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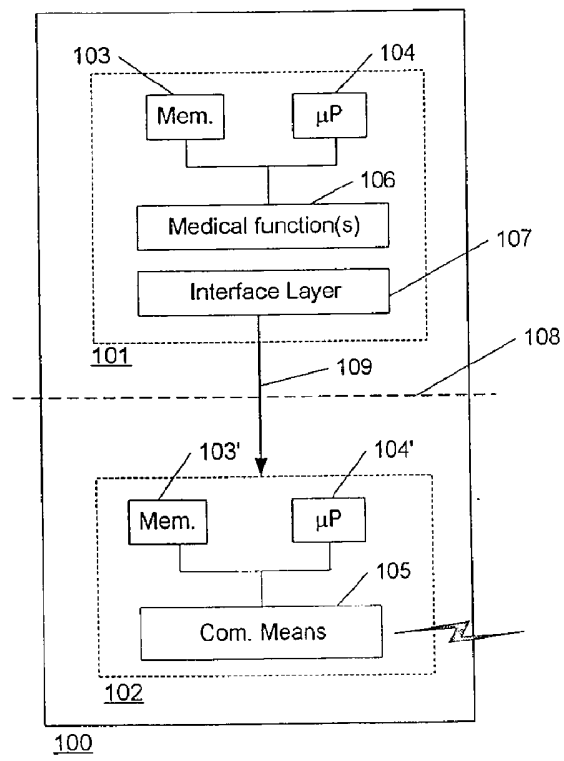
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(54) Benævnelse: Portable device and method of communicating medical data information

(57) Sammendrag:

This invention relates to a portable medical device for communication of medical data information comprising a medical device part comprising a first processor and first storage means, and means for executing one or more medical related functions, a communication device part comprising a second processor, second storage means, and communication means, where the medical device part and the communication device part is connected allowing for exchange of data information according to a predetermined protocol, where the exchange of communication is under the control of the medical device part and where the functionalities of each device part otherwise is separated.

Additionally, the invention relates to a method of communication of medical data information.



P a t e n t C l a i m s :

1. A portable medical device (100) for communication of
5 medical data information comprising
- a medical device part (101)
 - o comprising a first processor (104) and first storage means (103), and
 - o means (106) for executing one or more medical
10 related functions,
 - a communication device part (102)
 - o comprising a second processor (104'), second storage means (103'), and
 - o communication means (105),
- 15 where the medical device part (101) and the communication device part (102) is connected allowing for exchange of data information according to a predetermined protocol, the exchange of data information is under the control of the medical device part (101) and where the
20 functionalities of each device part otherwise is separated.
2. A device according to claim 1, c h a r a c t e r i z e d in that the predetermined protocol comprises the
25 medical device part (101) acting as a master and the communication device part (102) acting as a slave where the exchange of information is done by the medical device part (101) polling the communication device part (102).
- 30 3. A device according to claims 1 - 2, c h a r a c t e r i z e d in that the medical device part (102) further comprises one or more of:
- a user interface (201; 202),
 - at least one medical transducer (106)

- discrete and/or substantially continuously body fluid analysis means (106),
- drug administration means (106), and
- a short-range communication means (106') for exchanging data information with at least another medical device (405).

4. A device according to claim 3, characterized in that the at least another medical device (405) is selected from the group of:

- a drug administration device (405),
- a body fluid analyser (405),
- an insulin administration device (405),
- a blood glucose monitor (BGM) (405; 601),
- a continuous blood glucose monitor (CGM) (405; 601),
- an inhaler (405),
- a tablet dispenser (405),
- a lipid monitor (405),
- a pulse monitor (405),
- a lancet device (405),
- a storage container (405),
- a balance (405),
- and any other apparatus (405) adapted to measure at least one physiological parameter.

5. A device according to claims 1 - 4, characterized in that the device further comprises a power supply (203) supplying the communication device part (102) with power where the power supply may be turned on and off under the control of the medical device part (101).

6. A device according to claims 1 - 5, characterized in that said communication means (105) is

adapted to communicate according to the Bluetooth protocol.

7. A device according to claims 1 - 6, c h a r a c t e r i z e d in that said communication means (105) are adapted to communicate information according to one or more of:

- Radio frequency (RF) communication,
- Infrared (IR) communication,
- 10 • HTTP (Hyper Text Transmission Protocol),
- SHTTP (Secure Hyper Text Transmission Protocol),
- TCP/IP (Transmission Control Protocol/Internet Protocol),
- PPP (Point-to-Point),
- 15 • SSL (Secure Socket Layer),
- TLS (Transport Layer Security),
- IPsec (IP Security Protocol),
- S/MIME (Secure Multi-purpose Internet Message Exchange),
- 20 • XML (eXtensible Markup Language) and
- IrDA,

8. A device according to claims 1 - 7, c h a r a c t e r i z e d in that said communication means (105) are adapted to communicate with a wireless access point/a mobile terminal (401) where the access point/the terminal (401) is adapted to communicate according to one or more of:

- GSM (Global System for Mobile communication),
- 30 • GPRS (General Packet Radio System), and
- UMTS (Universal Mobile Telephone System).

9. A device according to claims 1 - 8, c h a r a c t e r i z e d in that the communication device part (101) is

adapted to exchange data information with a central server (403) via a wireless network access point (401).

10. System for supplying data from a portable medical
5 device (100) to a third party, where the system is adapted to

- automatically transmit data information from a portable medical device (100) to a central server (403) for storage in at least one database,
- 10 • process said data information, in order to derive additional information, and
- automatically transmit at least a part of the additional information to a predetermined third party.

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11. System according to claim 10, c h a r a c t e r i z e d in that said processing is done at said server (403) and/or at said medical device (100).

20 12. System according to claims 10 - 11, c h a r a c t e r i z e d in that said data information comprises information representing one or more of:

- at least one blood glucose value,
- at least one value representing a body fluid level,
- 25 • at least one physiological parameter,
- amount and/or type of administered medication,
- amount and/or type of administered insulin,
- a trend of a glucose or body fluid level,
- a prediction of a glucose or body fluid level,
- 30 • timestamp in- or excluding date,
- amount of food,
- measurement of physical activity,
- notification of appointment,
- inventory logistics, and

- body characteristics.
- warnings, and
- symptoms.

5 13. System according to claims 10 - 12, c h a r a c t e r
i z e d in that the system is adapted to transmit data
information from a portable medical device (100) to a
central server (403) according to the Bluetooth protocol
to a wireless access point (401) connected via a network
10 (503) to the central server (403).

14. System according to claims 10 - 13, c h a r a c t e r
i z e d in that said third parties are one or more of:

- at least one relative,
- 15 • at least one parent, and
- at least one medical professional.

15. System according to claims 10 - 14, c h a r a c t e r
i z e d in that the system is further adapted to

- 20 • exchange information between the portable medical
device (100) and another medical device (405) in
order to retrieve relevant data information.

16. System for collecting data information from a number
25 of portable devices (100), where the system is adapted
to:

- generate data information in a portable device
(100), the data information relating to a clinical
trial of a medical device and/or medical product,
- 30 • automatically sending the data information from the
portable device (100) to a central server (403) for
storage in a database,
- process said data information.

17. A method of communication of medical data information between a medical device part (101)

- o comprising a first processor (104) and first storage means (103), and
- 5 o means (106) for executing one or more medical related functions,

and a communication device part (102)

- o comprising a second processor (104'), second storage means (103'), and
- 10 o communication means (105),

where the medical device part (101) and the communication device part (102) exchanges data information according to a predetermined protocol, the exchange of data information is under the control of the medical device

15 part (101) and where the functionalities of each device part otherwise is separated.

18. A method according to claim 17, c h a r a c t e r i z e d in that the predetermined protocol comprises the

20 medical device part (101) acting as a master and the communication device part (102) acting as a slave where the exchange of information is done by the medical device part (101) polling the communication device part (102).

25 19. A method according to claims 17 - 18, c h a r a c t e r i z e d in that the medical device part (102) further comprises one or more of:

- a user interface (201; 202),
- at least one medical transducer (106)
- 30 • discrete and/or substantially continuously body fluid analysis means (106),
- drug administration means (106), and

- a short-range communication means (106') for exchanging data information with at least another medical device (405).

5 20. A method according to claim 19, characterized in that the at least another medical device (405) is selected from the group of:

- a drug administration device (405),
- a body fluid analyser (405),
- 10 • an insulin administration device (405),
- a blood glucose monitor (BGM) (405; 601),
- a continuous blood glucose monitor (CGM) (405; 601),
- an inhaler (405),
- a tablet dispenser (405),
- 15 • a lipid monitor (405),
- a pulse monitor (405),
- a lancet device (405),
- a storage container (405),
- a balance (405),
- 20 • and any other apparatus (405) adapted to measure at least one physiological parameter.

21. A method according to claims 17 - 20, characterized in that the method further comprises
25 controlling a power supply (203) by the medical device part (101), where the power supply supplies the communication device part (102) with power.

22. A method according to claims 17 - 21, characterized in that said communication means (105)
30 communicates according to the Bluetooth protocol.

23. A method according to claims 17 - 22, c h a r a c t e
r i z e d in that said communication means (105)
communicates information according to one or more of:

- Radio frequency (RF) communication,
- 5 • Infrared (IR) communication,
- HTTP (Hyper Text Transmission Protocol),
- SHTTP (Secure Hyper Text Transmission Protocol),
- TCP/IP (Transmission Control Protocol/Internet
Protocol),
- 10 • PPP (Point-to-Point),
- SSL (Secure Socket Layer),
- TLS (Transport Layer Security),
- IPsec (IP Security Protocol),
- S/MIME (Secure Multi-purpose Internet Message
15 Exchange),
- XML (eXtensible Markup Language) and
- IrDA,

24. A method according to claims 17 - 23, c h a r a c t e
20 r i z e d in that said communication means (105)
communicates with a wireless access point/a mobile
terminal (401) where the access point/the terminal (401)
communicates according to one or more of:

- GSM (Global System for Mobile communication),
- 25 • GPRS (General Packet Radio System), and
- UMTS (Universal Mobile Telephone System).

25. A method according to claims 17 - 14, c h a r a c t e
r i z e d in that the communication device part (101)
30 exchanges data information with a central server (403)
via a wireless network access point (401).

26. Method of supplying data from a portable medical device (100) to a third party, the method comprising the steps of:

- 5 • automatically transmitting data information from a portable medical device (100) to a central server (403) for storage in at least one database,
- processing said data information, in order to derive additional information, and
- 10 • automatically transmitting at least a part of the additional information to a predetermined third party (402; 404).

27. Method according to claim 26, c h a r a c t e r i z e d in that said processing is done at said server (403) and/or at said medical device (100).

28. Method according to claims 26 - 27, c h a r a c t e r i z e d in that said data information comprises information representing one or more of:

- 20 • at least one blood glucose value,
- at least one value representing a body fluid level,
- at least one physiological parameter,
- amount and/or type of administered medication,
- amount and/or type of administered insulin,
- 25 • a trend of a glucose or body fluid level,
- a prediction of a glucose or body fluid level,
- timestamp in- or excluding date,
- amount of food,
- measurement of physical activity,
- 30 • notification of appointment,
- inventory logistics, and
- body characteristics.
- warnings, and
- symptoms.

29. Method according to claims 26 - 28, c h a r a c t e r
i z e d in that said step of transmitting data
information from a portable medical device (100) to a
5 central server (403) is done by transmitting said data
information according to the Bluetooth protocol to a
wireless access point (401) connected via a network (503)
to the central server (403).

10 30. Method according to claims 26 - 29, c h a r a c t e r
i z e d in that said third parties (402; 404) are one or
more of:

- at least one relative,
- at least one parent, and
- 15 • at least one medical professional.

31. Method according to claims 26 - 30, c h a r a c t e r
i z e d in that said method further comprises the step
of:

- 20 • communicating between the portable medical device
(100) and another medical device (405) in order to
retrieve relevant data information.

25 32. Method of collecting data information from a number
of portable devices (100; 405; 601;), the method
comprising the steps of:

- generating data information in a portable device
(100; 405; 601), the data information relating to a
clinical trial of a predetermined medical product
30 and/or device,
- automatically sending the data information from the
portable device (100) to a central server (403) for
storage in a database,
- processing said data information.

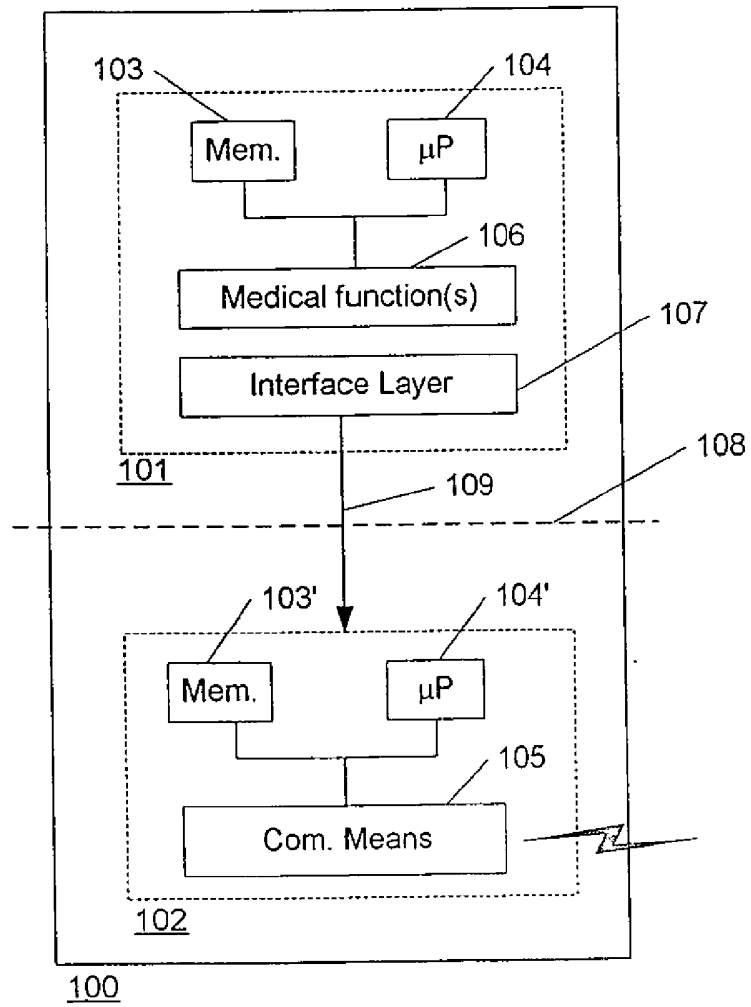


Figure 1

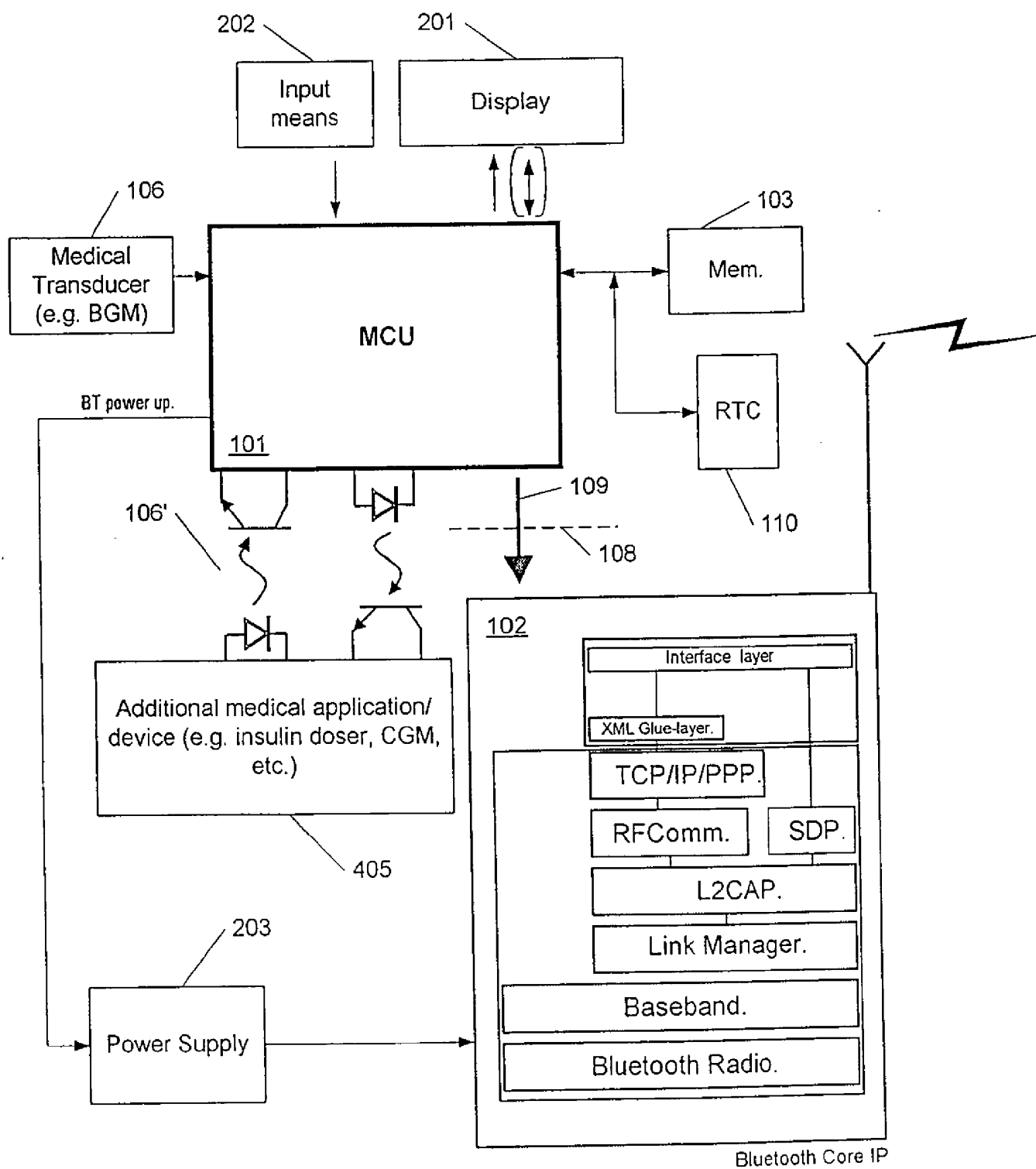


Figure 2

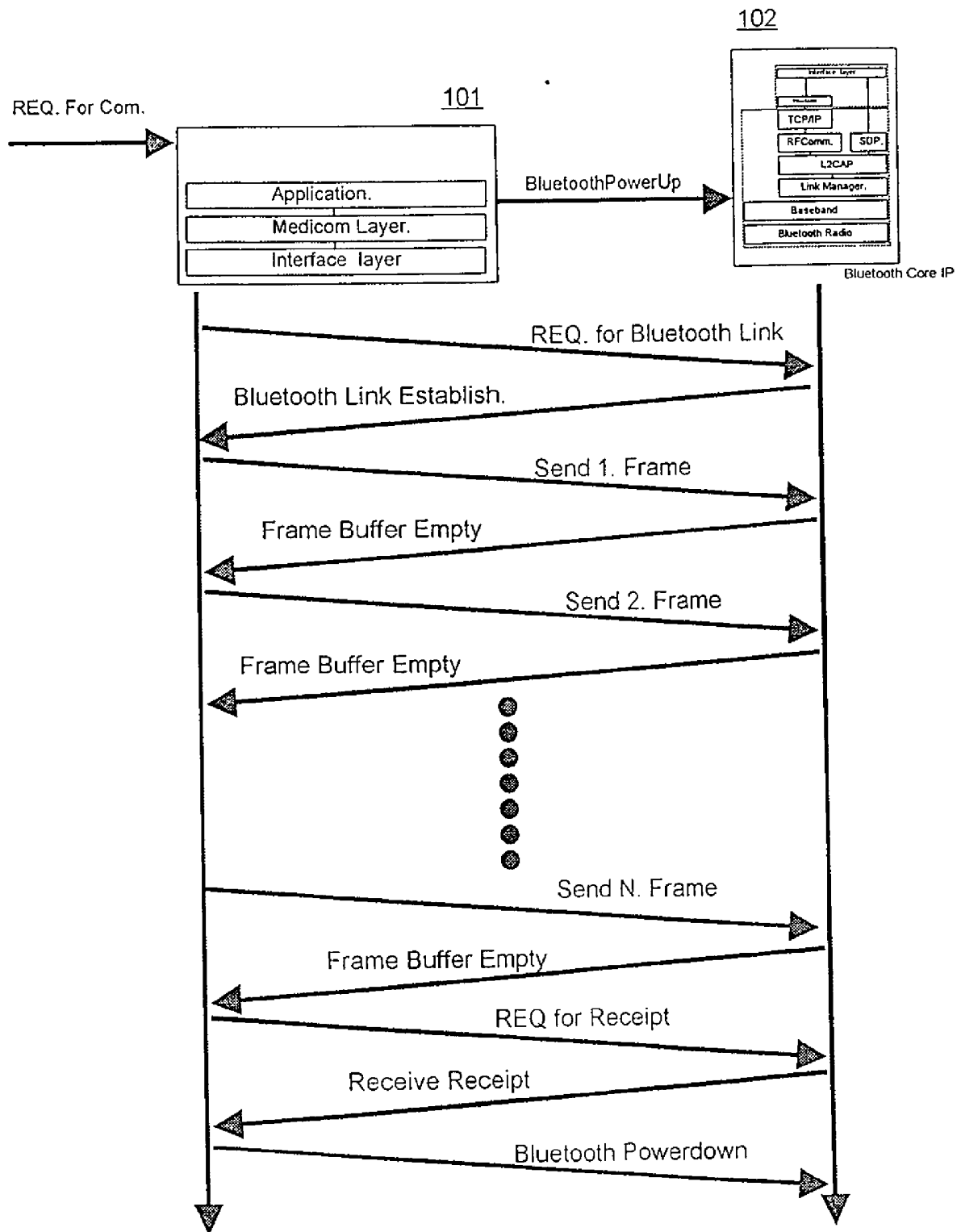


Figure 3

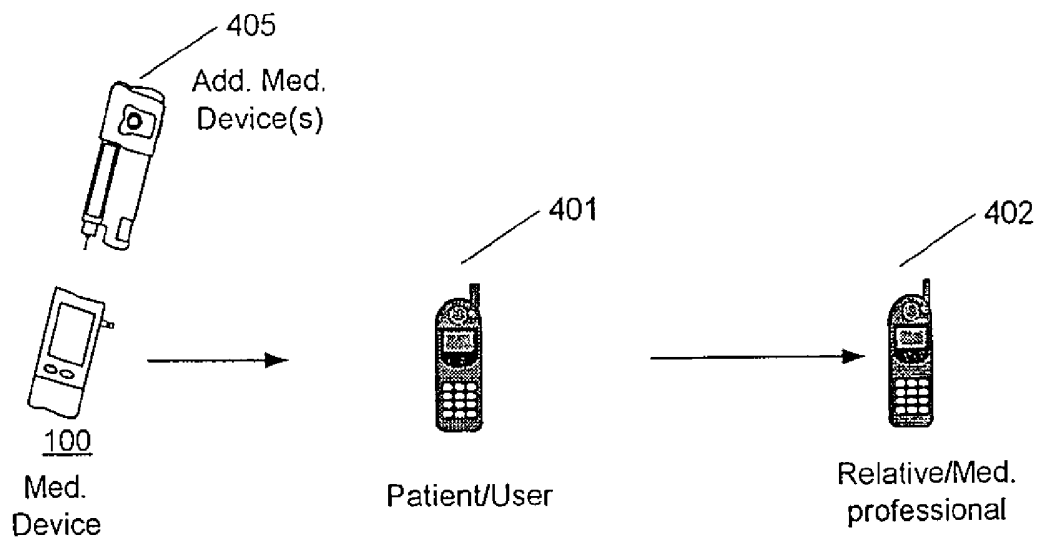


Figure 4a

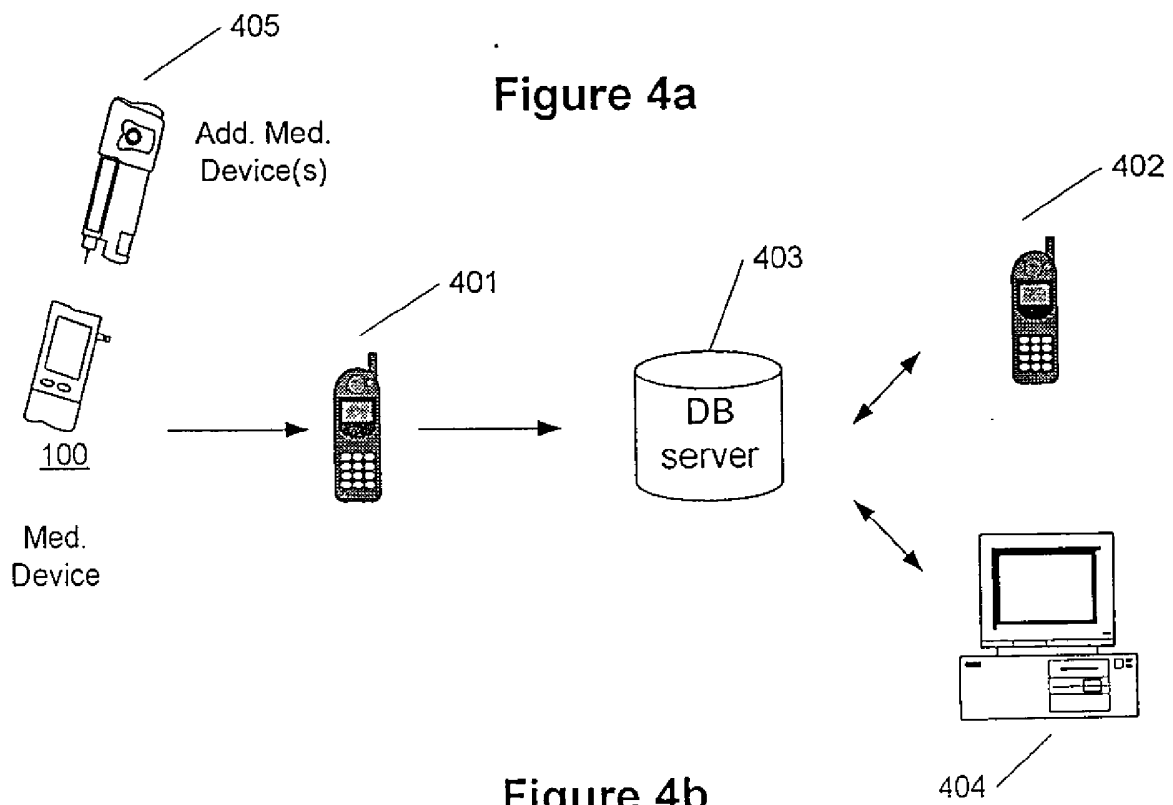


Figure 4b

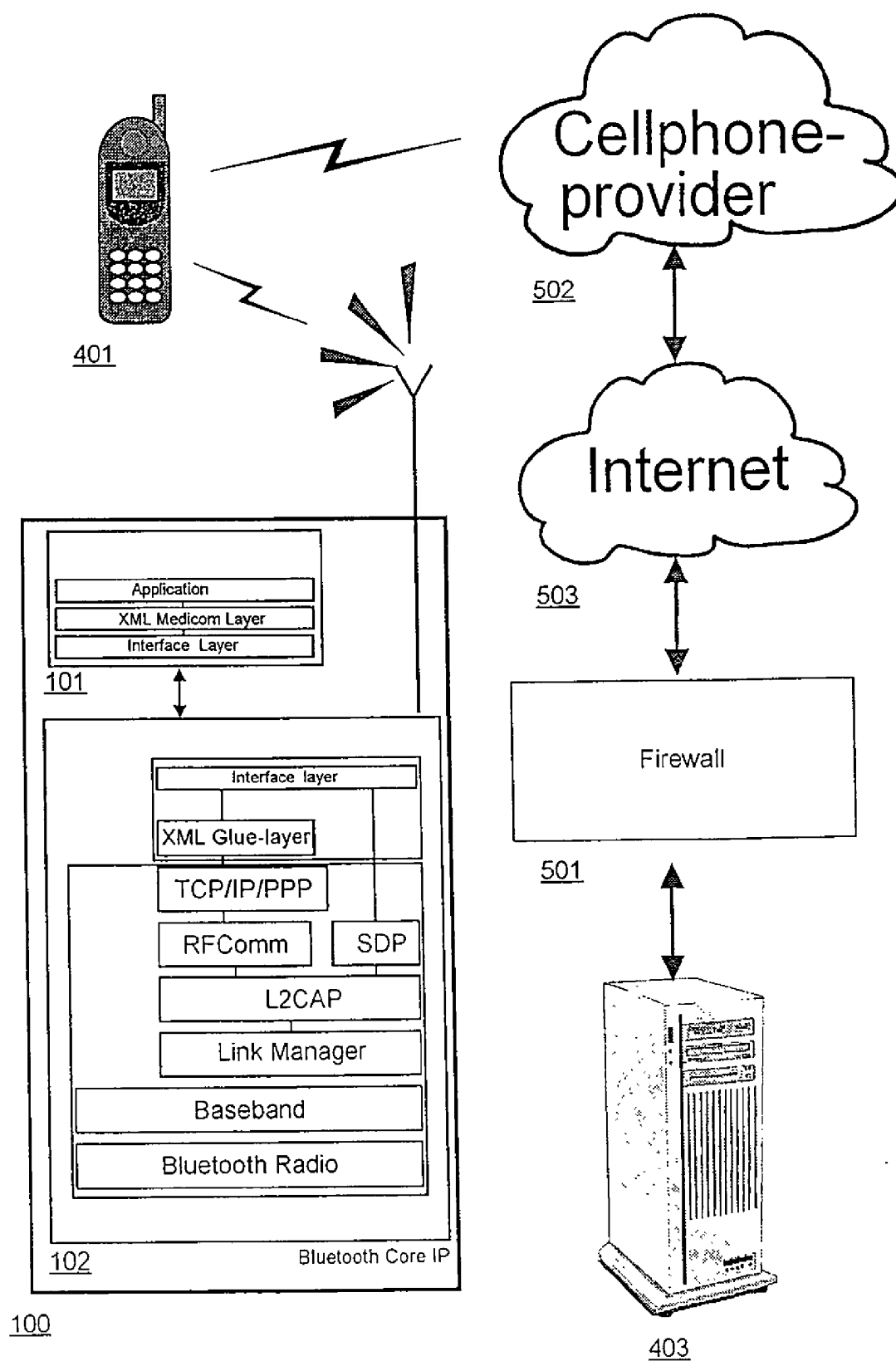


Figure 5

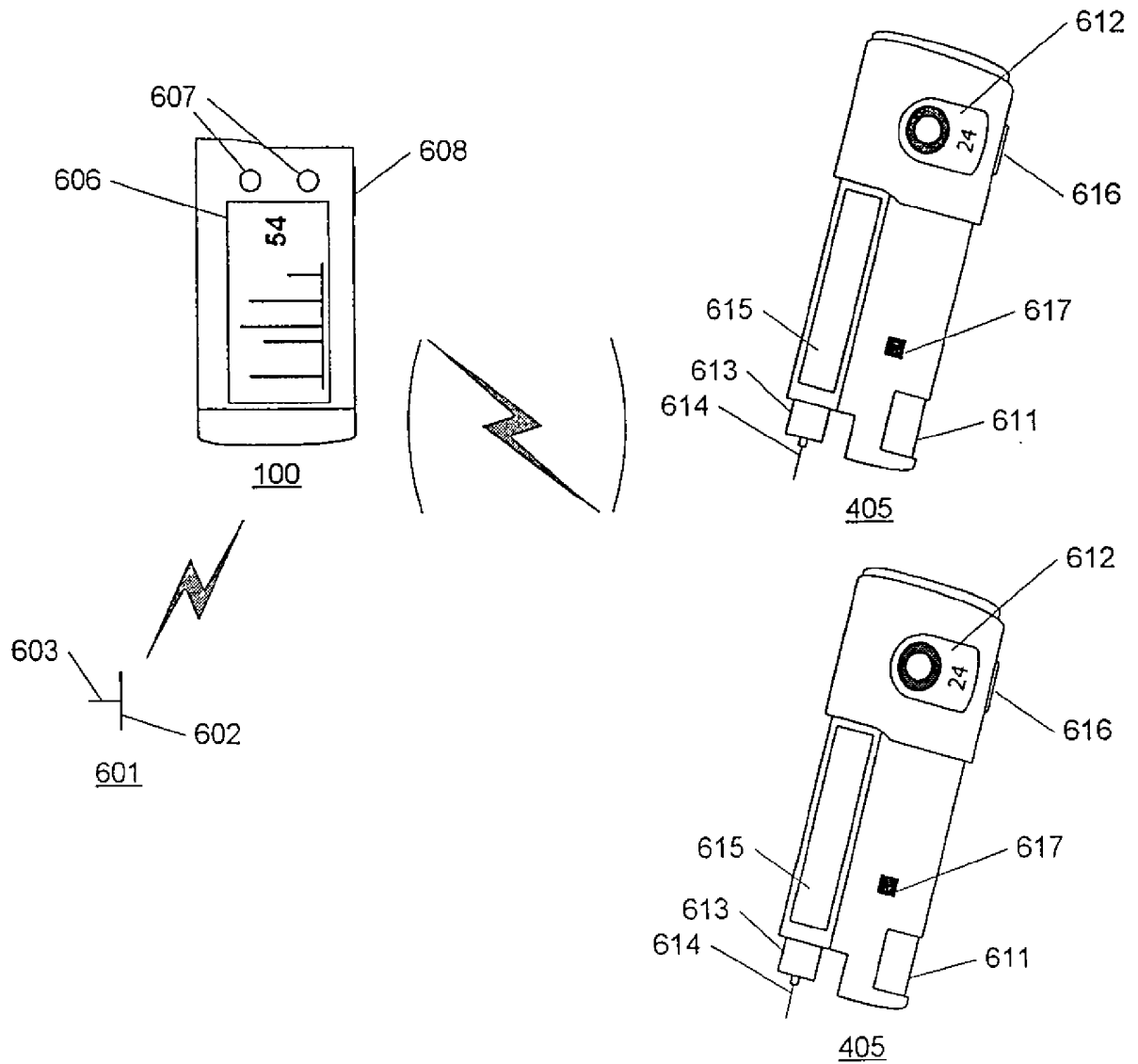


Figure 6a

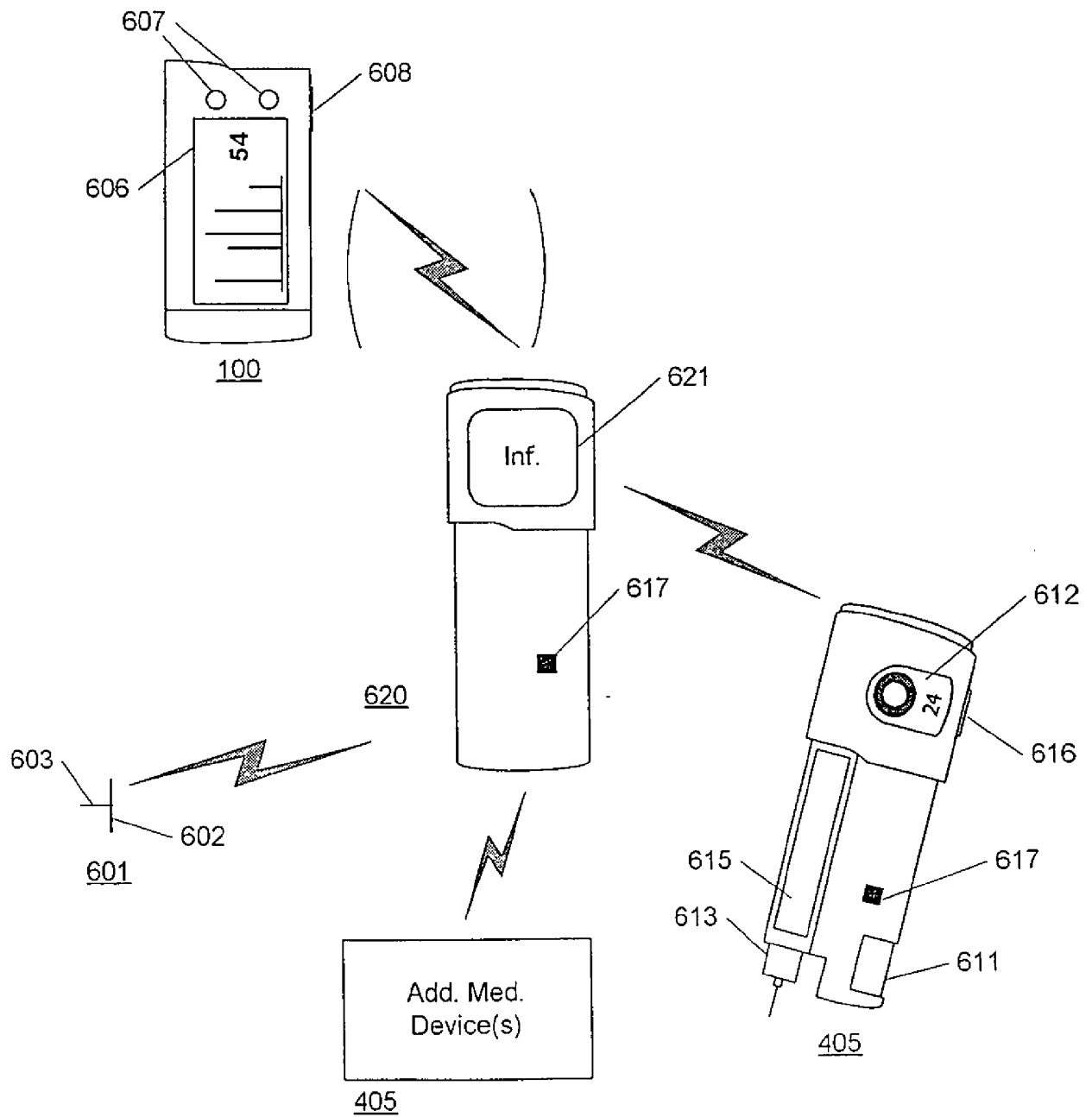


Figure 6b

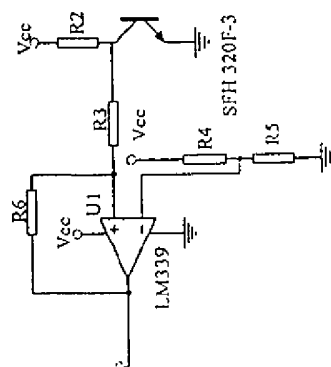
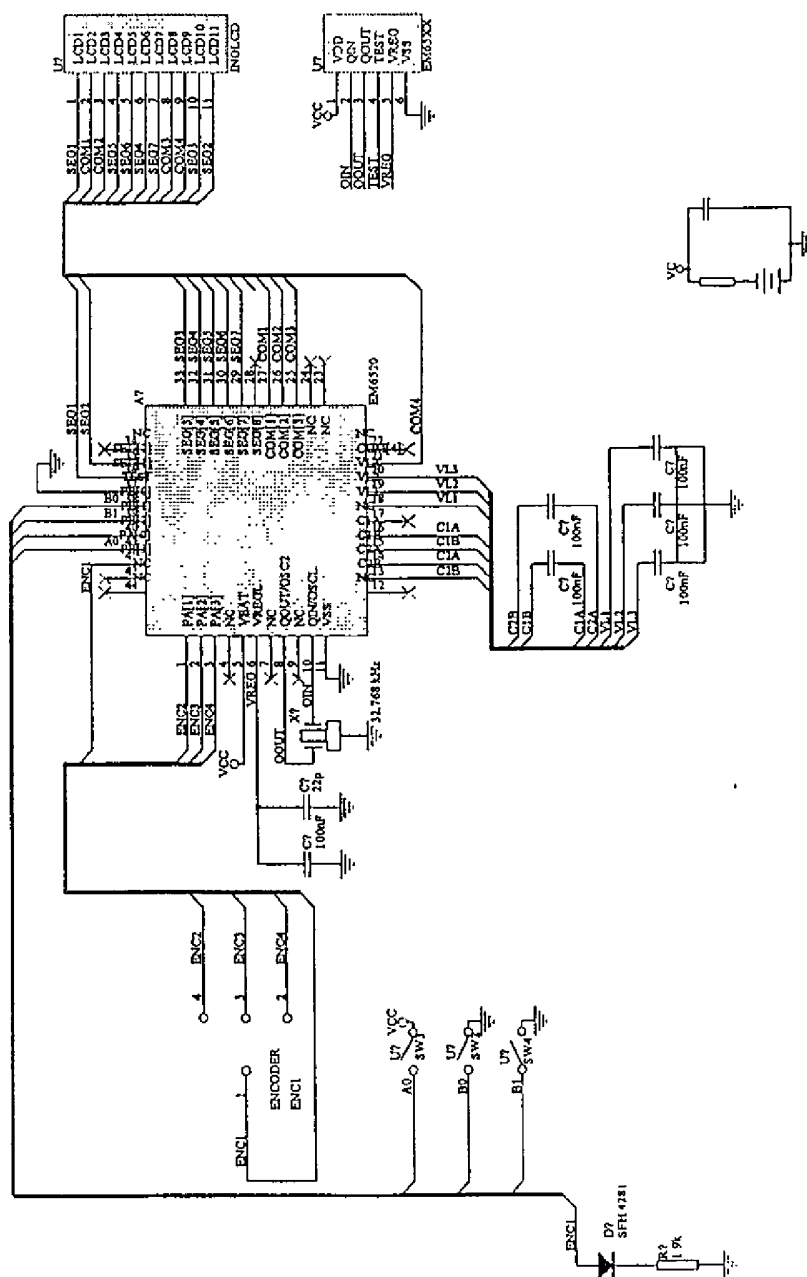


Figure 7a

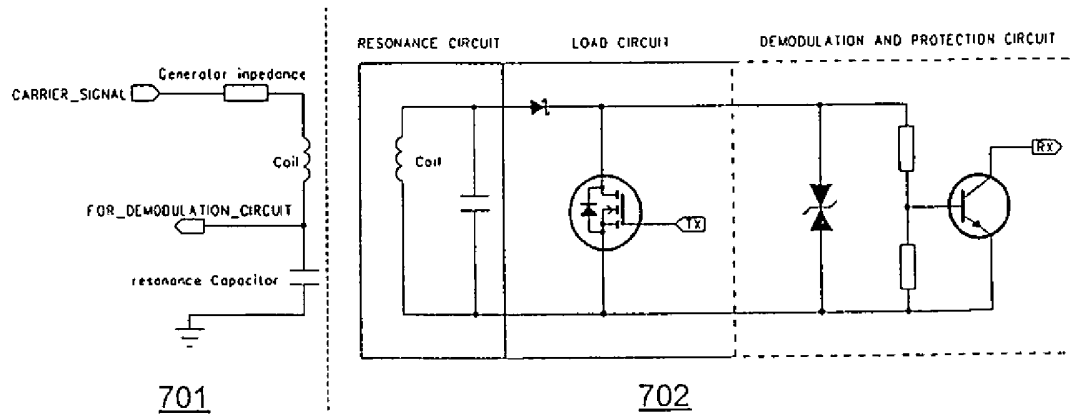


Figure 7c

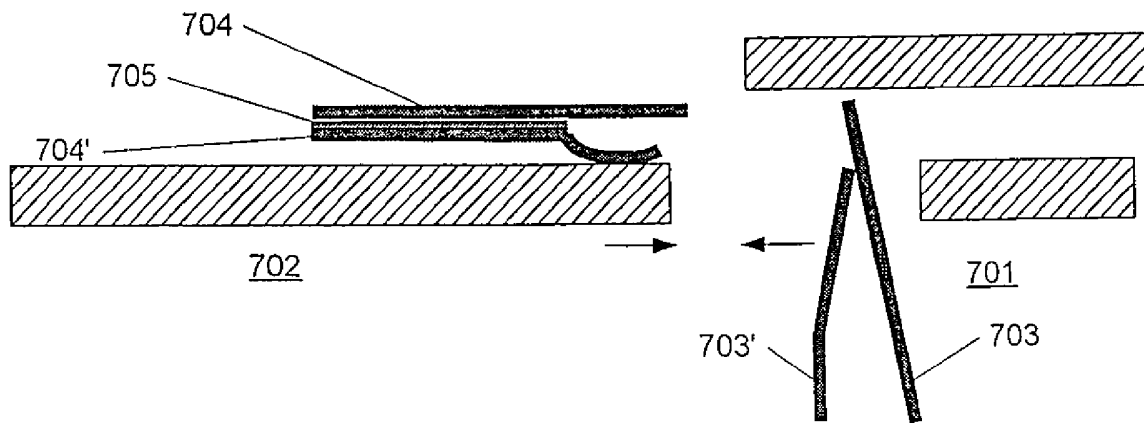


Figure 7b