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(54) Title: MATERIALS FOR THE CAPTURE OF SUBSTANCES

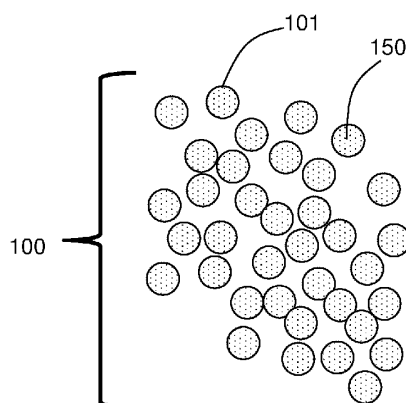


FIG. 2

(57) **Abstract:** Materials such as ion exchange materials for capturing substances, and associated methods and systems, are generally described. In some instances, adsorbent materials that can capture undesirable species from fluid mixtures such as waste streams are provided. The adsorbent material may include ceramic particles (e.g., as a resin) functionalized for effectively and/or selectively capturing species such as per- and poly- fluoroalkyl substances (PFAS) and/or metal or metalloid-containing ions (including heavy metals). Systems and methods for further treating species captured by the adsorbent material are also provided. For example, some embodiments are directed to mechanochemical treatment of captured species associated with the adsorbent material. Subjecting captured species such as PFAS to mechanochemical transformations can destroy potentially harmful contaminants in a relatively inexpensive and distributable manner.

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