

[54] SECURE COMMUNICATIONS IN A WIRELESS SYSTEM 5,600,324 2/1997 Reed et al. 340/825.69 5,661,804 8/1997 Dykema et al. 380/21

[75] Inventors: Francis C. Marino, Dixc Hills; Thomas P. Schmit, Huntington, both of N.Y.

OTHER PUBLICATIONS

Microchip Technology, Inc.; Data Sheets for HCS300 Code Hopping Encoder, 1996. Exel Microelectronics, Inc.; Data Sheets for XL106 Rolling Code Encoder/ Authentication Encoder/ Decoder Coprocessor, Dec. 1995. Exel Microelectronics, Inc.; Keeloq Code Hopping For Secure remote Controls, Mar. 30, 1994.

[73] Assignee: Pittway Corporation, Chicago, Ill.

[21] Appl. No.: 08/667,847

[22] Filed: Jun. 20, 1996

[51] Int. Cl.⁷ H04L 9/00; G08C 19/00; G06F 7/04

Primary Examiner—William Oen Attorney, Agent, or Firm—Anthony R. Barkume, P.C.

[52] U.S. Cl. 380/21; 340/825.72; 340/825.31; 340/825.09

[57] ABSTRACT

[58] Field of Search 380/21, 23, 28, 380/29, 43, 46; 340/506, 539, 825.22, 825.31, 825.32, 825.34, 825.5, 825.69, 825.72

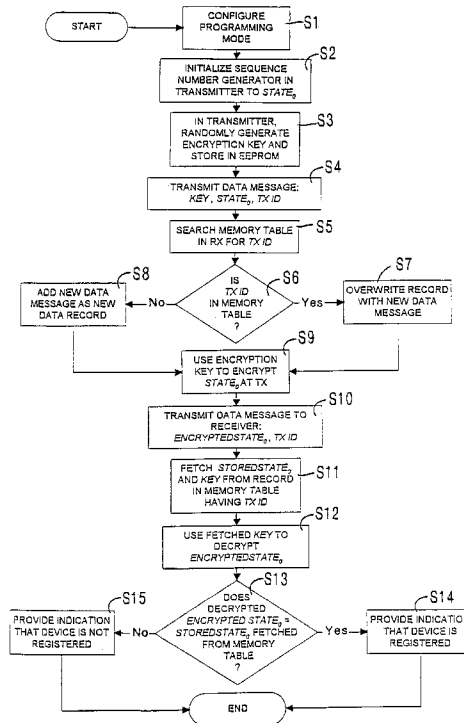
Disclosed are three major aspects relating to wireless transmission of encrypted data messages in a security system wherein the receiver stores locally an encryption key utilized by the transmitting device to encrypt the data message and the receiver uses the encryption key to decrypt an encrypted data message, and wherein a sequence number generator is used to synchronously track the message sequence at both the transmitter and receiver. A first major aspect involves encrypted device registration (learning) methods that are user-friendly and immune from detection by technically skilled intruders with special RF equipment, and periodic user-friendly changing of the encryption key per encrypted transmitting device in the system. A second major aspect involves encrypted device de-registration (unlearning, or deletion) that is likewise user friendly. A third major aspect of the invention allows the receiver to process encrypted and non-encrypted messages, interchangeably, within the same wireless security system.

[56] References Cited

U.S. PATENT DOCUMENTS

- 4,209,782 6/1980 Donath et al. . 4,847,614 7/1989 Keller 340/825.72 4,855,713 8/1989 Brunius . 5,144,667 9/1992 Pogue, Jr. et al. 380/21 5,146,215 9/1992 Drori 340/825.72 5,159,329 10/1992 Lindmayer et al. 340/825.72 5,291,193 3/1994 Isobe et al. . 5,325,432 6/1994 Gardeck et al. 380/21 5,341,425 8/1994 Wasilewski et al. 380/21 5,408,217 4/1995 Sanderford, Jr. . 5,442,341 8/1995 Lambropoulos 340/825.31 5,500,639 3/1996 Walley et al. . 5,517,187 5/1996 Bruwer et al. . 5,554,977 9/1996 Jablonski et al. 340/825.31

20 Claims, 7 Drawing Sheets



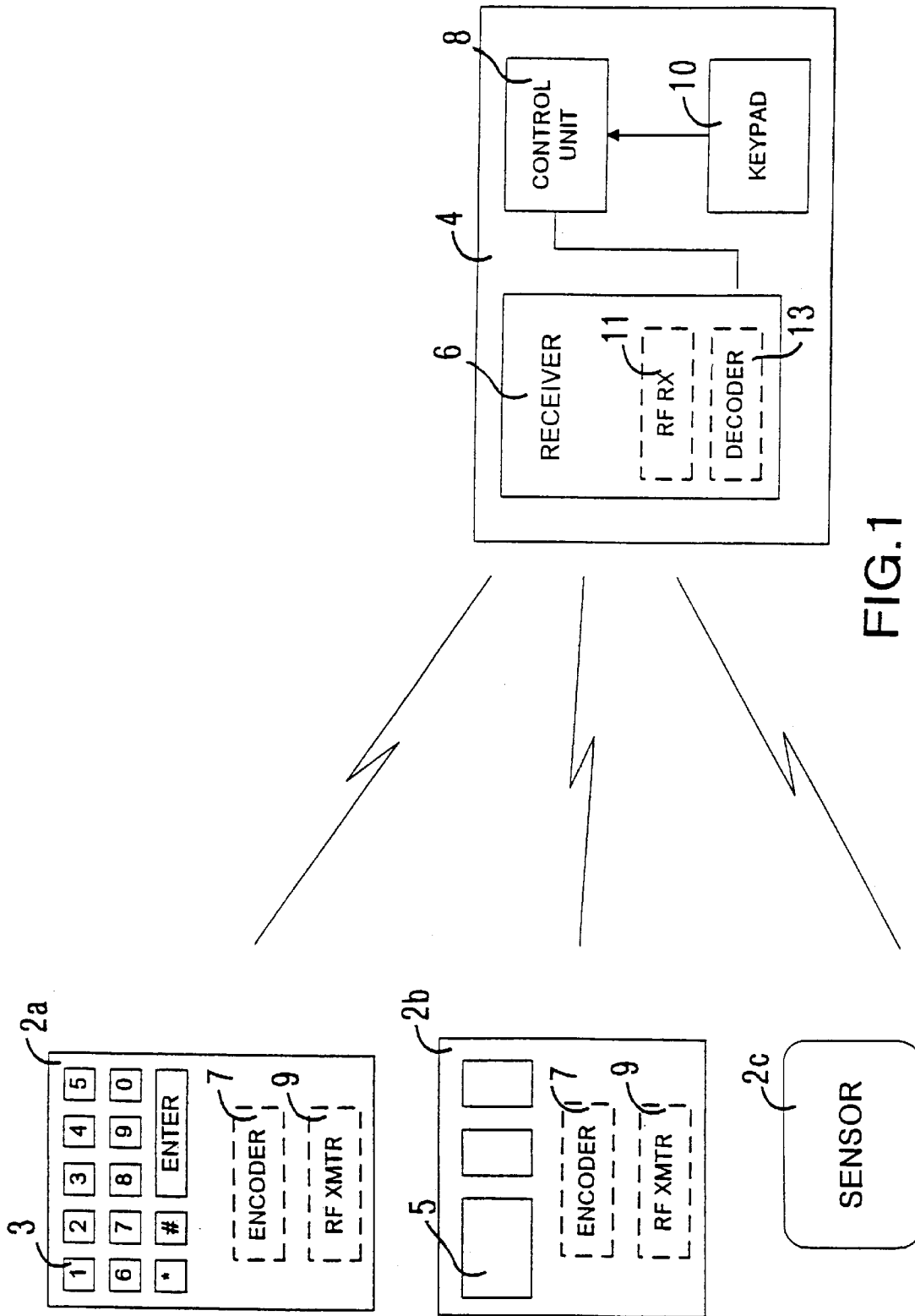


FIG. 1

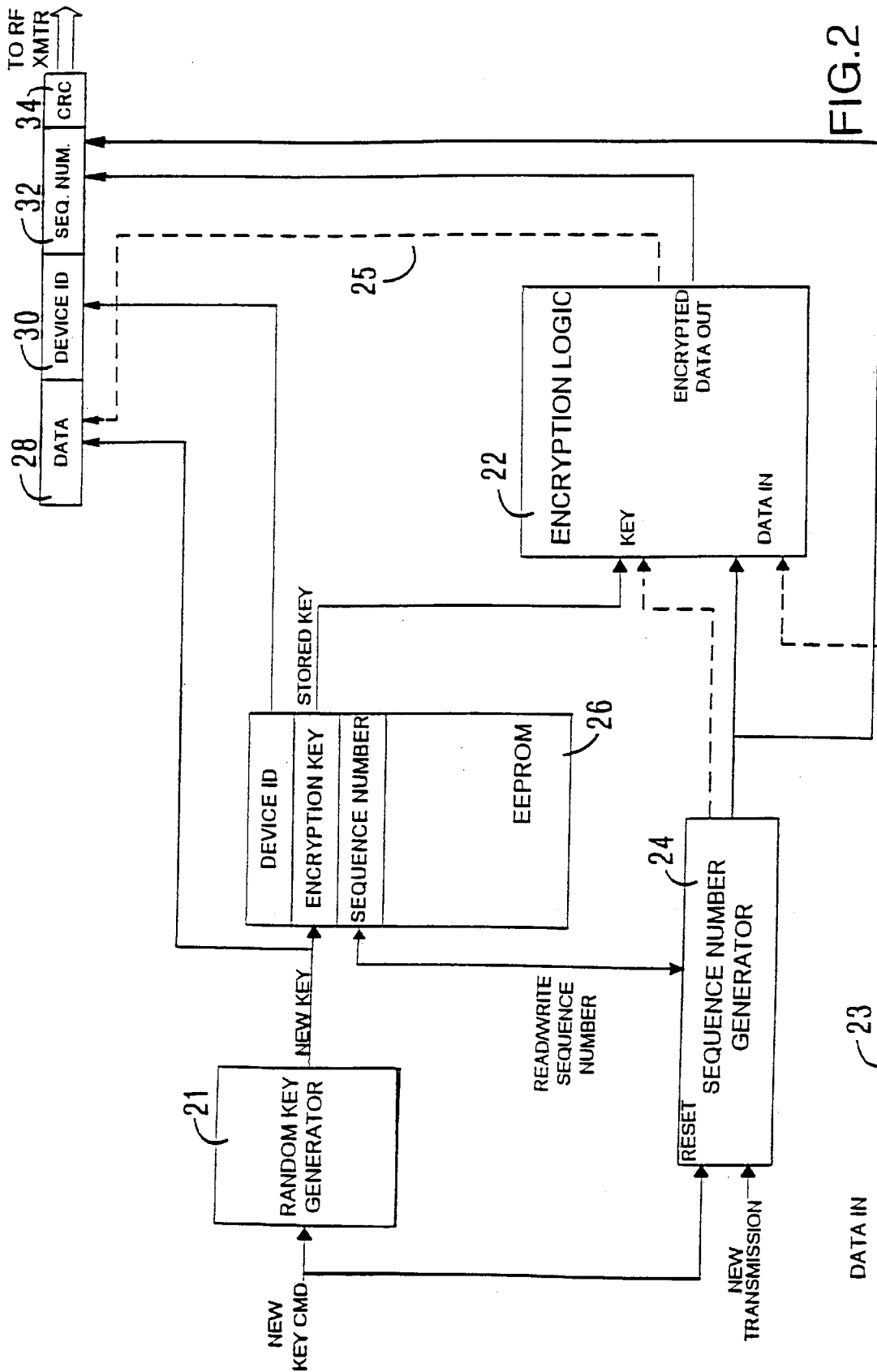


FIG. 2

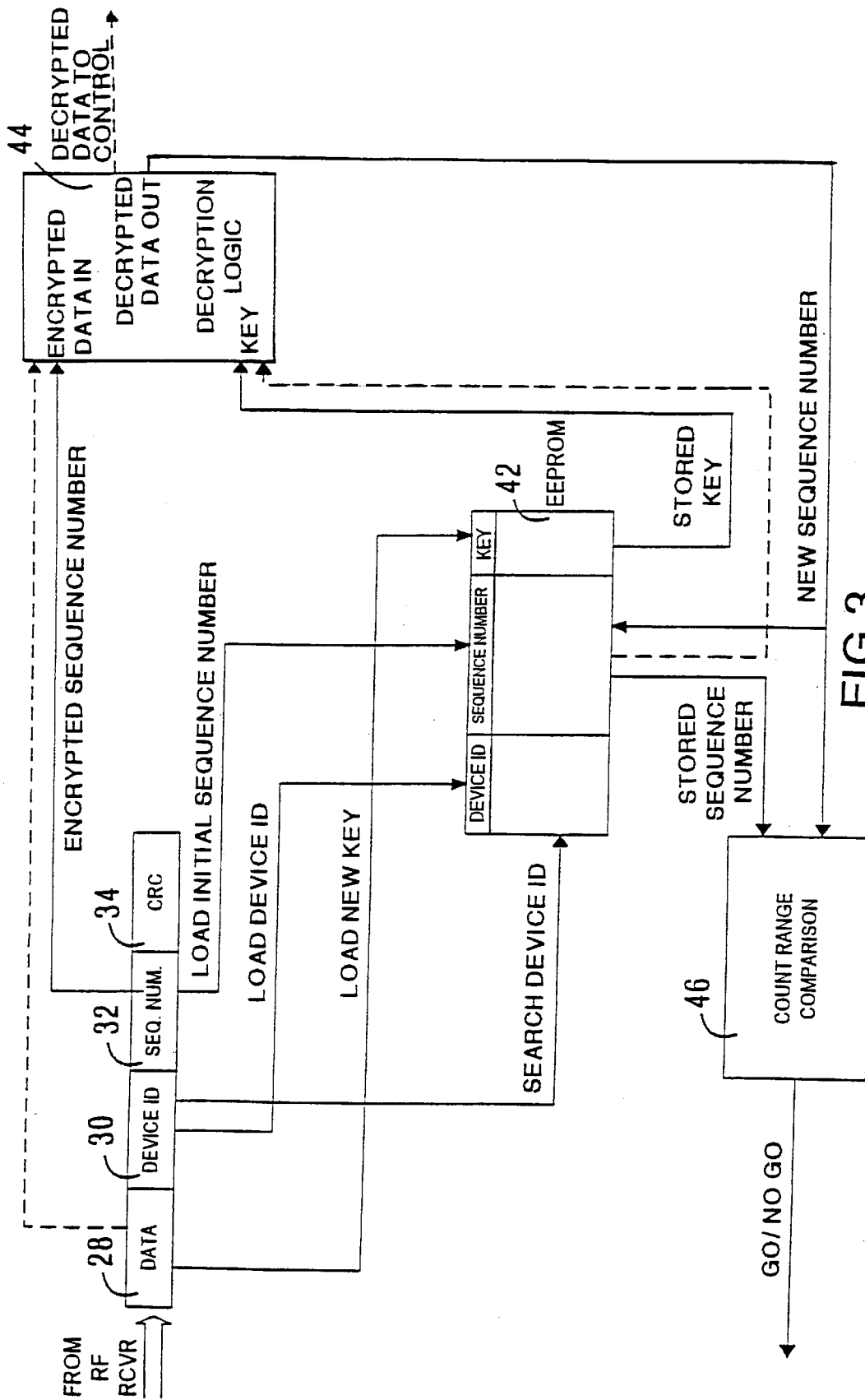


FIG. 3

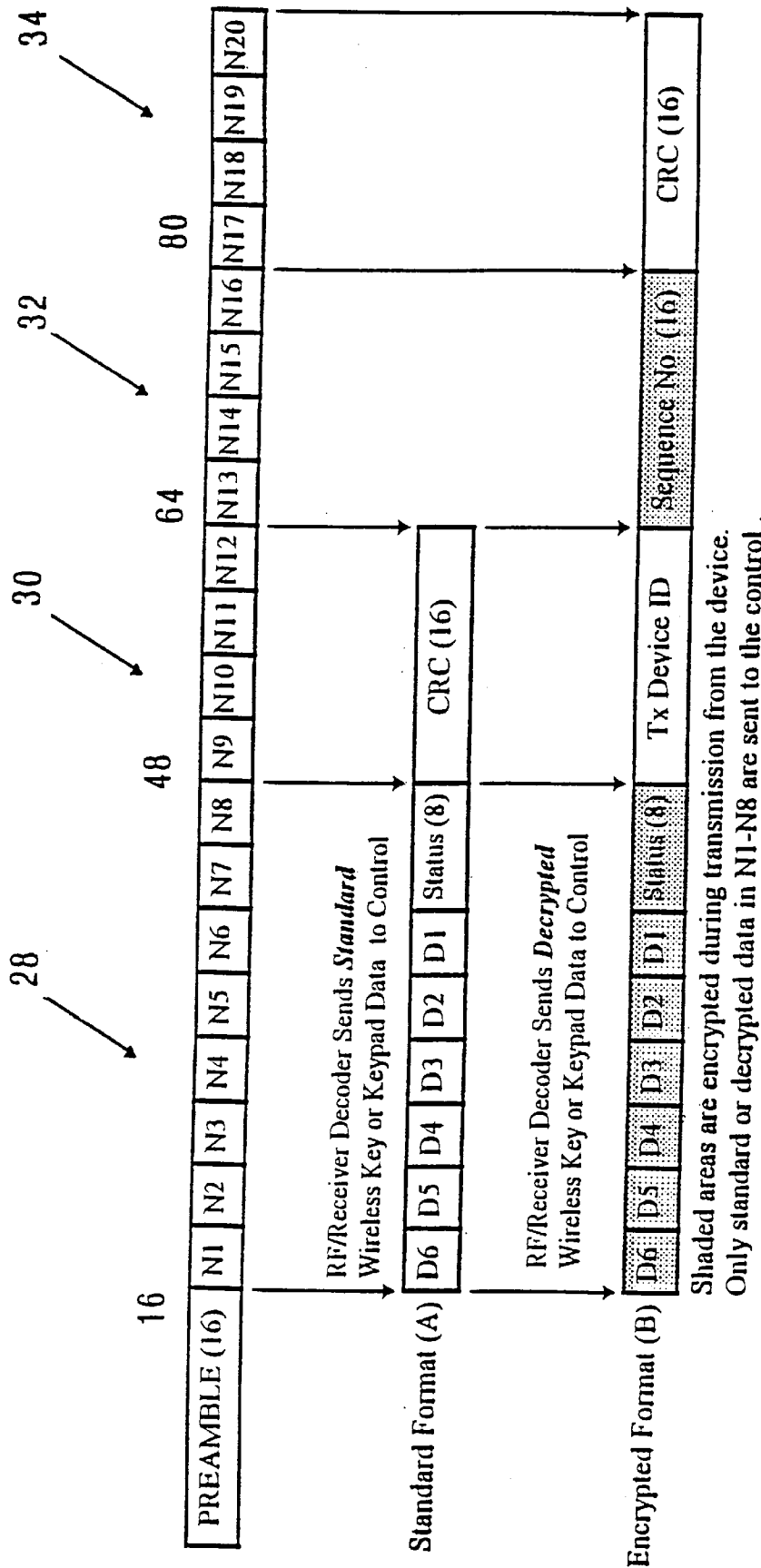


FIG. 4 Encrypted and Unencrypted Wireless Transmitted Message Formats

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.