US 20030151597A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2003/0151597 A1

(43) Pub. Date: Aug. 14, 2003

Roberts et al.

(54) EXTENDED REFRESHABLE TACTILE GRAPHIC ARRAY FOR SCANNED TACTILE DISPLAY

(76) Inventors: **John W. Roberts**, Gaithersburg, MD (US); **Oliver T. Slattery**, Germantown, MD (US); **Bretton Swope**, Gaithersburg, MD (US); **David W. Kardos**, Sykesville, MD (US); **Volker Min**, Heiloo (NL); **Michael Sutton**, Welwyn Garden city (GB); **Edwin C. Mulkens**, Uene (NL); **Gina Rodgers**, Chesapeake, VA (US); **Nicholas Guttenberg**, Gaithersburg, MD (US); **Tracy Comstock**, Cockeysville, MD (US)

Correspondence Address:
The Law Firm of
HARRIS & BURDICK
Suite E
6676 Gunpark Drive
Boulder, CO 80301 (US)

(21) Appl. No.: **10/335,688**

(22) Filed: **Jan. 2, 2003**

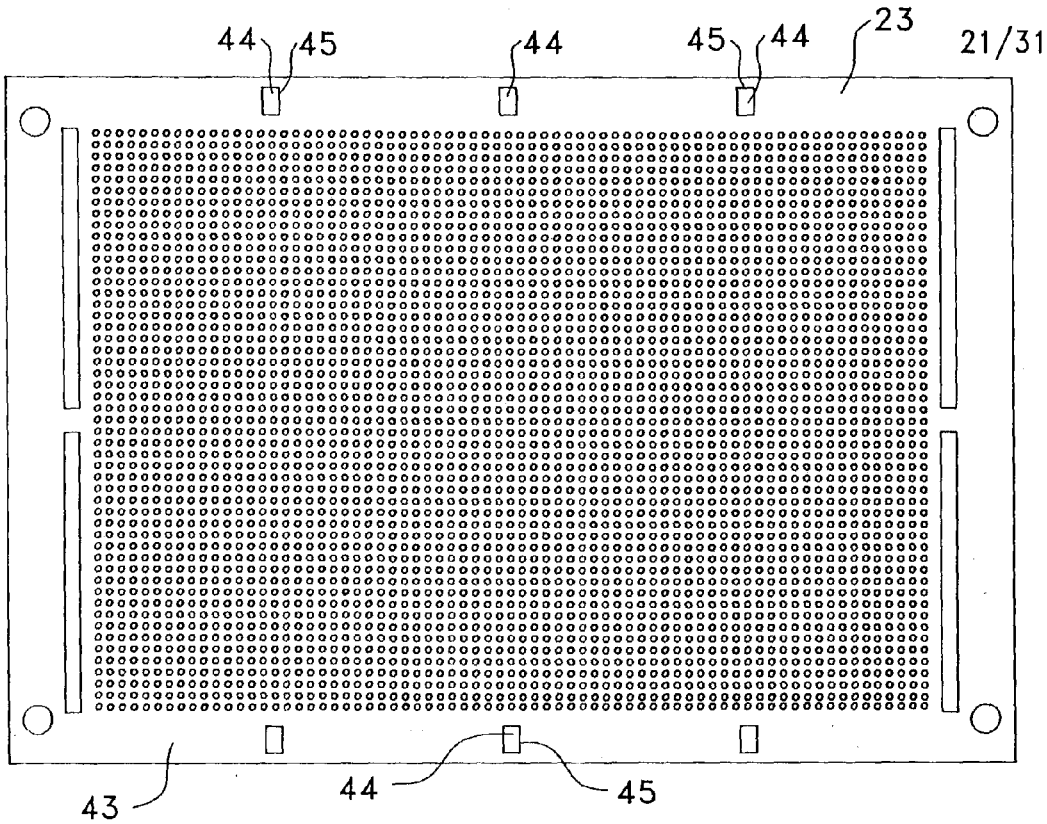
Related U.S. Application Data

(60) Provisional application No. 60/346,152, filed on Jan. 3, 2002.

Publication Classification

(51) **Int. Cl.**[7] **G09G 5/00**

(52) **U.S. Cl.** **345/173**

(57) **ABSTRACT**

Apparatus and methods for extended refreshable tactile graphic display are disclosed, the apparatus including an array of pins at a display surface, with pin setting actuators and display surface matrix preferably being separable units. The display matrix is provided by stacked functional layers, functions including temporary pin retention and pin locking.