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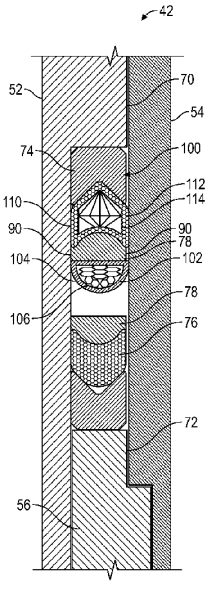

FIG. 3B

(57) Abstract: A sealing assembly for use in a wellbore tool includes thermoplastic materials arranged in a lattice structure to provide a bulk elasticity on the order of elastomeric materials. The lattice structure permits an energizing element of the sealing assembly to deform sufficiently in the elastic range of the thermoplastic materials to provide repeatable sealing capabilities. The lattice structure may be constructed by additive manufacturing processes to include voids therein, which allow the thermoplastic members of the lattice to flex and bend. The energizing element may thereby exhibit a greater elasticity in bulk than the elasticity of the thermoplastic materials themselves. The lattice structure may be enclosed in an outer cover constructed of a polymeric, elastomeric or other material to facilitate the interaction between the seal assembly and the corresponding sealing surfaces of a downhole wellbore tool.

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