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**Rightley**

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(54) **APPARATUS AND METHOD FOR SELECTIVELY CHANNELING A FLUID**

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See application file for complete search history.

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(57) **ABSTRACT**

An apparatus for selectively channeling a high temperature fluid without chemically reacting with the fluid. The apparatus includes an inlet and a membrane positioned adjacent to the inlet, each composed of a chemically inert material. The membrane is formed by compressive preloading techniques. The apparatus further includes a seat disposed on the inlet adjacent to the membrane. The seat is composed of a heat resistant and chemically inert material. Operation of the apparatus requires that the temperature of the fluid remains below the chemical characteristic melting point of the seat. The apparatus further includes an actuator coupled to the membrane for rendering the membrane in an open and a closed position with respect to the seat. Specifically, the actuator supplies a load in the normal direction to the membrane to selectively engage the membrane in a plurality of predetermined configurations. Operatively, the apparatus receives the fluid at the inlet. The fluid is received at a high temperature and is directed from the inlet to the membrane. In the closed position, the actuator engages the membrane to prevent the fluid from flowing from the inlet between the membrane and the seat. Alternatively, in the open position, the actuator engages the membrane to permit fluid flow from the inlet between the membrane and the seat to at least one outlet provided by the apparatus. In one exemplary embodiment, the fluid may be discharged from the at least one outlet to a sensor in fluid communication with the at least one outlet. Accordingly, the sensor may measure the fluid channeled through the heat resistant and chemically inert environment provided by the apparatus.

**9 Claims, 7 Drawing Sheets**

