US006018335A

United States Patent [19]

Onley et al.

[11] Patent Number: 6,018,335

[45] Date of Patent: *Jan. 25, 2000

[54] **PROGRAMMABLE KEYBOARD AND METHOD THEREFOR**

[75] Inventors: **Raymond V. Onley**; **Alan R. Hannan**, both of Cincinnati, Ohio

[73] Assignee: **KDI Precision Products, Inc.**, Cincinnati, Ohio

[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

[21] Appl. No.: **08/914,329**

[22] Filed: **Aug. 19, 1997**

[51] **Int. Cl.**[7] **G09G 3/26**

[52] **U.S. Cl.** **345/172**; 341/22; 345/168

[58] **Field of Search** 345/158, 156, 345/157, 174, 172, 168, 169; 341/20, 22, 23, 176; 364/231; 705/18, 25

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,200,913	4/1980	Kuhar et al.	341/23
4,280,121	7/1981	Crask	345/174
4,763,252	8/1988	Rose	345/168
4,823,311	4/1989	Hunter et al.	345/172
4,916,740	4/1990	Noda et al.	341/23
4,937,778	6/1990	Wolf et al.	345/168
4,964,075	10/1990	Shaver et al.	341/23
5,119,479	6/1992	Arai et al.	345/156
5,121,472	6/1992	Danish et al.	364/231
5,144,567	9/1992	Oelsch et al.	341/23
5,197,147	3/1993	Long et al.	364/228
5,241,646	8/1993	Arai	364/234
5,287,526	2/1994	Wolf et al.	345/172
5,305,449	4/1994	Ulenas	345/163
5,317,505	5/1994	Karabed et al.	345/156
5,363,296	11/1994	Fuyama	705/18
5,404,321	4/1995	Mattox	345/172
5,414,426	5/1995	O'Donnell et al.	341/76
5,485,614	1/1996	Kocis et al.	345/168
5,493,654	2/1996	Gopher et al.	341/22
5,504,483	4/1996	Hoffmann et al.	341/22
5,559,512	9/1996	Jasinski et al.	341/22
5,576,734	11/1996	Daniele et al.	345/168

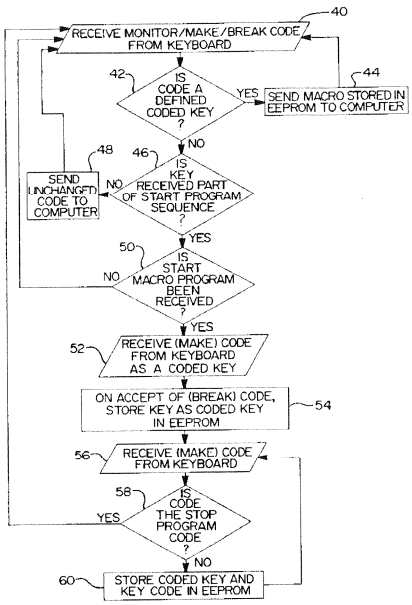
Primary Examiner—Dennis-Doon Chow

Attorney, Agent, or Firm—Harness, Dickey & Pierce, PLC

[57] **ABSTRACT**

An apparatus adapted to be coupled between a keyboard and a computer to enable a user to define desired keys as coded keys which are associated with MACROS defined by the user. The apparatus includes a microcontroller and an electrically erasable, programmable read only memory (EEPROM) which monitors codes transmitted from the keyboard and is placed in a programming mode when a predetermined program code is received from the keyboard. Once in the program mode, the next key depressed by the user is denoted as a coded key and the following keys depressed by the user are designated as a user programmed MACRO associated with the coded key. The apparatus stores this information in the EEPROM and thereafter when the coded key is depressed by the user the associated MACRO is generated and transmitted to the computer. The apparatus forms a very compact, relatively inexpensive means for enabling conventional keyboards to function as programmable keyboards. In an alternative preferred embodiment, editing and creation of the MACROS can be accomplished by receiving information from the computer through the use of a software program which enables the user to more conveniently enter and exit the programming mode, as well as make necessary edits to previously stored MACROS.

7 Claims, 4 Drawing Sheets



Case 6339-000006
HKM/MDE