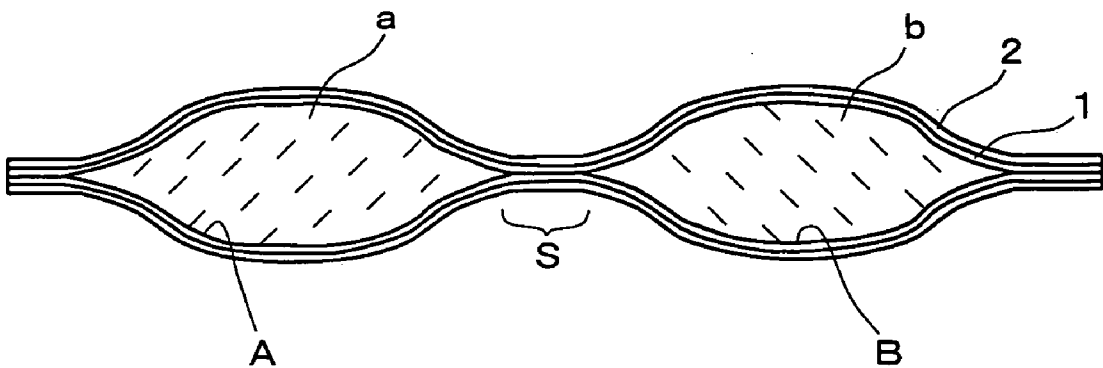
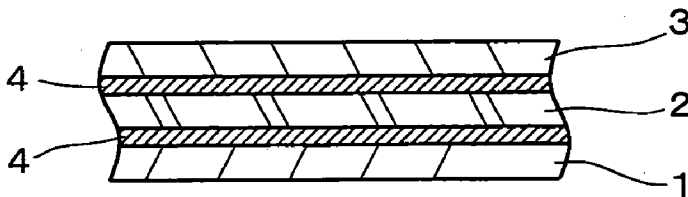


Fig. 2



CONTAINER

TECHNICAL FIELD

[0001] The present invention relates to a vessel that is capable of separating and enclosing at least two types of contents by an easy-open peelable seal, and that is particularly suitable for a two-component hair colour.

BACKGROUND ART

[0002] A two-component hair colour comprises a first agent containing an oxidation dye and an alkaline substance, and a second agent with aqueous hydrogen peroxide as the main component thereof, and these are usually enclosed in separate sealed vessels. At the time of use, the two agents are removed into a separately prepared mixing vessel and applied to hair after being mixed with a spatula or the like. However, in the case of the conventional two-component hair colour, both agents must be placed in separate vessels, and mixing must be performed once the agents are removed from their vessels, which creates difficulty in handling.

[0003] As a vessel in which two types of materials, preferably used after being mixed without coming into contact with the outside air, can be easily mixed prior to use without coming into contact with the outside air, there has been proposed a vessel in which two types of contents are separated and enclosed by an easy-open peelable seal (Japanese Patent No. 2675075, claim 1). During use of this vessel, force is applied to the contents from outside the vessel, the seal-treated part is opened and the separated compartments are connected, the contents are mixed without coming into contact with the atmosphere, part of the vessel is opened after mixing, and the mixture is removed to the outside.

[0004] Attempts have therefore been made to use a two-component hair colour with such a vessel.

[0005] However, because the conventional vessel, having an easy-open peelable seal, is formed from a film of resin blends that comprise at least two types of polyolefinic polymers selected from among a low-density polyethylene resin, high-viscosity polyethylene resin, polypropylene resin, and other materials with different fusion-starting temperatures, oxygen penetrates extremely easily through the vessel, leading to drawbacks that the first agent, which comprises an oxidation dye and alkaline substance, is oxidized and discolored while in storage. There are also problems with free ammonia gas dissipating out of the vessel, which leads to an inability to maintain the necessary alkali concentration when aqueous ammonia is contained as the alkaline substance. Furthermore, when the vessel is made from materials in which a low-density polyethylene sheet, or the like, is laminated through an adhesive onto the outside of a resin blend sheet comprising a polyolefinic polymer, the adhesive is weakened because of penetrating ammonia gas, which leads to undesirable interlaminar peeling.

[0006] These drawbacks are not limited to the case of two-component hair colour. These drawbacks also occur to differing degrees when various products (hair bleach, dressing, cooling agent, heating agent, and the like) for which the effects of outside oxygen must be avoided immediately prior to use, and for which two or more components thereof must initially be kept separate and then mixed at the time of use, are used with conventional vessels having a easy-open peelable seal.

[0007] An object of the present invention is to provide a vessel having an easy-open peelable seal, which is not easily affected by oxygen outside the vessel, and for which interlaminar peeling does not occur, even when ammonia gas evolves from the vessel, wherein this vessel is suitable for various products, including a two-component hair colour for which the effects of outside oxygen must be avoided immediately prior to use, and for which two or more components thereof must initially be kept separate and then mixed at the time of use.

DISCLOSURE OF THE INVENTION

[0008] The inventors discovered that the foregoing object could be achieved by newly providing part of the material that constitutes the vessel with a gas barrier layer for preventing the effects of oxygen from outside the vessel on the vessel contents, and for inhibiting the effects of ammonia gas generated inside the vessel, and thus developed the present invention.

[0009] Specifically, the present invention provides a vessel with at least two compartments separated by an easy-open peelable seal, wherein the vessel comprises a gas barrier layer in part of the vessel material that constitutes at least one of the separated compartments, such that the entire surface of that one compartment is covered.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a cross-sectional diagram depicting an example of the vessel of the present invention; and

[0011] FIG. 2 is an example of a cross-sectional view of the laminate material that constitutes the vessel of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

[0012] The present invention will be described in detail hereafter, with reference to the figures. The same symbols are used to refer to the same or similar structural elements in each of the figures.

[0013] FIG. 1, which is a cross-sectional diagram depicting an example of the vessel of the present invention, depicts an embodiment in which two compartments (A, B) are separated by an easy-open peelable seal S. Substance a is sealed in compartment A, and substance b is sealed in compartment B.

[0014] In the embodiment depicted in FIG. 1, the laminate material comprising at least an easy-open peelable material layer and a gas barrier layer is formed into a pouch shape, such that the easy-open peelable material layer is located on the inside of the vessel (specifically, the easy-open peelable material layer 1 is disposed over the entire inside surface of the vessel, and the gas barrier layer 2 is disposed over the entire outside surface thereof). However, the easy-open peelable material layer 1 need not be disposed over the entire inside surfaces of compartment A and compartment B as long as this layer is disposed over at least part of the seal S.

Also, the gas barrier layer 2 may be disposed so as to cover only the compartment in which the effects of oxygen from the outside must be avoided, or for which elimination of the effects of internal ammonia gas is desired.

[0015] In the present invention, the oxygen permeation rate of the laminate material comprising the gas barrier layer 2 may vary somewhat according to adhesion conditions even in the same structure, but 3.0 cc/m²·day·atm or less is preferable for avoiding degeneration of vessel contents by oxygen, and 1.0 cc/m²·day·atm or less is more preferable.

[0016] Gas barrier layers 2 that can be preferable for use in the present invention include polyvinyl alcohol film, silicon dioxide vapor-deposited polyvinyl alcohol film, ethylene vinyl alcohol copolymer film, or silicon dioxide vapor-deposited polyethylene terephthalate film.

[0017] The thickness of the gas barrier layer 2 may be determined as appropriate according to the desired oxygen permeation. The thickness of the silicon dioxide vapor-deposited layer in the silicon dioxide vapor-deposited polyvinyl alcohol film or silicon dioxide vapor-deposited polyethylene terephthalate film may also be determined as appropriate according to the color, desired oxygen permeation rate, and the like of the vapor-deposited layer thereof.

[0018] In the present invention, a resin mixture comprising at least two types of polyolefinic resins which have different fusion-starting temperatures, as described in claim 1 of Japanese Patent No. 2675075, and in column 6 (line 41) to column 7 (line 40) of the same specification, can be cited as a preferable material used for the easy-open peelable material layer 1.

[0019] In the present invention, it is preferable that a protective layer 3 for enhancing impact resistance, abrasion resistance, and the like is provided on the gas barrier layer 2 of the laminate material from which the vessel is composed, so as to be furthermore located outside the vessel (FIG. 2). In this case, it is preferable to bond each layer to its adjacent layer through an adhesive layer 4 (preferably, a urethane adhesive layer) that displays alkali resistance.

[0020] A nylon film or oriented polypropylene film can be cited as examples of protective layers 3 that can be preferable for use in the present invention.

[0021] The thickness of the protective layer 3 and the thickness of the adhesive layer 4 may be determined as appropriate according to the desired oxygen permeation rate.

[0022] The vessel of the present invention can be manufactured by a process in which, for example, the peripheral edges of two sheets of the laminate material in FIG. 2 are tightly sealed and processed into a pouch shape, such that the easy-open peelable material layers both are inwardly faced to each other, the first contents are introduced to the pouch at an amount of about an half in volume of the pouch, the central part of the pouch is sealed so as to be easy-open peelable, the remaining empty space in the pouch is filled with the second contents, and the open top end of the pouch is tightly sealed. As for the tight seal conditions thereof, these conditions include heating to a temperature approximately 5° C. or more above the highest fusion-starting temperature from among the fusion-starting temperatures of all resins contained in the easy-open peelable material.

Conditions of 120° C. and 4 seconds are also included as conditions for the easy-open peelable seal.

[0023] The vessel of the present invention as heretofore described can be preferable for use with hair colour. Specifically, a hair colour with a vessel having two separate compartments is encompassed by the present invention, wherein a publicly known oxidation dye is sealed in one compartment covered with a gas barrier layer, and a publicly known aqueous hydrogen peroxide agent is sealed in the other compartment. Not only can the effects of oxygen from the outside be prevented for this hair colour, but in a single vessel that uses an easy-peel material and has two compartments, even when an oxidation dye and a hydrogen peroxide agent, which are mutually reactive, are stored close to one another therein, reaction of oxygen or hydrogen peroxide gas generated from the hydrogen peroxide agent with the oxidation dye can be adequately prevented, and the storage stability of the oxidation dye can be kept high. The contents can also be mixed without coming into contact with the outside air, and interlaminar peeling by ammonia can also be minimized. Particularly, if monoethanolamine or the like is used as an alkaline agent for use in an oxidation hair colour, and the product is made ammonia-free, problems associated with ammonia can be overcome.

[0024] The vessel of the present invention having an easy-open peelable seal can also be preferable for application to a hair bleach (alkaline agent and aqueous hydrogen peroxide agent), dressing (edible high unsaturated fatty acid and water-based seasoning liquid), cooling agent (ammonium nitrate, water), heating agent (calcium oxide, water), or the like, for which the effects of outside oxygen must be avoided immediately prior to use, and for which two or more components thereof must initially be kept separate and then mixed at the time of use.

EXAMPLE

[0025] Examples 1 to 3 and Comparative Examples 1 to 3.

[0026] The vessels of Examples 1 to 3, as depicted in FIG. 1, were manufactured using laminate materials with the layer structures as recited in Table 1. The vessels of Comparative Examples 1 to 3 were also manufactured in the same manner as in Examples 1 to 3, except that an oriented polypropylene film (manufactured by Tohcello Co.) with a thickness of 20 μm was used instead of the gas barrier layer used in Examples 1 through 3.

[0027] The oxygen permeability (cc/m²·day·atm) of each laminate material, as measured in an environment of 23° C. using an oxygen permeability measuring device (isothermal gas permeation rate measuring device MT-C1, manufactured by Toyoseiki Seisaku-sho, Ltd.), is shown in Table 1. All of the oxygen permeability values for Comparative Examples 1 to 3 greatly exceeded 3.0 cc/m²·day·atm.

[0028] A first agent comprising 5% MEA (monoethanolamine), 20% BOE (benzyloxyethanol) and oxidation dye, and a second agent with 6% aqueous hydrogen peroxide as the main component thereof were used as contents.

[0029] Also, the tight sealing conditions for the peripheral edges were 200° C. and 5 seconds, and the easy-open peelable seal conditions were 120° C. and 4 seconds.

TABLE 1

Ex.	LAYER STRUCTURE	Oxygen Permeability (cc/m ² · day · atm)
1	NY ^{*1} /D ^{*2} /Si-VMPET ^{*3} /D/EPs ^{*4}	0.6
2	OPP ^{*5} /D/EVAL ^{*6} /D/PAN ^{*7} /D/EPs	0.8
3	OPP/D/TEC BARRIER S ^{*8} /D/SPECIAL OPP ^{*9} /D/EPs	0.4

Notes in Table 1
^{*1}Nylon film with thickness of 15 μm (manufactured by Unitika Ltd.)
^{*2}Urethane (polyether-based) adhesive (manufactured by Dainippon Ink Inc.) with thickness of 4 μm.
^{*3}Silicon dioxide vapor-deposited polyethylene terephthalate film (manufactured by Oike Industrial Co., Ltd.) with thickness of 12 μm.
^{*4}Easy-open peelable film (manufactured by Material Engineering Technology Laboratory, INC.) with thickness of 60 μm.
^{*5}Oriented polypropylene film (manufactured by Tohcello Co.) with thickness of 20 μm.
^{*6}Ethylene vinyl alcohol copolymer film (manufactured by Kuraray Co., Ltd.) with thickness of 5 μm.
^{*7}Polyacrylonitrile film (manufactured by Tamapoly Co., Ltd.) with thickness of 30 μm.
^{*8}Silicon dioxide vapor-deposited polyvinyl alcohol film (manufactured by Mitsubishi Chemical Kohjin PAX Co.) with thickness of 12 μm.
^{*9}Barrier coat oriented polypropylene film (manufactured by Futamura Chemical Industries Co., Ltd.) with thickness of 20 μm.

[0030] Storage stability testing was performed for the contents of the vessels thus obtained. Storage conditions with 75% humidity at a temperature of 40° C. for 6 months were employed. Performance was evaluated according to dye affinity, pH, alkali quantity, hydrogen peroxide quantity, interlaminar peeling, and apparent color of the hair colour. Results thereof are shown in Table 2.

TABLE 2

	Example			Comparative Example		
	1	2	3	1	2	3
40° C. FOR 6 MONTHS	good	good	good	poor	poor	poor

[0031] As shown in Table 2, the vessels of Examples 1 to 3, provided with a gas barrier layer, showed good storage stability, with almost no decline in performance, even after storage for 6 months at 40° C.

[0032] On the other hand, in the vessels of comparative examples 1 through 3, not provided with a gas barrier layer,

the oxidation dye was oxidized by the first agent, and became discolored before 6 months of storage at 40° C. were finished.

[0033] Storage stability was the same in embodiments 1 through 3 even when a first agent comprising aqueous ammonia was used. There was also no observable interlaminar peeling.

INDUSTRIAL APPLICABILITY

[0034] By means of the present invention, it is possible to obtain a vessel that has an easy-open peelable seal, cannot be easily affected by oxygen outside the vessel, and is devoid of interlaminar peeling even when ammonia gas evolves from the vessel. This vessel is a vessel suitable for various products, including a two-component hair colour for which the effects of outside oxygen must be avoided immediately prior to use, and for which two or more components thereof must initially be kept separate and then mixed at the time of use.

- 1. (Amended) A vessel in which a two-component hair colour that uses monoethanolamine as an alkaline agent is sealed as contents therein, wherein the vessel is separated into at least two compartments by an easy-open peelable seal, and is provided with a gas barrier, such that the entire surface of at least one of the two compartments is covered thereby.
- 2. The vessel according to claim 1, wherein said vessel is made into a pouch shape from a laminate material comprising at least an easy-open peelable material layer and a gas barrier layer, such that the easy-open peelable material layer is located on the inside of the vessel.
- 3. The vessel according to claim 2, wherein the laminate material has a protective layer over the gas barrier layer thereof, so as to constitute the outside of the vessel.
- 4. The vessel according to claim 2 or 3, wherein each layer constituting the laminate material are bonded to its adjacent layer through an adhesive layer that displays alkali resistance.
- 5. (Amended) A two-component hair colour comprising the vessel having two separate compartments according to any of claims 1 to 4, wherein an oxidation dye and monoethanolamine as an alkaline agent are sealed in one compartment covered with a gas barrier layer, and an aqueous hydrogen peroxide agent is sealed in the other compartment.

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