US006646540B1

(12) **United States Patent**
Lussey

(10) **Patent No.: US 6,646,540 B1**
(45) **Date of Patent: Nov. 11, 2003**

(54) **CONDUCTIVE STRUCTURES**

(75) Inventor: **David Lussey**, Richmond (GB)

(73) Assignee: **Peratech Limited**, Darlington (GB)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/018,400**

(22) PCT Filed: **Jun. 21, 2000**

(86) PCT No.: **PCT/GB00/02402**

§ 371 (c)(1),
(2), (4) Date: **Dec. 19, 2001**

(87) PCT Pub. No.: **WO00/79546**

PCT Pub. Date: **Dec. 28, 2000**

(30) **Foreign Application Priority Data**

Jun. 22, 1999	(GB)	9914399
Jul. 1, 1999	(GB)	9915296
Aug. 10, 1999	(GB)	9918837
Feb. 10, 2000	(GB)	0002912

(51) **Int. Cl.**[7] **H01C 10/10**

(52) **U.S. Cl.** **338/47**; 338/99; 338/114; 338/2

(58) **Field of Search** 338/2, 20, 21, 338/47, 5, 99, 101, 114

(56) **References Cited**

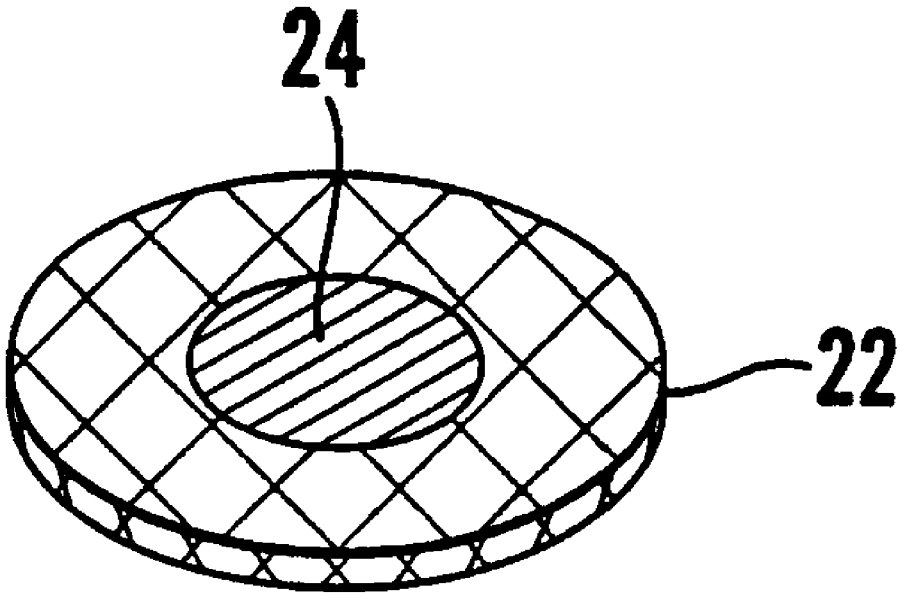
U.S. PATENT DOCUMENTS

1,455,735 A	*	5/1923	Rojas	338/99
2,042,606 A	*	6/1936	Kotowski	338/101
2,375,178 A	*	5/1945	Ruben	338/101
2,472,214 A	*	6/1949	Hurvitz	338/99
2,951,817 A	*	9/1960	Myers	338/114
3,125,739 A	*	3/1964	Deibel et al.	338/99
3,629,774 A	*	12/1971	Crites	338/114
4,054,540 A	*	10/1977	Michalchik	252/512
4,145,317 A	*	3/1979	Sado et al.	338/114
4,258,100 A	*	3/1981	Fujitani et al.	338/114
4,292,261 A	*	9/1981	Kotani et al.	264/437
4,529,959 A	*	7/1985	Ito et al.	338/295
4,790,968 A	*	12/1988	Ohkawa et al.	264/104
5,060,527 A	*	10/1991	Burgess	73/862.68
5,393,597 A	*	2/1995	Childers et al.	442/110
5,692,118 A	*	11/1997	Yasukawa	396/153

* cited by examiner

Primary Examiner—Karl D. Easthom
(74) *Attorney, Agent, or Firm*—Larson & Taylor, PLC

(57) **ABSTRACT**

A conductive structure is used in electric variable resistance devices to provide changes in electrical resistance with movement and changes in pressure, the variable resistance device comprising externally connectable electrodes **(10)** bridged by an element **(14)** containing polymer and particles of metal, alloy or reduced metal oxide, said element **(14)** having a first level of conductance when quiescent and being convertible to a second level of conductance by change of stress applied by stretching or compression or electric field, the device further comprising by means **(18)** to stress the element **(14)** over a cross-sectional area proportional to the level of conductance required.

28 Claims, 3 Drawing Sheets