(12) **United States Patent** (10) **Patent No.:** **US 6,696,985 B2**

Houston (45) **Date of Patent:** **Feb. 24, 2004**

(54) **REFORMABLE KEYBOARD WITH VARIABLE KEY DESIGN**

(75) Inventor: **John S. Houston**, Hopewell Junction, NY (US)

(73) Assignee: **International Business Machines Corporation**, Armonk, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 379 days.

(21) Appl. No.: **09/841,626**

(22) Filed: **Apr. 24, 2001**

(65) **Prior Publication Data**

US 2002/0154037 A1 Oct. 24, 2002

(51) **Int. Cl.**^{7} **H03M 11/00**
(52) **U.S. Cl.** **341/21**; 341/26
(58) **Field of Search** 341/26; 361/21, 361/22, 34; 400/87, 127, 128, 483, 485

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,121,048 A	10/1978	Dev Choudhury	.... 178/17 C
4,198,539 A	4/1980	Pepper, Jr.	.... 178/18
4,293,734 A	10/1981	Pepper, Jr.	.... 178/18
5,661,505 A	8/1997	Livits	.... 345/169
5,675,329 A	10/1997	Barker et al.	.... 341/22
5,718,590 A	2/1998	Choate	.... 434/227
5,790,103 A *	8/1998	Willner	.... 345/168
5,861,823 A	1/1999	Strauch et al.	.... 341/22
5,872,561 A *	2/1999	Figie et al.	.... 345/168
6,094,197 A	7/2000	Buxton et al.	.... 345/358
6,102,594 A	8/2000	Strom	.... 400/486

* cited by examiner

Primary Examiner—Michael Horabik
Assistant Examiner—Hung Dang
(74) *Attorney, Agent, or Firm*—Floyd Gonzalez

(57) **ABSTRACT**

Key patterns configured to accommodate the handicaps of the disabled user are imprinted or embossed on a sheet of conformable material. A matrix of sensing circuits for a keyboard are placed under the sheet to detect when and where the sheet is depressed and provides an output to a keyboard controller indicating which portion of the keyboard has been contacted. The keyboard controller relates the position data to the keyboard pattern on the sheet and provides key signals to the computer interface connector of the keyboard that are indistinguishable by a computer system from the QWERTY outputs of a standard keyboard. This enables the disabled user to carry this keyboard from one computer system to another and simply exchange it for the standard keyboard for the computer. Since the keyboard can be configured to accommodate the users handicap, no changes need be made to the operating system or any software of the computer in order to allow the disabled user to use the computer. Furthermore, other users are not required to do anything special to start using the computer system once the standard keyboard is re-installed.
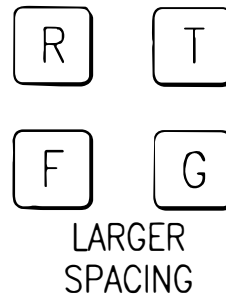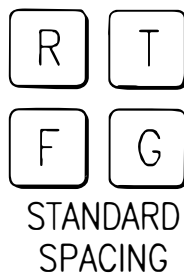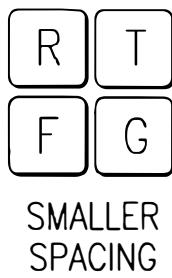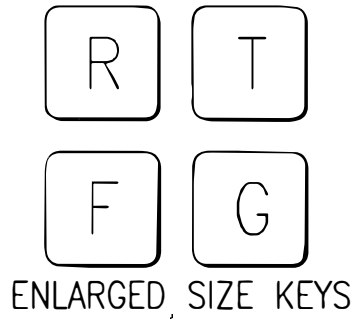
12 Claims, 5 Drawing Sheets

FIG.1
Prior Art

R T
F G
REDUCED
SIZE KEYS

R T
F G
STANDARD
SIZE KEYS

R T
F G
ENLARGED SIZE KEYS

R T
F G
SMALLER
SPACING

R T
F G
STANDARD
SPACING

R T
F G
LARGER
SPACING

FIG.2

302b   302c   304b   304c

R R
302a   r

T T
304a   t

FIG.3

FIG.4

404

504   514

PROCESSOR

PROGRAM MEMORY
(ROM) — 508

NON—VOLATILE
DATA MEMORY
(EEPROM) — 502

512 — BUFFER

WORKING MEMORY
(RAM) — 506

INPUT/OUTPUT INTERFACE — 510
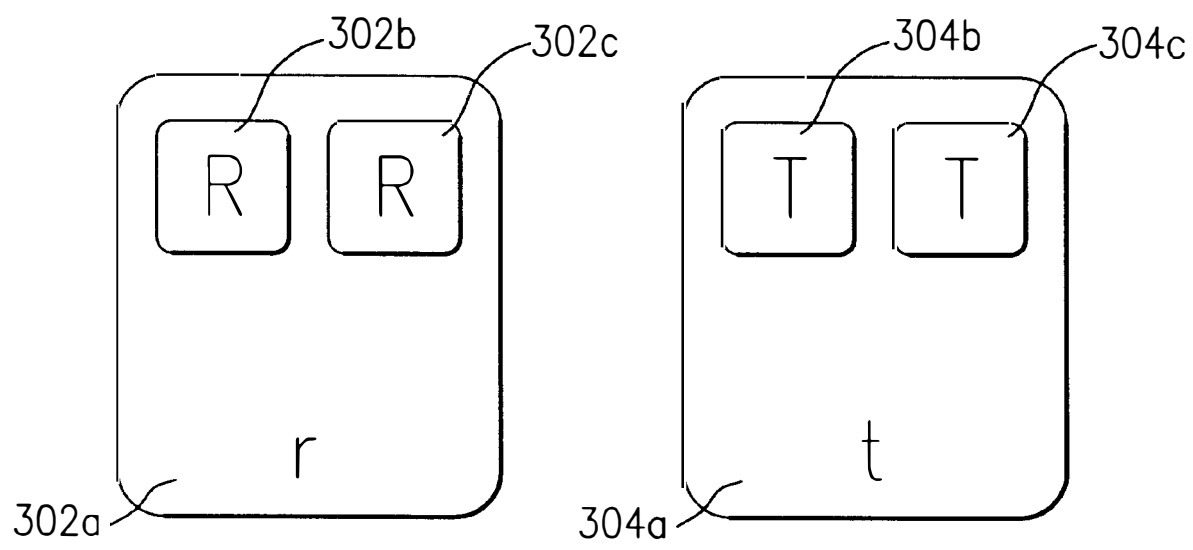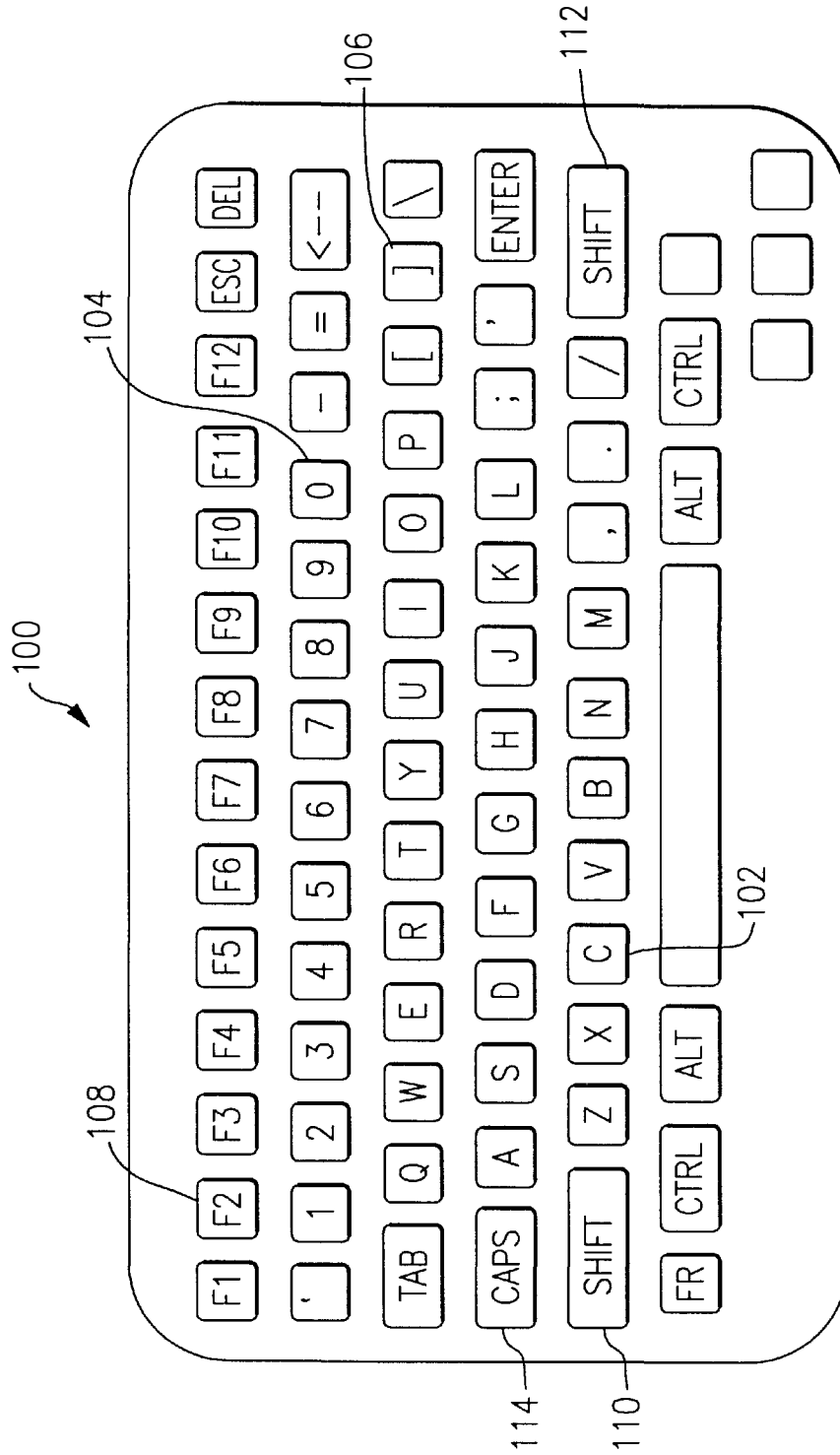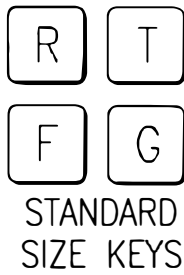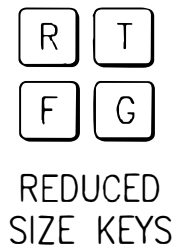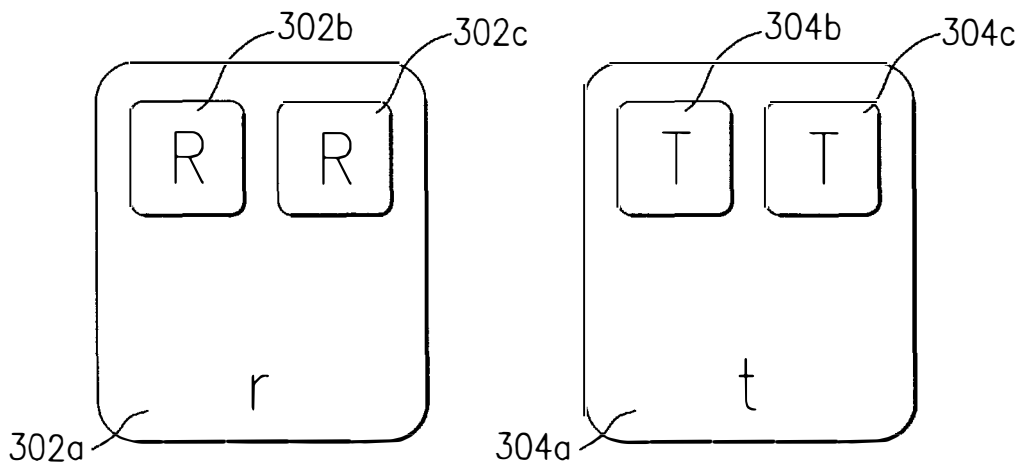
FIG.5

DOCKET ALARM
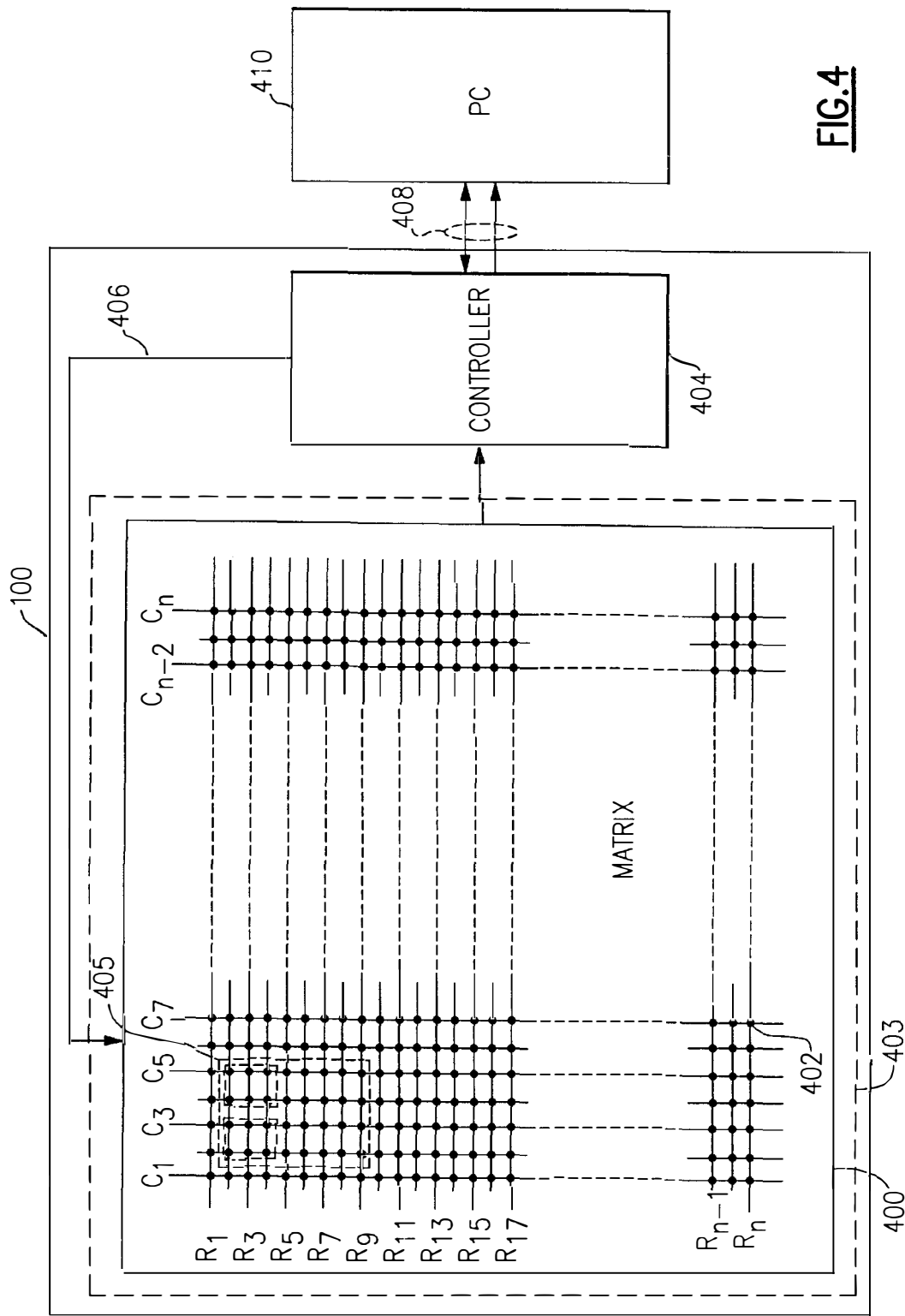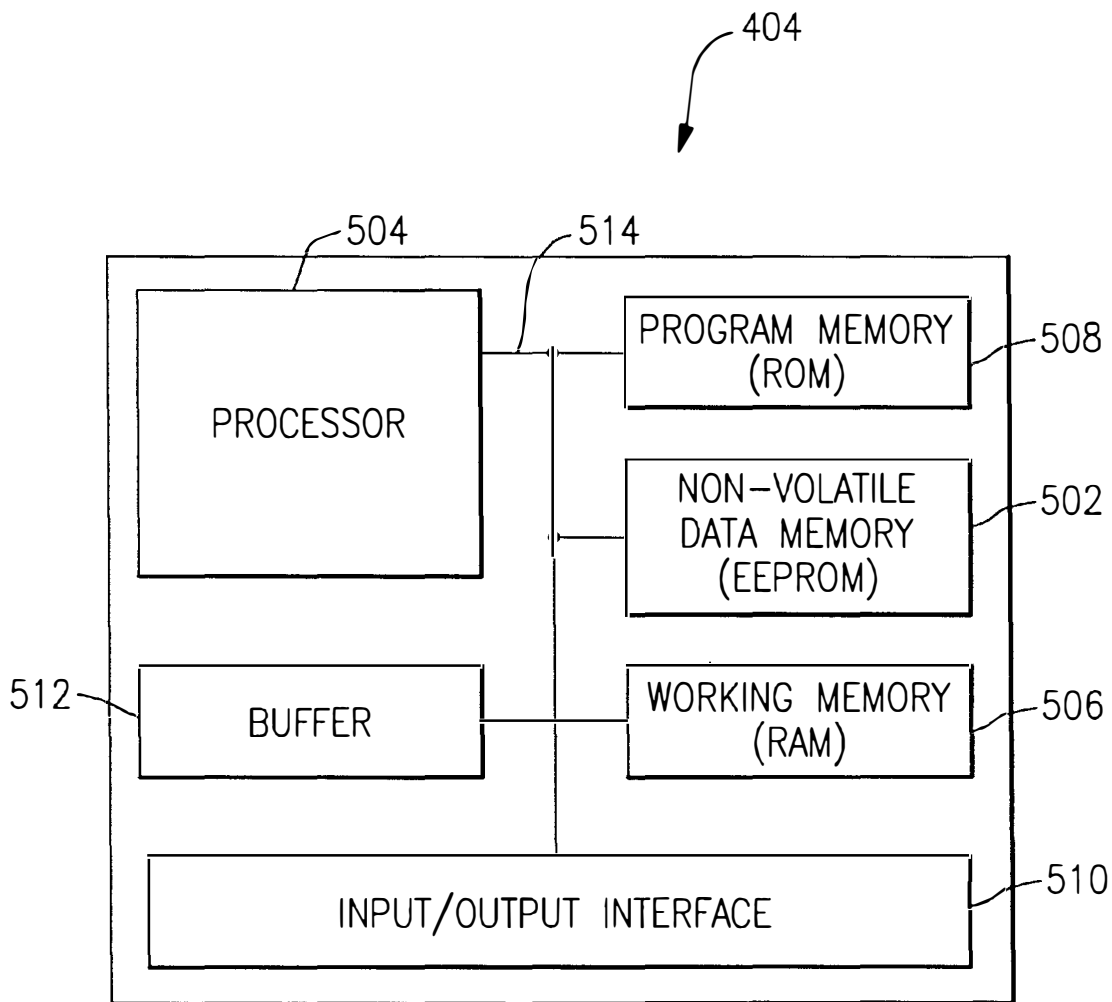
Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.

fastcase®
Smarter legal research.