

- 1 -

PRIMARY PACKAGE FOR CONTACT LENSField of the Invention

5 This invention relates to a primary package for a contact lens. More particularly, this invention relates to a disposable primary package which provides lens handling assistance. Further, this invention describes a method for making the primary package of this invention.

10

Background of the Invention

Contact lenses particularly disposable contact lenses are conventionally packaged in blister packages.

15 Blister packs or packages typically consist of two pieces: a base and a cover. The base is an injection-molded plastic which typically has a bowl-shaped, or rectangular-shaped recess for receiving the contact lens. The cover is a laminate material which typically consists of a laminate of an aluminum foil and
20 polypropylene. Within each blister pack is a single contact lens and enough solution to prevent drying of the contact lens and to maintain the contact lens ready for use. The contact lens user tears the cover from the base, removes the lens, and inserts the lens into his or
25 her eye. The cover and the base are then disposed of.

Contact lenses are designed with a front surface and a back surface and some contact lens designs also have a top and a bottom (rotationally oriented). The

- 2 -

use of identifying indicium or indicia on contact lenses has been disclosed in the prior art, such as in U.S. 4,525,044, and 5,467,149 to identify to the contact lens user which surfaces are the front and back and/or the proper orientation of the lens. Contact lens manufacturers try to make the identifying indicia big enough to be seen by the contact lens wearer; however, for identifying indicia which are molded into the lens surface, the identifying indicia have to be small enough so that it does not irritate the eye or the eyelid. Also identifying indicia must be small enough so that the identifying indicia are not noticeable when the contact lens is being worn. Therefore, the identifying indicia must be small; however, the small identifying indicia are hard to see when it is time to properly place the contact lens in the eyes. Contact lens users need the contact lenses to improve their vision; therefore, the contact lens users may need their glasses or another vision correction device to be able to see the identifying indicia for proper orientation of the contact lens on the eye.

It is known to put lenses on contact lens storage containers to help the wearers of contact lenses that are not disposable; however, there is nothing to help the wearer of disposable contact lenses purchased in disposable contact lens containers. This invention addresses this need.

- 3 -

Summary of the Invention

This invention provides a non-resealable, disposable package for housing a contact lens, said package comprising a magnifying lens. Preferably the package comprises a blister pack comprising a base, said base comprises a recess wherein said contact lens is housed. Preferably the blister pack further comprises a cover.

This invention further provides a method of making a non-resealable, disposable package for housing a contact lens comprising the step of molding a portion of said package in a mold form which provides for the formation of an integral magnifying lens when the contact lens package is molded. By this method, the magnifying lens is molded at the same time the package, preferably the base is molded, and the magnifying lens is integral and contiguous with the base, and comprises the same material as the base.

This invention provides an economical way to provide a magnifying lens as part of a disposable package which is helpful to the contact lens user particularly when the contact lens has an identifying indicium or indicia.

- 4 -

Brief Description of the Drawings

Figure 1 is a perspective view of a base of the package of this invention.

5 Figure 2 is a side view of a package of an alternative embodiment of this invention.

Figure 3 is a perspective view of a package of an alternative embodiment of this invention.

Detailed Description of the Preferred Embodiments of the
Invention

10

This invention provides a non-resealable, disposable package for housing a contact lens, said package comprising a magnifying lens. The package can take any form. In the preferred embodiment, the package is a blister pack, preferably comprising a base and a cover.

15

Figure 1 shows a perspective view of a base 11 of a package 10 of this invention. The package preferably houses a contact lens and solution, neither of which are shown, but can be any kind, many of which are commercially available or are disclosed in the prior art. Also not shown is the cover. The cover can comprise any type of cover, preferably a peelable lidstock layer comprising a laminate material. Covers of this type are disclosed in the prior art. The preferred laminate comprises a metal foil layer and at least one, preferably two polymer layers, e.g. polypropylene, coating the foil. The preferred foil is

20

25

- 5 -

aluminum. Examples of useful covers are described in US Patent 4,691,820 incorporated herein by reference.

Referring to Figure 1, the base 11 is shown having a recess 13 for receiving the contact lens and solution.

5 The base 11 also has a flange 15 preferably contiguous to the opening of the recess 13, which is extended on one side from the recess 13, to provide an area for a magnifying lens 17 and a grip region 16, shown having raised bumps 12. The flange preferably extends from 5
10 millimeters (mm) to 40 mm from the front edge 18 of the recess 13. The flange 15 preferably has a heat seal area 14 preferably raised from the surface of the flange 15. The cover (not shown) is preferably attached to the base 11 by heat-sealing in the seal area 14; however,
15 induction-sealing, ultrasonic welding or another bonding system can be used to attach the cover to the base 11. The overall dimensions of the base are approximately from 2 to 4 centimeters (cm) wide, and from 4 to 7 cm long and from 0.5 to 1.0 cm high. However, the base can
20 have any shape or size as long as the package, and preferably the base comprises a magnifying lens. In an alternative embodiment that is not shown, the magnifying lens could be added to a curved area of the flange.

Figure 2 shows a base where the magnifying lens is
25 added to the curved bottom of the recess of a base. In this area, the magnifying lens can be designed to provide additional benefits, for example, to assist contact lens inspection in the package for defects or to

- 6 -

assist for checking a package for the presence of a contact lens.

Figure 2 shows a portion of a package 20 of this invention. Figure 2 shows a base 21 of a package of this invention. The cover is not shown. The base 21 has a different shape from the shape of the base 11 shown in Figure 1; however, the similar elements of Figures 1 and 2 are labeled similarly. Most notably, in this embodiment, base 21 differs from base 11 in that the magnifying lens 27 of base 21 is located as a portion of the recess 23. As shown, a single curve magnifying lens is best suited for this embodiment.

The base of the package preferably comprises a plastic material which can be formed by injection molding or thermoforming. The plastic material used to make the base can be amorphous or semi-crystalline. The preferred base material is polypropylene, but can comprise other similar plastic materials, such as, other polyalkylenes, e.g. polyethylene, and polybutylene; polyesters, e.g. PET; polycarbonates; polystyrene, or other thermoplastic materials or copolymers of thermoplastic materials. It is preferred that the base material, particularly in the recess, has a vapor transmission of less than 15 grams/100 square inches/24 hours at 70° F and 50 percent relative humidity. It is preferred that the thickness of the materials of the base is approximately 2 mm or less. It is preferred that the same material is used to make the base and the

- 7 -

magnifying lens which is part of the base, and that the magnifying lens is integral and/or contiguous to the base.

5 The magnifying lens of the base, preferably has a thickness of 2 mm or less depending on the clarity of the material used to make the magnifying lens and/or the base. The material used to make the magnifying lens is preferably transparent; however, if the magnifying lens is thin, for example, less than 0.5 mm, a material that
10 might otherwise be translucent at greater thicknesses can be used to form the magnifying lens. For example, the preferred material to form the base is polypropylene; however, polypropylene becomes milky when thicker than 1 mm. Attempts to make a single curve
15 magnifying lens which provided sufficient power using polypropylene resulted in a milky, unclear magnifying lens at a thickness of approximately 1.5 mm. Changing the design to a fresnel magnifying lens and decreasing the thickness of the magnifying lens elements to 1.0 mm
20 or less, more preferably between from 0.01 to 0.5 mm, resulted in a clear magnifying lens. For materials which are transparent at greater thicknesses, the magnifying lens can be made either thin or thick, depending on the design of the magnifying lens. For
25 example, for polystyrenes the clarity of the material is not compromised at thicknesses above 1 mm; therefore, a single curve lens comprising polystyrene having a thickness of 1.5 mm could be used on a package. The

- 8 -

thickness of the magnifying lens will also be a function of the desired power. It is preferred that the power be between + 8 and + 12 diopters (D), more preferably + 12 D. In the preferred embodiment, the base comprises polypropylene, the base is about 1 mm thick, the magnifying lens is on the flange and has a maximum thickness of about 0.5 mm.

Figure 3 shows an alternative embodiment of the package of this invention. All the like elements of Figures 1, 2 and 3 are labeled similarly. The package 30 comprises a base 31 and a cover 39. The elements that are not shown in Figure 1 or 2 are the cover 39, and the gripper strips 32 in the grip region 36 of the flange 34. Unlike the package shown in Figures 1 and 2, the magnifying lens 37 is located on the cover 39 of the package shown in Figure 3.

The cover 39 is shown having a rectangular shape having similar dimensions as the base 31 to which it is heat-sealed. The cover 39 has a sealing portion 41, which is sealed to the base 31, and a gripping portion 40 which extends from sealing portion 41, and can be gripped to pull the cover 39 off the base 31. The magnifying lens 37 is shown in the gripping portion 40 of the cover 39. In an alternative embodiment which is not shown, the magnifying lens 37 could be located in the sealing portion 41 of the cover 39, preferably inside the strip 42 of the cover 39 which is sealed to the seal area 34 of the base 31. The cover 39 can

- 9 -

comprise any material or materials as long as the magnifying lens or the area of the cover where the magnifying lens is located comprises a transparent material, preferably a transparent plastic material.

5 The magnifying lens, the area on the cover where the magnifying lens is located, or the entire cover can comprise a transparent polymer layer. Examples of suitable transparent cover materials are disclosed and described in "Package for Medical Devices", US Serial
10 No. 09/259795 (VTN-445), incorporated herein by reference. The cover can comprise a composite of a non-transparent material and a transparent material. For example, the sealing portion 41 of the cover can comprise a multi-layer foil laminate attached to
15 transparent gripping portion 40. Alternatively the multi-layer foil laminate can have a cut-out into which the magnifying lens is formed or attached. Preferably, in any embodiment, the cover comprises one or more transparent plastic layers, which preferably are over
20 the entire surface of the cover.

The magnifying lens can be any design as long as it increases the size of the identifying indicia when the identifying indicia is viewed through the magnifying lens. For example, the magnifying lens can be a
25 refractive fresnel magnifier, concave-convex design, plano-convex design, meniscus convex, or combinations of these designs. The lens surfaces can be spherical or aspherical. For refractive fresnel design, the segment

- 10 -

sags may be equal or unequal. The fresnel design is more suitable for flat portions of the package, such as a flat area of a flange. In the preferred embodiment, the fresnel magnifying lens is present on the flange and comprises 2 to 10, and more preferably 4 to 8 segment sags. The single curve design is well-suitable for the curved area of the package, such as a curved bottom of the recess or a curved portion of a flange. The magnifying power can be controlled by the radii of the curves and the thickness of the material in each magnifying lens design. Although the geometry of the fresnel magnifier is more complex, it is presently preferred. Presently, it is preferred that the magnifying lens is between 10 and 40 mm, more preferably about 25 to 30 mm, in diameter or equivalently sized for differently shaped magnifying lenses. The outside shape of the magnifying lens can be rectangular, oval, polygonal, or any shape.

The magnifying lens can be added to the package during its manufacture. The magnifying lens can be added to the base or the cover during molding of either of these components of the package. In the preferred mode, the magnifying lens is molded into the base. The base is preferably molded out of a thermoplastic. The base is preferably injection molded between mold forms.

The mold forms for injection molding are preferably manufactured to include the magnifying lens. The

- 11 -

molding of plastic parts has been disclosed in the art.

Any known molding method can be used.

The magnifying lens can be added to the package by any method including the following. The magnifying lens
5 can be molded into the base which can occur at the same time the cover is sealed to the base, by providing, for example, a heated mold form which contacts the base under pressure to cause the base polymer to form the magnifying lens into the base. The cover can be made
10 having the magnifying lens incorporated into the cover by including an already-made magnifying lens. One example of how that might be done is to add the magnifying lens by adding a sticker to a transparent cover layer. The magnifying lens can be added to the
15 cover by stamping the cover between mold forms to provide the magnifying lens, for example, at the time the cover is sealed to the base.

The preferred embodiments have been described herein; however, alternative embodiments would be known
20 to a person of ordinary skill in the art, which would fall within the scope of the invention defined by the claims.

- 12 -

We claim:

1. A non-resealable, disposable package for housing a contact lens, said package comprising a magnifying lens.
2. The package of claim 1, further comprising a base, wherein said magnifying lens is part of said base.
3. The package of claim 2, wherein said base comprises a flange and wherein said magnifying lens is part of said flange.
4. The package of claim 2, wherein said base comprises a recess and wherein said magnifying lens is part of said recess.
5. The package of any one of claims 2 to 4, wherein said base and said magnifying lens comprise the same material, for instance polypropylene.
6. The package of claim 1, further comprising a cover wherein, said magnifying lens is part of said cover.
7. The package of claim 6, wherein said cover is transparent.
8. The package of claim 6, wherein said cover is a composite of transparent and non-transparent materials.
9. The package of any one of claims 1 to 8, wherein said magnifying lens is a fresnel magnifying lens.
10. The package of claim 9, wherein said fresnel magnifying lens has 2 to 10, preferably 4 to 8, segment sags.

- 13 -

11. The package of any one of claims 1 to 8, wherein said magnifying lens is a single curve magnifying lens.

12. The package of any one of claims 1 to 11, wherein said magnifying lens has a power between from +8 to +12 diopters.

13. A method of making a non-resealable, disposable package for housing a contact lens comprising the step of molding at least a portion of said package in a mold form which provides for the formation of an integral magnifying lens in said molded portion of said package.

14. The method of claim 13, wherein said molding step is an injection molding step.

15. The method of claim 13 or claim 14, which is used to produce the package of any one of claims 1 to 12.