Claims:

1. A system for fabricating a hybrid contact lens product having a lens insert embedded within a lens body, the lens insert comprising a first material and having a concave back surface and an opposite convex front surface, and the lens body comprising a second material different from the first material, wherein the system comprises:

a lens forming mold element which is a female mold half having a circular and concave central mold receptacle and a circumferential flange defining an internal geometry and surrounding the central mold receptacle;

a mold engagement and support base comprising a body having planar top and bottom surface and at least one mold engagement feature configured to engage a lens forming mold element and retain the lens forming mold element in a substantially fixed position relative to the mold engagement and support base; and

an insert placement and positioning device comprising a positioning housing, a suction conduit connected to an external suction source and extending centrally and axially through the positioning housing from top to base, an insert pick-up head mounted to the suction conduit, and a positioning ring coupling the suction conduit with the positioning housing at the top of the positioning housing, wherein the insert pickup head comprises an insert contact face configured for cooperative releasable engagement of the lens insert, at least one suction opening in fluid communication with the suction conduit, and at least one pressure relief channel, wherein the positioning housing comprises at least one positioning feature which comprises an external geometry and outside diameter around its base that is configured for a clearance or interference fit within the internal geometry of the circumferential flange of the lens forming mold element to provides precise locational positioning of the insert pickup head relative to the lens forming mold element both in an axial dimension and in a transverse dimension orthogonal to the axial dimension; and

a centering jig for positioning the lens insert for pickup by the insert placement and positioning device.

2. The system of Claim 1, wherein the at least one mold engagement feature comprises a collar projecting axially from the planar top surface of the mold engagement and support base, the collar being configured for engagement within a cooperatively

configured receiver of the lens forming mold element.

3. The system of Claim 1 or 2, wherein the collar comprises an at least partially annular structure and projects axially upward from the planar top surface of the mold engagement and support base.

4. The system of any one of Claims 1 to 3, wherein the positioning ring comprises a locking nut that can be manually loosened and tightened by hand to allow adjustment and locking of the axial position of the insert pick-up head relative to the positioning housing.

5. The system of any one of Claims 1 to 4, wherein the body of the mold engagement and support base is cylindrical in shape and comprises at least one partially annular or ring-shaped collar extended upwardly from the planar top surface and an open chamber extending through the body to a top opening bounded by the collar.

6. The system of any one of Claims 1 to 5, wherein the insert contact face defines a generally convex curvature.

7. The system of any one of Claims 1 to 6, wherein the insert pickup head is positionally adjustable relative to the positioning housing.

8. The system of Claim 7, wherein the positional adjustment of the insert pickup head relative to the positioning housing is provided by a threaded coupling between the insert pickup head and the suction conduit.

9. The system of any one of Claims 1 to 8, wherein the female mold half comprises an annular rim with a flat upper positioning surface surrounding the central mold receptacle near the outer periphery of the female mold half, and a peripheral recess surrounding the central mold receptacle adjacent the rim, wherein the female mold half comprises a L-shaped (in cross-section) external circumferential flange having a generally horizontal base ring portion and a vertical upright cylindrical or tubular wall portion, wherein the female mold half comprises an inverted annular recess beneath the upper positioning surface and between the peripheral recess and the upright wall portion forms a receiver for engagement over the collar of the mold engagement and support base when the female mold half is mounted onto the mold engagement and support

base.

10. The system of Claim 9, wherein the lens forming mold element at least partially comprises a UV-transmissive material.

11. The system of Claim 9 or 10, wherein the lens forming mold element comprises a diametrically opposed pair of engagement wings, and wherein at least one mold engagement feature of the mold engagement and support base comprises a diametrically opposed pair of slots, each slot configured to receive a corresponding engagement wing.

12. The system of any one of claims 1 to 11, wherein the insert pickup head comprises a plurality of suction openings in fluid communication with the suction conduit.

13. The system of Claim 12, wherein the plurality of suction openings are arranged in a circular array.

14. The system of any one of Claims 1 to 13, further comprising one additional lens forming element which is a male mold half.

15. The system of any one of claims 1 to 14, further comprising an insert mold for forming the lens insert.

16. The system of any one of claims 1 to 15, wherein the centering jig comprises a cylindrical housing with a chamfered top opening, a floor at bottom, a cylindrical sidewall, and a recess formed at the center of the floor and concentric with the cylindrical housing, wherein the recess has a size and shape closely conforming to the size and shape of the lens insert.

17. The system of any one of claims 1 to 16, further comprising dosing means for delivery of the second material to the lens forming mold element.

18. The system of any one of claims 1 to 17, further comprising energy delivery means for curing the second material within the lens forming mold element.

19. The system of any one of claims 1 to 18, further comprising a vacuum source for delivery of suction through the suction conduit.

20. The system of any one of claims 1 to 19, further comprising a sensor and

feedback controller configured to position the insert pickup head relative to the lens forming mold element.

21. The system of Claim 20, wherein the sensor comprises a low coherence interferometer sensor.

22. A method of fabricating a hybrid contact lens product having a lens insert embedded within a lens body, the lens insert comprising a first material and having a concave back surface and an opposite convex front surface, the method comprising:

obtaining a lens forming mold element which is a female mold half having a circular and concave central mold receptacle and a circumferential flange defining an internal geometry and surrounding the central mold receptacle;

releasably engaging a lens insert comprising a first material onto an insert contact face of an insert placement and positioning device, wherein the insert placement and positioning device comprises a positioning housing, a suction conduit connected to an external suction source and extending centrally and axially through the positioning housing from top to base, an insert pick-up head mounted to the suction conduit, and a positioning ring coupling the suction conduit with the positioning housing at the top of the positioning housing, wherein the insert pickup head comprises the insert contact face configured for cooperative releasable engagement of the lens insert, at least one suction opening in fluid communication with the suction conduit, and at least one pressure relief channel, wherein the positioning housing comprises at least one positioning feature which comprises an external geometry and outside diameter around its base that is configured for a clearance or interference fit within the internal geometry of the circumferential flange of the lens forming mold element to provides precise locational positioning of the insert pickup head relative to the lens forming mold element both in an axial dimension and in a transverse dimension orthogonal to the axial dimension;

delivering a first quantity of a second material different from the first material into the circular and concave central mold receptacle of the lens forming mold element;

precisely positioning the lens insert in contact with the first quantity of the second material within the circular and concave central mold receptacle of the lens forming mold element, wherein the precise positioning of the lens insert is at least partially controlled by positional interaction between said at least one positioning feature of the positioning housing of the insert placement and positioning device and the lens forming mold

element;

releasing the lens insert from engagement with the insert contact face;

delivering a second quantity of the second material into the circular and concave central mold receptacle of the lens forming mold element to encapsulate the lens insert within the second material; and

curing the second material to form a lens body with the lens insert encapsulated within the lens body.

23. The method of Claim 22, further comprising the step of at least partially curing the first quantity of the second material within the mold receptacle before releasing the lens insert from engagement with the insert contact face.

24. The method of Claim 22 or 23, wherein the lens insert is releasably engaged on the insert contact face of the insert placement and positioning device by delivery of suction through at least one suction opening in the insert contact face.

25. The method of any one of claims 22 to 24, wherein the precise positioning the lens insert is at least partially controlled by a sensor and feedback controller configured to position the insert placement and positioning device relative to the lens forming mold element.

26. The method of any one of claims 22 to 25, further comprising engaging the lens forming mold element onto a mold engagement and support base which comprises a body having planar top and bottom surface and at least one mold engagement feature configured to engage the lens forming mold element and retain the lens forming mold element in a substantially fixed position relative to the mold engagement and support base.

27. The method of claim 26, wherein said at least one mold engagement feature comprises a collar projecting axially from the planar top surface of the mold engagement and support base, the collar being configured for engagement within a cooperatively configured receiver of the lens forming mold element.

28. The method of claim 27, wherein the collar comprises an at least partially annular structure and projects axially upward from the planar top surface of the mold engagement and support base, wherein the female mold half comprises an annular rim with a flat upper positioning surface surrounding the central mold receptacle near the

outer periphery of the female mold half, and a peripheral recess surrounding the central mold receptacle adjacent the rim, wherein the female mold half comprises a L-shaped (in cross-section) external circumferential flange having a generally horizontal base ring portion and a vertical upright cylindrical or tubular wall portion, wherein the female mold half comprises an inverted annular recess beneath the upper positioning surface and between the peripheral recess and the upright wall portion forms a receiver for engagement over the collar of the mold engagement and support base when the female mold half is mounted onto the mold engagement and support base.

29. The method of any one of claims 22 to 28, wherein the lens forming mold element comprises a diametrically opposed pair of engagement wings, and wherein at least one mold engagement feature of the mold engagement and support base comprises a diametrically opposed pair of slots, each slot configured to receive a corresponding engagement wing, wherein the positioning ring comprises a locking nut that can be manually loosened and tightened by hand to allow adjustment and locking of the axial position of the insert pick-up head relative to the positioning housing, wherein the body of the mold engagement and support base is cylindrical in shape and comprises at least one partially annular or ring-shaped collar extended upwardly from the planar top surface and an open chamber extending through the body to a top opening bounded by the collar, wherein insert contact face comprises a smoothly radiused convex surface configured to generally match and closely conform to the back surface of the lens insert, wherein the insert pickup head is positionally adjustable relative to the positioning housing, wherein the positional adjustment of the insert pickup head relative to the positioning housing is provided by a threaded coupling between the insert pickup head and the suction conduit, wherein the insert pickup head comprises a plurality of suction openings in fluid communication with the suction conduit, wherein the plurality of suction openings are arranged in a circular array.