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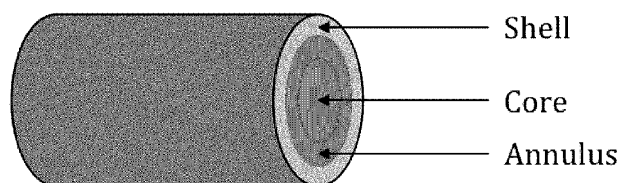


Fig. 5E

(57) Abstract: Aspects of the invention include systems and methods for producing selectively permeable cell laden solid core fiber structures, and for producing three-dimensional (3D) biological structures for digital files. In embodiments, the printed fibers comprise living cells embedded in at least one annulus layer or the printed fibers comprise a solid core of at least one biological material. The tissue fiber can be used in tissue engineering as synthetic tissue structures.



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