

surface which utilizes electronic number representations. Electronic representation of characters is achieved in a variety of ways. In one embodiment of the present invention any one of the following methods is utilized including: light emitting diodes (LED); liquid crystal display (LCD); electroluminescent; and cathode ray tubes (CRT). It is understood that the other technology exists for representing characters electronically and may be implemented in this invention. Utilization of manual buttons with the numbers represented with liquid crystal display (LCD) or light emitting diodes (LED) permit the utilization of raised buttons on a keypad structure. Touchscreen pads from ATM machines only requires logic de-codes to make sure that the user is typing in correct numbers/characters. "Characters" as is utilized in this invention, refer to a series of representative elements including numbers, letters, and other symbols. After the user enters a password comprising of a set of characters, the location of the keypad characters get randomly reshuffled so that characters are presented in different locations. By scattering the keypad, the physical utilization of the buttons is changed and ultimately results in the even wear of the buttons. Additionally, people spying on a user will find that the pattern utilized by the person is invalid. In the preferred embodiment, this random reshuffling occurs after every utilization by any user. Since the keypad was scattered before and after utilization, the pattern does not tell the watcher what the actual password/code numbers are. It is understood that although the invention describes a set of characters representing the password entered on the keypad, any number of characters, including a single character, may be utilized as a password within the invention.

The process of repositioning the numbers, coding and decoding the number configuration is implemented utilizing a software algorithm in the preferred embodiment. The invention permits tracking the areas that need to decode scrambled physical locations to real numbers. The numbers are then randomly reshuffled after utilization. Reshuffling occurs internally utilizing the software intelligence which also maps the new location of the digits to allow for decoding of the user's entered code.

The reshuffling numbers may occur at random or in a predefined pattern i.e. after each utilization or after every three utilizations of the keypad. Computer routines are not purely random, and could also be pseudo-random. For purposes of this invention, this random or pseudo-random nature is referred to as "generally random." By scattering the keypad, the numbers are in different physical positions and the wear of the buttons is even. Over a large number of reshuffling the buttons will get even wear. This prevents someone spying on the user from narrowing down the code because the user entered pattern does not reveal the password. Once the reshuffling occurs, entering the same pattern results in a different set of characters from the previously entered code and access to the system is denied.

With reference now to the figures, and in particular with reference to FIG. 1, the present invention is implemented according to the series of diagrammatic representations. FIG. 1 depicts the changing physical location of the input buttons according to one embodiment of the present invention. A keypad **101** is depicted showing a configuration of input button locations **101a** which are represented by the

letters A through L. This configuration represents the basic keypad framework upon which the invention is implemented. This framework is static, i.e. input button locations **101a** remain in place. In the preferred embodiment, the keypad is a numeric keypad **102** with digits 0 through 9 an "\*" and "#" button. Numeric keypad **102** in the present invention has the characters located on visually descriptive buttons **102a** in random locations. These buttons are visually descriptive in that the characters are displayed on or within the buttons to facilitate interfacing by the user of the keypad. Input button locations **101a** correspond to visually descriptive buttons **102a**, (i.e. '8' corresponds to location 'C', '\*' to location 'I', etc.). In this illustrative embodiment, a user sequentially selects (pushes or touches) digits 1-2-3 **102b** from the randomized numeric keypad **102**. These buttons are illustrated with hash marks over digits 1-2-3 **102b** on numeric keypad **102**. The selection of the digits prompts the keypad decoding mechanism to determine the actual digits selected, the order of selection, and whether these digits represent the correct security code of the system. This process is described in detail below. In the preferred embodiment, once digits 1-2-3 **102b** have been selected, the numbers are randomly repositioned and the characters given new locations on reconfigured numeric keypad **103**. The next authorized user may then selected digits 1-2-3 **102b** from their new physical location on reconfigured numeric keypad **103** as illustrated with hash marks over digits 1-2-3 **102b** on reconfigured numeric keypad **103**.

FIG. 2 illustrates the process which occurs during the decoding of the entered digits on the numeric keypad. A user first selects digits 1-2-3 **102b** on the first configuration of the character set. The selection is depicted by hash marks over digits 1-2-3 **102b** on numeric keypad **102**. Digits 1-2-3 **102b** are represented on the framework's physical location E, G, and L of the numeric keypad. Each number is linked in memory to its physical location. In the preferred embodiment, the keypad decoding mechanism reads the internal code saved with this character configuration **203** to analyze the physical locations punched (interfaced) and assign it to the corresponding digit in memory based on character configuration **203**. Once this identification is completed, an analysis is conducted to determine if the assigned digits correspond to the correct access code for the system. The system then provides access based on the result of this determination. In the preferred embodiment, the numbers are immediately reshuffled to provide a new configuration. The numeric keypad's digits are repositioned and particularly, digits 1-2-3 **102b** get translated into the physical location L-D-A. The keypad code mechanism saves this new character configuration **204** and awaits for the next entry of digits by a user on reconfigured numeric keypad **103** according to the preferred embodiment. The next authorized user enters digits 1-2-3 **102b** utilizing the reconfigured numeric keypad **103** with the digit locations at L-D-C. Once the correct locations are punched (interfaced), the keypad decoding mechanism translates the punched locations into their respective digits and the process of reshuffling and repositioning, etc. begins again. In the preferred embodiment, the reshuffling occurs after each user selection whether or not the correct code is entered. It is understood that the reshuffling may be done at different intervals and be subject to a variety of conditions.