United States Patent [19] Lampotang et al. [54] CO₂ DIAGNOSTIC MONITOR [75] Inventors: Samsun Lampotang; Dietrich Gravenstein; Joachim S. Gravenstein; Nikolaus Gravenstein; Michael J. Banner, all of Gainesville, Fla. [73] Assignee: The University of Florida, Gainesville, Fla. [21] Appl. No.: 255,400 [22] Filed: Oct. 11, 1988 [51] Int. Cl.⁵ A61M 16/00 [52] U.S. Cl. 128/207.14; 128/205.23; 128/200.26 128/204.22, 205.23, 200.26; 436/133; 422/86 [56] References Cited U.S. PATENT DOCUMENTS 2,136,236 11/1938 Draper . 2,638,096 5/1953 Waldhaus . 6/1959 Kilmer 436/133 2,890,177

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[57] ABSTRACT

[11]

A diagnostic monitor checks the carbon dioxide (CO₂) · content of a gas exiting a patient during endotracheal or esophageal intubation. A plurality of composition portions substantially change color in response to exposure to the carbon dioxide. The composition portions change color in response to different times of exposure to carbon dioxide. A magnifying or condensing lens may be positioned on the monitor to enhance viewing of the color change. The monitor may advantageously be made as part of an intubation system through which the gases from a patient exit the patient. The differences in time of exposure needed to cause the color change may be accomplished by using semipermeable membranes having differing thicknesses, CO₂ permeabilities, and/or surface areas with each membrane corresponding to a particular one of the composition portions.

30 Claims, 8 Drawing Sheets

