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[54] PRECISION MOLDING OF POLYMERS

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[52] **U.S. Cl.** **249/105;** 249/144; 249/160; 264/2.2; 425/808

[58] **Field of Search** 249/105, 113, 134, 141, 249/144, 160; 264/1.1, 2.2, 2.6; 425/130, 543, 808

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[57] **ABSTRACT**

A method and apparatus for precision molding soluable polymers is disclosed, in order to form an exact and precisely shaped product, such as contact lenses and surgical implants. A preferred mold for forming contact lenses includes a female part having an indentation and a sharp circumferential edge surrounding the indentation. The mold also includes a male part which is adapted to contact the sharp circumferential edge of the female part to form the molding cavity between the indentation of the female part and the male part. A semi-permeable gate is formed between the female part and the male part for introducing coagulating fluid into the molding cavity while preventing the escape of the polymer solution from the molding cavity. The semi-permeable gate allows the diffusion of the coagulating fluid into the molding cavity at a faster rate than the rate of diffusion of solvent out of the molding cavity. The polymer solution is coagulated by the influx of the coagulating fluid into the polymer solution which causes both the coagulation and swelling of the polymer solution. Swelling of the polymer solution coagulates the solution under pressure within the molding cavity to form a precisely shaped product. Coagulation proceeds under pressure since the solvent diffuses out of the semi-permeable gate at a slower rate than the diffusion of the coagulating fluid into the molding cavity.

11 Claims, 3 Drawing Sheets