

**United States Patent** [19]

[11] **Patent Number:** **5,659,691**

**Durward et al.**

[45] **Date of Patent:** **Aug. 19, 1997**

- [54] **VIRTUAL REALITY NETWORK WITH SELECTIVE DISTRIBUTION AND UPDATING OF DATA TO REDUCE BANDWIDTH REQUIREMENTS**
- [75] **Inventors:** James Durward; Jonathan Levine; Michael Nemeth; Jerry Pretteggiani; Ian T. Tweedie, all of Calgary, Canada
- [73] **Assignee:** Virtual Universe Corporation, Calgary, Canada
- [21] **Appl. No.:** 125,950
- [22] **Filed:** Sep. 23, 1993
- [51] **Int. Cl.<sup>6</sup>** ..... G06F 3/14; G06F 15/163; G06F 3/16
- [52] **U.S. Cl.** ..... 395/329; 395/615; 395/200.34; 395/978
- [58] **Field of Search** ..... 395/600, 154, 395/155, 119, 152, 162, 326, 329, 511, 501, 502, 526, 339, 200.09, 335, 978; 364/578, 514 A

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[57] **ABSTRACT**

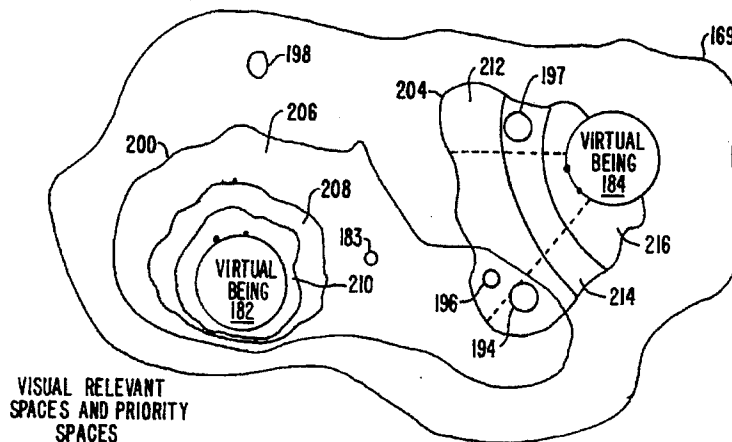
A virtual reality system has a database for defining one or more three-dimensional virtual spaces. A communication unit establishes a communication between the database and a user, and a data communication unit communicates data from the database to the user so that the user's computer may display a portion of a selected virtual space on the user's head mounted display. The communications unit also receives data corresponding to the position, orientation, and/or movement of the user relative to a reference point and uses the data to define a virtual being within the virtual space, wherein the position, orientation, and/or movements of the virtual being are correlated to the received data. Preferably, the data communicated to the user typically corresponds to the portion of the virtual space viewed from the perspective of the virtual being. To reduce the amount of data communicated between the computer and each user, visual and sound priority spaces may be defined within the portion of the virtual space data communicated to the user, and elements within selected priority spaces may be updated in priority over other priority spaces.

**15 Claims, 4 Drawing Sheets**

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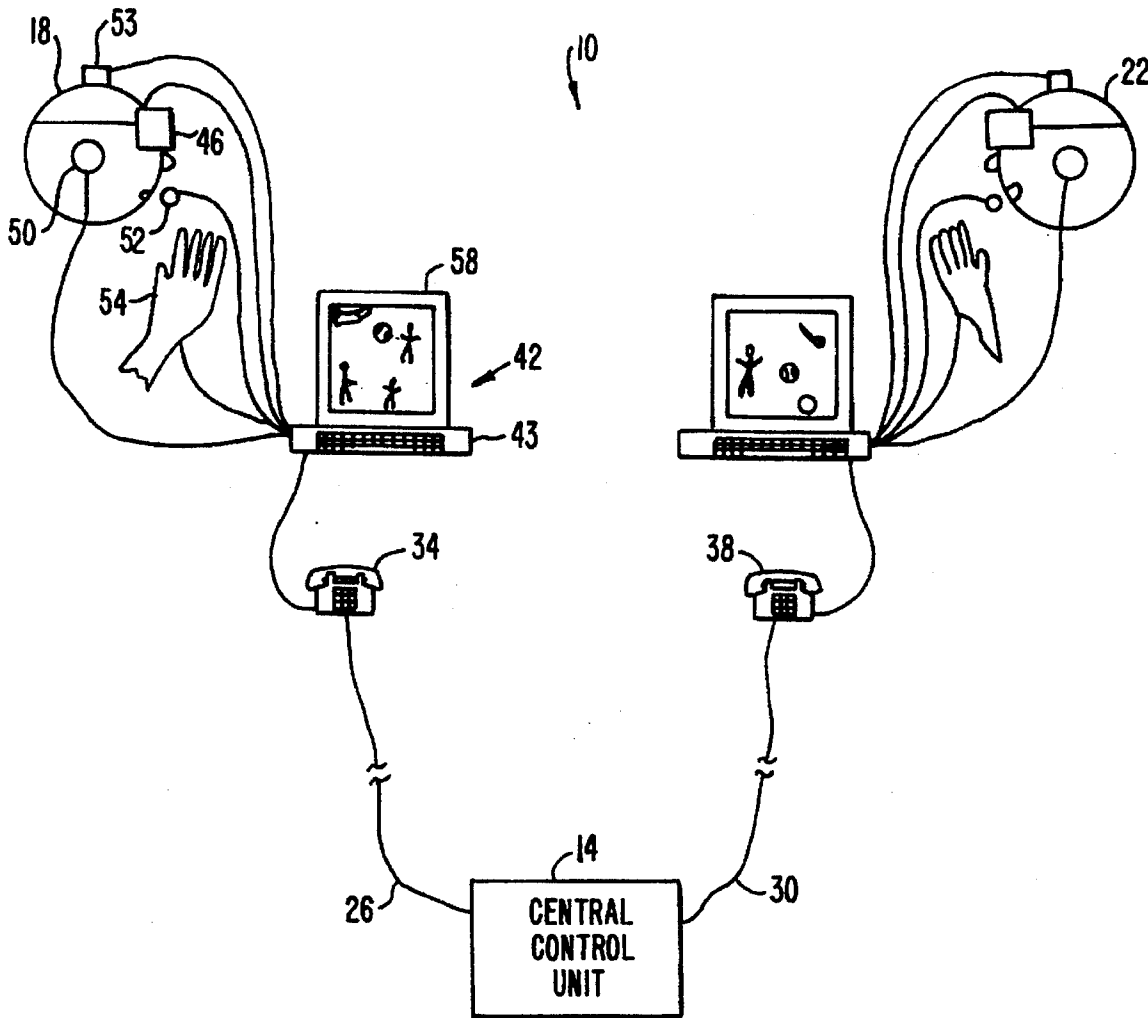


FIG. 1.

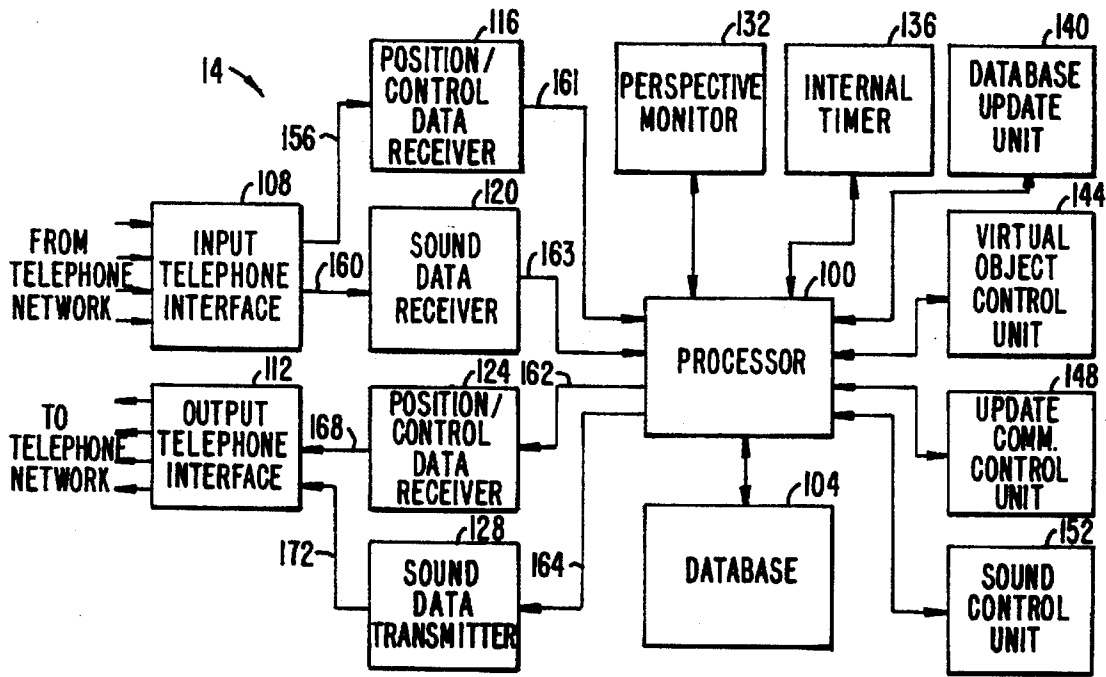


FIG. 2.

104

70	ID0	CAD	160
72	ID1	GAME 1	164
74	ID2	TASK 1	168
		⋮	
	IDN	VIRTUAL SPACE N	169

FIG. 3.

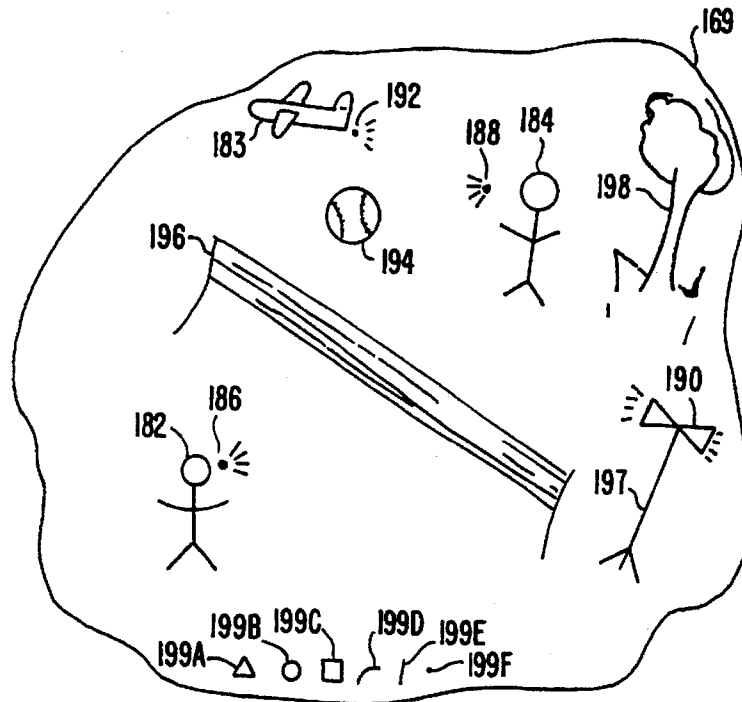


FIG. 4.

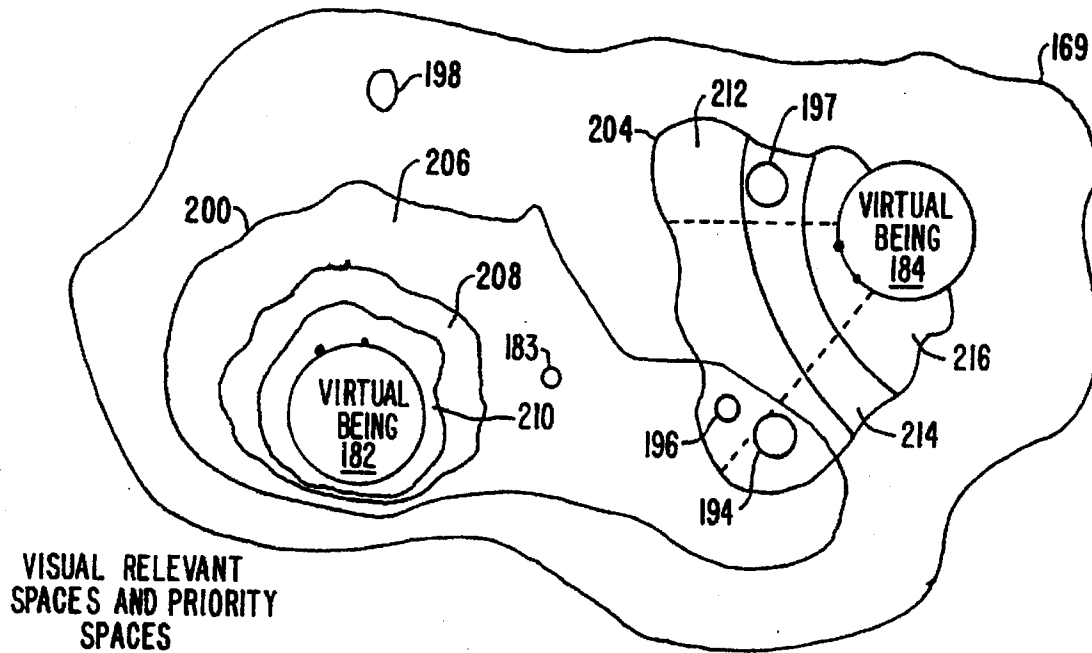


FIG. 5.

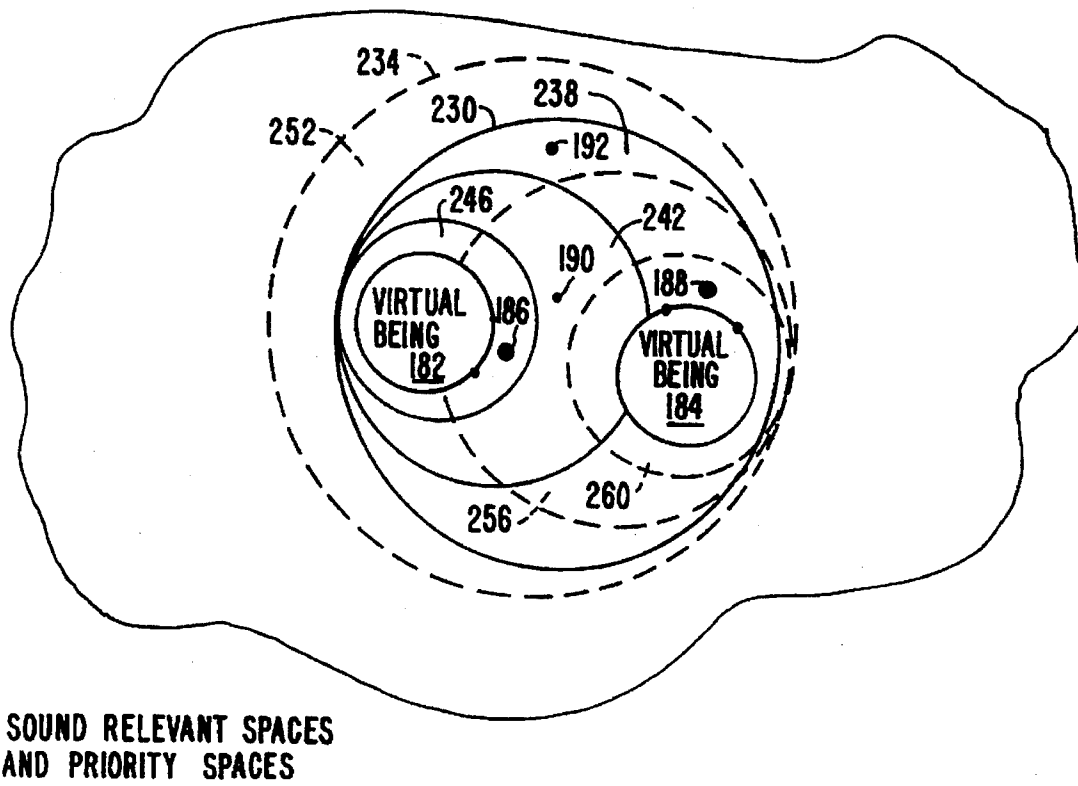


FIG. 6.

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