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(54) Title: THERMALLY EXPANDING SEALING ELEMENTS

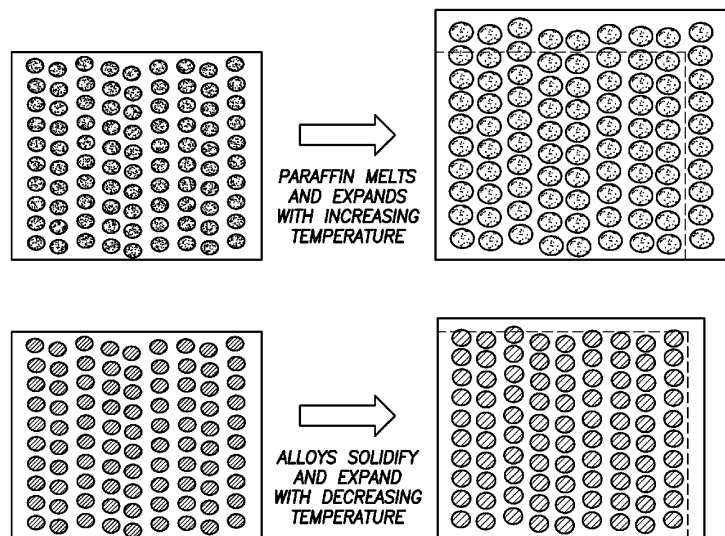


FIG.4

(57) Abstract: A sealing element can be used to create a seal in a wellbore or components of a downhole tool. The sealing element can include an elastomer matrix and a substance embedded within the elastomer that expands at a phase change temperature. The substance can be an organic-based substance, such as a polymeric plastic, a thermoplastic, or a wax. The organic -based substance can expand at a temperature greater than or equal to the phase change temperature. The substance can also be a metal-based substance. The metal-based substance can expand at a temperature less than or equal to the phase change temperature. After expansion, the substance can fill small gaps or cracks formed in the elastomer matrix from temperature fluctuations. The sealing element can be included on a downhole tool. The sealing element can be an O-ring or a gasket or included on packer assembly, a plug, or a liner hanger.

[Continued on next page]

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