



**MOTOROLA**

# Motorola v. Apple

## Motorola Patents

Tutorial, October 6, 2011

Judge Ursula Ungaro  
District Court of Florida  
Case No. 1:10cv023580-Civ-UU



**MOTOROLA**


U.S. Patent No. 5,958,006

and

U.S. Patent No. 6,101,531

Motorola Patent


# U.S. Patent Nos. 5,958,006 & 6,101,531

  
 US005958006A

**United States Patent** [19] [11] **Patent Number:** **5,958,006**  
**Eggleston et al.** [45] **Date of Patent:** **Sep. 28, 1999**

[54] **METHOD AND APPARATUS FOR COMMUNICATING SUMMARIZED DATA** 5,613,108 3/1997 Morikawa ..... 393/616  
 5,619,648 4/1997 Canale ..... 395/200/01  
 5,648,062 7/1997 Chouhan ..... 370/211

[75] Inventors: Gene Eggleston, Cary; Mitch Hansen, Fox River Grove, both of Ill.

  
 US006101531A

**United States Patent** [19] [11] **Patent Number:** **6,101,531**  
**Eggleston et al.** [45] **Date of Patent:** **Aug. 8, 2000**

[73] Assignee: **Motorola, Inc., Schaumburg, Ill.**

[21] Appl. No.: **08/574,541**

[22] Filed: **Dec. 19, 1995**

[54] **SYSTEM FOR COMMUNICATING USER-SELECTED CRITERIA FILTER PREPARED AT WIRELESS CLIENT TO COMMUNICATION SERVER FOR FILTERING DATA TRANSFERRED FROM HOST TO SAID WIRELESS CLIENT** 5,377,354 12/1994 Scannel et al. .... 709/103  
 5,406,557 4/1995 Baudoin .....  
 5,491,820 2/1996 Belove et al. .... 707/3  
 5,506,987 4/1996 Emery et al. ....  
 5,518,126 4/1996 Harkins et al. ....  
 5,568,540 10/1996 Green et al. ....  
 5,621,727 4/1997 Vaudreuil .....  
 5,764,809 6/1998 Eggleston et al. .... 709/203

[75] Inventors: Gene Eggleston, Cary; Mitch Hansen, Fox River Grove, both of Ill. *Primary Examiner—Le Hien Luu*  
*Attorney, Agent, or Firm—Romni N. Bose; Terri S. Hughes*

[73] Assignee: **Motorola, Inc., Schaumburg, Ill.** [57] **ABSTRACT**

- The '006 and '531 Patents have the same specification

[54] **SYSTEM FOR COMMUNICATING USER-SELECTED CRITERIA FILTER PREPARED AT WIRELESS CLIENT TO COMMUNICATION SERVER FOR FILTERING DATA TRANSFERRED FROM HOST TO SAID WIRELESS CLIENT**

[75] Inventors: **Gene Eggleston, Cary; Mitch Hansen, Fox River Grove, both of Ill.**

[73] Assignee: **Motorola, Inc., Schaumburg, Ill.**

[21] Appl. No.: **09/060,686**

[22] Filed: **Apr. 15, 1998**

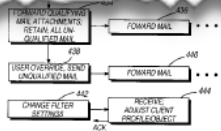
[54] **METHOD AND APPARATUS FOR COMMUNICATING SUMMARIZED DATA**

[75] Inventors: **Gene Eggleston, Cary; Mitch Hansen, Fox River Grove; Anthony Rzany, Crystal Lake, all of Ill.**

[73] Assignee: **Motorola, Inc., Schaumburg, Ill.**

[21] Appl. No.: **08/574,541**

[22] Filed: **Dec. 19, 1995**



# '006/'531 Patents: Overview of the Invention

The present invention relates to communications and more particularly an improved method and apparatus for transferring data in a communications system.

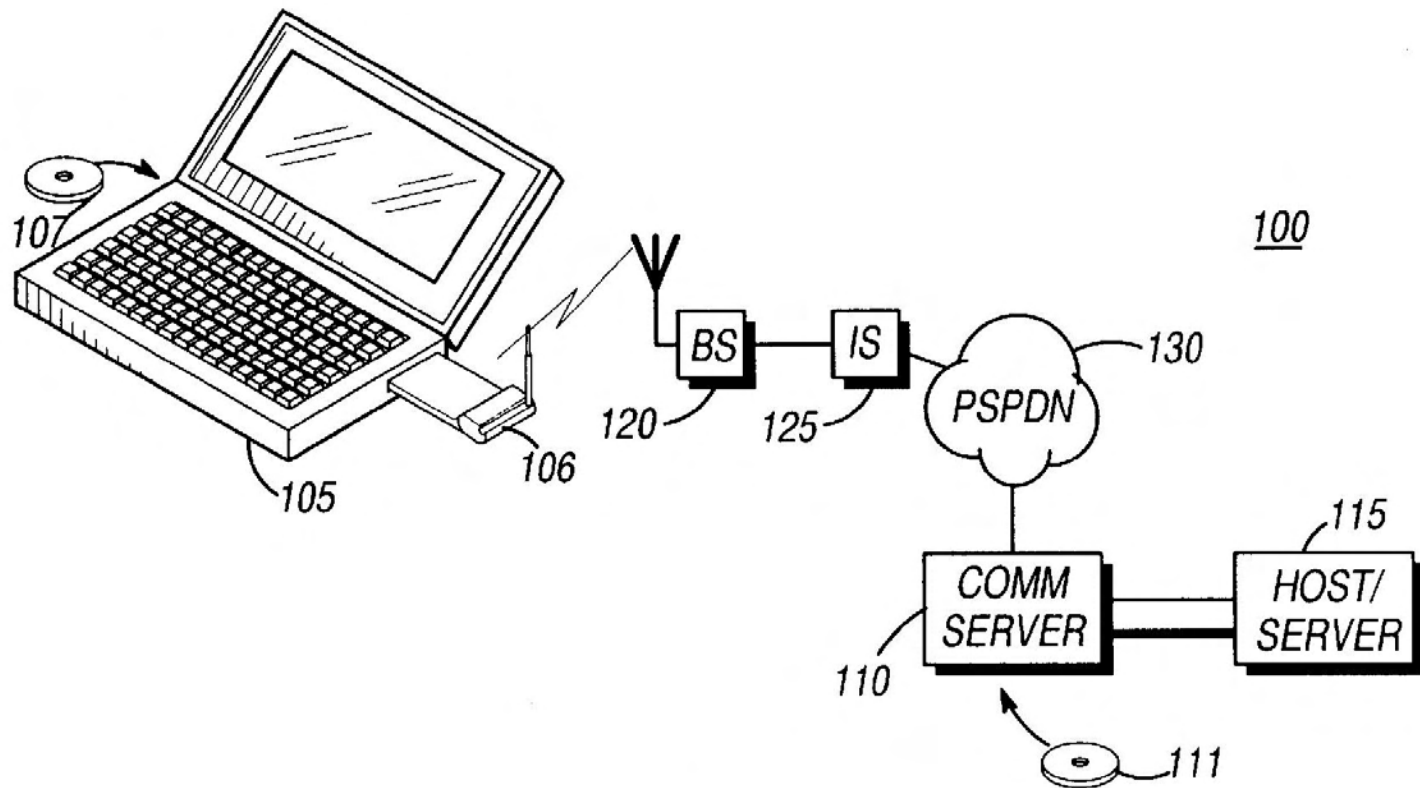


FIG. 1

'006 Patent, 1:11-13  
'531 Patent, 1:16-18

## '006/'531 Patents: Problem To Be Solved

- **Transferring data over a wired or wireless network is expensive.**
- **More data can be more expensive for user**

## SPAM Compounds the Problem

- Unsolicited Messages (“Junk Mail”)
- SPAM has experienced exponential growth since the mid-1990’s and now comprises about 90% of all emails sent
- SPAM costs U.S. businesses tens of billions of dollars every year
- Blocking SPAM is crucial to reducing data transfer

- **Some prior art systems transmitted only the header information from email messages (i.e. sender, subject, time sent) and gave the user the option to download the contents of the message later.**

### 4.3. Concept of reducing data communication traffic



When the mobile pen station is receiving e-mail, the base station extract the headers from each message to be transmitted and makes an e-mail list according to a rule customized by the user. The mobile pen station first reads this e-mail list, then selects the e-mail number to be read and asks the base station to send the actual contents of the message.

## ➤ Disadvantages:

- User cannot view any of the message content
- Difficult for the user to decide whether or not she needs contents of the message just based on header

### 4.3. Concept of reducing data communication traffic

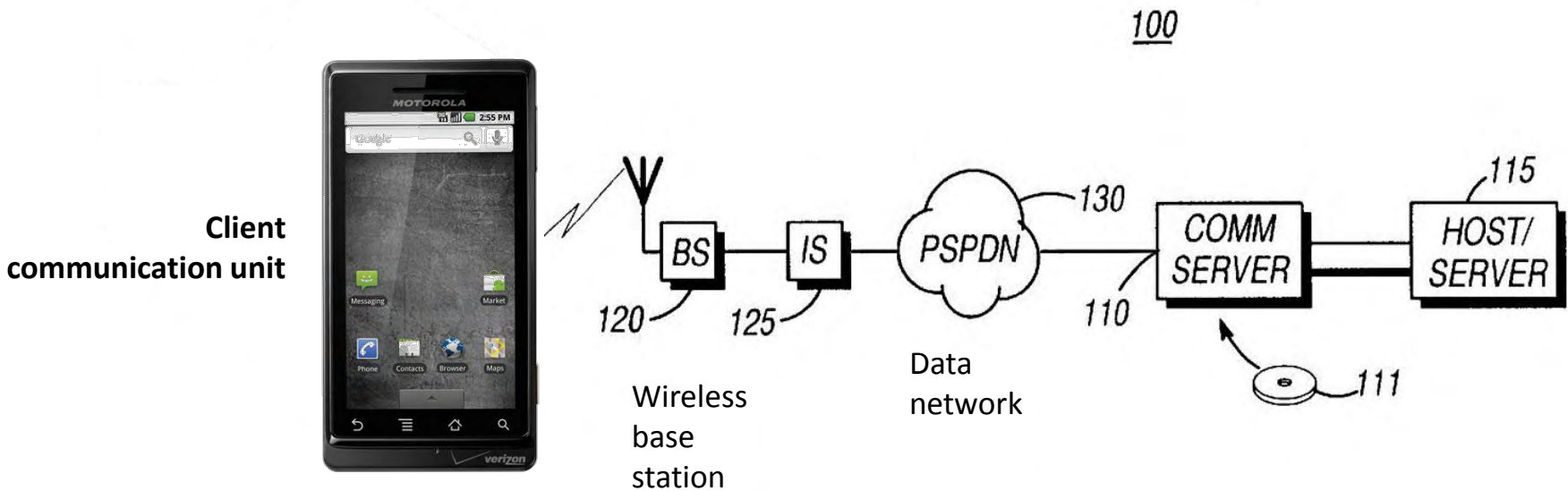


When the mobile pen station is receiving e-mail, the base station extract the headers from each message to be transmitted and makes an e-mail list according to a rule customized by the user. The mobile pen station first reads this e-mail list, then selects the e-mail number to be read and asks the base station to send the actual contents of the message.



# '006/'531 Patents: Overview

- The '006 and '531 Patents address the filtering of data being sent to the mobile device using user-definable parameters

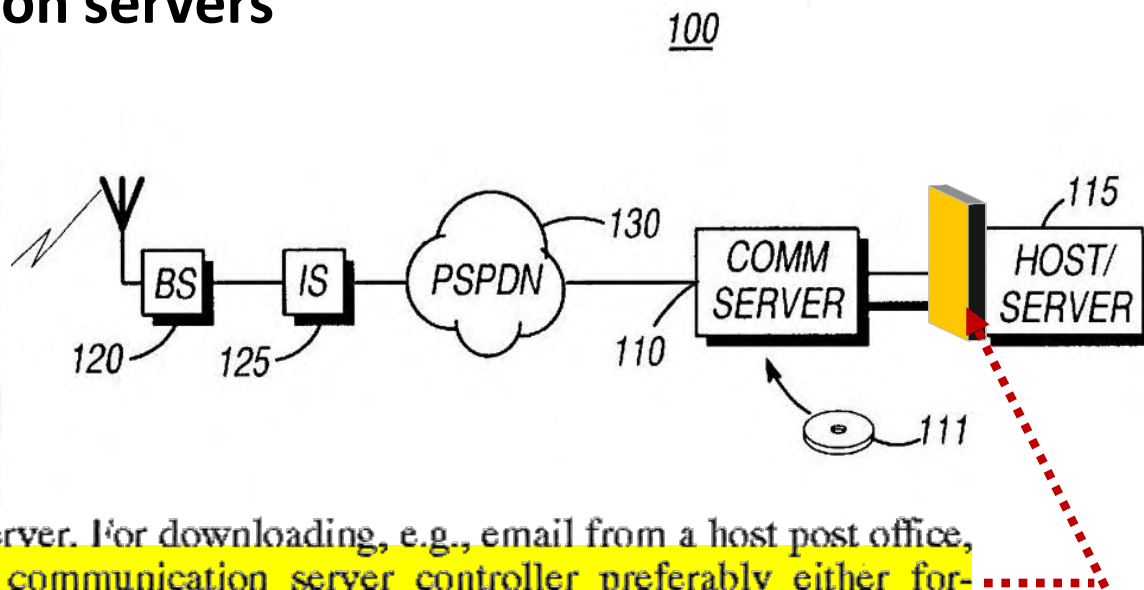


See '006 Patent, 2:66-3:3

See '531 Patent, 3:4-8

# '006/'531 Patents: Overview

- Filtering can occur anywhere, such as between the host and communication servers



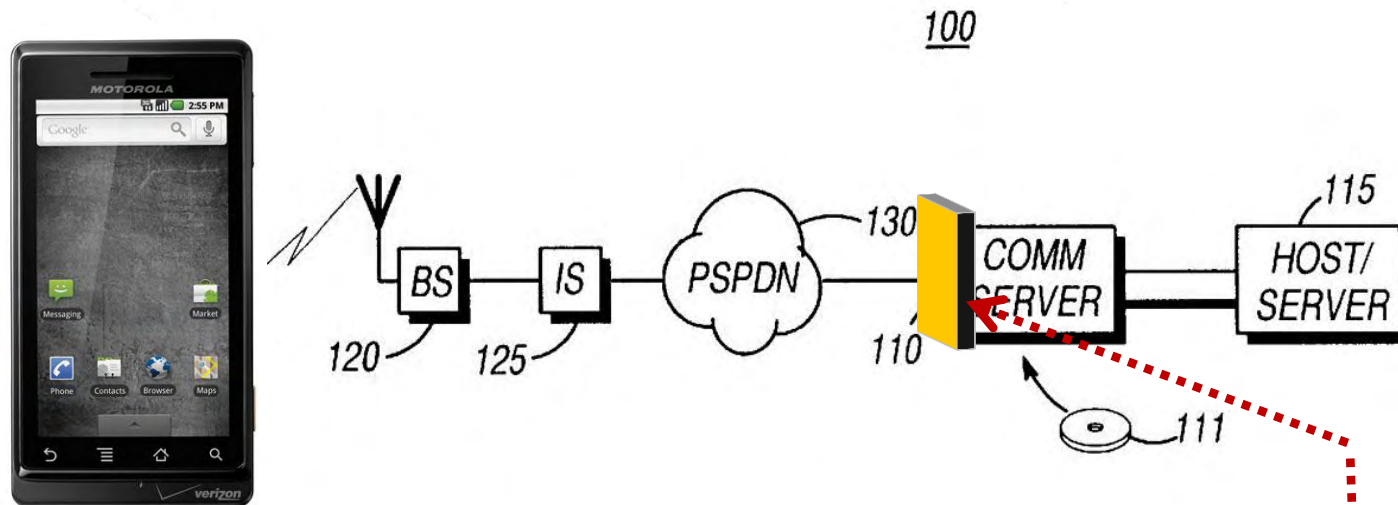
server. For downloading, e.g., email from a host post office, a communication server preferably either forwards the filter parameters in a query object or message to the post office to apply and return qualified mail, or the communication server receives all unprocessed mail and applies the filters locally, only acknowledging as processed that mail which is qualified. For uploading, e.g., email from a client, a client controller applies an upload prestage filter so as to retain all filter rejected mail, while transmitting mail passing the filters. Thus, only desired data transfers (i.e., those meeting user defined filters) are communicated over the expense-bearing networks between the remote unit and communication server.

'006 Patent, 3:3-15

'531 Patent, 3:8-20

# '006/'531 Patents: Overview

- They also disclose filtering data at the communication server



server. For downloading, e.g., email from a host post office, a communication server controller preferably either forwards the filter parameters in a query object or message to the post office to apply and return qualified mail, or the communication server receives all unprocessed mail and applies the filters locally, only acknowledging as processed that mail which is qualified. For uploading, e.g., email from a client, a client controller applies an upload prestage filter so as to retain all filter rejected mail, while transmitting mail passing the filters. Thus, only desired data transfers (i.e., those meeting user defined filters) are communicated over the expense-bearing networks between the remote unit and communication server.

'006 Patent, 3:3-15

'531 Patent, 3:8-20

## ➤ The Filtering Process – Examples of email Criteria

FIGS. 5 and 6 illustrate two approaches to prestage filtering particularly useful for email filtering. In FIG. 5, a series of five reject filters are applied to each message. If a mail message does not meet any of the criteria (priority, date, size, author, or subject/key word) then it is left unprocessed (steps 502–516). Once all unreviewed messages (i.e., all unprocessed messages, or if expanded marking is available all unprocessed messages not previously filtered) have been filtered, those not rejected are forwarded (step 518). FIG. 6 illustrates the application of granularity filters. If a message exceeds the filter size, it is appropriately truncated (including insertion of a note indicating truncation) (steps 602–606). Similarly, if there are text or file attachments, and these are marked to be filtered, they are stripped with, optionally, a note being inserted alerting the addressee that the attachment was stripped (steps 608–614). Once filtered, the message is sent (step 616).

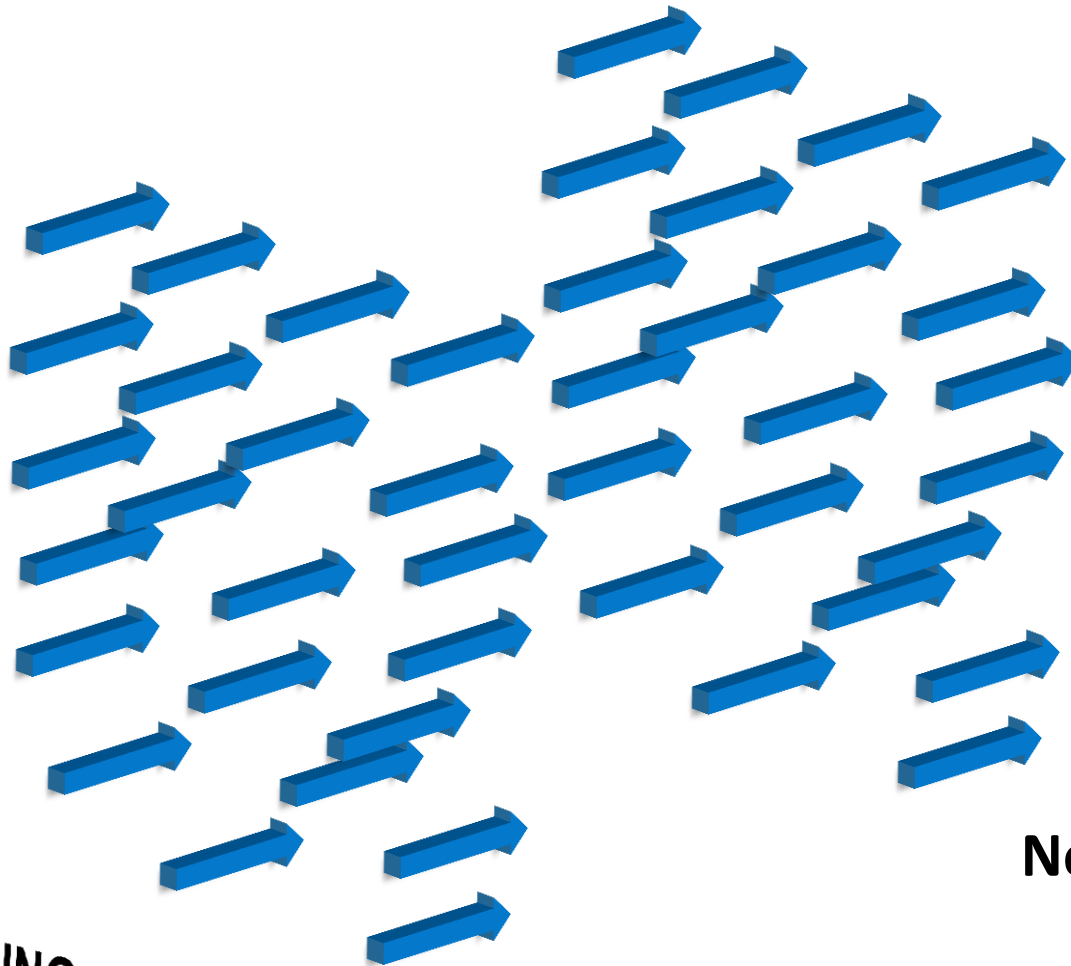
## ➤ The Filtering Process – Message Size, attachments...

FIGS. 5 and 6 illustrate two approaches to prestage filtering particularly useful for email filtering. In FIG. 5, a series of five reject filters are applied to each message. If a mail message does not meet any of the criteria (priority, date, size, author, or subject/key word) then it is left unprocessed (steps 502–516). Once all unreviewed messages (i.e., all unprocessed messages, or if expanded marking is available all unprocessed messages not previously filtered) have been filtered, those not rejected are forwarded (step 518). FIG. 6 illustrates the application of granularity filters. If a message exceeds the filter size, it is appropriately truncated (including insertion of a note indicating truncation) (steps 602–606). Similarly, if there are text or file attachments, and these are marked to be filtered, they are stripped with, optionally, a note being inserted alerting the addressee that the attachment was stripped (steps 608–614). Once filtered, the message is sent (step 616).

## Qualifying and Non-Qualifying Data Units

- **Qualifying data units are those that meet the parameters of the filter. Qualifying data units are delivered to the mobile device.**
- **Non-qualifying data units are those that do NOT meet the parameters of the filter.**
- **Only identifying information of non-qualifying data units is sent to the mobile device.**

# Visual representation of filtering

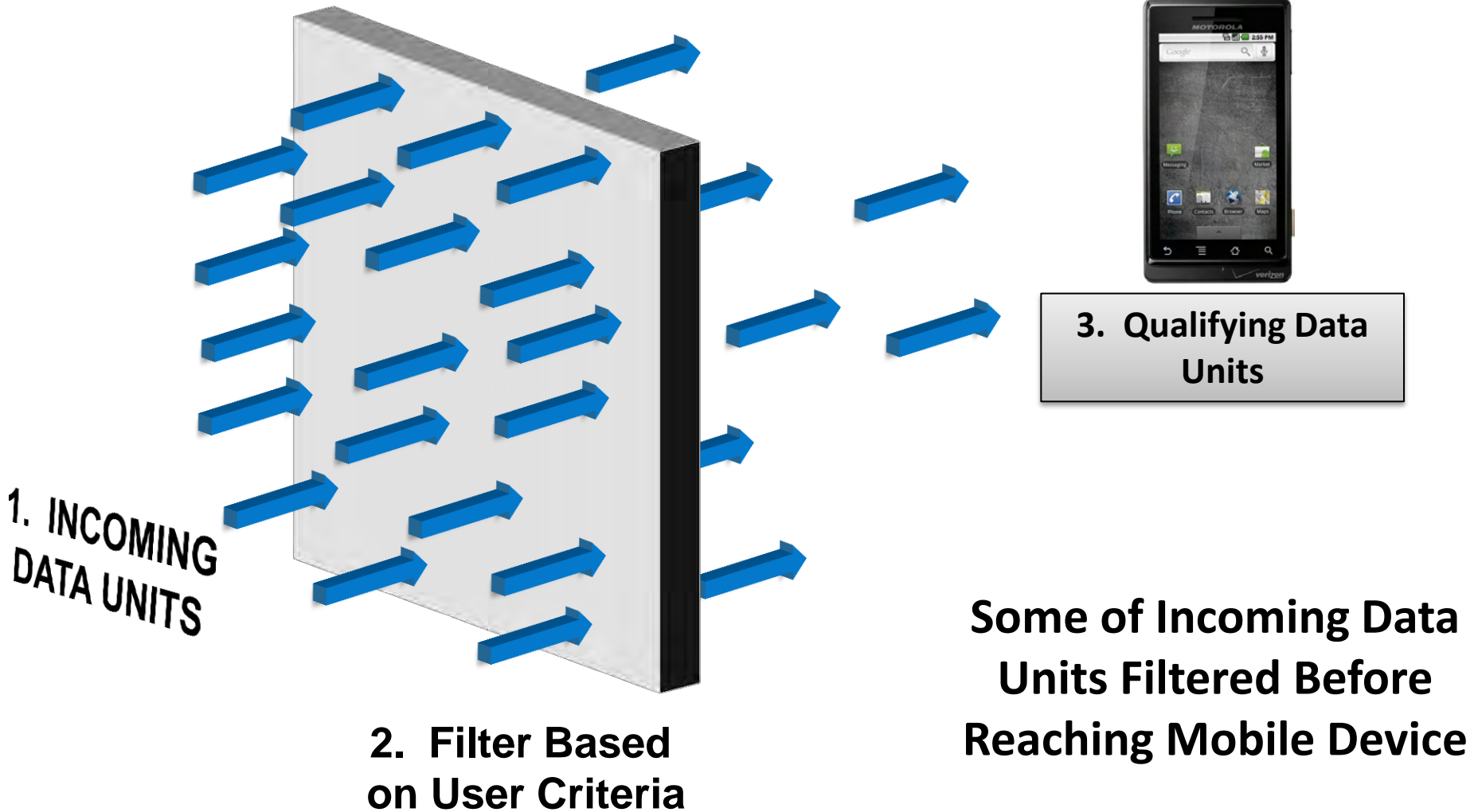


**INCOMING  
DATA UNITS**



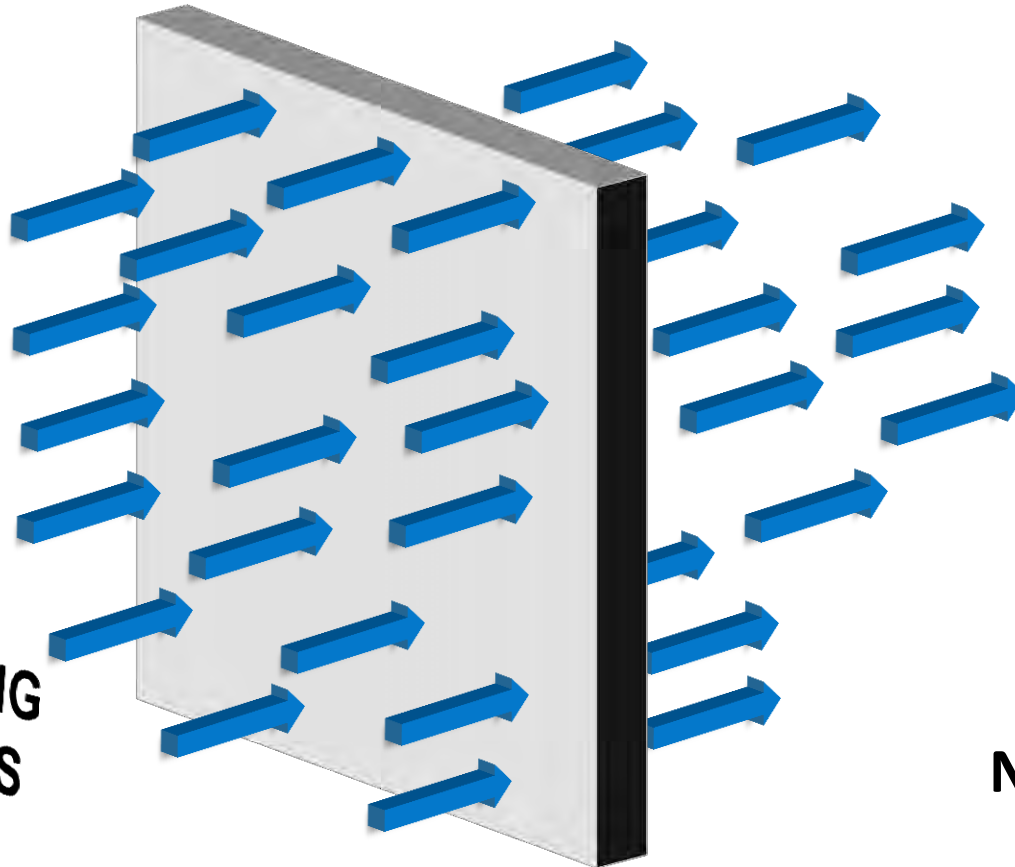
**No Filter: All of Incoming  
Data Units Reach The  
Mobile Device**

# Visual representation of filtering





# Visual representation of filtering



**1. INCOMING  
DATA UNITS**

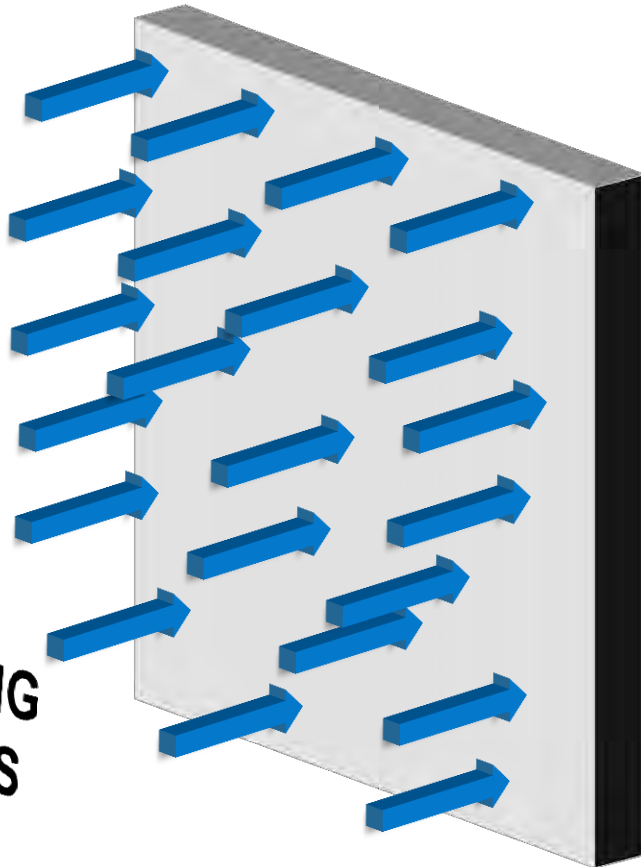
**2. Filter Based  
on User Criteria**



**3. Qualifying Data  
Units**

**None of Incoming Data  
Units Filtered Before  
Reaching Mobile Device**

# Visual representation of filtering



**1. INCOMING  
DATA UNITS**

**2. Filter Based  
on User Criteria**



**3. Qualifying Data  
Units**

**All of Incoming Data  
Units Filtered Before  
Reaching Mobile Device**

# '006/'531 Patents: Wireless and Wired Components

## ➤ The '006 and '531 Patents can be used in systems with wireless and wired components

One skilled in the art will appreciate that there are many variations that are possible for the present invention, only a limited number of which have been described in detail above. Thus, for example, while the embodiments above describe application to clients communicating in certain systems, one should appreciate that it has application to any communication system, wired or wireless, client-server, distributed or other networks, etc., in which the user is remote from a host. It can also be used with almost any application program or groups of programs (e.g., transferring database, wordprocessing, graphics, voice etc. files, executing programs and control messages, etc.), not just email or groupware. Moreover, while processor 206, con-

'006 Patent, 15:62-16:7

'531 Patent, 15:66-16:11

In order to keep connectivity costs to a minimum, the server 110 is preferably connected to the LAN/WAN on which the host 115 is also connected, via any standard LAN/WAN communication channel (e.g., a bus or backbone).

'006 Patent, 4:39-43

'531 Patent, 4:45-49

# '006/'531 Patents: Wireless and Wired Components

The screenshot shows the Apple website's AirPort Express product page. The 'Wireless Printing' section is highlighted with a red box. It features an image of the AirPort Express Base Station connected to a printer. Below the image, the text reads: "Wireless Printing. Now when you need to print, you never have to go far — one for every computer so you never have to go far to print! Say you want to print a Google Map from the living room, or your son wants to print his school report from his bedroom. Taking each computer into the desk simply to print something is inconvenient, and buying a printer for every room is expensive." Below this, there is a sub-section titled "A printer in every room. Virtually." which states: "With wireless printing through AirPort Express, it's almost like having a printer in every room of the house. AirPort Express uses the Mac- and PC-compatible Bonjour networking technology to let everyone in the house take advantage of one centrally available printer. Wirelessly, of course." Another sub-section titled "Good to print." explains: "Here's how simple it is to set up: Just plug the printer into the USB port on the AirPort Express Base Station, add it to the printer list on your Mac or PC, and you're good to print — without a single cable tethering anyone's computer to the printer." It also notes: "If all you want to do is access your USB printer wirelessly, you don't even need a broadband Internet connection. You can just set up your AirPort Express for wireless printing and that's it." The page also includes a "Buy Now" button and a "Which Wi-Fi are you?" section.



**Good to print.**  
Here's how simple it is to set up: Just plug the printer into the USB port on the AirPort Express Base Station, add it to the printer list on your Mac or PC, and you're good to print — without a single cable tethering anyone's computer to the printer.

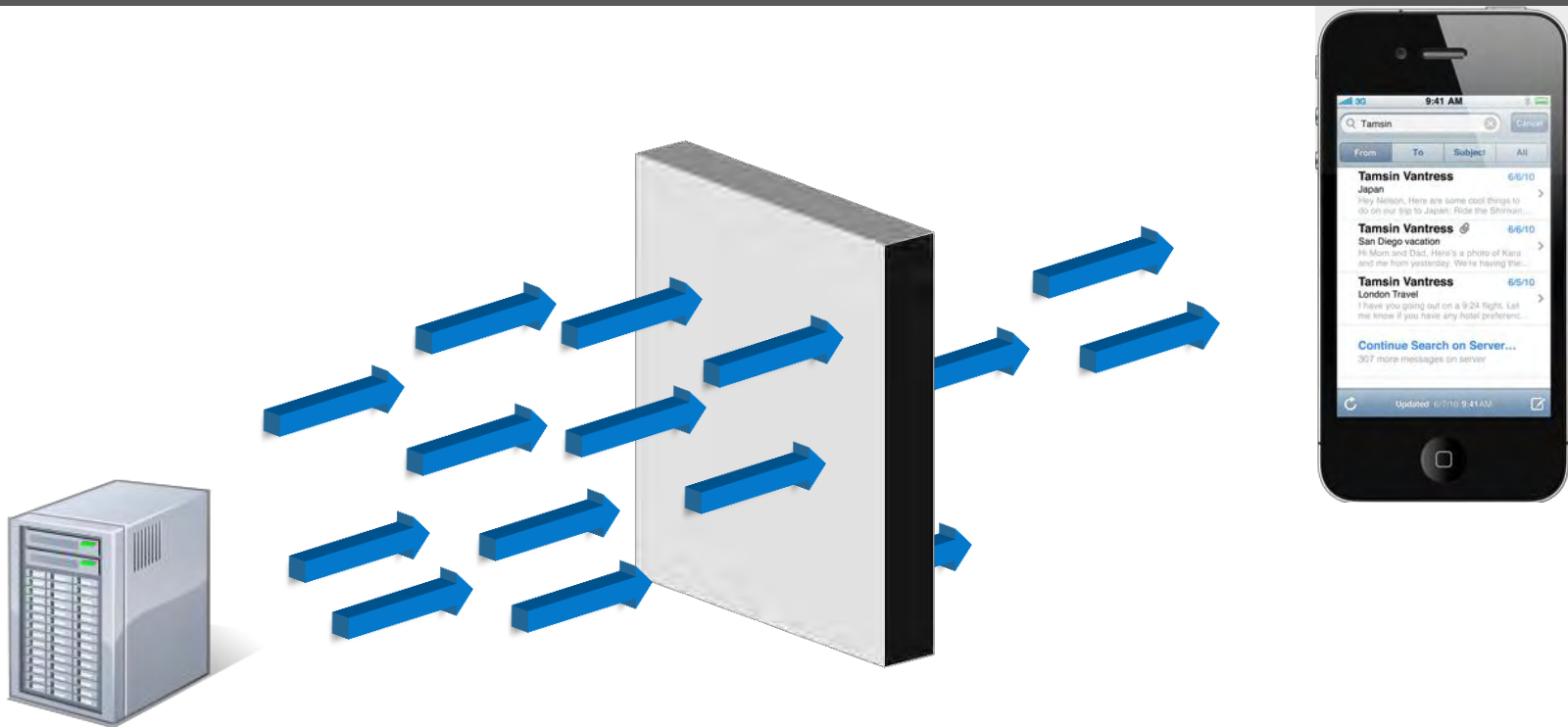
If all you want to do is access your USB printer wirelessly, you don't even need a broadband Internet connection. You can just set up your AirPort Express for wireless printing and that's it.

# '006/'531 Patents: Accused Products

- **MobileMe**
- **Apple iPhone 3G**
- **Apple iPhone 3G S**
- **Apple iPhone 4G**
- **Apple iPad / iPad with 3G**
- **Apple iPad 2 / iPad 2 with 3G**
- **Apple iPod Touch**
- **Apple MacBook**
- **Apple MacBook Pro**
- **Apple MacBook Air**
- **Apple iMac**
- **Apple Mac Mini**
- **Apple Mac Pro**



# '006/'531 Patents: Accused Products



- MobileMe
- Apple iPhone 3G
- Apple iPhone 3G S
- Apple iPhone 4G
- Apple iPad / iPad with 3G
- Apple iPad 2 / iPad 2 with 3G
- Apple iPod Touch
- Apple MacBook
- Apple MacBook Pro
- Apple MacBook Air
- Apple iMac
- Apple Mac Mini
- Apple Mac Pro



**MOTOROLA**

U.S. Patent No. 5,754,119

Motorola Patent

# U.S. Patent No. 5,754,119



US005754119A

**United States Patent** [19]  
**Deluca et al.**

[11] **Patent Number:** 5,754,119  
 [45] **Date of Patent:** May

[54] **MULTIPLE PAGER STATUS SYNCHRONIZATION SYSTEM AND METHOD**  
 [75] **Inventors:** Michael J. Deluca; Joan S. Deluca, both of Boca Raton, Fla.  
 [73] **Assignee:** Motorola, Inc., Schaumburg, Ill.

5,221,838 6/1993 Gutman et al.  
 5,225,826 7/1993 Deluca et al.  
 5,258,751 11/1993 Deluca et al.  
 5,365,227 11/1994 Cannon et al.  
 5,481,258 1/1996 Fawcett et al.  
 5,561,848 10/1996 Minami  
 5,596,318 1/1997 Michalski

[21] **Appl. No.:** 522,026  
 [22] **Filed:** Aug. 31, 1995  
 [51] **Int. Cl.:** H04Q 7/18  
 [52] **U.S. Cl.:** 340/825.21; 340/311.1; 340/825.44; 370/313; 455/426; 455/31.3; 455/88; 455/70  
 [58] **Field of Search:** 340/825.21, 311.1, 340/825.44, 825.47, 825.52, 825.69, 313; 455/31.1, 426, 31.2, 31.3, 88, 70; 370/310, 311, 312, 313, 314

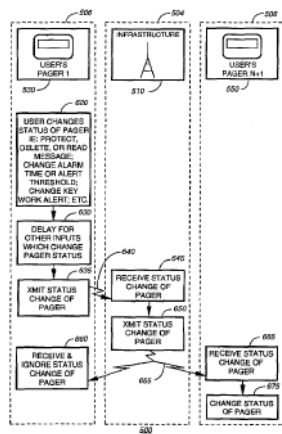
**OTHER PUBLICATIONS**  
 Motorola Product Family 255 Service Manual, Motorola, Inc., Boynton Beach, Florida, 6881024B80, Aug. 1995.  
 Motorola Product Family 255 Controller Supply by Motorola, Inc., Boynton Beach, Fla. No. 6881024B80, Aug. 1995.  
 Introduction to the Wireless Concert, 1995 by Inc., Fort Worth, Texas, part No. 6880491G01.A

**Primary Examiner:** Michael Horabik  
**Assistant Examiner:** William H. Wilson, Jr.

[56] **References Cited**  
**U.S. PATENT DOCUMENTS**  
 4,412,217 10/1983 Willard et al.  
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 4,851,829 7/1989 DeLuca et al.  
 4,875,038 10/1989 Siwick et al.  
 4,932,929 8/1990 DeLuca et al.  
 5,124,697 6/1992 Moore  
 5,153,582 10/1992 Davis  
 5,168,493 12/1992 Nelson et al.

**ABSTRACT**  
 Status changes made on first pager (130) are wirelessly communicated to an infrastructure (2) which communicates the status changes to other pagers (550) so that the other pagers make corresponding status changes. Thus, a user's status changes made on one pager are automatically made on the user's other pagers. Status changes include changes to received messages, alert thresholds, and key word alerts.

11 Claims, 3 Drawing Sheets



# United States Patent [19] Deluca et al.

[54] **MULTIPLE PAGER STATUS SYNCHRONIZATION SYSTEM AND METHOD**

[75] **Inventors:** Michael J. Deluca; Joan S. Deluca, both of Boca Raton, Fla.

[73] **Assignee:** Motorola, Inc., Schaumburg, Ill.

[21] **Appl. No.:** 522,026

[22] **Filed:** Aug. 31, 1995

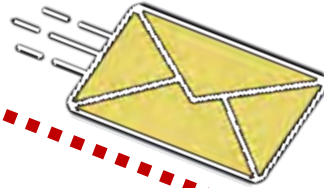
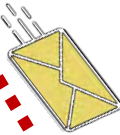


# '119 Patent: Overview of the Invention

- The '119 Patent teaches a system and method of “synchronization” among multiple mobile devices.
  - Status changes on one mobile device synchronized to other mobile devices.
- The '119 Patent teaches a system and infrastructure that is able to update such status changes *without user intervention.*

# '119 Patent: The Prior Art Problem

INFRASTRUCTURE



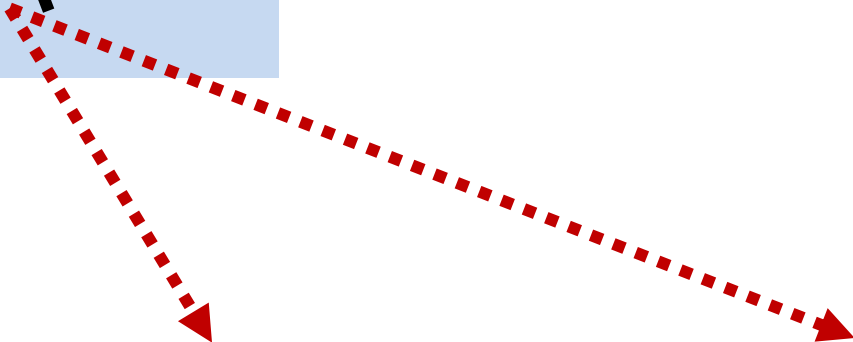
- The prior art recognized that where the user has multiple devices, incoming messages should be directed to all of them

# '119 Patent: The Prior Art Problem

INFRASTRUCTURE



- But, the prior art had a problem with synchronizing changes, e.g., unread vs. read emails, on multiple devices



Unread



Unread

# '119 Patent: The Prior Art Problem

INFRASTRUCTURE



- But, the prior art had a problem with synchronizing changes, e.g., unread vs. read emails, on multiple devices



Read



Unread

# '119 Patent: The Prior Art Problem

INFRASTRUCTURE



- But, the prior art had a problem with synchronizing changes, e.g., unread vs. read emails, on multiple devices



Delete



Unread

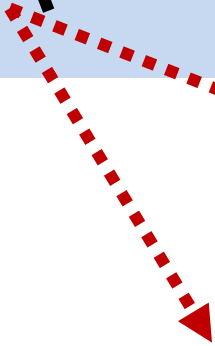
# '119 Patent: The Prior Art Problem

- **Previously, the user had to manually sync her devices**
  - ***I.e.*, when a new message was read and deleted on one device, would still be marked as “unread” on her other devices.**
- **Requiring user intervention to sync changes was inefficient, time consuming and subject to error**

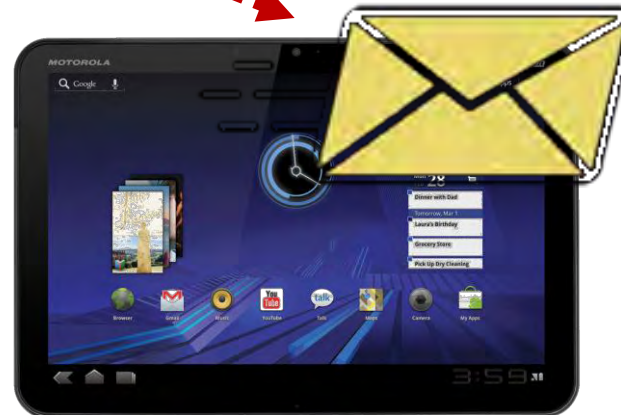
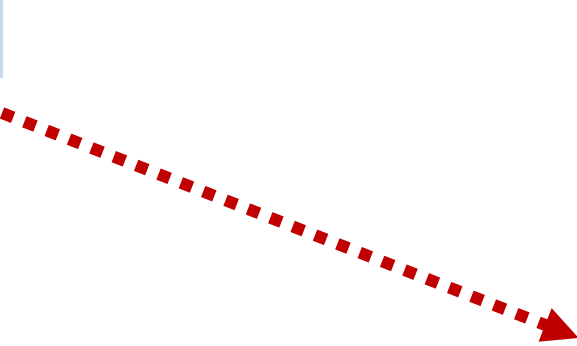
See `119 Patent, 1:29-48

# '119 Patent: The Solution - Demonstration

INFRASTRUCTURE



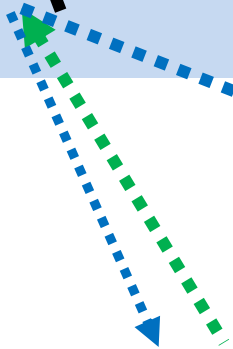
Unread



Unread

# '119 Patent: The Solution - Demonstration

INFRASTRUCTURE



Unread



Read



# '119 Patent: The Solution

The invention of the '119 patent can be incorporated into ANY transceiver – *i.e.*, any device that can send and receive information over a wireless infrastructure.

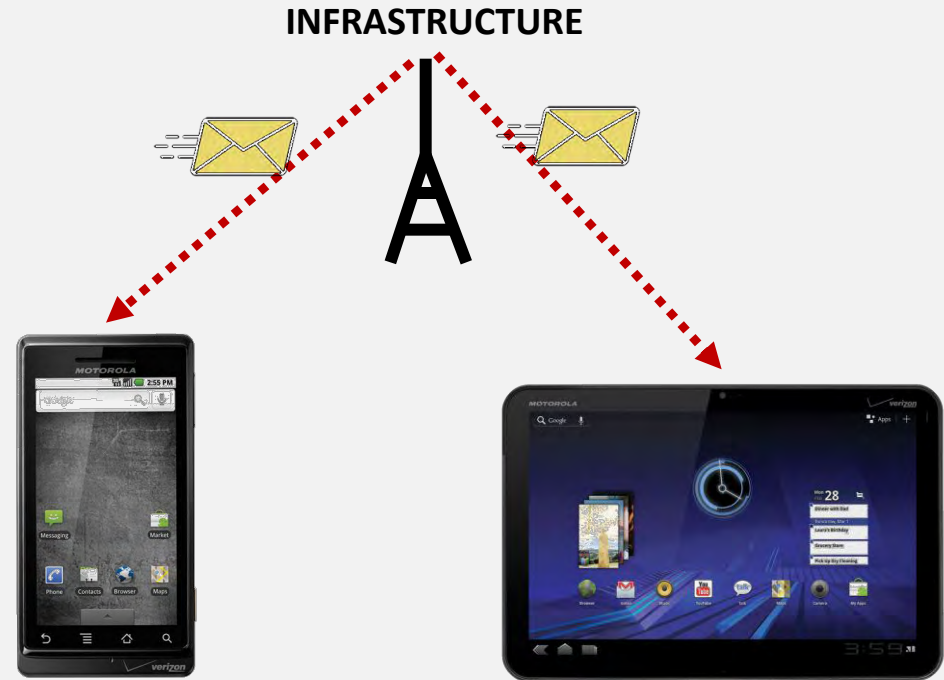
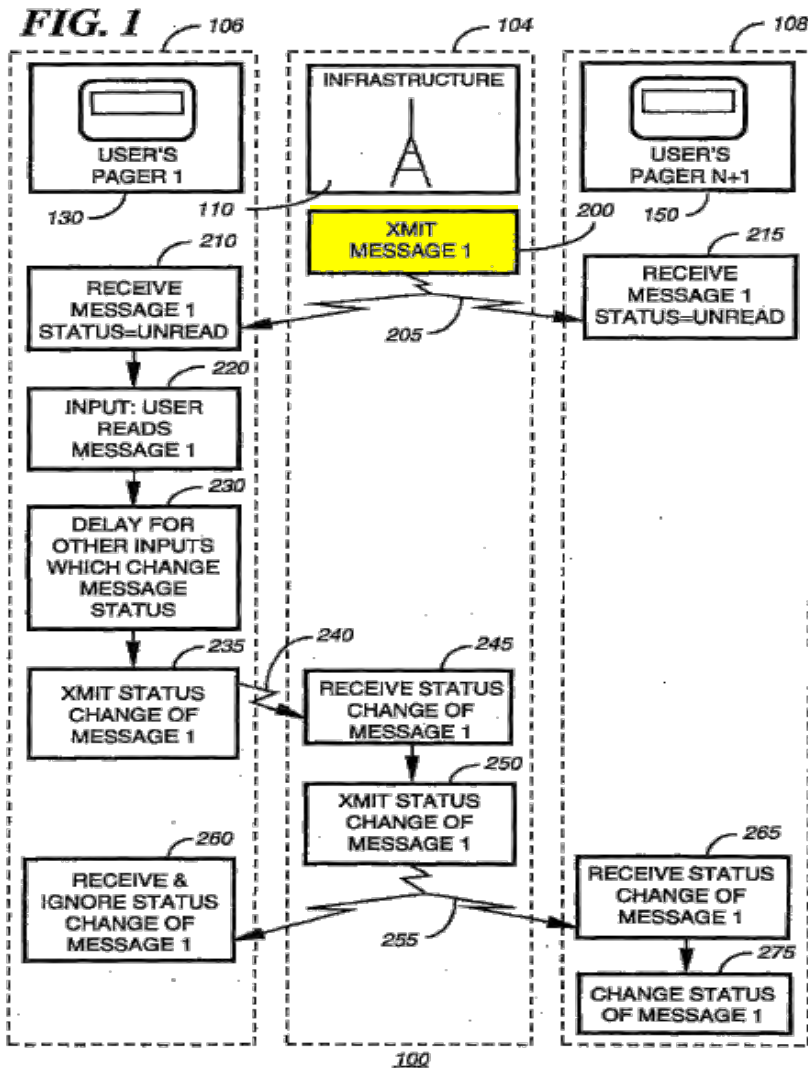
The invention also includes a method of synchronizing message information among a plurality of transceivers, such as pager 130 and pager 150, including the steps of: transmitting, in step 200, by a wireless messaging infrastructure a first message having a first status; in one transceiver, such as pager 130, of the plurality of transceivers

'119 Patent, 9:45-50

➤ A transceiver is a device comprising both a transmitter and a receiver which are combined and share common circuitry or a single housing.

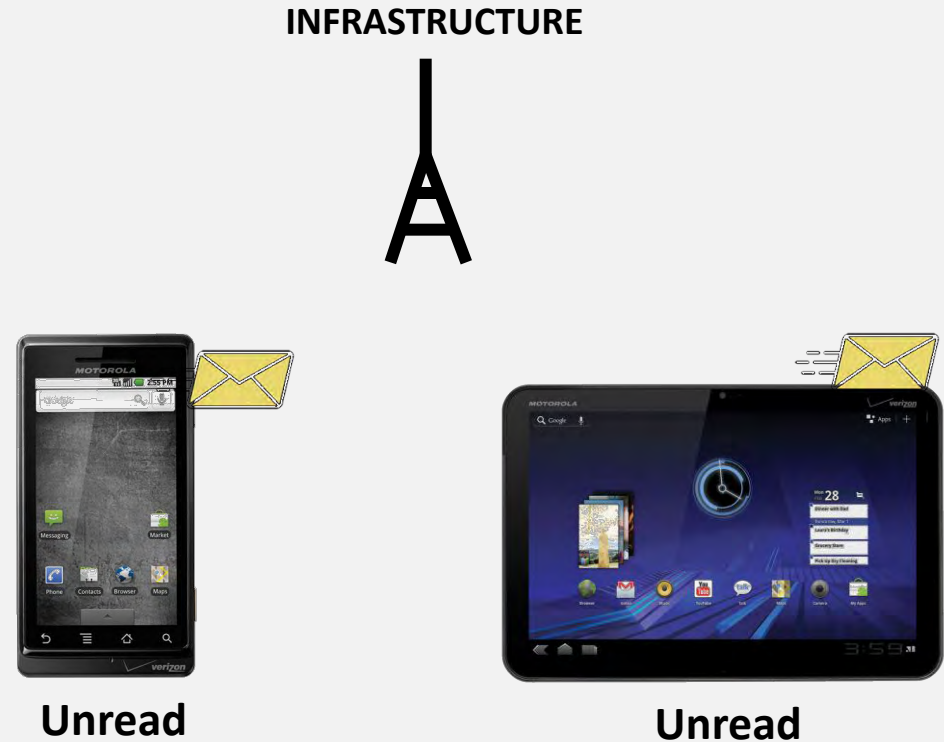
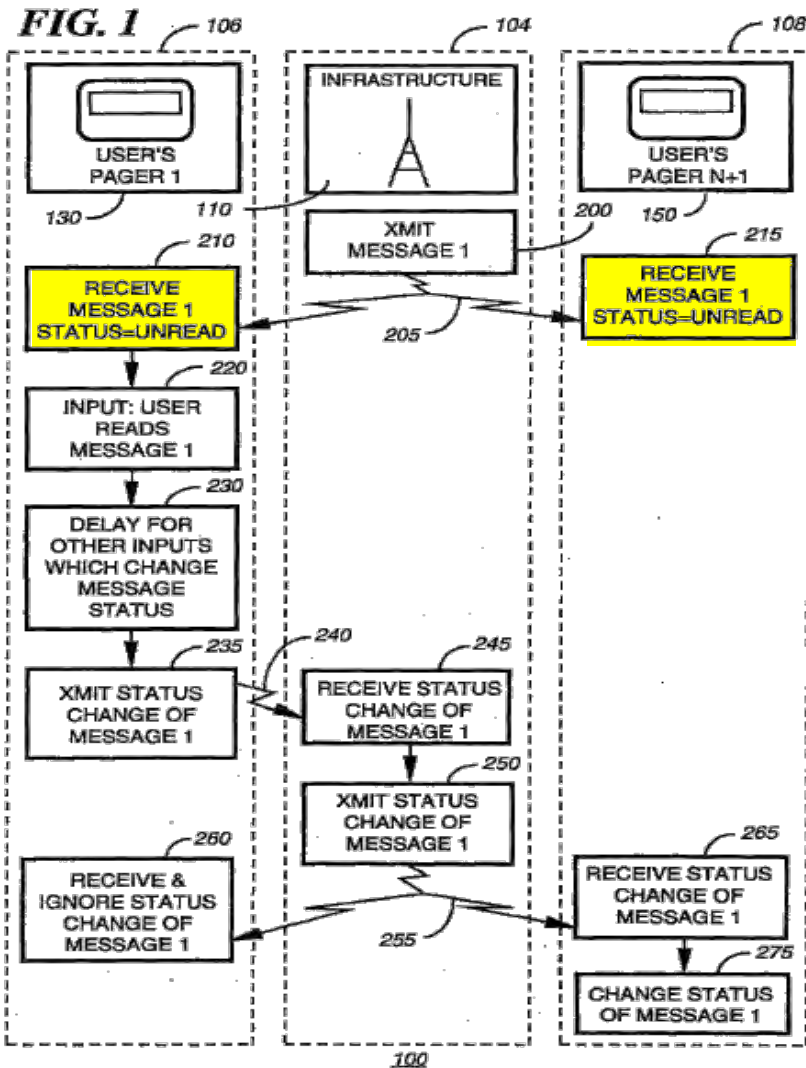
# '119 Patent: The Solution

## 1. A first message is transmitted to each user device.



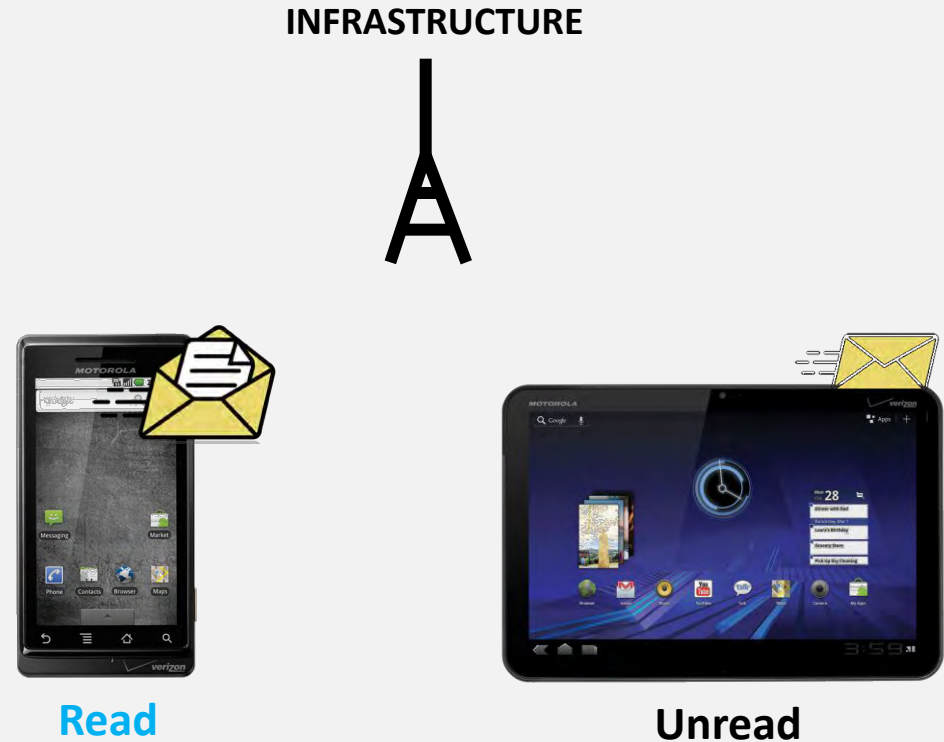
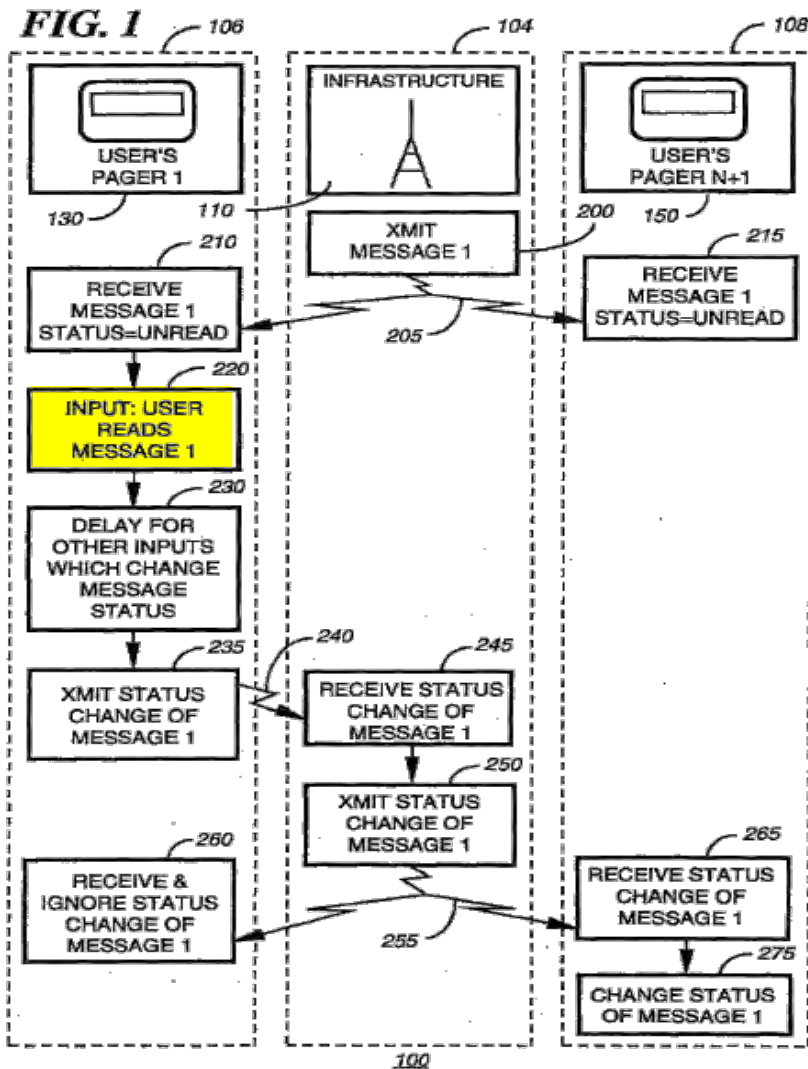
# '119 Patent: The Solution

2. The first message is received by each user device; the status of the message is "unread" on all devices.



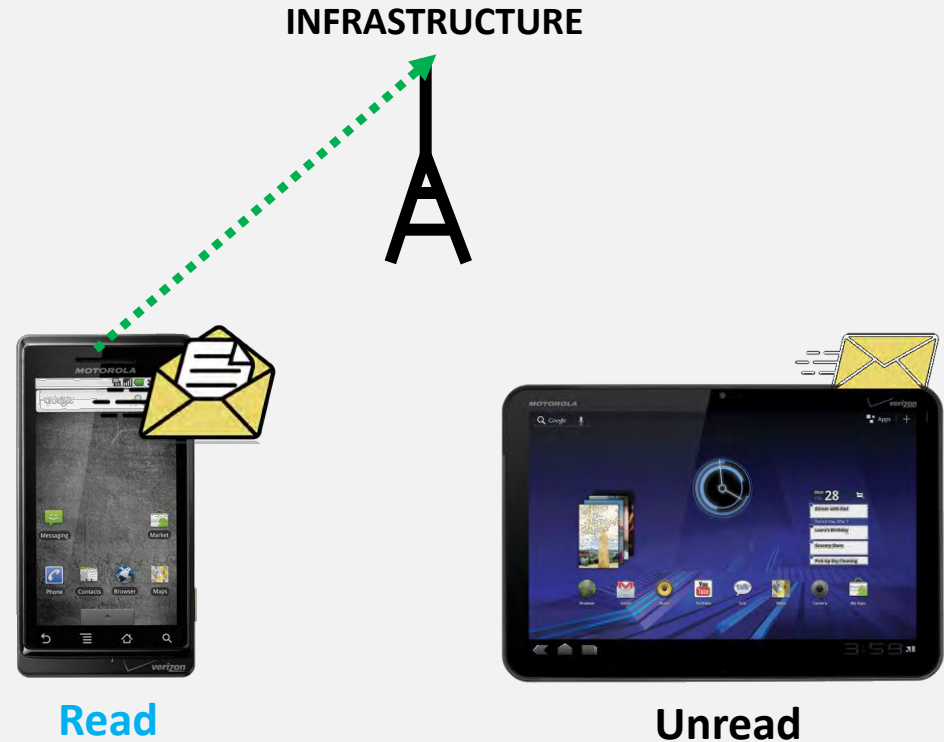
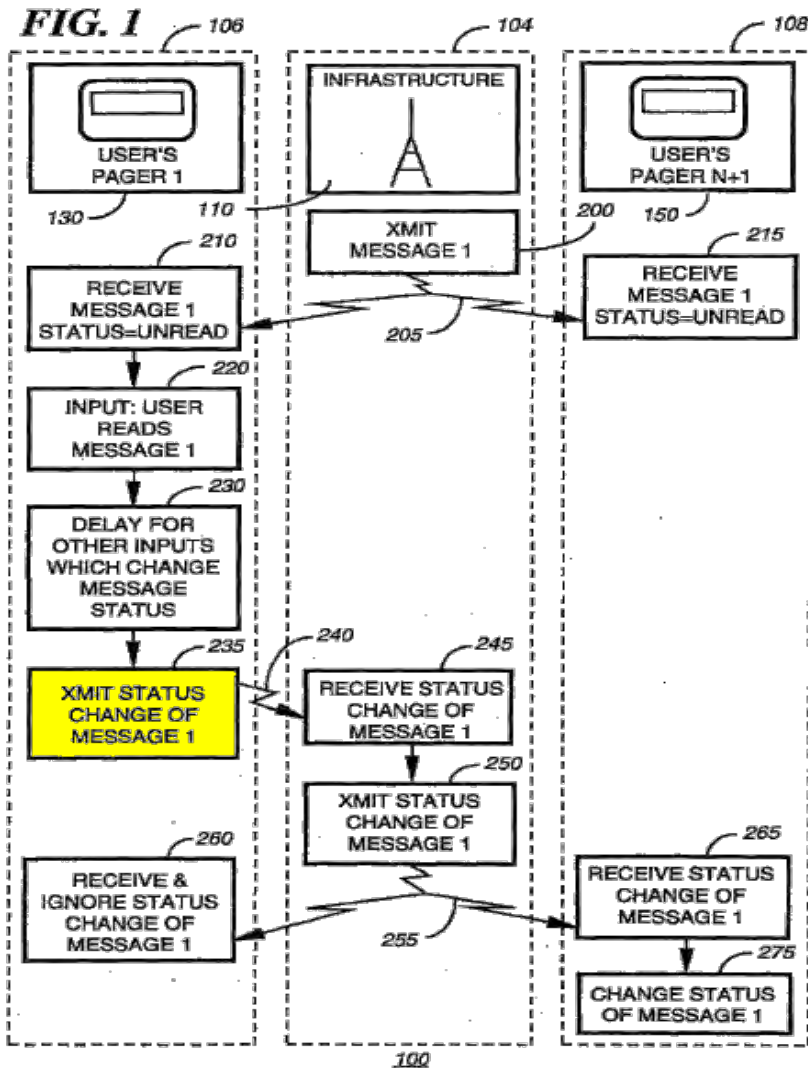
# '119 Patent: The Solution

## 3. User reads first message on first device; status of the message changes to "read" on first device



# '119 Patent: The Solution

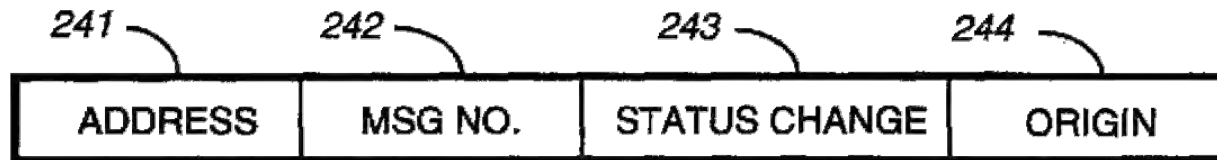
## 4. The first device sends a second message indicative of changed status.



# '119 Patent: The Solution

4. The first device sends a second message indicative of changed status.

- Figure 3 illustrates one embodiment of a second message indicative of the changed status:

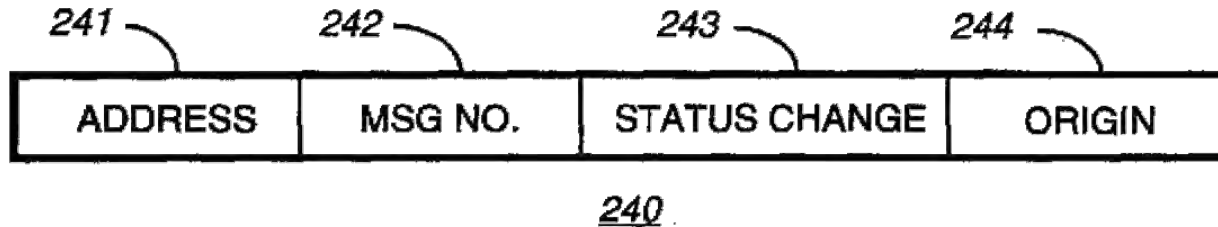


240

**FIG. 3**

# '119 Patent: The Solution

## 4. The first device sends a second message indicative of changed status.

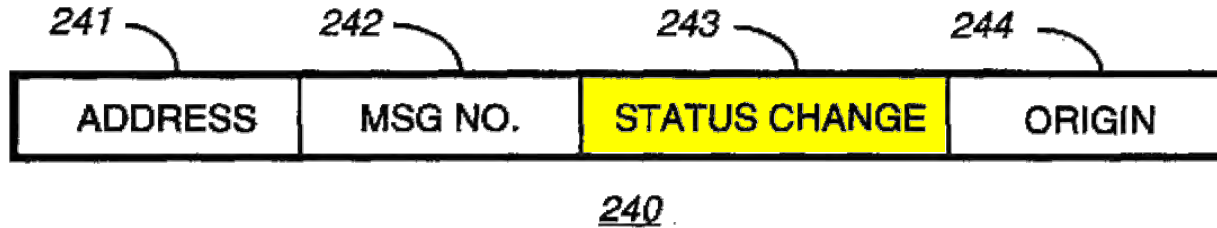


**FIG. 3**

- As illustrated, this second message contains 4 fields: address, message number, status change, and origin.
1. Address Field - used to selectively identify the portable devices;
  2. MSG No. Field - used to identify the message whose status is being updated;
  3. Status Change Field – “for indicating the status change” of the updated message; and
  4. Origin Field - identifies the portable device sending the second message.

# '119 Patent: The Solution

4. The first device sends a second message indicative of changed status.



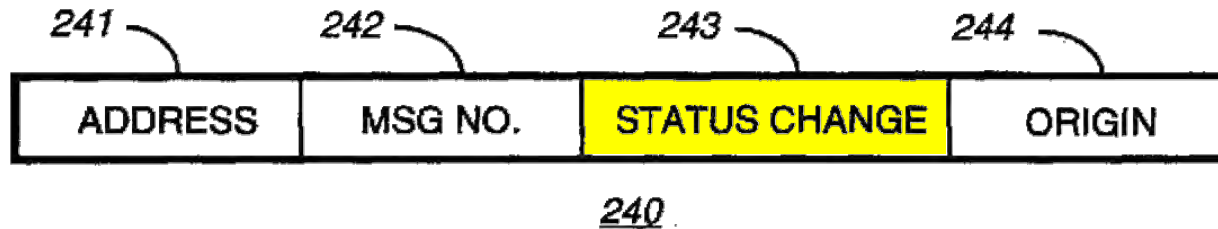
**FIG. 3**

- The Status Change field contains only three 3 bits.
- A bit (aka a “binary digit”) is the smallest unit of information that a computer can read.
- *A bit can have only two possible values: either a “0” or a “1”*



# '119 Patent: The Solution

4. The first device sends a second message indicative of changed status.



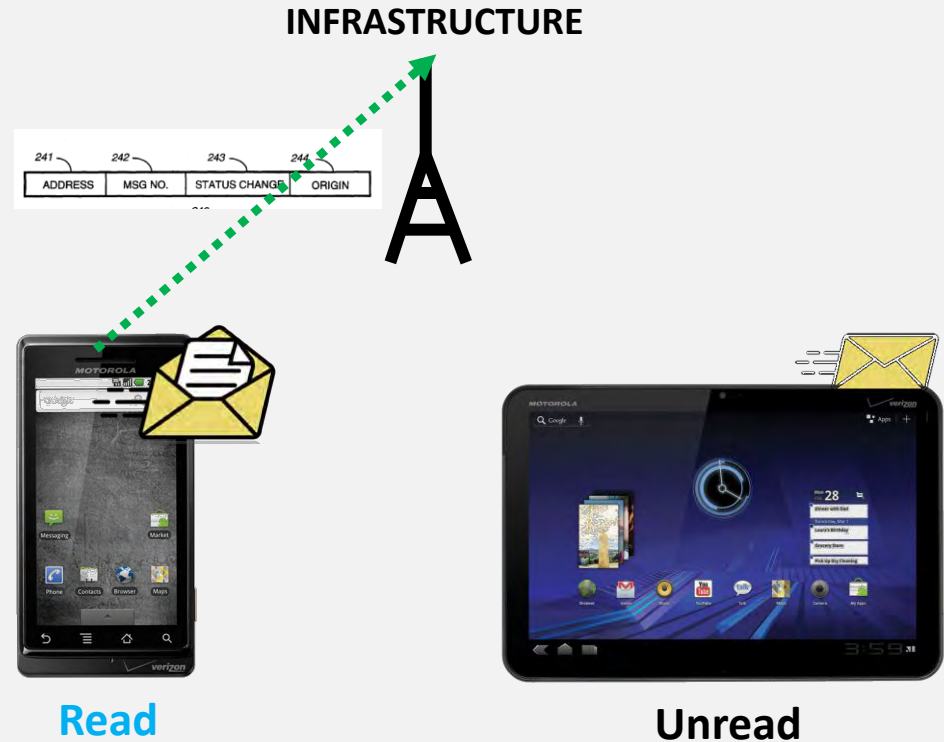
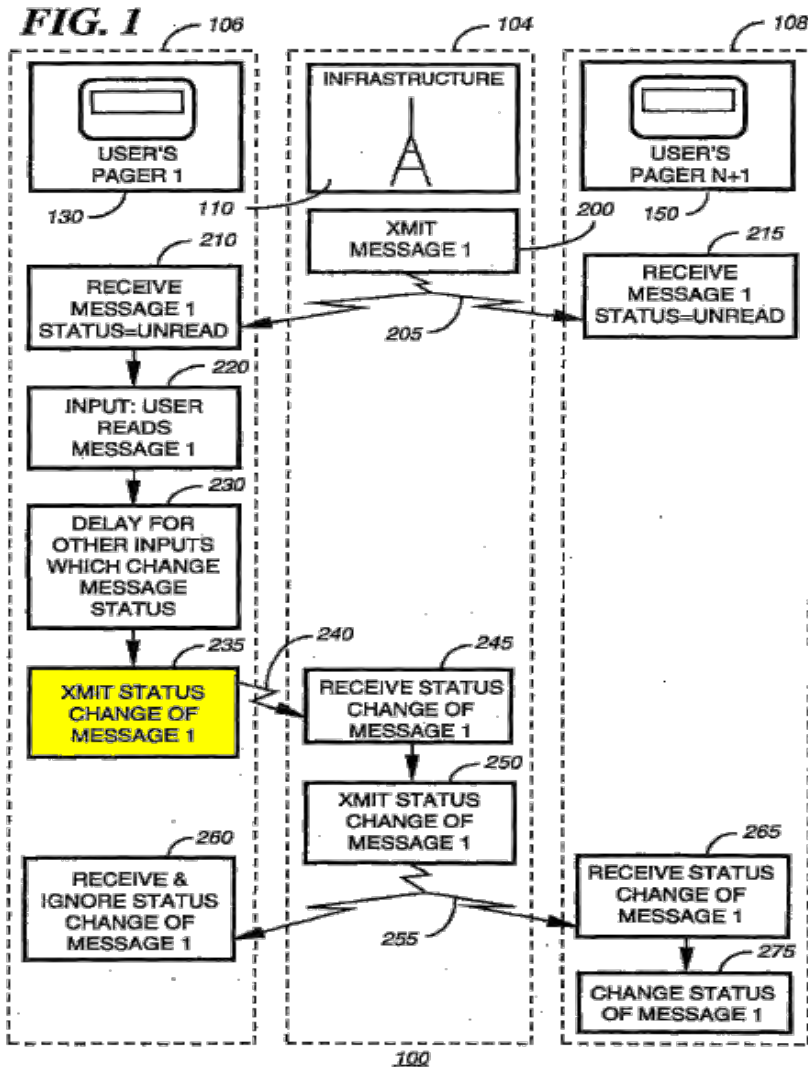
**FIG. 3**

“These three bits indicate the corresponding status of the identified message.”

'119 Patent, 6:5-6 (emphasis added).

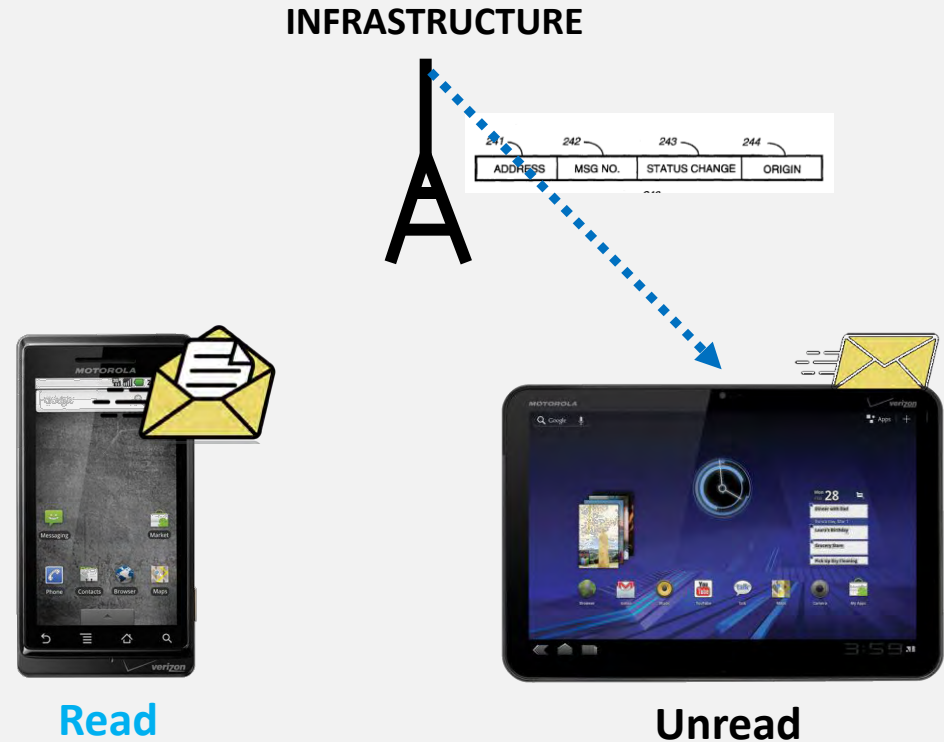
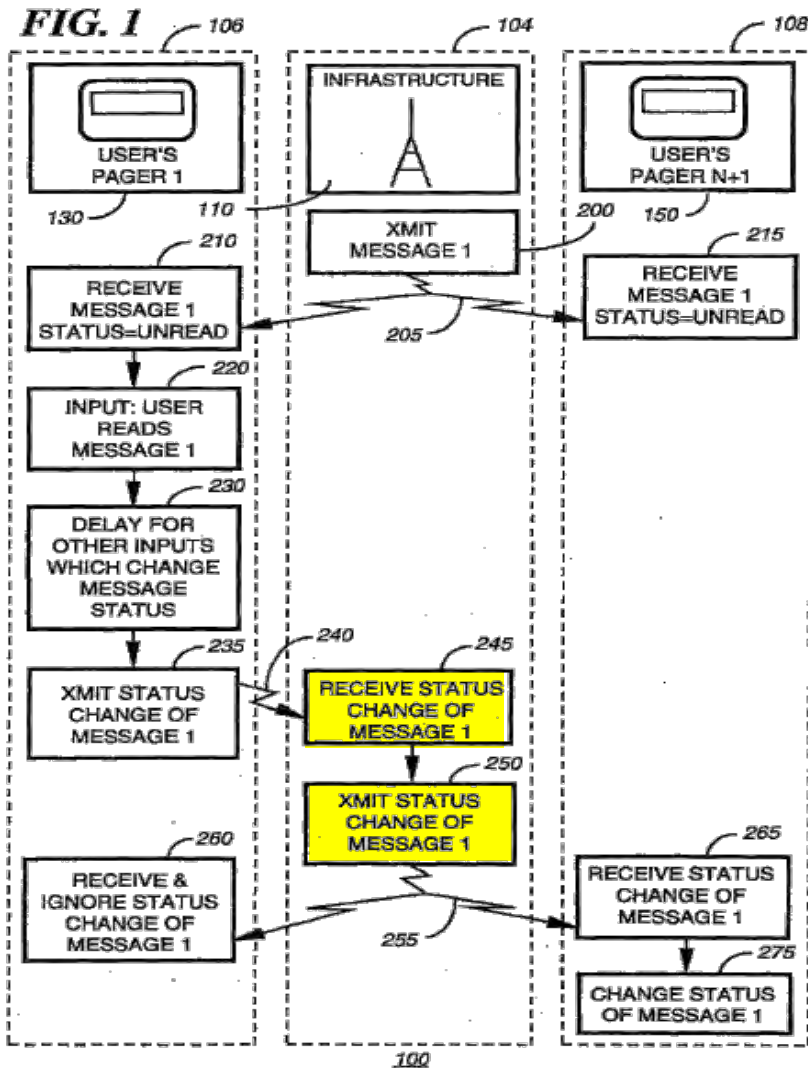
# '119 Patent: The Solution

4. The first device sends a second message indicative of changed status.



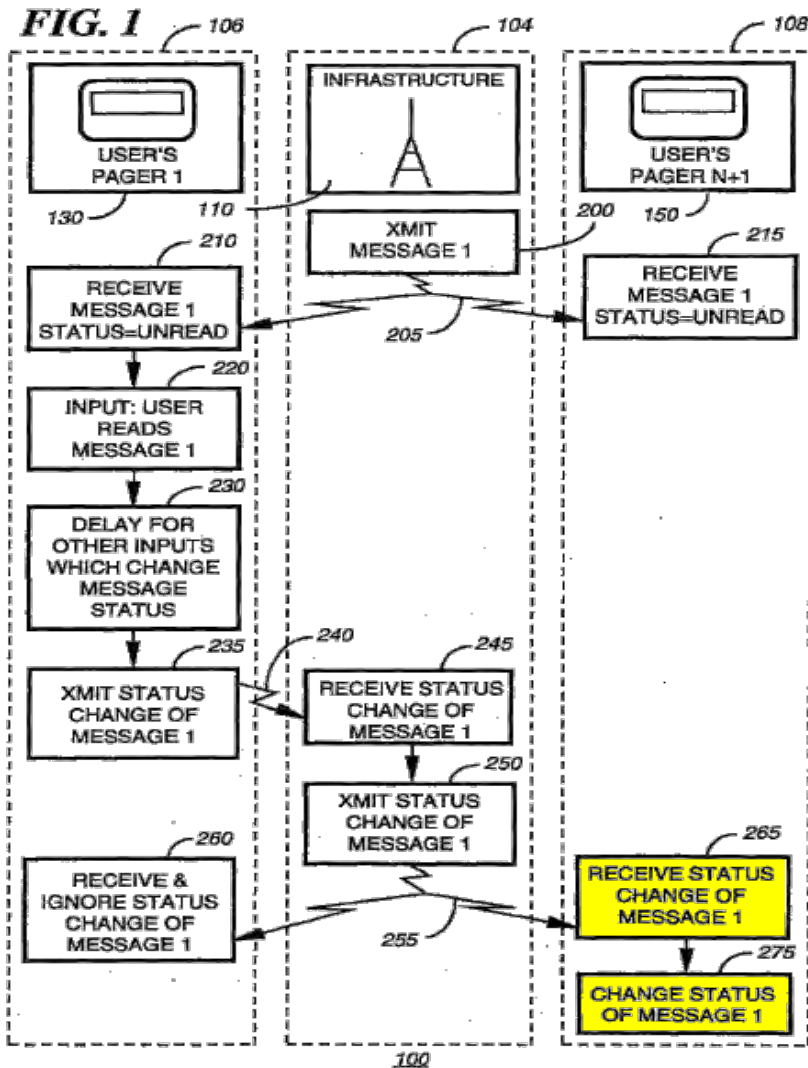
# '119 Patent: The Solution

5. The infrastructure received the second message and transmits a third message indicative of the second status



# '119 Patent: The Solution

## 6. The other transceiver receives the third message changes the status of the first message



INFRASTRUCTURE



Read



Read

## '119 Patent: The Solution

- Although this invention synchronizes multiple devices without user intervention, one or more delays may occur throughout the process.

Infrastructure **110** receives message **240** at step **245**. The message is then submitted to a message queue of the infrastructure **110** for transmission by the infrastructure. In step **250**, the infrastructure transmits the status of the first message via a third message, or message **255**. Message **255**

# The '119 Patent

## II. Apple's Infringing Products: iPhones, iPads, and MobileMe



# Apple's Infringing Devices

- iPhones, iPads, and MobileMe work together to synchronize message status among multiple devices.



# The '119 Patent

## III. Motorola devices embodying the claimed invention





# Motorola Embodiments

- All of Motorola's mobile devices using the Android operating system embody the claimed inventions.
  - Including the Atrix, Bravo, Charm, Citrus, Cliq, Cliq XT, Cliq 2, Defy, Devour, Droid, Droid 2, Droid 2 Global, Droid X, Droid Pro, BackFlip, Flipout, Flipside, i1, and Xoom.





**MOTOROLA**

U.S. Patent No. 5,710,987

Motorola Patent



US005710987A

**United States Patent** [19] **Patent Number:** 5,710,987  
**Paulick** [45] **Date of Patent:** Jan. 20, 1998

[54] **RECEIVER HAVING CONCEALED EXTERNAL ANTENNA** 0522538 1/1993 European Pat. Off. ....  
 60-46627 3/1985 Japan .  
 63-224422 9/1988 Japan .  
 0305726 12/1989 Japan .

[75] **Inventor:** Thomas Eugene Paulick, Palatine, Ill.

[73] **Assignee:** Motorola, Inc., Schaumburg, Ill.

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[21] **Appl. No.:** 459,376  
 [22] **Filed:** Jun. 2, 1995

Faris Howat, "The Mitsubishi International 4000", Business, Dec. 1992, pp. 68-78.  
 Seth Malgieri, "West Coast Firm Puts 'Beep' Inside Telephone", Radio Communication Report, Dec. 1992, pp. 1 and 22.

**Related U.S. Application Data**

[63] Continuation of Ser. No. 23,234, Feb. 25, 1993, abandoned.  
 [51] **Int. Cl.<sup>5</sup>** H04B 1/03; H04B 1/08  
 [52] **U.S. Cl.** 455/90; 455/128; 455/129; 455/349; 455/351; 343/702; 361/814  
 [58] **Field of Search** 455/89, 90, 128, 455/129, 269, 280, 347-351; 379/57, 58, 61, 433; 340/311.1, 825.44; 343/702; 361/814

*Primary Examiner*—Chi H. Pham  
*Attorney, Agent, or Firm*—Kevin D. Kaschke

**ABSTRACT**

A radiotelephone/pager unit (100) includes a enclosing (102, 104) radiotelephone circuitry (224) to a radiotelephone antenna (108) operable at radiotelephone frequencies and pager circuitry (218) coupled to antenna (212) operable at pager frequencies. The radiotelephone antenna (108) is located outside the housing (104) in a conventional manner. The pager antenna located outside the housing (102, 104) and concealed or integrally formed with a hand grip (122), a display (402), an escutcheon (502), a keypad (110), or a casing (114) such that the pager antenna's presence is unnoticed by the user. The pager antenna (212) forms a loop antenna substantially surrounding a user interface element such as a display (112), a keypad (110), an earpiece (114) or control buttons (118, 120) to minimize space.

**References Cited**

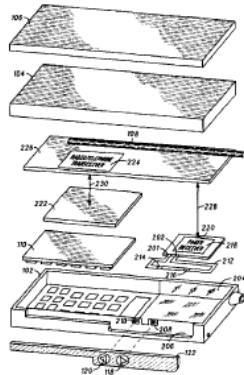
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| 5,392,461  | 2/1995  | Yukio           | 455/89    |

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23 Claims, 5 Drawing Sheets



## United States Patent [19] Paulick

[54] **RECEIVER HAVING CONCEALED EXTERNAL ANTENNA**

[75] **Inventor:** Thomas Eugene Paulick, Palatine, Ill.

[73] **Assignee:** Motorola, Inc., Schaumburg, Ill.

[21] **Appl. No.:** 459,376

[22] **Filed:** Jun. 2, 1995

# '987 Patent: Overview of the Invention

## FIELD OF THE INVENTION

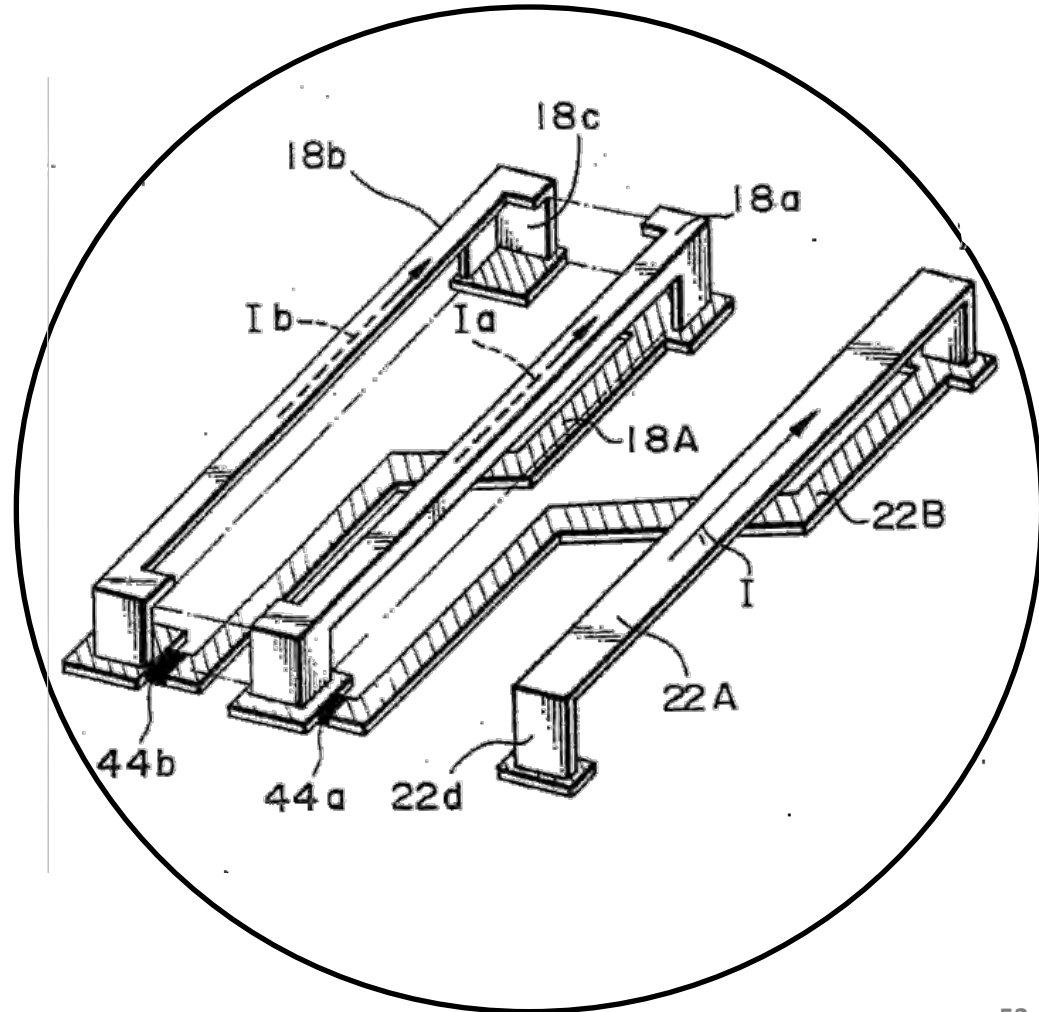
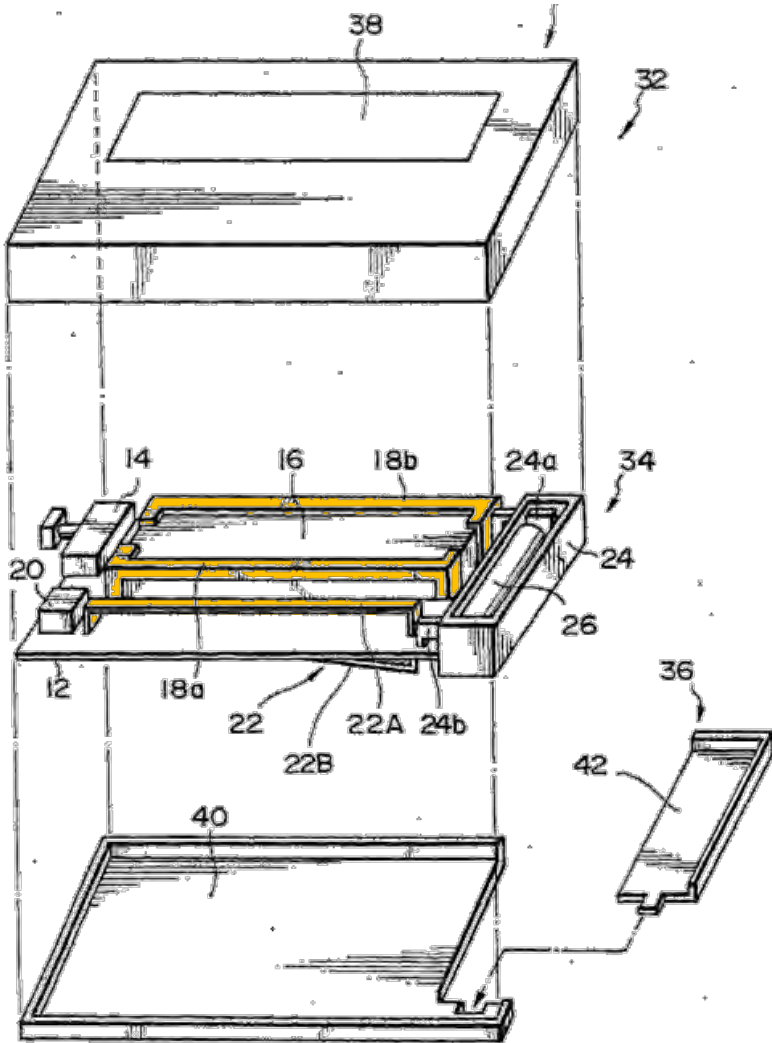
The present invention relates generally to antennas and more particularly to concealment of a pager antenna external to a radiotelephone/pager unit.

A radiotelephone/pager unit (100) includes a housing enclosing (102, 104) radiotelephone circuitry (224) coupled to a radiotelephone antenna (108) operable at radiotelephone frequencies and pager circuitry (218) coupled to a pager antenna (212) operable at pager frequencies. The radiotelephone antenna (108) is located outside the housing (102, 104) in a conventional manner. The pager antenna (212) is located outside the housing (102, 104) and **concealed under or integrally formed with** a hand grip (122), a display lens (402), an escutcheon (502), a keypad (110), or a cap (601) such that the pager antenna's presence is unnoticeable to a user. The pager antenna (212) forms a loop antenna substantially surrounding a user interface element such as a display (112), a keypad (110), an earpiece (114) or volume control buttons (118, 120) to minimize space.

- The inventions disclosed by the '987 patent address external antennas concealing and/or integrating with a device

# Prior Art - U.S. Patent No. 5,408,699

- Prior art put the antenna in the interior of the device



# '987 Patent: Overview

5,710,987

## 1 RECEIVER HAVING CONCEALED EXTERNAL ANTENNA

This is a continuation of application Ser. No. 08/023,234, filed Feb. 25, 1993 and now abandoned.

### FIELD OF THE INVENTION

The present invention relates generally to antennas and more particularly to concealment of a pager antenna external to a radiotelephone/pager unit.

### BACKGROUND OF THE INVENTION

Paging systems and radiotelephone systems, such as cellular radiotelephone systems, have gained widespread acceptance over the years. The trend in growth of these systems has continued to be positive, especially as the technology has evolved to enable reductions in the size and weight of pagers and portable cellular radiotelephones. Many of the users of portable cellular radiotelephones have continued to be users of pagers, which has resulted in the requirement that those users carry not only a portable cellular radiotelephone but also a pager. With the trend in technology continuing to enable further miniaturization of both portable cellular radiotelephones and pagers, it is now possible to combine both elements into a single portable unit. Such a combination, however, has been shown to create problems not previously encountered when both the portable cellular radiotelephone and the pager were separate units.

The portable radiotelephone typically has an antenna outside an at least partially shielded housing for transmitting and receiving radio frequency signals at radiotelephone frequencies. The pager typically has an antenna inside an unshielded housing for receiving radio frequency signals pager frequencies. When a pager is combined with the portable radiotelephone into a single unit, the location of the radiotelephone antenna and the pager antenna is considered.

The most likely place for the radiotelephone's antenna is at its conventional location outside the radiotelephone housing. Consideration is given to the location of the pager's antenna both inside and outside the radiotelephone's housing. The pager antenna can not be located inside the radiotelephone's shielded housing portion, since the shielded housing would prevent the pager's antenna from receiving paging signals. The pager's antenna can be located inside an unshielded portion of the radiotelephone's housing, however, the compactness of a single unit makes unshielded locations rare. Furthermore, remotely locating the pager's antenna from the pager circuitry to reach an unshielded location produces inefficiencies in the pager's antenna. The pager antenna can be located outside the radiotelephone's housing. However, locating the pager antenna in addition to the radiotelephone antenna outside the radiotelephone's housing would change the external appearance of the radiotelephone and possibly increase its size.

Thus, there is a need for a beneficial location for the pager antenna without compromising the antenna's performance or the appearance and size of the unit.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a radiotelephone/pager unit constructed in accordance with the present invention.

FIG. 2 is an exploded view of the radiotelephone/pager unit of FIG. 1 showing a first location of a pager antenna.

FIG. 3 is a perspective view of the pager antenna of FIG. 2 integrally formed with switch contacts.

FIG. 4  
unit of F  
antenna.

FIG. 5  
unit of F

FIG. 6  
unit of F  
antenna.

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alert 124.

The external appearance and functionality of the unit's radiotelephone portion is similar to that of a conventional portable cellular radiotelephone, model number 1293A, manufactured and available from Motorola, Inc. The functionality of the unit's pager portion is similar to that of a conventional available keypad 1112 and a phone po

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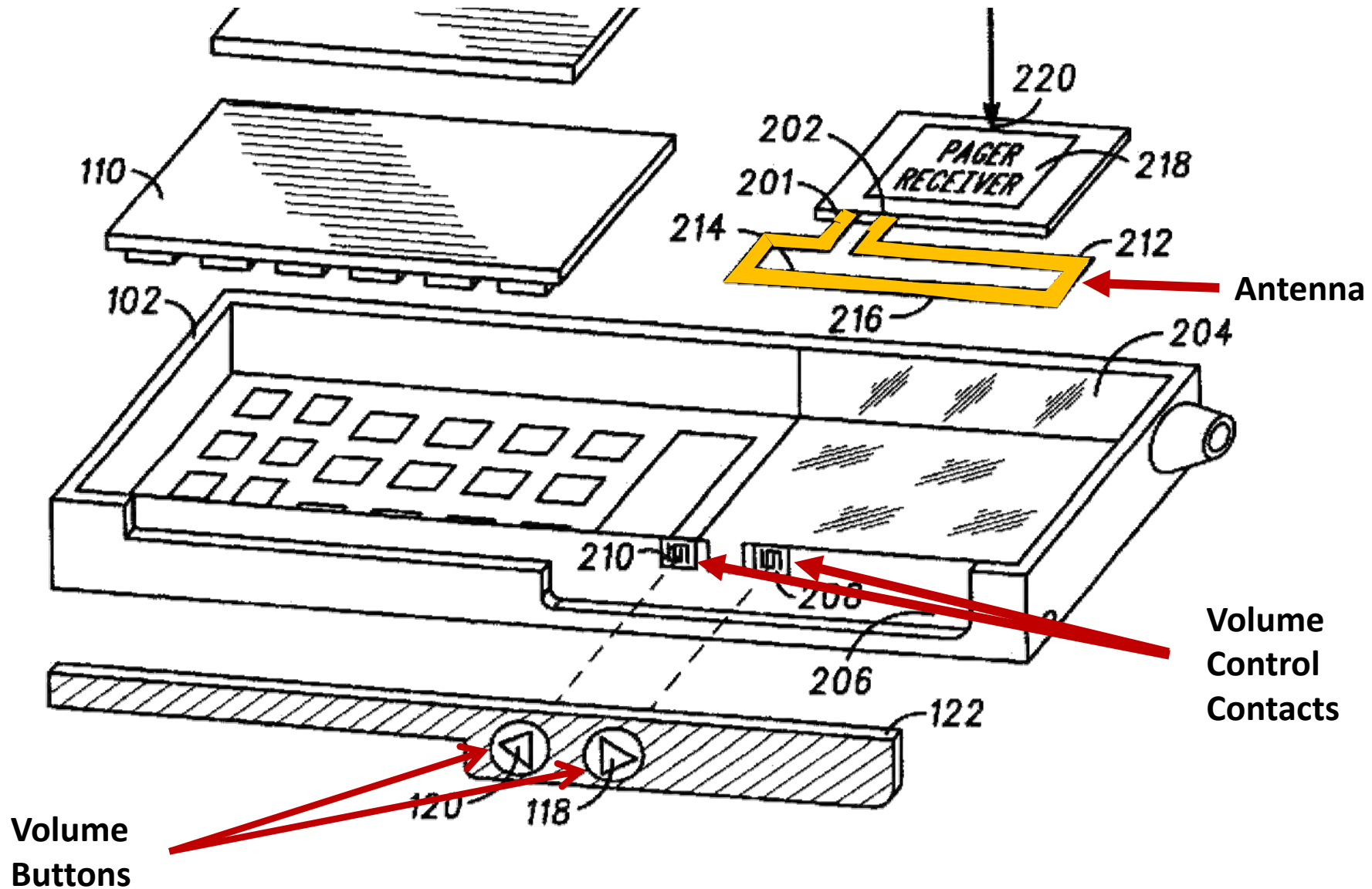
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A unique element of the present invention which will be shown and discussed later in the preferred embodiments of the present invention is that the pager antenna is located outside the radiotelephone's housing and yet not noticeable to a user.

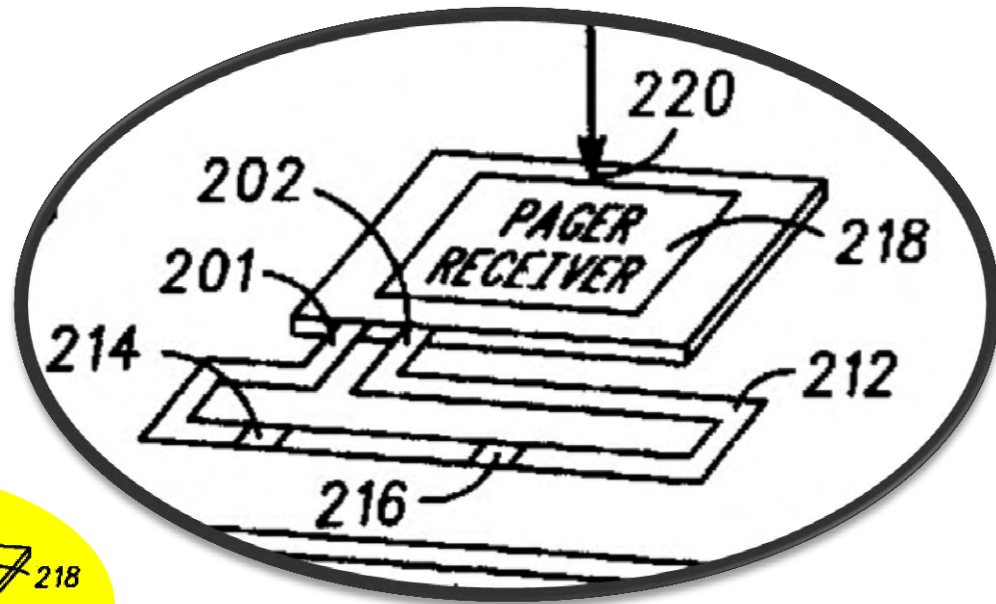
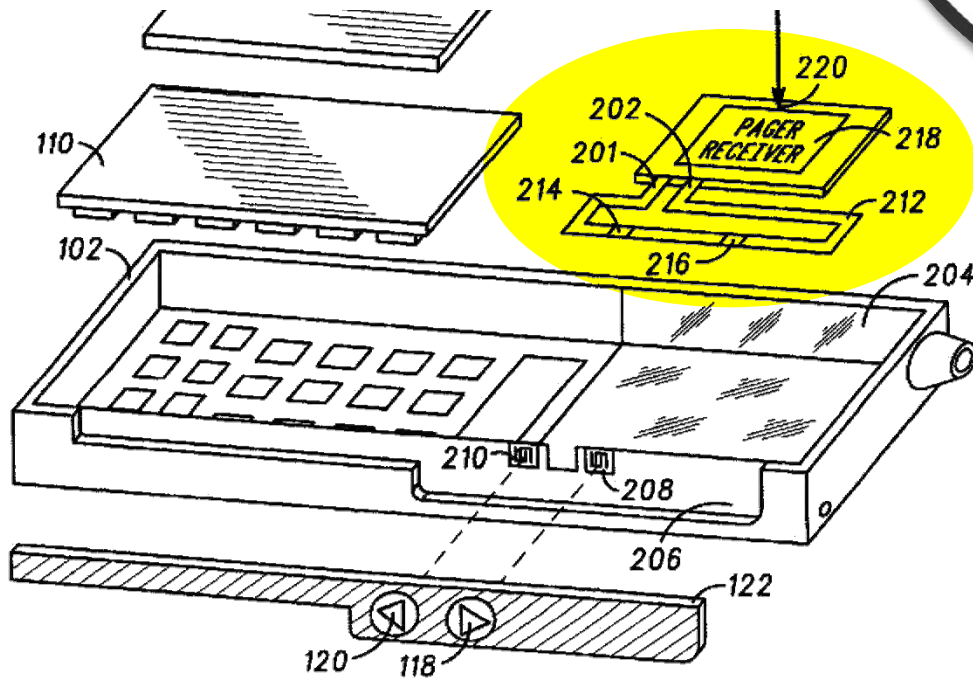
pager's antenna close to the pager's circuitry. The following preferred embodiments of the present invention will also show the pager's antenna forming a loop substantially surrounding the tactile, visual and acoustic user interface of the unit 100 including but not limited to the volume control buttons 118 and 120, the keypad 110, the display 112, and the carpiece 102. Surrounding user interface of the unit 100 with a loop antenna beneficially minimizes the space consumed by the antenna for the unit 100.

# '987 Patent: Overview



# '987 Patent: Overview

- The terminals (201 and 202) are the portions of the overall antenna that are connected to the receiver



'987 Patent, FIG 2



# '987 Patent: Overview

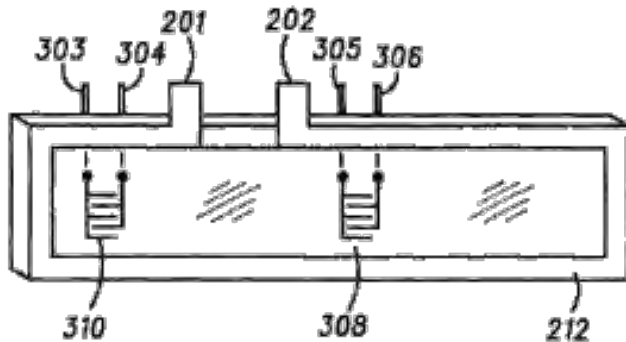


FIG. 3

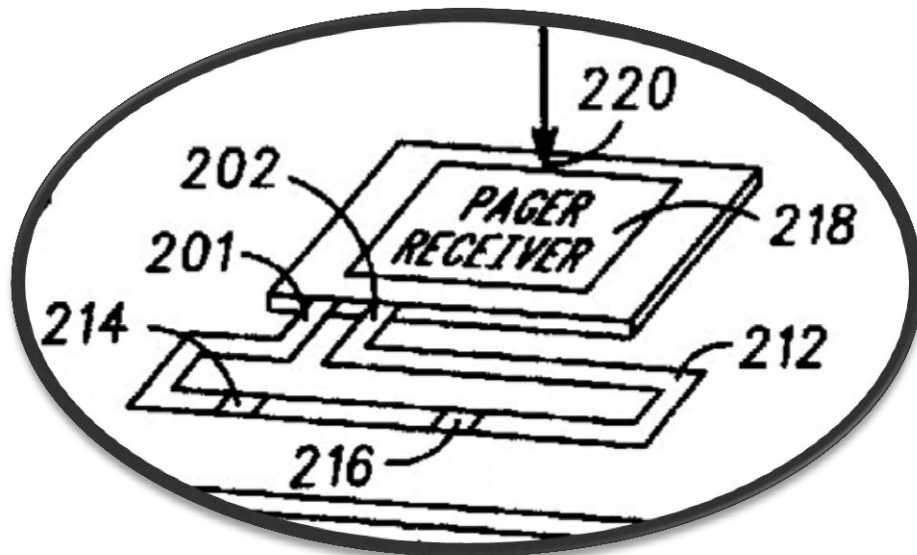
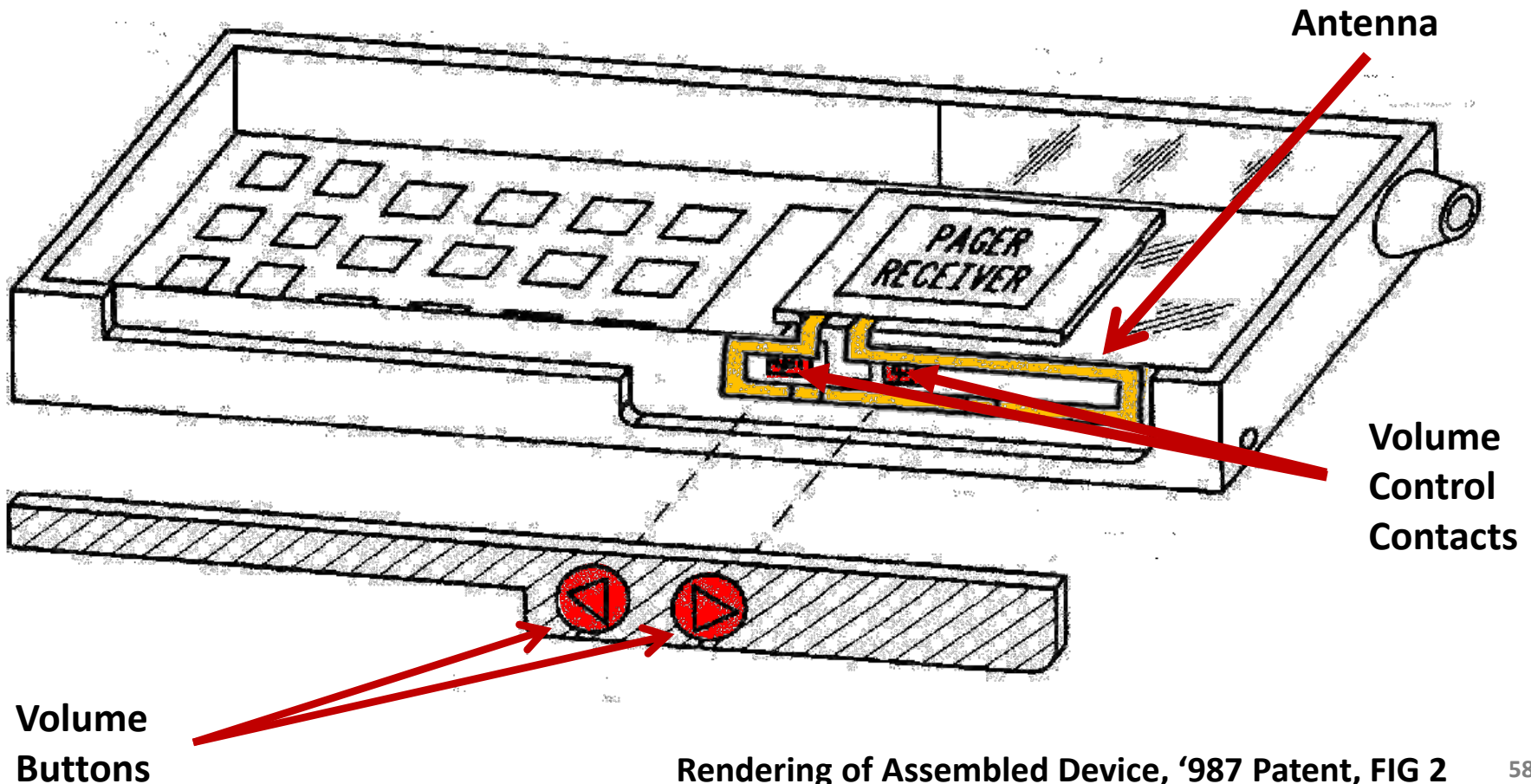


FIG. 2

- The antenna (212) is a continuous piece of metal
- Both Figure 2 and Figure 3 show terminals as part of antenna

# '987 Patent: Overview

- Antenna located inside the device housing to connect to the receiver circuitry and the remainder of the antenna wraps around the volume buttons
- A portion of the antenna is inside the housing of the device when the device is assembled



# '987 Patent: Accused Products

## ➤ Apple iPhone 4



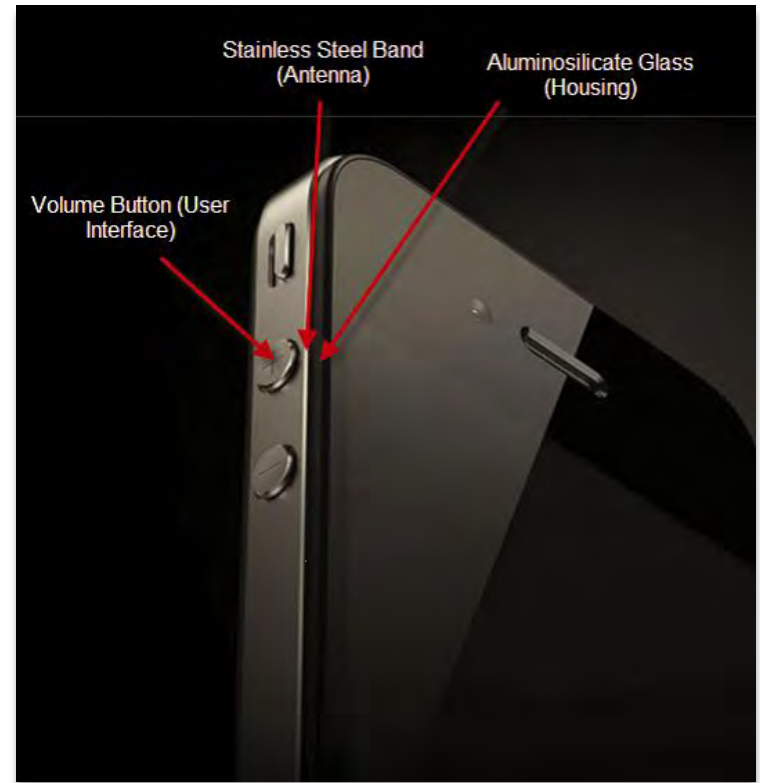
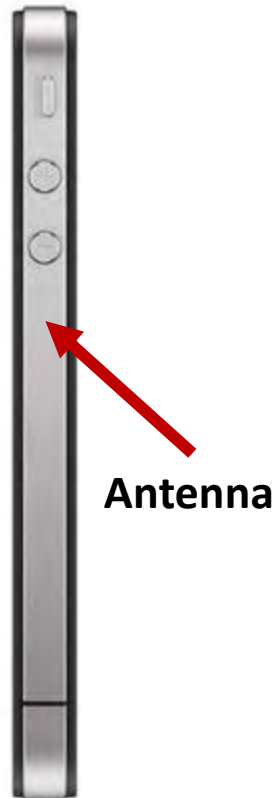
# '987 Patent

- Earlier Apple products had visually similar metal bands



# '987 Patent: Accused Products

## ➤ Apple iPhone 4





**MOTOROLA**

U.S. Patent No. 6,008,737

Motorola Patent

# U.S. Patent No. 6,008,737



US006008737A

**United States Patent** [19] **Patent Number:** **6,008,737**  
**Deluca et al.** [45] **Date of Patent:** **\*Dec. 28, 1999**

- [54] **APPARATUS FOR CONTROLLING UTILIZATION OF SOFTWARE ADDED TO A PORTABLE COMMUNICATION DEVICE** 5,335,278 8/1994 Matchett et al. 340/825.34  
 5,371,493 12/1994 Sharpe et al. 340/825.33  
 5,493,492 2/1996 Cramer et al. 385/232  
 5,577,100 11/1996 McGregor et al. 455/406  
 [75] **Inventors:** Michael J. Deluca, Boca Raton; Doug Kraul; Walter L. Davis, both of Parkland, all of Fla. 5,606,497 2/1997 Cramer et al. 395/232  
 5,612,682 3/1997 De Luca et al. 340/825.44  
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 [73] **Assignee:** Motorola, Inc., Schaumburg, Ill.

[\*] **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.:** 08/672,004  
 [22] **Filed:** Jun. 24, 1996

**Related U.S. Application Data**

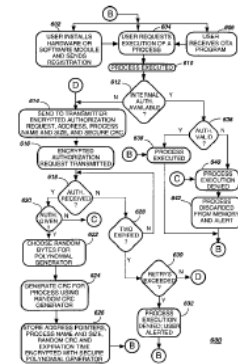
- [63] **Continuation-in-part of application No. 08/452,785, May 30, 1995, Pat. No. 5,612,682.**  
 [51] **Int. Cl.<sup>6</sup>** G07D 7/00  
 [52] **U.S. Cl.** 340/825.34; 340/825.34; 340/825.44; 455/408; 379/121; 705/32  
 [58] **Field of Search** 340/825.34; 825.44; 340/825.33; 825.35; 825.22; 455/426; 405; 406; 408; 395/200.01; 200.05; 230; 232; 228; 229; 379/114; 121

**References Cited**

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 5,325,418 6/1994 McGregor et al. 455/406

9 Claims, 7 Drawing Sheets



## United States Patent [19] Deluca et al.

[54] **APPARATUS FOR CONTROLLING UTILIZATION OF SOFTWARE ADDED TO A PORTABLE COMMUNICATION DEVICE**

[75] **Inventors:** Michael J. Deluca, Boca Raton; Doug Kraul; Walter L. Davis, both of Parkland, all of Fla.

[73] **Assignee:** Motorola, Inc., Schaumburg, Ill.

[\*] **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).

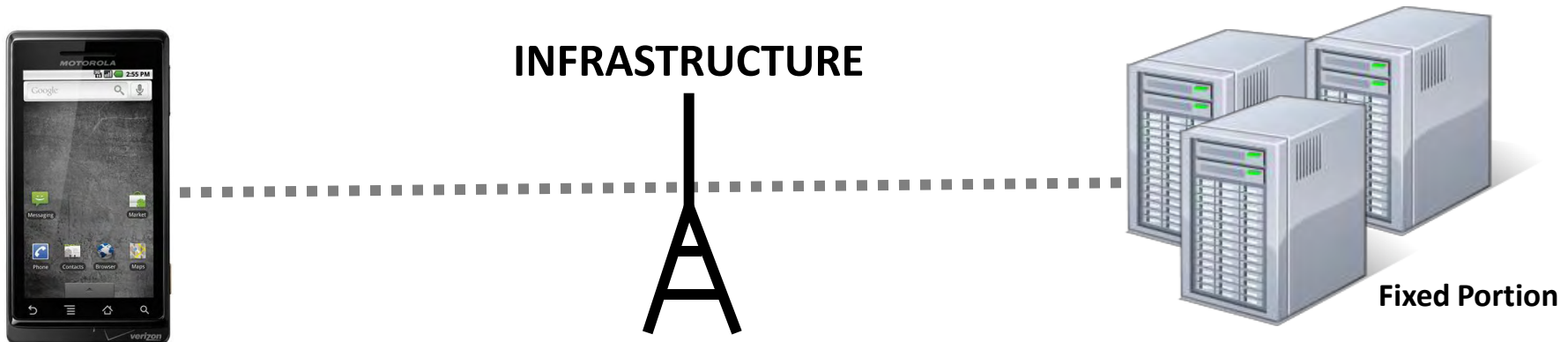
[21] **Appl. No.:** 08/672,004

[22] **Filed:** Jun. 24, 1996

# '737 Patent: Overview of the Invention

- The teaches a system and method of controlling the utilization of a hardware or software process installed on a portable communication device

Thus, it should be apparent by now that the present invention provides a method and apparatus for controlling utilization of a hardware or software process added to a portable communication device **122**. In particular, the present invention provides a novel method and apparatus for remotely authorizing software and hardware modules added to a portable communication device





# '737 Patent: Background

- Advances in technology allowed mobile devices to perform sophisticated tasks, such as email, data processing, and banking and financial transactions
- This method was designed with technological advancements in mind

With today's technology improvements, paging devices are expected to acquire more sophisticated functions such as electronic mailing services, spread sheet applications, investment finance services such as stock market charts, quotation requests, purchase and sale transactions, etc. These services

'737 Patent, Col. 1:22-27

# '737 Patent: Background

The invention of the '737 patent can be incorporated into ANY transceiver – *i.e.*, any device that can send and receive information over a wireless infrastructure.

An apparatus at a fixed portion (102) of a communication system controls utilization of software (398) in a portable communication device (122) that includes a transceiver (302) for communicating with the fixed portion. The por-

'737 Patent, Abstract

➤ **A transceiver is a device comprising both a transmitter and a receiver which are combined and share common circuitry or a single housing.**

## '737 Patent: The Prior Art Problem

- **Advanced functionality on mobile devices would be offered at a premium.**
- **Need to ensure that only authorized users could use this premium functionality of mobile devices.**

# '737 Patent: The Prior Art Problem

In prior art devices, registration has been accomplished by mailing a signed certificate with a purchase receipt of a software application or hardware module. This form of registration, however, does not prevent an unscrupulous user from using pirated software applications and/or unauthorized hardware modules.

'737 Patent, 1:27-44

6,008,737

## APPARATUS FOR CONTROLLING UTILIZATION OF SOFTWARE ADDED TO A PORTABLE COMMUNICATION DEVICE

This application is a continuation-in-part of application Ser. No. 08,452,785 filed May 30, 1995, by Dulica et al., entitled "Method and Apparatus for Controlling Utilization of a Process Added to a Portable Communication Device", now U.S. Pat. No. 5,612,682, issued Mar. 18, 1997.

### FIELD OF THE INVENTION

This invention relates in general to communication systems, and more specifically to a method and apparatus for controlling utilization of a process added to a portable communication device.

### BACKGROUND OF THE INVENTION

In the past, paging devices were limited to alpha-numeric and voice paging. With technology improvements in circuit integration and more efficient communication protocols that provide low-cost communication, paging devices have grown in sophistication and services provided. With today's technology improvements, paging devices are expected to acquire more sophisticated functions such as electronic mailing services, spread sheet applications, investment finance services such as stock market charts, quotation requests, purchase and sale transactions, etc. These services require sophisticated software applications and/or hardware modules to be operated in the paging device. Paging devices using sophisticated services such as those will require a means for registration and licensing to prevent unauthorized use of processes, including software applications and hardware modules. In prior art device registration has been accomplished by mailing a signed certificate with a purchase receipt of a software application or hardware module. This form of registration, however, does not prevent an unscrupulous user from using pirated software applications and/or unauthorized hardware modules.

Thus, what is needed is a method and apparatus for controlling utilization of a process added to a portable communication device. Preferably, the method and apparatus should serve as a mechanism to prevent unauthorized use of software applications and hardware modules.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an electrical block diagram of a communication system in accordance with the preferred embodiment of the present invention.

FIG. 2 is an electrical block diagram of elements of a fixed portion of the communication system in accordance with the preferred embodiment of the present invention.

FIGS. 3 and 4 are elements of an electrical block diagram of a portable communication device in accordance with the preferred embodiment of the present invention.

FIG. 5 is a timing diagram of elements of an outband protocol and an inband protocol of the fixed and portable portions of the communication system in accordance with the preferred embodiment of the present invention.

FIG. 6 is a flow chart depicting an authorization operation of the fixed portion in response to a message originated by the portable communication device in accordance with the preferred embodiment of the present invention.

FIG. 7 is a flow chart depicting an authorization operation of the portable communication device as it attempts to obtain authorization to use a process in accordance with the preferred embodiment of the present invention.

Referring to FIG. 1, a communication system 100 is shown. The system 100 includes a fixed portion 110 and a portable communication device 120. The fixed portion 110 includes a base station 112, a control unit 114, and a network 116. The portable communication device 120 includes a mobile station 122, a control unit 124, and a network 126. The base station 112 is connected to the control unit 114, which is connected to the network 116. The mobile station 122 is connected to the control unit 124, which is connected to the network 126. The network 116 and network 126 are connected to each other via a communication link 118. The control unit 114 and control unit 124 are connected to each other via a communication link 120. The communication link 118 is a public switched telephone network (PSTN) 110 for receiving selective call registrations therefrom. Selective call registrations comprising voice and data messages from the PSTN 110 can be generated, for example, from a conventional telephone 124 coupled to the PSTN 110 in a manner that is well known in the art. Data and control transmissions between the base station 112 and the portable communication device 122 preferably utilize a protocol similar to Motorola's well-known FLEX digital selective call signaling protocol. This protocol utilizes well-known error detection and error correction techniques and is therefore tolerant to bit errors occurring during transmission, provided that the bit errors are not too numerous in any one code word. Outband channel transmissions comprising data and control signals from the base station 112 preferably utilize two and four-level frequency shift keying (FSK) modulation, operating at sixteen-baud or thirty-two-baud (symbols-per-second (Sp/s), depending on traffic requirements and system transmission gain. Inband channel transmissions from the portable communication device 122 to the base station 112 preferably utilize four-level FSK modulation at a rate of thirty-two-baud bits per second (Sp/s). Inband channel transmissions preferably occur during predetermined data packet time slots synchronized with the outband channel transmission. It will be appreciated that, alternatively, other signaling protocols, modulation schemes, and transmission rates can be utilized as well for either or both transmission directions. The outband and inband channels preferably operate on a single carrier frequency utilizing well-known time division duplex (TDD) techniques for sharing the frequency. It will be further appreciated that, alternatively, the outband and inband

# '737 Patent: Prior Art Problem

- Existing authorization systems, such as mail-in registration, were slow, inconvenient and ineffective.
- No effective solution for authenticating a user of a mobile device over a wireless network.

# The '737 Patent Technology

- The '737 patent teaches a mobile device containing hardware and/or software that can request authorization from a central database and that contains hardware and/or software that can allow utilization after receiving authorization.
- Two elements:
  1. An element that generates an external request for authorization; and
  2. An element that allows utilization.

# The '737 Patent Technology

## Element 1: An External Authorization Request

the processor 308 proceeds to step 614 where an encrypted external authorization request message is constructed comprising the authorization request command

'737 Patent 15:20-22

- In this embodiment, the external authentication request is encrypted, meaning it is unreadable to anyone except those possessing special knowledge (often referred to as a “key”).
  - This ensures that when your portable device sends a message to the central database, or vice-versa, only the intended recipient can read the message.

# The '737 Patent Technology

## Element 1: An External Authorization Request

The authorization request must contain at least one of:

1. An address identifying the portable communication device;
2. A software name; and
3. A size of the software

9. A portable communication device in a communication system having a fixed portion, the portable communication device comprising:

a processor;

an authorization element coupled to the processor for obtaining usage authorization for utilizing software in the portable communication device, in which the authorization element generates an external authorization request, and in which the authorization element communicates with the fixed portion to obtain the usage authorization in response to the external authorization request, and in which the external authorization request includes at least one of: an address identifying the portable communication device, a software name and a size of the software; and

a second authorization element coupled to the processor for allowing utilization of the software, in response to usage authorization being obtained from the fixed portion.



# The '737 Patent Technology

## Element 1: An External Authorization Request

- This request is sent to a central database that contains a list of authorized users / devices:

The database of portable device records 216 contains, as a minimum, a list of process records 220 for each portable communication device 122. To access the list of process records 220 of a portable communication device 122, a portable device address 218 corresponding to the address of a portable communication device 122 is used to search the database of portable device records 216 . . . .

'737 patent at 3:39-57

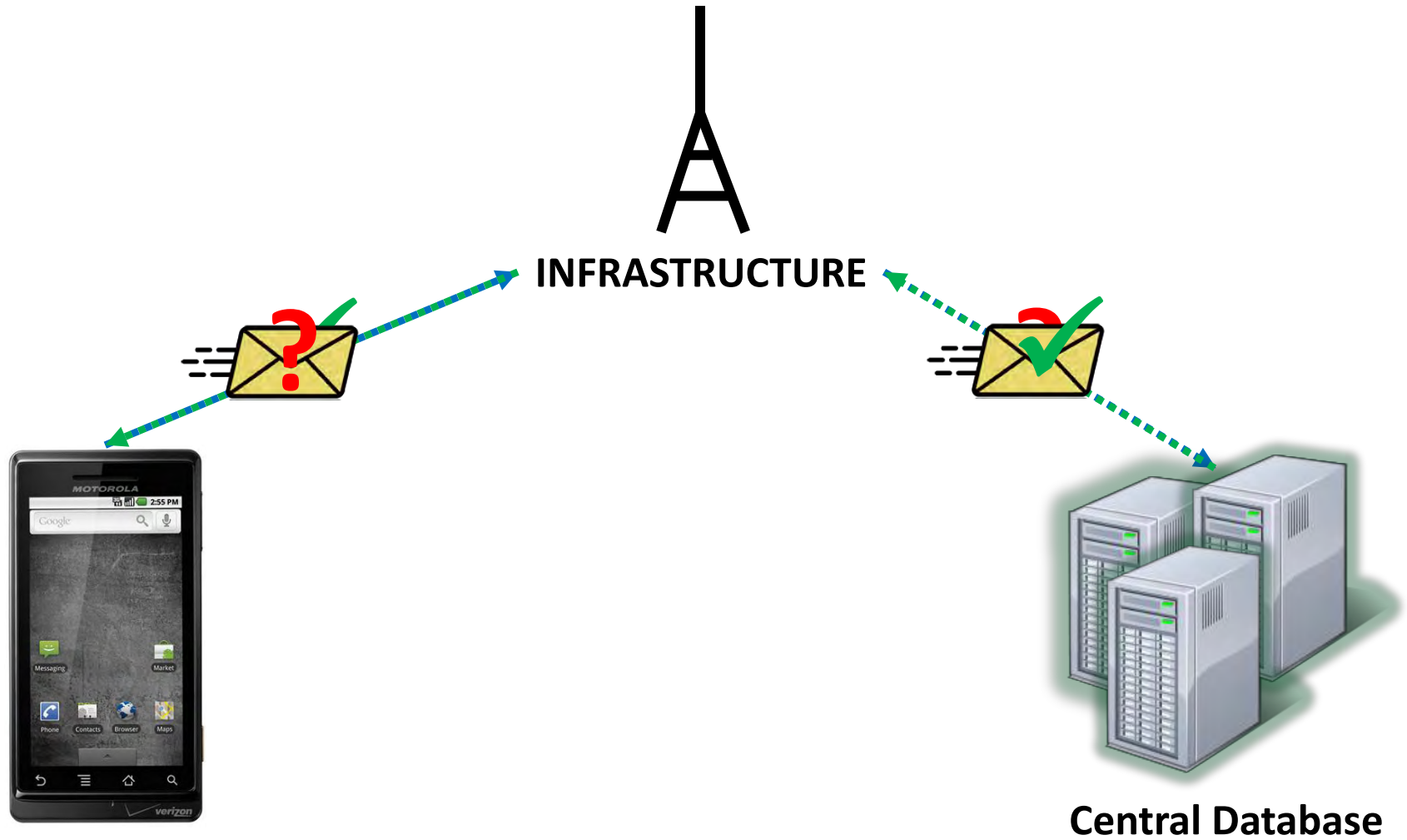
# The '737 Patent Technology

## Element 1: An External Authorization Request

- If the central database determines that a user/device is authorized, it transmits an authorization message back to the requesting mobile device.

# The '737 Patent Technology

## Authorized User



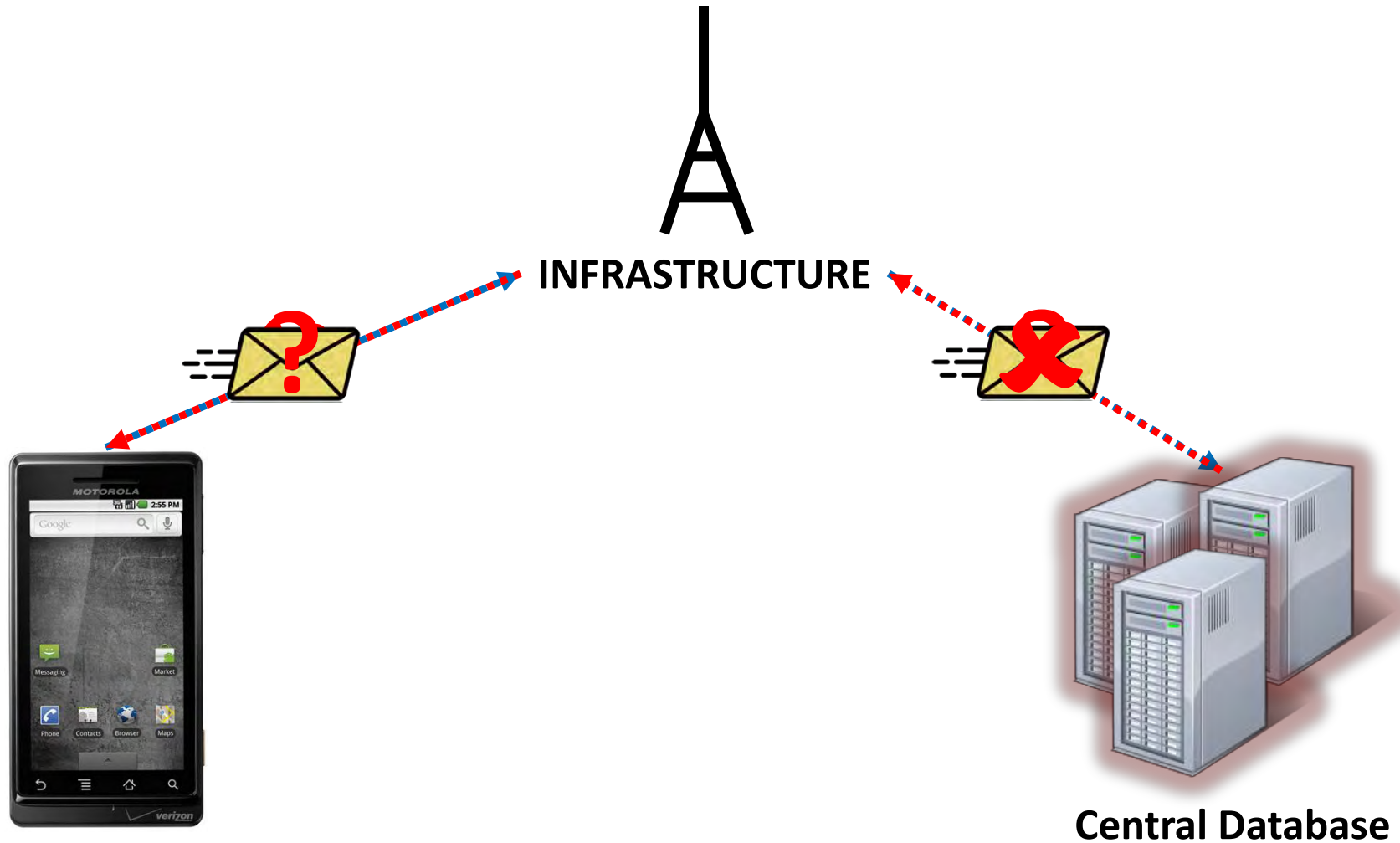
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## Element 1: An External Authorization Request

- If the central database determines that a user/device is not authorized, it transmits an denial message back to the requesting mobile device.

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## Unauthorized User



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## Element 2: Usage Allowance

- Upon receiving a authorization message, the mobile device authorizes usage of the software or media file.

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## II. Apple's Infringing Products: iPhones, iPads, Laptops, and Apple TV

- Apple iPhone 3G
- Apple iPhone 3GS
- Apple iPhone 4G
- Apple iPad / iPad with 3G
- Apple iPad 2 / iPad 2 with 3G
- Apple iPod Touch
- Apple MacBook
- Apple MacBook Pro
- Apple MacBook Air
- Apple iMac
- Apple Mac Mini
- Apple Mac Pro
- Apple TV

# The '737 Patent

## III. Motorola devices embodying the claimed invention





# Motorola Embodiments

- All of Motorola's mobile devices using the **Android Marketplace**.
  - Including the Atrix, Bravo, Charm, Citrus, Cliq, Cliq XT, Cliq 2, Defy, Devour, Droid, Droid 2, Droid 2 Global, Droid X, Droid Pro, BackFlip, Flipout, Flipside, i1, and Xoom.

