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(54) **MAGNETICALLY REFRIGERATING MAGNETIC MATERIAL, MAGNETIC REFRIGERATION APPARATUS, AND MAGNETIC REFRIGERATION SYSTEM**

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CPC ***F25B 21/00*** (2013.01); ***H01F 1/015*** (2013.01); *F25B 2321/0022* (2013.01); *Y02B 30/66* (2013.01)

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See application file for complete search history.

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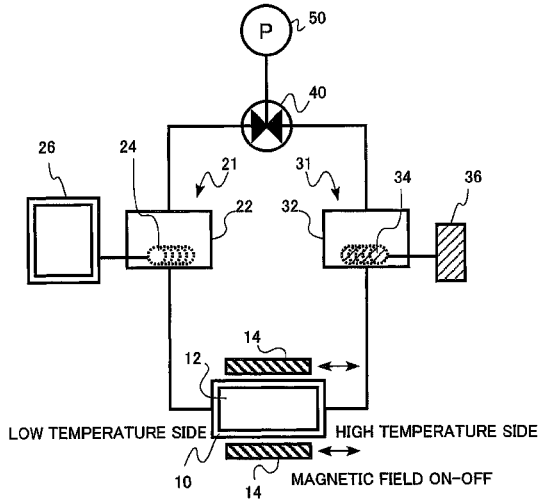
(57) **ABSTRACT**

There are provided a magnetic material for magnetic refrigeration improving a magnetic refrigeration efficiency by including a wide operation temperature range and a magnetic refrigeration apparatus and a magnetic refrigeration system using the magnetic material. The magnetically refrigerating magnetic material is formed of a magnetic material shown by a composition formula of $Gd_{100-x-y}Zr_xY_y$, wherein $0<x<3.4$ as well as $0\leq y\leq 13.5$, and the magnetic refrigeration apparatus and the magnetic refrigeration system uses the magnetic material. It is preferable that the magnetic material be approximately spherical magnetic particles having a maximum diameter of 0.3 mm or more to 2 mm or less.

14 Claims, 5 Drawing Sheets