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(54) Title: TECHNIQUES FOR IMPROVED IMPRINTING OF SOFT MATERIAL ON SUBSTRATE USING STAMP INCLUDING UNDERFILLING TO LEAVE A GAP AND PULSING STAMP

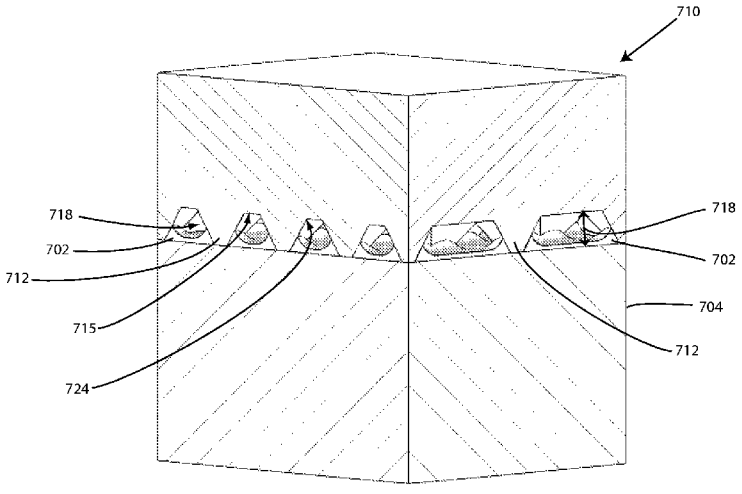


Fig. 7

(57) Abstract: A method for imparting a pattern to a flowable resist material on a substrate entails providing a resist layer so thin that during a stamp wedging process, the resist never completely fills the space between the substrate and the bottom surface of a stamp between wedge protrusions, leaving gap everywhere therebetween. A gap remains between the resist and the extended surface of the stamp. If the resist layer as deposited is somewhat thicker than the targeted amount, it will simply result in a smaller gap between resist and tool. The presence of a continuous gap assures that no pressure builds under the stamp. Thus, the force on the protrusions i determined only by the pressure above the stamp and is well controlled, resulting in well-controlled hole sizes. The gap prevents resist from being pumped entirely out of any one region, and thus prevents any regions from being uncovered of resist. The stamp can be pulsed in its contact with the substrate, repeatedly deforming the indenting protrusions. Several pulses clears away any scum layer better than does a single press, as measured by an etch test comparison of the degree to which a normal etch for a normal duration etches away substrate material. A method for imparting a pattern to a flowable resist material on a substrate entails providing a resist layer so thin that during a stamp wedging process, the resist never completely fills the space between the substrate and the bottom surface of a stamp between wedge protrusions, leaving a gap everywhere therebetween. A gap remains between the resist and the extended surface of the stamp.

WO 2013/044180 A1