(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 June 2003 (05.06.2003)

PCT

(10) International Publication Number
WO 03/046995 A1

(51) International Patent Classification[7]: H01L 29/41, G11C 5/02, 11/22

(21) International Application Number: PCT/NO02/00390

(22) International Filing Date: 29 October 2002 (29.10.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
20015815 28 November 2001 (28.11.2001) NO

(71) Applicant *(for all designated States except US)*: **THIN FILM ELECTRONICS ASA** [NO/NO]; P.O. Box 1872 Vika, N-0124 Oslo (NO).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **GUDESEN, Hans Gude** [NO/BE]; 17, rue Fulton, B-1000 Brussels (BE).

(74) Common Representative: **LEISTAD, Geirr, I.**; Thin Film Electronics ASA, P.O. Box 1872 Vika, N-0124 Oslo (NO).

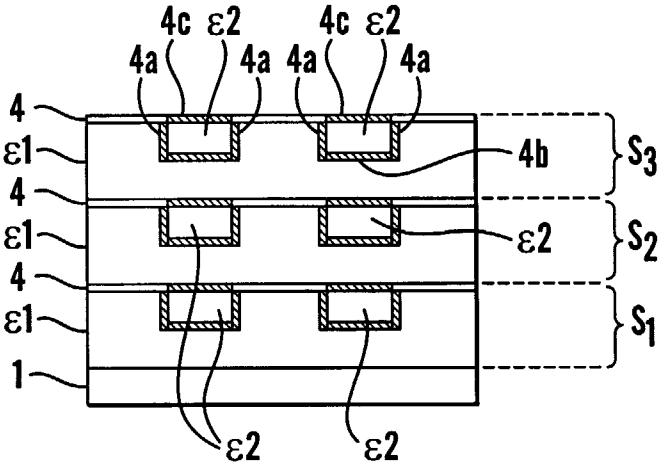
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MATRIX-ADDRESSABLE APPARATUS WITH ONE OR MORE MEMORY DEVICES



(57) Abstract: In a matrix-addressable apparatus comprising one or more memory devices with multidirectionally switchable memory cells (5) arranged in a passive matrix-addressable array, the memory cells comprise a memory medium in the form of a ferroelectric or electret thin-film memory material capable of being polarized by an applied electric field and exhibiting hysteresis, and preferably the memory material is a polymer or copolymer. A memory device in the apparatus comprises at least a first and a second electrode means (E 1;E2) such that the electrodes (ε2) of the second electrode means (E2) are provided in recesses (3) in the electrodes (ε1) of the first electrode means (E1) and oriented orthogonally thereto, the recesses (3) extending only half-way through the electrodes (ε1) of the first electrode means (E1). The electrodes (ε2) of the second electrode means (E2) are provided in the recesses (3) surrounded by memory material (4a,4b) which also contacts the crossing electrodes (ε1) of the first electrode means (E1) whereby a memory cell (5) is defined in the crossing between electrodes (ε1;ε2) of the first and second electrode means (E1;E2) respectively and formed by a memory material surrounding the electrodes (ε2) of the second means (E2) on at least three sides thereof, thus providing at least three switching directions in the memory cell (5) at different locations thereof. Two or more memory devices can be stacked in the apparatus according to the invention, thus implementing the latter as a volumetric data storage apparatus.

WO 03/046995 A1