[54] **SYSTEM FOR THE EXTRACTION AND UTILIZATION OF OXYGEN FROM FLUIDS**

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[58] Field of Search 204/130, 129; 55/16; 422/48; 423/579, 129; 261/DIG. 28, 101

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[57] **ABSTRACT**

A method for extracting oxygen from a fluid environment, which comprises the steps of (1) contacting a first fluid environment containing oxygen with a first surface of a first oxygen permeable membrane having a first and a second surface, wherein the membrane separates the environment from an interior space of a closed container, (2) transporting a carrier fluid into contact with the second surface of the membrane, wherein the carrier fluid is confined in the closed container and the carrier fluid contains a binding-state oxygen carrier, whereby oxygen which diffuses through the membrane binds to the carrier to give a bound oxygen complex, (3) transporting the carrier fluid containing the bound oxygen complex to a first electrode compartment of an electrochemical cell which forms a second portion of the closed container, (4) electrochemically modifying the binding-state oxygen carrier to an oxidation state having less binding affinity for oxygen, thereby releasing free oxygen into the carrier fluid and producing a nonbinding-state oxygen carrier, (5) removing oxygen from the carrier fluid, (6) transporting the carrier fluid containing the nonbinding-state oxygen carrier to a second electrode compartment of an electrochemical cell which forms a third portion of the closed container, and (7) electrochemically modifying the nonbinding-state oxygen carrier to the binding-state oxygen carrier, is disclosed along with an apparatus useful for carrying out the method of the invention.

20 Claims, 19 Drawing Figures
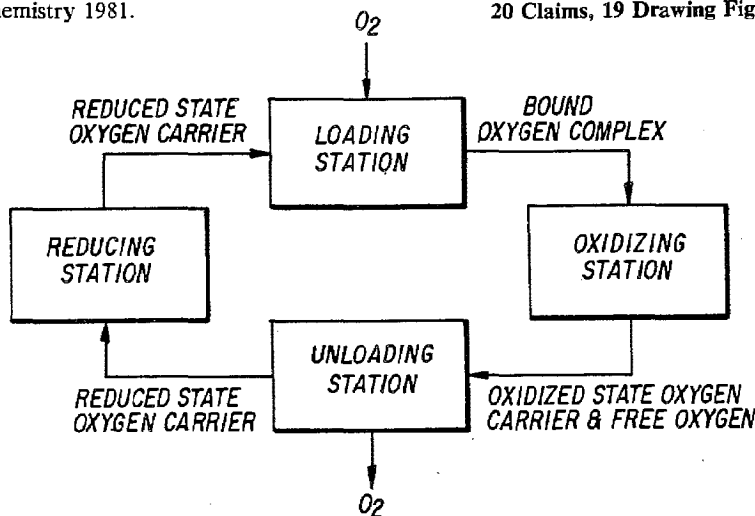
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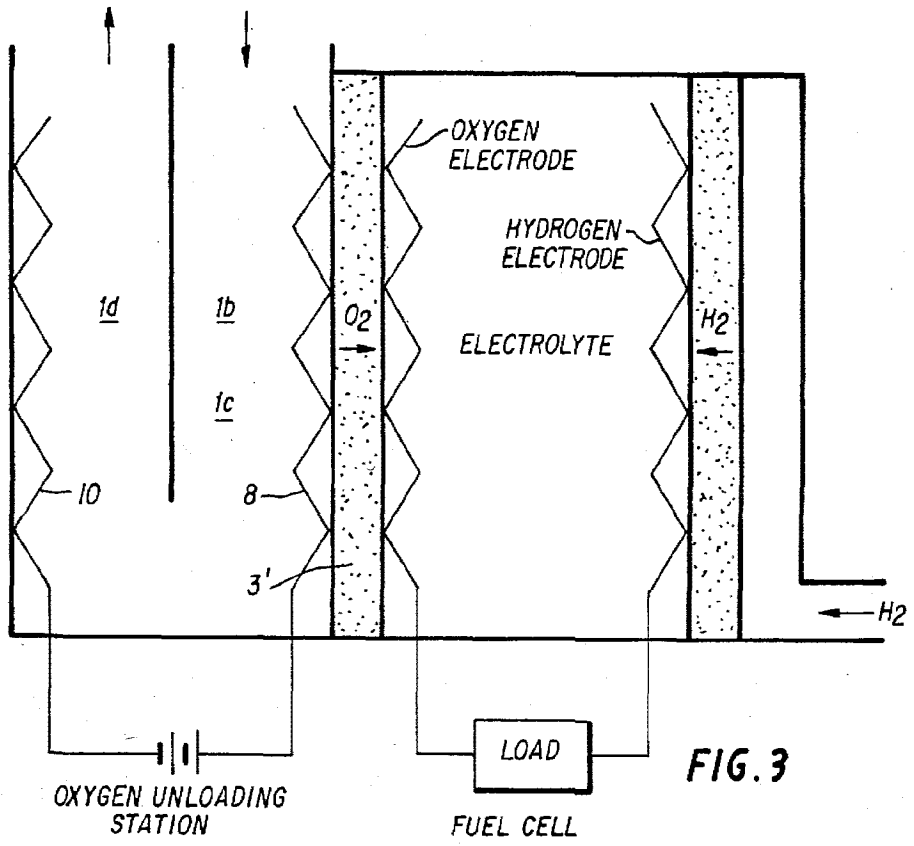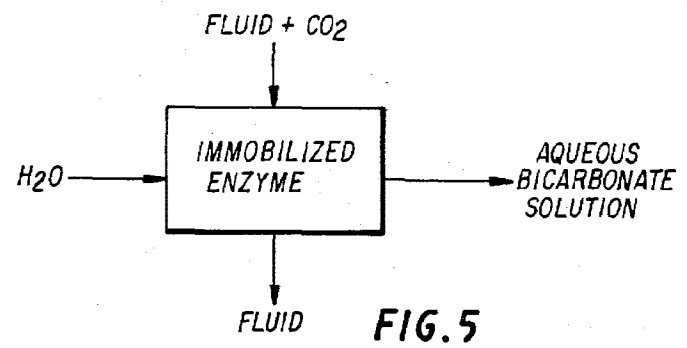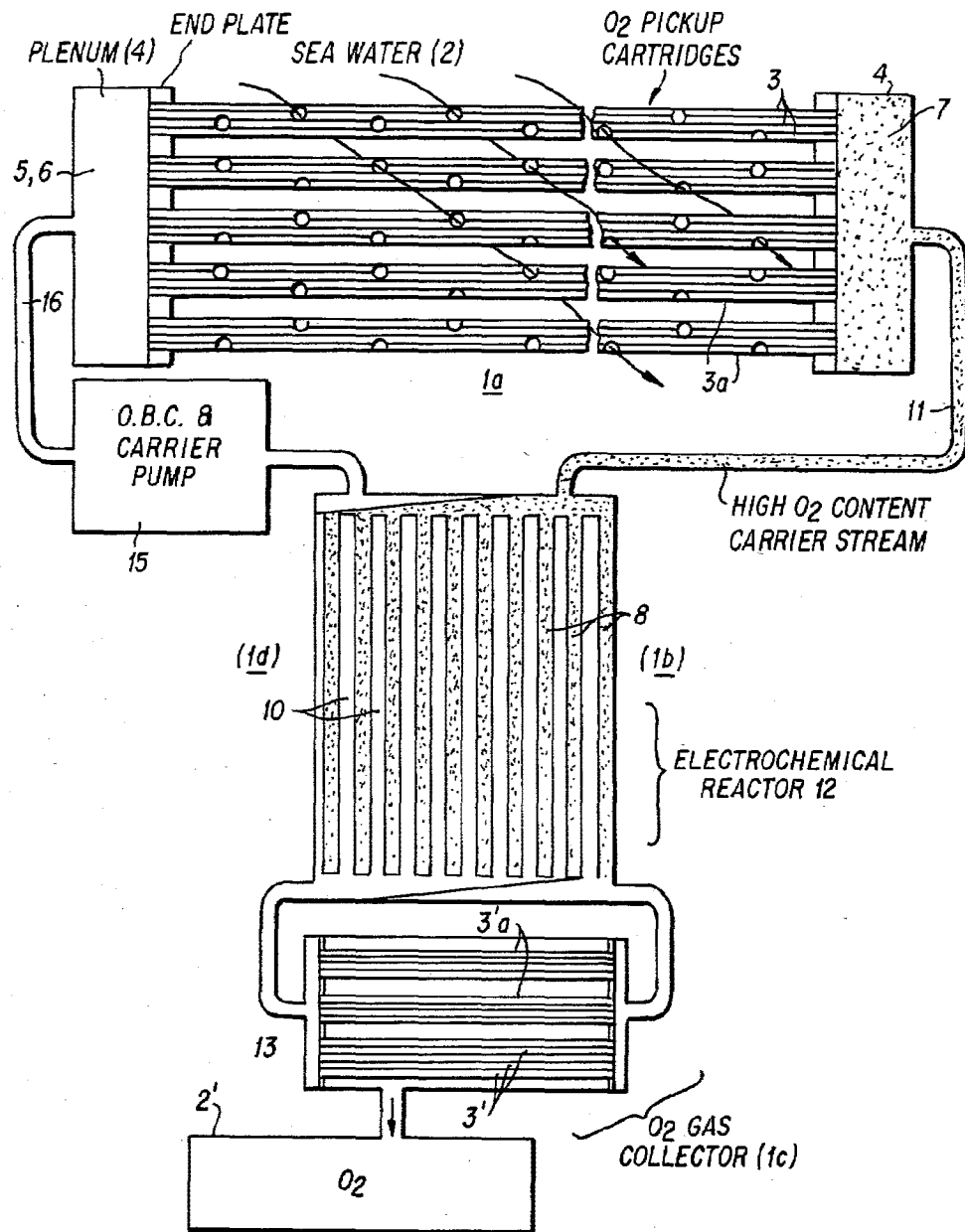
FIG.1

FIG.2
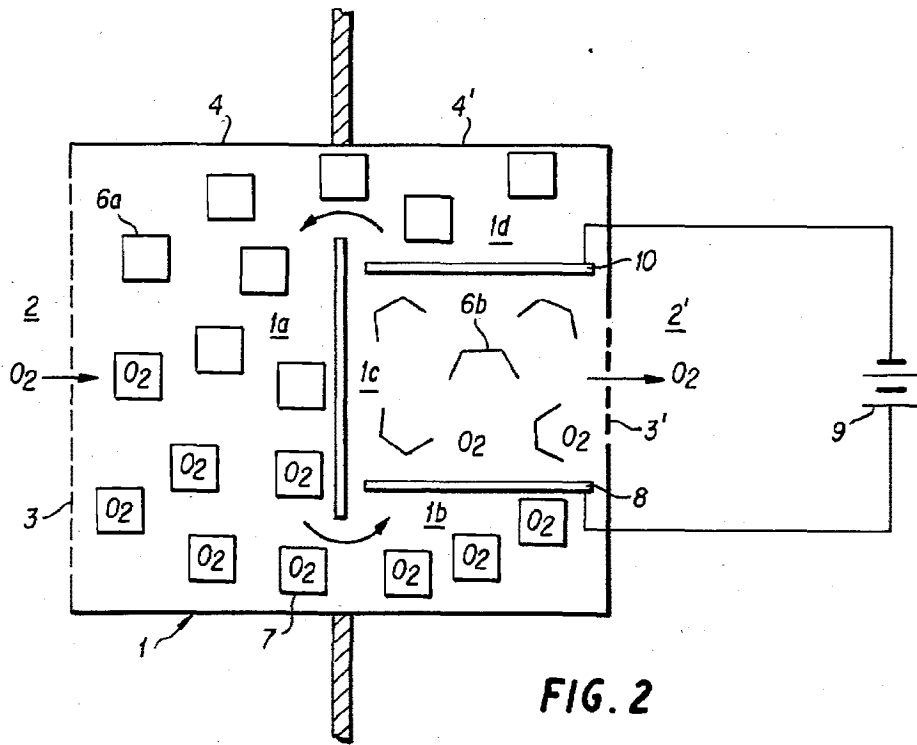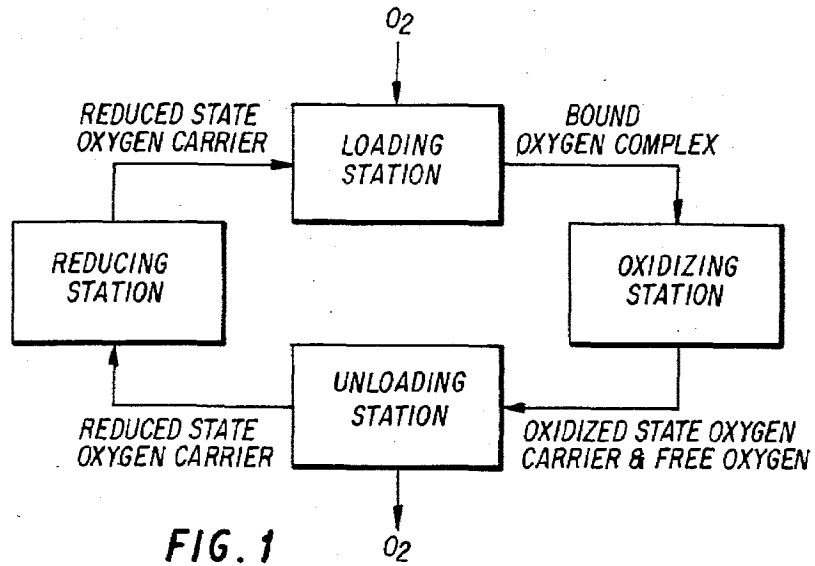
FIG. 3

FIG. 5

FIG. 4
O₂ EXTRACTION FLUID SYSTEM

DOCKET ALARM

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