



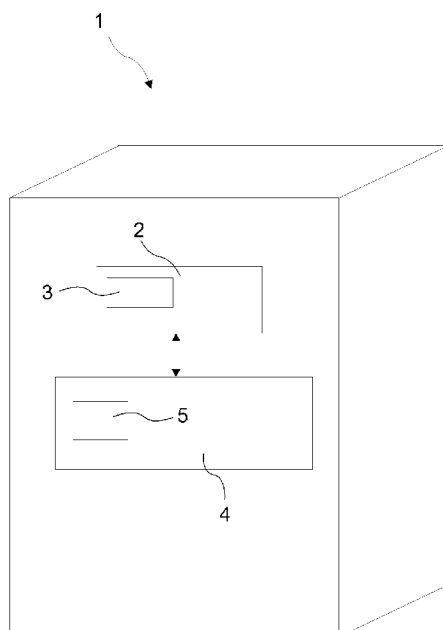
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[Continued on next page]

(54) **Title:** A HOUSEHOLD APPLIANCE

Figure 1



(57) **Abstract:** The present invention relates to a household appliance (1) comprising a network card (2) that provides the connection to the wireless local area network (WLAN), a processor (3) that is disposed on the network card (2) and that enables the network card (2) to be controlled, and a transmission power value (P) defined on the processor (3) by the producer.

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Description**A HOUSEHOLD APPLIANCE**

[0001] The present invention relates to a household appliance which can connect to a wireless local area network (WLAN).

[0002] Today, there is a wireless local area network in almost every home.

Wireless local area networks created by means of modems enable electrical devices, especially smartphones and computers, to connect to the Internet. White goods are known that can connect to the wireless local area network inside the house by means of a card disposed thereon.

Thus, the white goods can be controlled by the user by means of the electronic devices such as smartphones, tablets, etc. that are suitable for installing applications. By means of the application, the user can select the functions of the white goods, transfer the selected programs and functions to the white good and get the information related to the operational state of the white good as notifications via the electronic device he/she uses. The card and the application communicate wirelessly by means of a communication protocol. The factors that affect the wireless communication performance are important for the connection of the white good to the network. The transmission power value which, one of these factors, is defined on the card by the producer. Higher transmission power values provide healthier and more accurate communication with the modem. Thus the wireless communication quality is improved. The transmission power value may change due to the ambient temperature.

The transmission power value reduces as the ambient temperature increases. Therefore, the wireless communication quality is degraded. The producers set the transmission power value lower than the optimal efficiency value so that the transmission power value does not exceed the standard limit value in lower ambient temperatures. However, the transmission power value that further decreases at room temperature causes problems in the wireless local area connection. The device that is disconnected from the network due to connection problems cannot be controlled.

[0003] In the state of the art European Patent Document No. EP1131906, a

method for changing the transmission power value of a mobile device is disclosed.

[0004] The aim of the present invention is the realization of a household appliance wherein the transmission power value that affects the wireless communication quality is kept within the optimal range.

[0005] The household appliance realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a network card that provides the connection to the wireless local area network in the environment. A processor that controls the connection is provided on the network card. The transmission power value that affects the quality of the connection and changes according to the ambient temperature is defined on the processor by the producer.

[0006] The household appliance of the present invention comprises the processor that enables the transmission power value to change according to the ambient temperature. The optimal transmission power values according to the ambient temperature are defined on the processor by the producer. By detecting the changing ambient temperature, the transmission power value is determined according to the temperature value defined on the processor.

[0007] In an embodiment of the present invention, the household appliance comprises a control card that is in constant communication with the network card and a temperature sensor that is disposed on the control card. The control card manages the functions of the household appliance and enables the household appliance to connect to the wireless local area network by being in communication with the network card. The ambient temperature information is received from the temperature sensor disposed on the control card and transmitted to the network card. Thus, the transmission power value that is suitable for the ambient conditions is obtained.

[0008] In an embodiment of the present invention, the network card comprises a temperature sensor. By means of the temperature sensor, the ambient temperature is detected and the suitable transmission power value is obtained.

- [0009] In an embodiment of the present invention, the network card comprises a threshold transmission power value predefined on the processor by the producer. The processor enables the transmission power value to be kept below the threshold value.
- [0010] In an embodiment of the present invention, the transmission power value is monitored continuously by the network card the processor.
- [0011] In an embodiment of the present invention, the control card and the network card communicate with each other via serial cable connection. Thus, the household appliance is enabled to connect to the local area network.
- [0012] The household appliance of the present invention can be a washer, a drier, a cooker or a cooler.
- [0013] The household appliance realized in order to attain the aim of the present invention is illustrated in the attached figures, where:
- [0014] Figure 1 - the schematic view of the household appliance comprising the first temperature sensor.
- [0015] Figure 2 - the schematic view of the household appliance comprising the second temperature sensor.
1. Household appliance
 2. Network card
 3. Processor
 4. Control card
 5. 1st temperature sensor
- [0016] 105- Second temperature sensor
- [0017] The household appliance (1) comprises a network card (2) that provides the connection to a wireless local area network (WLAN) and a processor (3) that is disposed on the network card (2) and that enables the network card (2) to be controlled. The target transmission power value (P_t) is prerecorded to the processor (3) by the producer. The transmission power value (P_i) affects the quality of the connection of the household appliance (1) to the wireless local area network and changes due to the ambient temperature.
- [0018] The processor (3) to which the optimum transmission values for ambient

temperatures are prerecorded by the producer enables the transmission power value (P) to change according to the ambient temperature. There is a certain optimum transmission power value (Po) that enables the household appliance (1) to have a high quality connection with the local area network. The optimum transmission power values (Po) change according to the ambient temperature and the optimum transmission power values dependent on the ambient temperature is recorded on the processor (3). By changing the transmission power value (P) according to the changing ambient temperature, the quality of the connection of the household appliance (1) to the local area network is improved.

[0019] In an embodiment of the present invention, the household appliance (1) comprises a control card (4) that communicates with the network card (2), a first temperature sensor (5) that is disposed on the control card (4) and that detects the ambient temperature, and the network card (2) having the processor (3) that enables the transmission power value (P) to change according to the temperature information received from the control card (4). The control card (4) controls the operation of the functions of the household appliance (1). By communicating with the network card (2), the control card (4) enables the household appliance (1) to connect to the local area network. The ambient temperature is measured by means of the first temperature sensor (5) disposed on the control card (4). The information related to the measured ambient temperature can be transferred from the control card (4) to the network card (2). Thus, the network card (2) enables the transmission power value (P) to reach the optimum value according to the ambient temperature by the network card (2). (Figure 1).

[0020] In an embodiment of the present invention, the household appliance (1) comprises a second temperature sensor (105) that is disposed on the network card (2) and that provides the detection of the ambient temperature, and the network card (2) having the processor (3) that enables the transmission power value (P) to change according to the information received from the second temperature sensor (105). The ambient temperature is detected by means of the second temperature

sensor (105) and the transmission power value (P) is changed accordingly. (Figure 2).

- [0021] In an embodiment of the present invention, the network card (2) comprises the processor (3) that has a threshold transmission power value (P_m) predefined by the producer and that enables the transmission power value (P) to be kept below threshold transmission power value (P_m). A threshold transmission power value (P_m) is provided so that the household appliance (1) complies with certain standards. The transmission power value (P) is required to be below the threshold transmission power value (P_m). The optimum power transmission value (P_o) that is determined according to the ambient temperature is defined so as to be below the threshold value (P_m). Thus, the household appliance (1) is enabled to comply with the standards.
- [0022] In an embodiment of the present invention, the processor (3) enables the transmission power value (P) to be controlled by the network card (2). The network card (2) controls the transmission power value (P) continuously by means of the processor (3). Thus, the transmission power value (P) is enabled to change according to changing ambient conditions.
- [0023] In an embodiment of the present invention, the household appliance (1) comprises the network card (2) that provides serial cable communication (UART) with the control card (4). Thus, the control card (4) and the network card (2) is enabled to be in constant communication. The information obtained from the control card (4) can be transmitted to the network card (2) serially.
- [0024] The household appliance (1) of the present invention can be a washer, a drier, a cooker or a cooler.
- [0025] By means of the household appliance (1) of the present invention, the transmission power value (P) is kept within the optimal range. Thus, the quality of connection of the household appliance (1) to the wireless local area network is improved. Furthermore, problems such as disconnection are avoided.

Claims

1. A household appliance (1) comprising network card (2) that provides the connection to the wireless local area network (WLAN), a processor (3) that is disposed on the network card (2) and that enables the network card (2) to be controlled, and a transmission power value (P) defined on the processor (3) by the producer **characterized in that**, the network card (2) comprising the processor (3) to which the optimum transmission values for ambient temperatures are prerecorded by the producer enables the transmission power value (P) to change according to the ambient temperature
2. A household appliance (1) as in Claim 1, **characterized by** a control card (4) that communicates with the network card (2), a first temperature sensor (5) that is disposed on the control card (4) and that detects the ambient temperature and the network card (2) having the processor (3) that enables the transmission power value (P) to change according to the temperature information received from the control card (4).
3. A household appliance (1) as in any one of the above claims, **characterized by** a second temperature sensor (105) that is disposed on the network card (2) and that enables the detection of the ambient temperature, and the network card (2) having the processor (3) that enables the transmission power value (P) to change according to the information received from the second temperature sensor (105).
4. A household appliance (1) as in any one of the above claims, **characterized by** the network card (2) comprising the processor (3) that has a threshold transmission power value (P_m) predefined by the producer and that enables the transmission power value (P) to be kept below the threshold transmission power value (P_m).
5. A household appliance (1) as in any one of the above claims, **characterized by** the processor (3) that enables the transmission power value to be controlled by the network card (2).
6. A household appliance (1) as in any one of the above claims, **characterized by** the network card (2) that is connected to the control card (4) via serial cable connection (UART).
7. A household appliance (1) as in any one of the above claims, which is a

washer.

8. A household appliance (1) as in any one of the claims 1 to 6, which is a dryer.
9. A household appliance (1) as in any one of the claims 1 to 6, which is a cooker.
10. A household appliance (1) as in any one of the claims 1 to 6, which is a cooler.

Figure 1

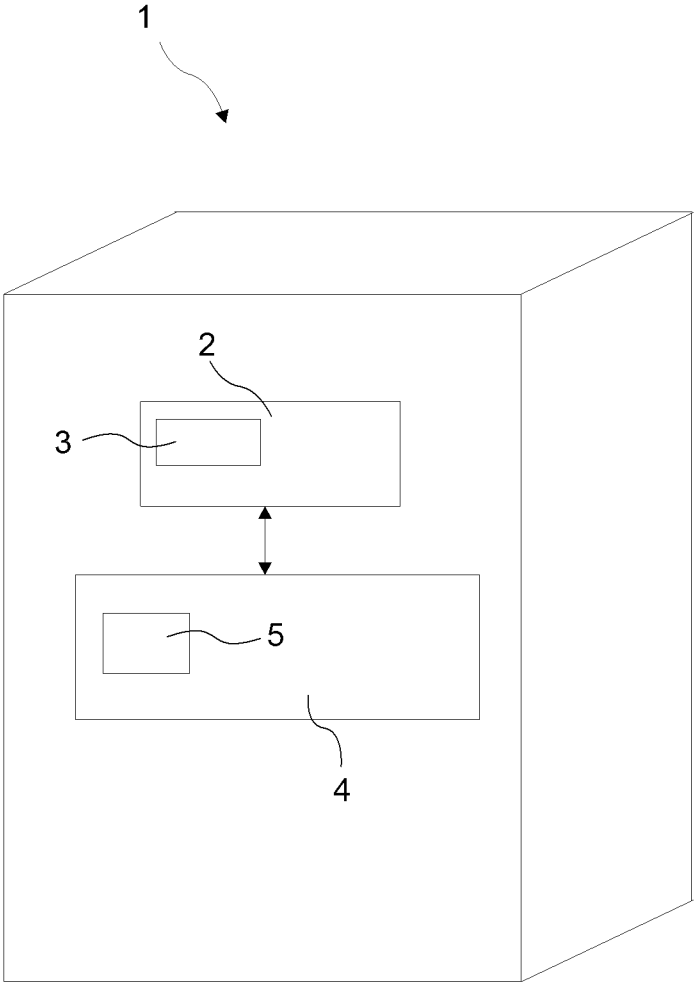
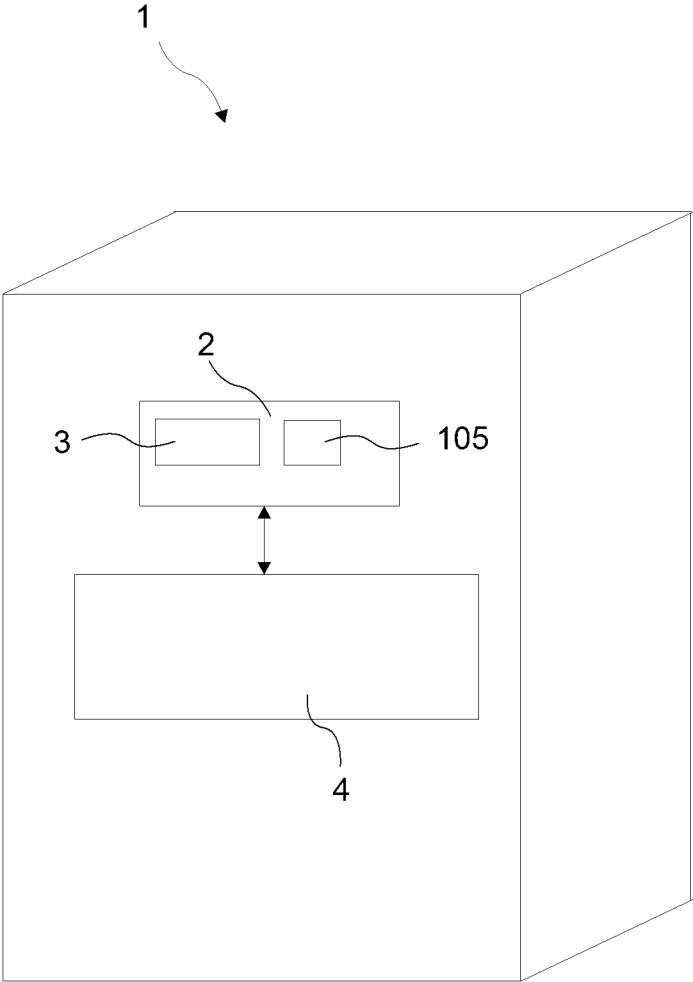


Figure 2



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/054851

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04W52/22

ADD. H04W52/36 H04L12/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04W H04L H04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/77950 A1 (QUALCOMM INC [US]) 21 December 2000 (2000-12-21) claims 1-29 figures 4,7,8 page 8, line 29 - page 13, line 9 -----	1-10
X	US 2014/156081 A1 (HA MIKYUNG [KR]) 5 June 2014 (2014-06-05) claim 1 figure 11 paragraph [0001] - paragraph [0007] paragraph [0035] - paragraph [0037] ----- -/-	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/054851

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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