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Waggamon et al.

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[54] **REMOTE CONTROLLED GARAGE DOOR OPENING SYSTEM**

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[52] **U.S. Cl.** **340/825.31**; 340/825.34

[58] **Field of Search** 340/825.31, 825.69, 340/825.72, 825.34, 825.22, 825.56; 341/176, 173

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[57] **ABSTRACT**

A remote control system for opening and closing a barrier, such as a garage door, includes an RF receiver and a plurality of RF transmitters. The transmitters and receiver include circuitry programmed to provide transmission of encrypted code signals each time the transmitters are used and employing a code hopping method which prevents unauthorized signal interception or code "grabbing". The system is operated in a code learning mode for the receiver by momentarily actuating a receiver learn mode button for receiving each transmitter identification code and a secret decryption key for that transmitter with the system automatically returning to the operate mode. Each transmitter identification and secret key code signal is automatically and randomly stored in an available and unused memory in the receiver circuitry. A multibit hopping code is transmitted from each transmitter to the receiver with each transmitter operation in the operate mode of the system and the hopping code changes with each transmission to prevent theft or code grabbing and resultant unauthorized operation of the system.

4 Claims, 5 Drawing Sheets

