

from available polyimides and polyamides, as well as porous polymethylmethacrylate (HEMA), polyethersulfone, polysulfone, polymethylmethacrylate (PMMA), polyesters, silicones, and polyethyltoluene (PET). Also by way of example, conventional techniques may be employed to build astigmatism-corrective curvatures and axial orientation into the integral haptic and lens structure, complete with a recognition profile or the like from which correct astigmatic-correction axis orientation can be recognized by the physician prescribing and/or installing the structure. Such orientation-refining techniques are described in my copending application Ser. No. 225,349 (filed Jan. 15, 1981), and in FIG. 17, I show an integrally formed lens 40 and haptic 41 wherein a small asymmetrical fillet 42 provides the means of recognizing correct orientation to achieve proper use of the astigmatism-correcting lens prescribed for the particular user.

FIG. 18 illustrates that for any of the haptic configurations contemplated herein, and specifically in the context of the haptic configuration of FIG. 17, the deformation step used to create lens curvature may also be used to impart a haptic curvature generally in accordance with the curvature of the cornea. As noted from FIG. 18, this curvature is generally away from the originally flat nature of the starting sheet of material, but is generally tangent to the plane of the starting sheet in the vicinity of haptic juncture with the central lens element.

The reference to etching herein is to be understood as contemplating any of various well recognized selective erosion techniques. For the case of plastic erosion, these techniques include plasma etching, ion milling, and chemical etching. For the case of glass erosion, these techniques include hydrofluoric-acid etching and hydrofluoric-gaseous etching.

While the invention has been described in detail for various illustrative forms and processes, it will be understood that modifications may be made without departing from the scope of the invention.

For example, in either of the techniques illustrated by FIGS. 10 and 11, the severable tie elements 25-26-27 (25'-26') may be characterized by a central "pin-hole" opening external to the perimeter of each of the haptics thereby connected. Such pin-hole opening is illustratively shown at 27' in FIG. 10 and will be understood, in context with other such pin-hole openings (i.e., at other severable connections) to provide a precise optically scannable reference, as when automatically positioning a severably connected array of etched lens blanks with haptics, the positioning being for accurate placement in a multiple-lens press, and/or for precise automated laser cut-off of completed lens-haptic units 10-11 from the array.

Also, in connection with the pressing of lens elements as described above, it will be understood that the die used for pressing may be configured to develop in the lens a rounded outer edge, rather than the sharply defined outer edge shown for example at the circular peripheral edge of the convex surface of lens 10 in FIG. 5. A sharp exposed corner is thereby avoided.

Further, it will be understood that the lenspressing operations described are purely illustrative, in that not only may astigmatism-corrective curvature be embodied in the pressing die, but so also may other complex curvatures, as for example the curvatures which will embody multifocal (e.g., bi-focal, tri-focal) properties in the single piece of press-formed lens-blank material.

What is claimed is:

1. The method of making a unitary lens and haptic construction integrally formed from the same single sheet of transparent material, comprising a relatively thick rigid central lens component having a generally circular periphery, and a relatively thin pliant generally annular outer haptic component comprising plural leg formations radiating from the lens periphery at angular offset from each other; which method comprises selecting the sheet of transparent material of thickness at least sufficient to accommodate ultimate thickness of the lens component, masking one side of the sheet to permit selective removal of material in the generally annular included area of the haptic component to the exclusion of the central area of the lens component, masking the other side of the sheet to permit selective removal of material to define haptic leg formations within the generally annular included area of the haptic component to the exclusion of the central area of the lens component, subjecting both masked sides of the masked sheet to an eroding environment, the erosion exposure of said one side being to the depth extent of defining the relatively thin ultimate haptic thickness, and the erosion exposure of said other side being to the depth extent of at least said ultimate haptic thickness, removing the masks, and thereafter forming a lens curvature in at least one of the surfaces of the lens component.

2. The method of claim 1, wherein the transparent material is a plastic and said erosion exposure is by chemical etching.

3. The method of claim 1, wherein the transparent material is a plastic and said erosion exposure is by plasma ion discharge.

4. The method of claim 1, wherein the lens-curvature forming step is performed by die compression.

5. The method of claim 1, wherein the transparent material is glass and said erosion is by hydrofluoric-acid etching.

6. The method of claim 1, wherein the transparent material is glass and said erosion is by hydrofluoric gaseous etching.

7. The method of claim 1, wherein at least part of the etching occurs simultaneously from both sides of said sheet.

8. The method of claim 1, wherein the transparent material is glass, and the lens-curvature forming step is performed by conventional lens grinding techniques while retaining adjacent haptic formations in a deformed position out of the locus of ultimate grinding curvature of the involved surface.

9. The method of making a unitary lens and haptic construction integrally formed from the same single sheet of transparent material, comprising a relative thick rigid central lens component having a generally circular periphery, and a relatively thin pliant generally annular outer haptic component comprising plural leg formations radiating from the lens periphery at angular offset from each other; which method comprises selecting the sheets of transparent material of thickness at least sufficient to accommodate ultimate thickness of the lens component, selecting a circular area within said sheet for ultimate lensperimeter definition, forming a lens curvature within and limited by said selected circular area, masking one side of the sheet to permit selective removal of material in the generally annular included area of the haptic component to the exclusion of the central area of the lens component, masking the other side of the sheet to permit selective removal of material to define haptic leg formations within the gen-