



US005482050A

United States Patent [19]

[11] Patent Number: **5,482,050**

Smokoff et al.

[45] Date of Patent: **Jan. 9, 1996**

- [54] **METHOD AND SYSTEM FOR PROVIDING SAFE PATIENT MONITORING IN AN ELECTRONIC MEDICAL DEVICE WHILE SERVING AS A GENERAL-PURPOSE WINDOWED DISPLAY**
- [75] Inventors: **Timothy L. Smokoff**, Renton; **Erik R. Horsley**, Redmond, both of Wash.
- [73] Assignee: **SpaceLabs Medical, Inc.**, Redmond, Wash.
- [21] Appl. No.: **198,100**
- [22] Filed: **Feb. 17, 1994**
- [51] Int. Cl.⁶ **G06F 159/00**
- [52] U.S. Cl. **128/710; 128/660.04; 395/158; 395/159; 395/161; 395/650**
- [58] **Field of Search** **364/413.01, 413.02, 364/413.03, 413.04, 413.05, 413.06, 413.07, 413.1, 413.11; 395/157, 158, 650, 140, 159, 161; 340/825.32, 825.5, 825.51; 345/133; 128/710, 712, 661.03, 660.04**

"The Integration of Text, Graphics, and Radiographic Images on X-Terminal Clinical Workstations"—London, et al. Medinfo '92, Elsevier Science Publishers, B.V. (North-Holland), published 1992, pp. 41-46.
 Software Product: Chartcomp by Electronic Cottage Associates, in Datapro Software Catalog, record created Jan. 11, 1992 (Accession #00244614).
 Macintosh User's Guide, by Apple Computer, Inc., published 1992, pp. 98-99.
 Cowart, Robert: *Mastering Windows 3.1*, published by Sybex, Inc, published 1992, p. 420.

Primary Examiner—David M. Huntley
Assistant Examiner—Joseph Thomas
Attorney, Agent, or Firm—Seed and Berry

[57] ABSTRACT

A method and system for providing safe patient monitoring in an electronic medical device while serving as a general-purpose windowed display is provided. In a preferred embodiment, an electronic medical device is capable of providing services to executing programs in response to requests for services from executing programs. These requests for services each specify a service to be provided. The electronic medical device ensures the integrity of an executing patient monitoring program while simultaneously providing services to a non-patient monitoring program that is executing. The electronic medical device provides the service specified by each request for services from the executing patient monitoring program and declines to provide services as they are specified by requests for services from the executing nonpatient monitoring program if provision of the service as specified would interfere with the executing patient monitoring program. In one embodiment, the electronic medical device omits to provide any service in response to a request for services from the executing non-patient monitoring program that specifies a service that would interfere with the executing patient monitoring program. In one embodiment, the electronic medical device provides a service specified by the executing non-patient monitoring program in a manner different from that specified in the request for services, where the service provided in the different manner does not interfere with the executing patient monitoring program.

[56] References Cited

U.S. PATENT DOCUMENTS

4,410,938	10/1983	Higashiyama	395/575
4,484,302	11/1984	Cason et al.	395/158
4,542,376	9/1985	Bass et al.	345/120
4,550,315	10/1985	Bass et al.	345/199
4,688,167	8/1987	Agarwal	395/650
4,710,767	12/1987	Sciacero et al.	345/191
4,794,386	12/1988	Bedrij et al.	345/119
4,899,136	2/1990	Beard et al.	345/156
4,954,818	9/1990	Nakane et al.	345/120
5,001,469	3/1991	Pappas et al.	345/120
5,062,060	10/1991	Kolnick	395/159
5,072,409	12/1991	Bottorf et al.	395/137

(List continued on next page.)

OTHER PUBLICATIONS

"Patient Monitor Human Interface Design"—Tivig, et al., Hewlett-Packard Journal vol. 42, Issue n.4, 11 pages, published Oct. 1991.

27 Claims, 5 Drawing Sheets

