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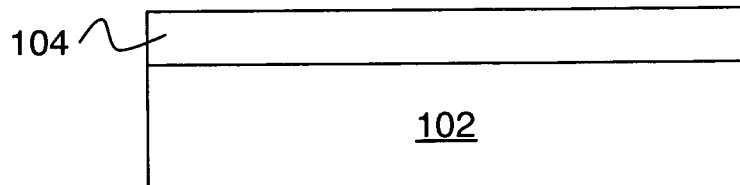


Fig. 1a

(57) Abstract: Forward osmosis membranes having a hydrophilic support layer and a polyamide rejection layer in a thin film composite membrane are considered. Preferred support layer materials include aramid polymers and PVDF. A woven or non-woven mesh can be incorporated into the support layer to improve handling properties of the membrane. Flat sheet and hollow fiber configurations are possible. Antifouling techniques are provided. The polyamide layer can be formed on the hydrophilic support layer by interfacial polymerization. Applications include forward osmosis and pressure retarded osmosis applications, such as industrial product and/or waste concentration, hydration bags, energy/pressure generation, and controlled delivery of chemicals (e.g., for pharmaceutical applications).

