# United States Patent [19]

## Lampotang et al.

[54] **APPARATUS AND METHOD FOR DETECTING AND IDENTIFYING A DRUG**

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### Related U.S. Application Data

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[52] **U.S. Cl.** .......................................... **434/272**; 434/262

[58] **Field of Search** ........................... 434/262, 265–268, 434/272, 275; 128/774

[56]  **References Cited**

#### U.S. PATENT DOCUMENTS

| | | |
|---|---|---|
| 3,520,071 | 7/1970 | Abrahamson et al. . |
| 3,661,052 | 5/1972 | Lucien et al. . |
| 3,808,706 | 5/1974 | Mosley et al. . |
| 4,167,070 | 9/1979 | Orden . |
| 4,561,851 | 12/1985 | Ferreira et al. . |
| 4,570,640 | 2/1986 | Barsa . |
| 4,853,521 | 8/1989 | Claeys et al. ........................ 604/407 X |
| 4,878,388 | 11/1989 | Loughlin et al. . |
| 4,907,973 | 3/1990 | Hon . |
| 5,006,050 | 4/1991 | Cooke et al. ........................ 604/153 X |
| 5,385,474 | 1/1995 | Brindle ..................................... 434/267 |
| 5,403,192 | 4/1995 | Kleinwaks et al. . |
| 5,509,810 | 4/1996 | Schertz et al. .......................... 434/262 |

#### OTHER PUBLICATIONS

M.L. Good, M.D., and J. S. Gravenstein, M.D., *Anesthesia Simulators and Training Device*,International Anesthesiology Clinics 27:161–164 (1989).

Good, et al., *Hybrid Lung Model for Use in Anesthesia Research and EducationAnesthesiology*, Hybrid Lung Model for Use in Anesthesia Research and Education, 71:982–984 (1989).

D.M. Gaba, M.D. and A. DeAnda, *A Comprehensive Anesthesia Simulation Environment: Re–creating the Operating Room for Research and Training*, Anesthesiology, 69:387–389 (1988).

M.L. Good,et al., *Critical Events Simulation for Training in Anesthesiology*, Journal of Clinical Monitoring, 4:140 (1988).

S. Lampotang, et al., *A lung model of carbon dioxide concentrations with mechanical or spontaneous ventilation*, Critical Care Medicine, 14:1055–1057, (1986).

S. Abrahamson, *Chapter 31: Human Simulation for Training in Anesthesiology*, Medical Engineering, pp. 370–374.

J. S. Densen, M.D. and S. Abrahamson, Ph.D., *A Computer–Controlled Pateint Simulator*, JAMA, 208:504–508, (1969).

Ross et al., *Servocontrolled Closed Circuit Anaesthesia: A method for the automatic controlof anaethesia produced by a volatile agent in oxygen*, British Journal of Anesthesia, 44:1053–1060 (1983).

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[57]  **ABSTRACT**

An apparatus and method for detecting and identifying a drug administered in real time in an integrated patient simulator uses a manikin which receives the administration of the drug. A bar code is affixed to an implement for administering the drug, wherein the implement is an intravenous drip bag or a syringe. A scanner is used to scan the bar code to identify the type and concentration of the drug contained within the implement. The information obtained by the scanner is then used by a computer associated with the patient simulator to effect a response in the manikin.

**15 Claims, 7 Drawing Sheets**