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(54) **WIRELESS COMMUNICATION DEVICE FOR ELECTRIC METER AND METHOD OF MANUFACTURE THEREOF**

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(*) Notice: This patent is subject to a terminal disclaimer.

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/769,838, filed on Jan. 25, 2001, now Pat. No. 6,462,713, which is a continuation of application No. 09/040,113, filed on Mar. 17, 1998, now Pat. No. 6,181,294.

(51) **Int. Cl.**

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H01Q 1/22	(2006.01)
H01Q 9/04	(2006.01)
H01Q 9/16	(2006.01)

(52) **U.S. Cl.** **343/719**; 340/870.02; 340/870.03

(58) **Field of Classification Search** ..... None
See application file for complete search history.

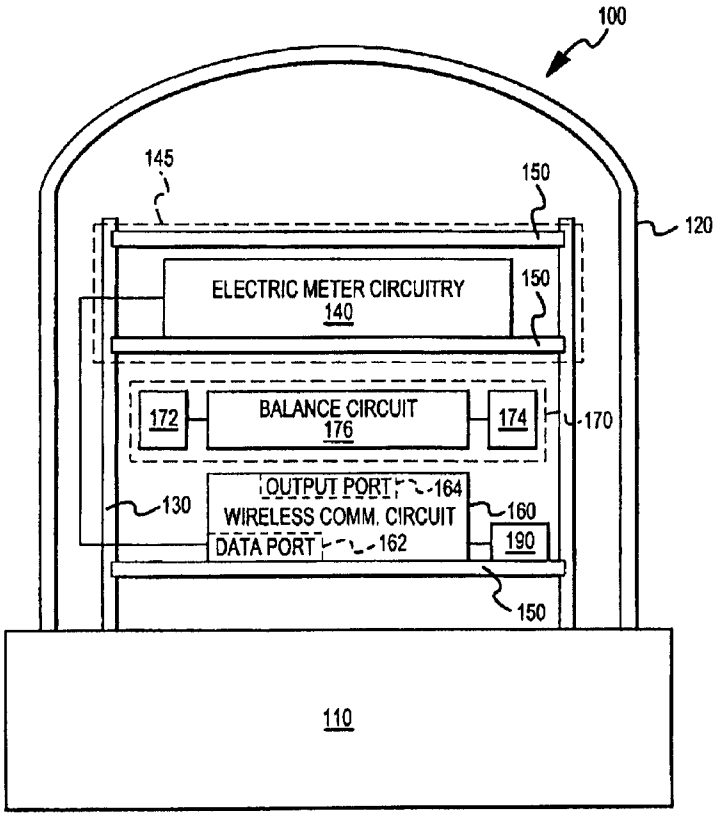
(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/011,432, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

Primary Examiner—Anjan K. Deb

(57) **ABSTRACT**

For use with an electric meter chassis having a dielectric housing protruding therefrom, a wireless communication device that permits information to be communicated to and from the electric meter and a method of manufacturing the same. In one embodiment, the device is comprised of: (1) a communication circuit within the chassis coupled to electric meter circuitry, and (2) an antenna element within the dielectric housing, the antenna element coupled to the communication circuit.



EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1**, **3**, **5**, **8**, **10-11** and **16** is confirmed.

Claims **2**, **4**, **6-7**, **9**, **12-15** and **17-20** are cancelled.

New claims **21-53** are added and determined to be patentable.

21. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communication circuit within said chassis for communicating meter information through said dielectric housing, said wireless communication circuit coupled to electric meter circuitry; and

an antenna element coupled to said wireless communication circuit and located within said dielectric housing.

22. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates power quality information.

23. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates power outrage information.

24. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates site analysis information.

25. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates diagnostic information.

26. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates energy usage.

27. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates power demand.

28. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates power factor.

29. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates time of use.

30. The electric meter chassis as recited in claim 21 wherein said communication circuit communicates interval recordings of energy usage.

31. The electric meter chassis as recited in claim 21 wherein said communication circuit has a carrier frequency of between 700 and 950 megahertz.

32. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communication circuit within said chassis for bidirectionally communicating meter information, said wireless communication circuit coupled to electric meter circuitry; and

an antenna element coupled to said wireless communication circuit and located within said dielectric housing.

33. The electric meter chassis as recited in claim 32 wherein said communication circuit accepts remotely generated operational commands.

34. The electric meter chassis as recited in claim 32 wherein said communication circuit reports data.

35. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communication circuit within said chassis for communicating meter information via a wireless data network, said wireless communication circuit coupled to electric meter circuitry; and

an antenna element coupled to said wireless communication circuit and located within said dielectric housing.

36. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communciation circuit within said chassis for communicating meter information via a wireless communication network, said wireless communication circuit coupled to electric meter circuitry; and

an antenna element coupled to said wireless communication circuit and located within said dielectric housing.

37. The electric meter chassis as recited in claim 36 wherein said wireless communication circuit is configured to communicate said meter information to an electricity provider.

38. The electric meter chassis as recited in claim 36 wherein said wireless communication network is bidirectional.

39. The electric meter chassis as recited in claim 36 wherein said communication circuit accepts remotely generated operational commands.

40. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communication circuit within said chassis for instantaneously communicating meter information, said communication circuit coupled to electric meter circuitry; and

an antenna element coupled to said wireless communication circuit and located within said dielectric housing.

41. The electric meter chassis as recited in claim 40 wherein said communication circuit communicates power outage information.

42. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communication circuit within said chassis for communicating meter information to permit energy usage to be monitored, said communication circuit coupled to electric meter circuitry; and

an antenna element coupled to said wireless communication circuit and located within said dielectric housing.

43. The electric meter chassis as recited in claim 43 wherein said communication circuit receives information.

44. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communication circuit within said chassis for communicating meter information, including receiving information and communicating time of use, said communication circuit coupled to electric meter circuitry; and

an antenna element coupled to said wireless communication circuit and located within said dielectric housing.

45. An electric meter chassis having a dielectric housing protruding therefrom, comprising:

a wireless communication circuit within said chassis for communicating meter information through said dielectric housing, said wireless communication circuit coupled to electric meter circuitry located on one or more circuit boards within said dielectric housing; and

an antenna within said dielectric housing, said antenna coupled to said wireless communication circuit.

46. The electric meter chassis as recited in claim 45 wherein said electric meter circuitry is located on only one of said one or more circuit boards.

47. The electric meter chassis as recited in claim 45 wherein a data port couples said wireless communication circuit to said electric meter circuitry.

48. The electric meter chassis as recited in claim 47 wherein said data port forms at least a portion of said wireless communication circuit.

49. The electric meter chassis as recited in claim 45, further including a capacitively backed up power supply configured to power said electric meter circuitry.

50. The electric meter chassis as recited in claim 45 wherein at least a portion of said antenna is embodied on a circuit board.

51. The electric meter chassis as recited in claim 50 wherein a balance circuit portion of said antenna is embodied on said circuit board.

52. The electric meter chassis as recited in claim 50 wherein said circuit board on which said at least said portion of said antenna is embodied is not said one or more circuit boards said electric meter circuitry is located on.

53. The electric meter chassis as recited in claim 45 wherein antenna elements of said antenna are composed of copper.

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