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(54) Title: FILTERS WITH PICOMETER-LEVEL SENSITIVITY INCORPORATING COAXIALLY STACKED MACROCYCLES EMBEDDED IN SOLID FILLER MATERIAL, AND METHODS OF MANUFACTURE OF SAME

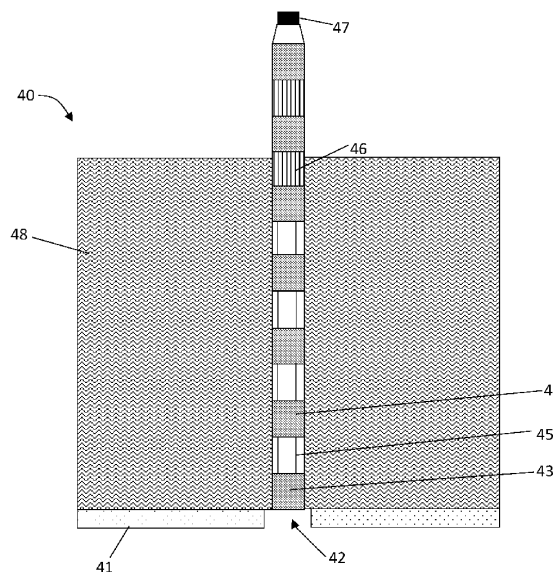


Fig. 4A

(57) Abstract: A filter configured to allow communication of substances from one side to another side, and configured to separate substances passing therethrough, includes a mechanically stable porous substrate; and a solid material in contact with the porous substrate. The solid material defines a skin having at least one channel, each channel having at least one entrance at a surface of the skin and at least one exit at a pore of the porous substrate. The entrance of each channel has a diameter which is 3 nm or less, and optionally between 2.5 and 4.5 angstroms. Each channel may include tubular structures comprised of macrocycles that are at least partially embedded within the solid material. Optionally, a top portion of each channel comprises an asymmetric tubular structure. The asymmetric tubular structure includes at least one molecule having a second internal diameter which is narrower than the first internal diameter.

[Continued on next page]

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