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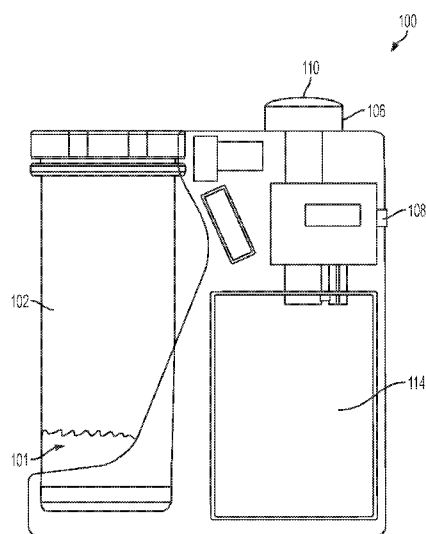
(54) Title: HYDROGEN GENERATION SYSTEMS AND METHODS UTILIZING SODIUM SILICIDE AND SODIUM SILICA
GEL MATERIALS

FIG. 1

(57) Abstract: Systems, devices, and methods combine thermally stable re-
actant materials and aqueous solutions to generate hydrogen and a non-toxic
liquid by-product. The reactant materials can sodium silicide or sodium silica
gel. The hydrogen generation devices are used in fuels cells and other indus-
trial applications. One system combines cooling, pumping, water storage, and
other devices to sense and control reactions between reactant materials and
aqueous solutions to generate hydrogen. Springs and other pressurization
mechanisms pressurize and deliver an aqueous solution to the reaction. A
check valve and other pressure regulation mechanisms regulate the pressure
of the aqueous solution delivered to the reactant fuel material in the reactor
based upon characteristics of the pressurization mechanisms and can regulate
the pressure of the delivered aqueous solution as a steady decay associated
with the pressurization force. The pressure regulation mechanism can also
prevent hydrogen gas from deflecting the pressure regulation mechanism.