the figures and the accompanying description. In general, the method involves providing user-specific voice data, preferably in the form of a user-specific SCM database, a subscriber subsequently generating a voice sound to access a CU, granting the subscriber access to the CU to establish a communication link if the subsequently generated voice sound matches, correlates or is otherwise comparable with user-specific voice data, and denying the subscriber access to the CU if the subsequently generated voice sound is incomparable with the user-specific voice data.

The purpose of the invention is to inhibit unauthorized use of a CU. The determination of whether a subscriber is an authorized user, carried out through a process called "authorization training", is made by virtue of algorithms which operate to compare an SCM of the subscriber's voice with a database of user-specific SCM parameters developed by the subscriber through a process called "connection training". If the SCM developed from the initial stages of a typical call establishment is not comparable with an inventory of stored user-specific SCM parameters, the call is considered "unauthorized", and the connection request is denied. An exception to this is a request for certain emergency calls such as a request for a 911 connection.

This authorization approach, when used for every call, does not require the subscriber to always enter a personal-identification-number (PIN), thereby making it less susceptible to eavesdropping methods that focus on capturing the PIN and using it to make unauthorized calls.

The authorization training is enabled by the use of a Subscriber Identification (SID) which can be furnished to a subscriber by a service provider and kept private by the subscriber. The SID is normally on a UIC supplied by the service provider and is used only to initiate connection training.

FIG. **1** illustrates a communication system **10** in accordance with a preferred embodiment of the invention. Communication system **10** includes Mobile Communication Units **12** (MCUs), satellites **14**, Control Facility **20** (CF), Public Switched Telephone Network **24** (PSTN), conventional telephone **26**, and Fixed CU **28** (FCU). As used herein, where both MCUs **12** and FCUs **28** perform the same functions, the general term Communication Unit (CU) will be used.

MCUs **12** can be, for example, cellular telephones or radios adapted to communicate with satellites **14** over radio-frequency (RF) communication links **16**. FCUs **28** can be telephone units linked directly with PSTN **24** which have attached or portable handsets. Unlike conventional telephone **26**, CUs **12** and **28** include vocoder devices for compressing speech data. In a preferred embodiment, CUs **12** and **28** also include a User Information Card (UIC) interface. This interface allows a CU subscriber to swipe or insert a UIC containing information unique to the subscriber. A UIC can be, for example, a magnetic strip card. The UIC contains one or more user identification numbers, SCM tables, and input stimulus tables which are loaded into the vocoding process. By using a UIC, a user can load his or her user-unique vocoding information, in the form of encoding information tables, into any CU. CUs **12** and **28** are described in more detail in conjunction with FIG. **3**.

Satellites **14** can be low-earth, medium-earth, or geostationary satellites. In a preferred embodiment, satellites **14** are low-earth orbit satellites which communicate with each other over inter-satellite link **18**. Thus, a call from a first CU **12**, **28** that is serviced by a first satellite **14** can be routed directly through one or more satellites over links **18** to a second CU **12**, **28** serviced by a second satellite **14**. In an alternative embodiment, satellites **14** can be part of a "bent pipe" system, i.e. a system in which satellites do not communicate with one another but rather function as transponders with respect to terrestrial-based transceivers. Satellites **14** route data packets received from CUs **12**, CF **20**, and other communication devices (not shown). Satellites **14** communicate with CF **20** over link **22**.

CF **20** is a device which provides an interface between satellites **14** and a terrestrial telephony apparatus, such as PSTN **24**, which provides telephone service to conventional telephone **26** and FCU **28**. In a preferred embodiment, CF **20** includes a vocoder which enables CF **20** to decode encoded speech signals before sending the speech signals through PSTN **24** to conventional telephone **26**. Because FCU **28** includes its own vocoder, the vocoder located within CF **20** does not need to decode the encoded speech signals destined for FCU **28**. CF **20** is described in more detail in conjunction with FIG. **4**.

As described above, in a preferred embodiment a user's SCM table and input stimulus table are stored on a UIC. In an alternative embodiment, the SCM table and input stimulus table are stored in a CU memory device. In another alternative embodiment, CF **20** includes a memory device in which SCM tables and input stimulus tables are stored for registered subscribers. During call setup, a CF that has the registered subscriber's tables in storage sends the SCM table and input stimulus table to both the transmit vocoder and the receive vocoder.

FIG. **1** illustrates only a few of CUs **12** and **28**, satellites **14**, CF **20**, PSTN **24**, and telephone **26** for ease of illustration. However, any number of CUs **12** and **28**, satellites **14**, CFs **20**, PSTNs **24**, and telephones **26** can be used in a communication system which implements the present invention.

FIG. **2** illustrates a communication system **40** in accordance with an alternative embodiment of the invention. Communication system **40** includes MCUs **42**, CFs **44**, PSTN **50**, conventional telephone **52**, and FCU **54**. MCUs **42** can be, for example, cellular telephones or radios adapted to communicate with CFs **44** over RF links **46**. CUs **42** and **54** include a vocoder device for compressing speech data. In a preferred embodiment, CUs **42** and **54** also include a UIC interface. CUs **42** and **54** are described in more detail in conjunction with FIG. **3**.

CF **44** is a device which provides an interface between MCUs **42** and a terrestrial telephony apparatus, such as PSTN **50** which provides telephone service to conventional telephone **52** and FCU **54**. In addition, CF **44** can perform call setup functions and other system control functions. In a preferred embodiment, CF **44** includes a vocoder which enables CF **44** to decode encoded speech signals before sending the speech signals through PSTN **50** to conventional telephone **52**. Because FCU **54** includes its own vocoder, the vocoder located within CF **44** does not need to decode the encoded speech signals destined for FCU **54**.

Multiple CFs **44** can be linked together using link **48** which can be a radio-frequency (RF) or hard-wired link. Link **48** enables CUs **42** and **54** in different areas to communicate with each other. CF **44** is described in more detail in conjunction with FIG. **4**.

FIG. **2** illustrates only a few of CUs **42** and **54**, CFs **44**, PSTN **50**, and telephone **52** for ease of illustration. However, any number of CUs **42** and **54**, CFs **44**, PSTNs **50**, and telephones **52** can be used in a communication system which implements the present invention.