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(54) **UV LIGHT MANAGEMENT PACKAGE AND PROTECTIVE COVER**

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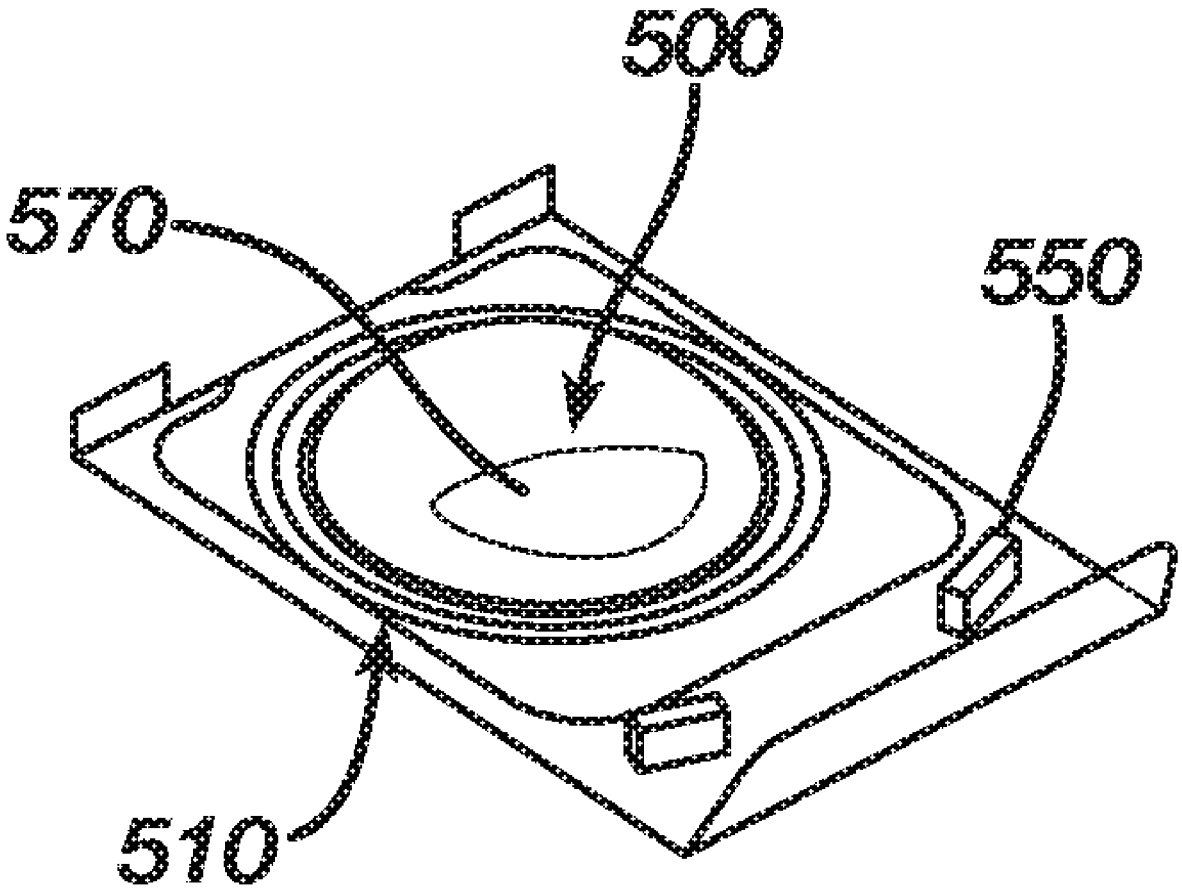
CPC ***A45C 11/005*** (2013.01); ***B65D 81/30*** (2013.01)

(57) **ABSTRACT**

There is described a contact lens package containing a bowl for holding a contact lens. The bowl is sealed by a film engaging the bowl so as to hold a contact lens between said bowl and the film. A lens is placed in saline between the bowl and the film. Finally, there is contained a light sensitive cover attached to the bowl. This controls the type of light which passes through said cover and onto said bowl. Typically, the cover is impervious to ultraviolet light.



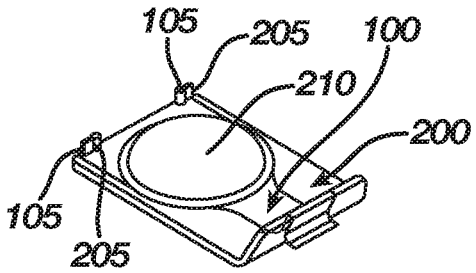


FIG. 1

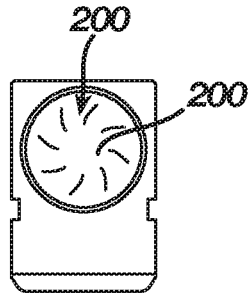


FIG. 1B

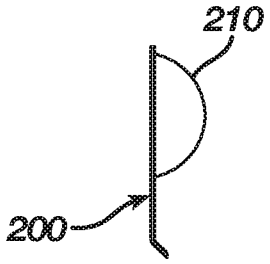


FIG. 1C

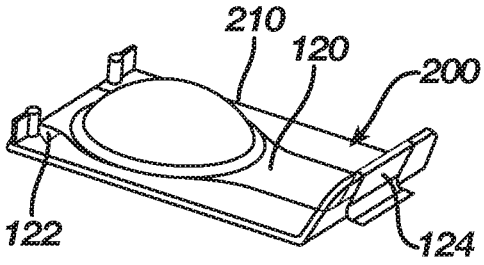


FIG. 2

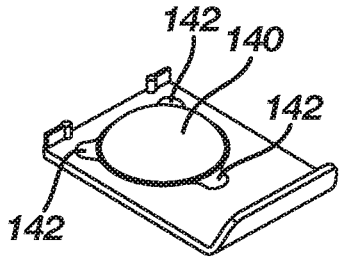


FIG. 3A

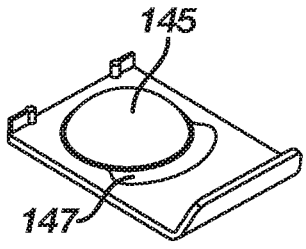


FIG. 3B

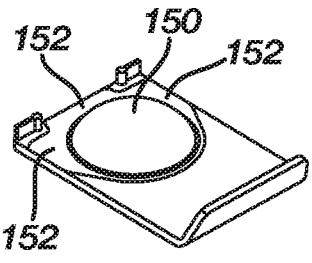


FIG. 3C

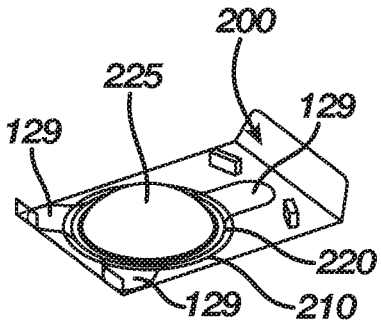


FIG. 4A

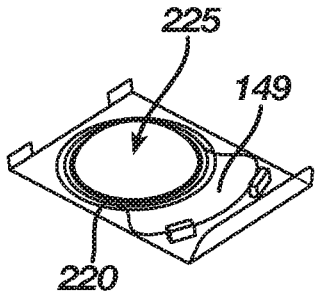


FIG. 4B

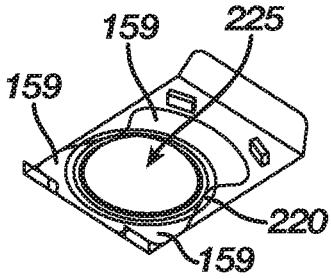


FIG. 4C

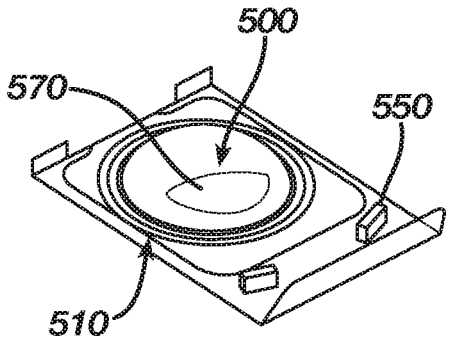


FIG. 5

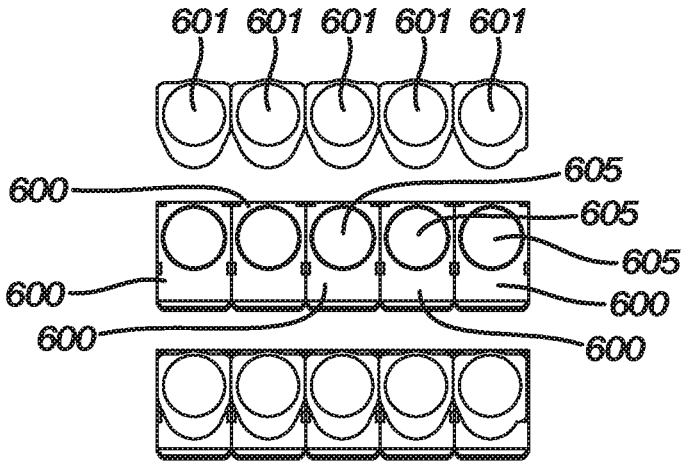


FIG. 6A

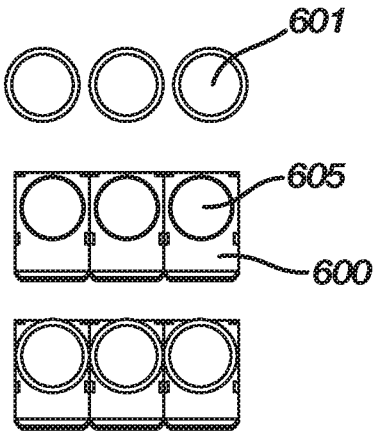


FIG. 6B

UV LIGHT MANAGEMENT PACKAGE AND PROTECTIVE COVER

BACKGROUND OF THE INVENTION

[0001] The present invention relates to packages used by consumers of contact lenses. More specifically, the present package helps inhibit the transmittance of ultraviolet light through the package and thus protect contact lens from UV exposure. This attribute will be useful for packaging contact lenses that contain any light or UV sensitive compounds such as a drug and/or light sensitive photochromic compounds. It is perceived that exposure of ultraviolet or visible light to the lens may cause the light sensitive compound's efficacy to be compromised, not as a danger to the user, but for its loss of unique product benefits.

DESCRIPTION OF THE DRAWINGS

[0002] FIG. **1** is a perspective drawing of a contact lens package cover for use with a contact lens blister bowl as in FIGS. **1**B and **1**C (pan and elevation view respectively, without the cover), made according to the description of the invention contained herein;

[0003] FIG. **2** is a perspective drawing of a modification to the package of FIG. **1**;

[0004] FIGS. **3**A. **3**B and **3**C are further modifications of the present invention wherein the cover is ultrasonically welded to the package;

[0005] FIGS. **4**A, **4**B and **4**C are modifications of the cover of FIGS. **3**A, **3**B and **3**C;

[0006] FIG. **5** describes a further configuration of the attachment of the cover to the package; and

[0007] FIGS. **6**A and **6**B describe still other modifications of the attachment to the cover of the lens package.

DESCRIPTION OF THE INVENTION

[0008] Contact lenses are currently expanding in their choices of offerings, so that product portfolio will include photochromic contact lenses. Current primary packaging (polypropylene blister and foil laminated lidstock) does not protect against transmission of UV or visible light and may allow the potential activation of the photochromic lens, resulting in photo-fatigue of the lens and loss of its efficacy.

[0009] A "Light Management Protective Cover" (LMPC) was developed to address the premature exposure to photochromic product. The LMPC is an attachable or adhered/bonded cover/shade used on current contact lens primary packaging surfaces to prevent/limit light exposure (including but not limited to UV) to its contents (including but not limited to contact lens).

[0010] The LMPC is applied post-sterilization to the underside of the contact lens bowl and is intended to remain affixed to the outside of primary package. As a result, this invention will not impact the heat seal or sterilization processes used with the lens packaging, which are the two most important processing techniques utilized to ensure a sterile barrier packaging system. In addition, the LPMC cover does not come into contact with the packing solution or the physical lens itself and the primary package bowl offers sufficient barrier between the cover and the lens. Therefore, this solution mitigates concerns with respect to any material from the cover leaching into any of the interior of the package, the solution containing the lens, or into the lens itself—as all of these elements never come into contact with the LPMC.

[0011] As seen in FIG. **1**, there is described a snap on cover **100** to be used with the standard contact lens package **200**, as seen in FIG. **1**B. The cover **100** has a snap-on feature presented as tabs **105**, placed at one end of the cover **100**. These tabs **105** mate with the flanges **205** on package **200**. The cover **100** thus is enabled to be attached to the bowl portion **210** of package **200**, without creating a need to bond the cover **100** to the bowl **210** or, indeed the package **200**.

[0012] As previously mentioned, the cover **100** is opaque and blocks ultraviolet light, so that if there is a contact lens placed in bowl **210** such that the lens is light activated, the cover will prevent inadvertent activation of the lens, or alternately deterioration of a drug that is present in the lens.

[0013] FIG. **2** describes a modification of the cover of FIG. **1**. As can be seen in FIG. **2**, there is described a cover **120** that contains snap on flanges **122**, **124**. These flanges **122**, **124** are provided at either end **121**, **123** of cover **120**—so that the cover **120** can be attached at both ends of the blister package **200**, that is, the same package **200** which was featured in the description of the cover **100** of FIG. **1**. The modified design **120** of FIG. **2** ensures a better contact between the cover **120** and package **200**, and thereby reduces the probability of the passage of light therethrough. This feature enables the cover **120** to be attached to the bowl **210** of package **200**, without having to create a bond of any sort between the cover **120** and the bowl **210**.

[0014] FIGS. **3**A, **3**B and **3**C describe further modifications of the foregoing designs. As seen in these Figures, the "snap on" features of covers **100**, **120** are removed. Now, covers **140**, **145** and **150** incorporate features for ultrasonic welding. These are described as tabs **142**, **147**, **152** seen in each of these three Figures. These modifications now further reduce the probability of lens exposure to light. As seen in FIGS. **3**A, **3**B and **3**C, contact between covers **140**, **145** or **150** with the bowl **210** is further enhanced, so that any snap-on features are eliminated. Each of the flanges **142**, **147**, **152** can be fusion bonded or welded to the bowl **210** by an ultrasonic or hot tip welding process, which are standard techniques known in the packaging industry.

[0015] FIG. **3**A, **4**B and **4**C describe further modifications of the concepts of FIGS. **3**A, **3**B and **3**C. Now, as can be seen in FIGS. **4**A, **4**B and **4**C, there are provided larger weld spots, provided a distance apart from the heat seal ring **220** adjoining bowl **210** of the package **200**. These extended wings or tails **129**, **149**, **159** enable welding of the cover **225** to the package bowl **210** apart from the heat seal ring **220**. This feature ensures minimal damage to the already created heat seal bond between the bowl **210** and package lidstock and maintains a sterile barrier on the package **200**.

[0016] Finally, FIG. **5** demonstrates a "squared up" modification of the cover seen in FIG. **4**C, so that there is reduced potential for light seepage. The attachment of cover **500** to package **550** is provided such that there is an increased surface area for welding. This feature provides enhanced covering of the bowl **510**, to make welding of bowl **510** to cover **500** even easier, and further apart from the heat seal ring.

[0017] As best seen in FIG. **5**, a cover and package **500**, **550** is ideally styled for containing a photochromic contact lens. The package is configured to address and minimize UV exposure of the photochromic contact lenses. The preferred

material for cover **500** is polypropylene with a UV blocker and TiO2. When used with typical contact lens packages formed from polypropylene and having a wall thickness of between 0.55 mm and 0.85 mm, the preferred material thickness of the cover **500** is roughly 0.375 mm. This allows the cover to be pliable yet sturdily attached to the package **550**. It is understood however, that the thickness of cover **500** can be in the range of 0.025 mm to 1.0 mm to meet specific product requirements. As well, other materials are certainly possible, as well be explained below.

[0018] The scope of materials useful as the LMPC cover is contemplated to be quite broad. The material of choice should be compatible with the materials used in the primary package **550** and particularly bowl **510**, so that a bond is formed between both materials when fusion bonded or welded. For instance, if the bowl **510** is made of polypropylene, the preferred material for use as the cover **500** is also polypropylene, although any other thermoplastic polymer, such as a propylene-based elastomer, a blend of polypropylene and polyethylene, EVA, etc. may be used. What is required is that the cover **500** is able to restrict passage of UV light.

[0019] Similarly, if the bowl **510** is made of a cyclic olefin polymer (COP), a preferred material option for LMPC cover **500** is also COP, but any other thermoplastic polymer such as a COP blend, a cyclic olefin copolymer (COC) or a COC blend, EVA, etc., or any other UV restricting material may be used. Depending on the product critical-to-quality requirements (CTQs) and the material composition of the primary package bowl **510**, the cover **500** should contain a compatible thermoplastic resin with or without additives such as TiO_2, UV blocker, colored masterbatch, etc. The UV absorbers in cover **500** can be additives to the material such as benzotriazoles; benzophenones; triazines; or a combination of two or more of these additives.

[0020] The cover **500** should be fixedly attached to the package **550**. A preferred method of fixation is to bond the cover **500** to the blister package by thermally welding it thereto, such as by using a hot tool tip as an external heat source, in order to apply heat in specifically useful areas around the cover **500**. Applying heat there will tend to minimally yet sufficiently melt the polymer from which the cover **500** is created, and thereby effectuate a mechanical bond between the surfaces of the cover **500** and the package **550**. Naturally, it is contemplated that other means of attachment, such as forms of thermal attachment (laser, infrared) and friction (such as vibration, ultrasonic) bonding techniques may be utilized.

[0021] As can be seen in FIGS. **6**A and **6**B, there is described a further modification of the package of the present invention. Here, package **600** has a preformed cap **601** attached to the bowl **605**. This cap **601** is typically made by injection molding. The cap **601** is typically attached to bowl **605** by laser welding, post-production. Of course, it is UV light impermeable, consistent with the disclosure of the present invention. Cap **601** is typically press fit into bowl **605**, but alternately it may be laser or sonic welding to bowl **605**. As can be seen in FIG. **605**, the configuration of the packages is such that a strip of packages **600** may be formed in production. Then caps **601** may be applied to the bowls **605** consecutively.

[0022] In this fashion, opening and closing functionality of the package is not impinged upon, as it must not be. Yet, with the covers of the present invention attached to the contact lens package, certain forms of light such as UV light are inhibited from penetrating the package such as package **550** and a contact lens **570** contained in solution inside it. This arrangement preserves the functionality of the polychromic aspects of the lens.

[0023] The foregoing invention is to be understood in conjunction with the appended claims, taking into account all appropriate equivalents.

What is claimed is:

1. A contact lens package comprising:
a bowl for holding a contact lens;
a film engaging said bowl so as to hold a contact lens between said bowl and the film; and
and a light sensitive cover attached to said bowl, such that said cover controls the type of light which passes through said cover and onto said bowl.

2. The package of claim **1** wherein said cover prevents the passage of ultraviolet light.

3. The package of claim **1** wherein said bowl is generally translucent.

4. The package of claim **1** wherein said cover snaps over said bowl.

5. The package of claim **1** wherein said cover is welded to said bowl.

6. The package of claim **1** wherein said cover further contains flanges for gripping by the fingers of a user.

7. The package of claim **1** wherein said cover is sonically welded to said bowl.

8. A contact lens package comprising:
a bowl for holding a contact lens;
a generally translucent cover placed over said bowl; and
and a light sensitive insert attached to said cover, such that said insert controls the type of light which passes through said insert and onto said cover.

9. The package of claim **8** wherein said cover prevents the passage of ultraviolet light.

10. The package of claim **8** wherein said bowl is generally translucent.

11. The package of claim **8** wherein said cover snaps over said bowl.

12. The package of claim **8** wherein said cover is welded to said bowl.

13. The package of claim **8** wherein said cover further contains flanges for gripping by the fingers of a user.

14. The package of claim **8** wherein said cover is welded to said bowl.

15. In combination:
a contact lens package comprising:
a bowl for holding a contact lens;
a film engaging said bowl so as to hold a contact lens between said bowl and the film; and
and a light sensitive cover releasably attached to said bowl, such that said cover controls the type of light which passes through said cover and onto said bowl; and
a contact lens held within said package.

16. A cover adapted to be placed over the bowl forming the outside of a contact lens package, said cover blocking the passage of ultraviolet light into said bowl.

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