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**Datasheet for the decision  
of 7 October 2021**

**Case Number:** T 1405/14 - 3.5.06

**Application Number:** 07749805.3

**Publication Number:** 2010987

**IPC:** G06F1/16

**Language of the proceedings:** EN

**Title of invention:**

COMPUTING DEVICE ANTENNA IDENTIFICATION SYSTEM AND METHOD

**Applicant:**

Hewlett-Packard Development Company, L.P.

**Headword:**

Computing Device Antenna Identification/HEWLETT-PACKARD

**Relevant legal provisions:**

EPC 1973 Art. 56

RPBA 2020 Art. 13(2)

**Keyword:**

Inventive step - (no)

Amendment to case - amendment admitted (yes)

**Decisions cited:**

T 1294/16

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 1405/14 - 3.5.06

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.06**  
**of 7 October 2021**

**Appellant:** Hewlett-Packard Development Company, L.P.  
(Applicant) 10300 Energy Drive  
Spring TX 77389 (US)

**Representative:** Zimmermann, Tankred Klaus  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 24 January 2014  
refusing European patent application No.  
07749805.3 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** M. Müller  
**Members:** A. Teale  
B. Müller

## **Summary of Facts and Submissions**

I. This is an appeal against the decision, dispatched with reasons on 24 January 2014, to refuse European patent application No. 07 749 805.3 on the basis that the subject-matter of claim 1 did not involve an inventive step, Article 56 EPC, in view of the following document:

D1: EP 0 987 618 A1.

II. The International Search Report also mentioned the following document (hereinafter referred to as D2):

D2: EP 1 503 450 A1.

III. With a notice and grounds of appeal and the appeal fee, all received on 21 March 2014, the appellant filed amended claims according to an auxiliary request. The appellant requested that the decision be set aside and that a patent be granted based on either the main request, with the claims as per the decision, or the auxiliary request. Oral proceedings were requested as an auxiliary request.

IV. In an annex to a summons to oral proceedings the board introduced D2, Article 114(1) EPC, and expressed the following provisional view on the appeal. The subject-matter of claim 1 of the main request seemed to lack inventive step, Article 56 EPC 1973, in view of D1 and the common general knowledge of the skilled person, as evidenced by D2. The subject-matter of claim 1 of the auxiliary request seemed to lack inventive step, Article 56 EPC 1973, in view of the combination of D1,

D2 and the common general knowledge of the skilled person.

V. With a response received on 19 July 2021 the appellant filed amended claims replacing those of the auxiliary request. The appellant stated that "neither the Applicant nor the undersigned Representative of the Applicant shall attend the Oral Proceedings" and requested a decision on the state of the file taking into account the appellant's comments in the same response on the board's provisional view. The oral proceedings were subsequently cancelled.

VI. The application is thus being considered in the following form:

Description (both requests):  
pages 2 to 6, as originally filed, and 1, 1a and 1b, received on 19 July 2010.

Claims:  
Main request: 1 to 3, received on 7 October 2013.  
Auxiliary request: 1 to 3, received on 19 July 2021.

Drawings (both requests):  
Pages 1/2 to 2/2, as originally filed.

VII. Claim 1 of the main request reads as follows:

"1. A portable computing device (12) antenna identification system (10), comprising:  
an antenna (26) configured to be disposed in the portable computing device (12), the antenna (26) having a first sensor connector (70) uniquely configured to transmit a binary signal indicative of an identity of the antenna (26),

wherein the first sensor connector (70) comprises a plurality of sensor connector elements (70<sub>1</sub> - 70<sub>4</sub>), wherein one of the plurality of sensor connector elements (70<sub>1</sub>) is configured as a ground element and the remaining connector elements (70<sub>2</sub> - 70<sub>4</sub>) are configured as signal elements couplable to a voltage source,  
wherein selected ones of the signal elements (70<sub>2</sub> - 70<sub>4</sub>) are bridged to the ground element (70<sub>1</sub>) to transmit a unique binary signal indicative of the identity of the antenna (26), and  
wherein the first sensor connector (70) is couplable to a second sensor connector (72) disposed in the portable computing device (12)."

VIII. Claim 1 of the auxiliary request has been restricted with respect to that of the main request by adding the following features:

- i. The antenna (26) is configured to be "integrated" (previously: disposed) in the portable computing device.
- ii. The antenna is coupled to a wireless module (24) of the portable computing device (12) via a cable (50, 52), the cable (50, 52) for transmitting communication signals and power/ground signals between the antenna (26) and the wireless module (24).
- iii. The antenna (26) comprising an antenna portion (60) and an identification portion (62).
- iv. The antenna portion (60) having one or more antennas (64, 66) for transmitting/receiving wireless signals, and the identification area (62) having a first sensor connector (70).

- v. The binary signal indicative of the identity of the antenna (26) is transmitted to the wireless module (24).
- vi. The connector elements (70<sub>1</sub> - 70<sub>4</sub>) are couplable to a voltage source via the cable (50, 52).
- vii. The first sensor connector is directly couplable to the second sensor connector.
- viii. The first sensor connector (70) is for communicating the unique signal indicative of the identity of antenna (26) via the second sensor connector (72) to the wireless module (24).

## **Reasons for the Decision**

- 1. Summary of the invention
  - 1.1 The application relates to a portable computing device, such as a notebook/laptop (see figure 1; 12 and page 2, line 8), which can be configured to use a variety of different antennas (26). The invention concerns how the computer identifies the antenna. As shown in figure 2, the solution lies in each antenna comprising an identification portion (62) having a "sensor connector" (72) which is couplable to a corresponding sensor connector (72) mounted in the display (18) of the laptop. The antenna sensor connector (70) communicates a unique signal indicative of the antenna type to the laptop sensor connector (72) with which the wireless module in the laptop can identify the antenna; see [11].
  - 1.2 The corresponding sensor connectors (70, 72) comprise a plurality of conductor elements (70<sub>1</sub>, 70<sub>2</sub>, 70<sub>3</sub>, 70<sub>4</sub>) for

transmitting a unique binary signal indicative of the antenna type to the laptop; see [12]. Figures 3A-3C show how different combinations of three conductor elements (70<sub>2</sub>, 70<sub>3</sub>, 70<sub>4</sub>) may be connected to a ground element (70<sub>1</sub>) to express three binary digits, i.e. eight different binary signal combinations; see [13-14].

2. The board's understanding of the invention

2.1 The expression in claim 1 of both requests "an antenna configured to be disposed in the portable computing device" is not understood literally to mean any location in the device, as the notebook could screen the antenna, preventing signals from being transmitted and received, but rather in the light of figure 2, which shows the antenna (26) integrated into the edge of the display member (screen 18), as meaning that the antenna is disposed in a peripheral part of the computing device, thus allowing signals to be transmitted and received.

2.2 Although claim 1 of the main request does not set out a wireless module, the board understands the claim to cover the antenna comprising other circuitry, such as a wireless module. Hence the claim covers an antenna with a WLAN, Bluetooth or GSM module inserted into the portable computing device. It is only in the auxiliary request that it is specified that a wireless module is already present in the computing device. Claim 1 of the auxiliary request covers antennas for different regional WLAN or GSM bands, or antennas with different gains (omnidirectional for short range, directional for long range), being inserted into the computing device.



3. The prior art on file

3.1 Document D1 (EP 0 987 618 A1)

3.1.1 D1 relates to a laptop having an expansion bay (see figure 2; 70) into which one of eight different expansion devices, such as a floppy disk (110) or a power adapter (180), can be inserted; see [36]. All expansion devices have essentially the same external geometry so that they all fit into the same expansion bay; see [47]. As shown in figure 3, a connector (95) on the inserted expansion device mates with a connector (45) in the laptop (40).

3.1.2 As shown in figures 23 and 26, each different type of expansion device is identified via the connectors (95,45) to a discriminating unit (210) in the laptop by means of the three ID lines ID0-ID2. As indicated by the dashed lines on the left of the figure, the expansion device can connect each of the ID lines to ground (GND) or let it float, in which case it will be pulled high by the pull-up resistor in the notebook. According to [77],

"The discriminating unit 210 has three ID lines ID1, ID2, ID3 so that one of the lines connected to the ground differs from drive to drive which is attached to the bay housing 70. That is, each of the eight types of the drive units can be discriminated based on a combination of a high signal "1" and a low signal "0" of the three ID lines [...]. More specifically, for example, when the floppy disk drive 110 is attached to the bay housing 70, the signal level of the ID lines becomes "001" whereas the signal level becomes "000"

when the CD-ROM drive 130 is attached to the bay housing 70."

- 3.1.3 The appellant has argued that the discriminating unit (210) in D1 is in the notebook. The board sees the discriminating unit as the combination of the circuitry in the expansion device with that in the notebook. Figure 23 shows three ID lines passing from the drive (110) (left) to the notebook (right), three possible connections in the drive between a respective ID line and ground (GND), and three pull-up resistors in the notebook. Although figure 23 labels the right-hand part "210", implying that the discriminating unit is in the notebook, the board interprets the whole figure as the discriminating unit, its 3-bit output signal being the three ID lines on the right. The binary signal is produced by a potential divider formed by the combination of the drive and the notebook when they are connected. The resistances in the drive are either 0 (short to ground) or infinite (open circuit), and those in the notebook are the pull-up resistors, their ratio for each ID line determining whether a binary "1" or "0" is produced.
- 3.1.4 The appellant has pointed to the statement in D1 that "one of the lines connected to the ground differs from drive to drive" and interprets this as meaning that in D1 a drive will cause "all but one of the pull-up resistors to pull the signal level on the respective signal line to a high level", i.e. that only the following three ("1 of N", rather than binary) ID signals are possible: "011", "101" and "110".
- 3.1.5 The board does not accept this interpretation of D1 in view of the statement in [77] that "each of the eight types of the drive units can be discriminated based on

a combination of a high signal "1" and a low signal "0" of the three ID lines [...] and the fact that "000", which is not in "1 of N" format, identifies the CD-ROM drive. The board consequently finds that the person skilled in the art of portable computing devices would recognise, in this context, that the statement that "one of the lines connected to the ground differs from drive to drive" should at least be interpreted broadly, or even regarded as an error, and understood to mean that "one **or more** of the lines connected to the ground differs from drive to drive". Given the fact that eight options are represented by three binary ID lines, it is directly and unambiguously derivable from D1 that a three bit binary identity signal passes from the drive to the notebook in D1.

- 3.1.6 The board regards the connector (111,131,141, etc.) on each expansion device as a first sensor connector in the claims. The corresponding connector (figure 3; 45) in the expansion bay of the notebook is seen as the second sensor connector in the claims. In the following, the term "accessory" has been used as a general term covering both the expansion devices of D1 and the antenna in the claim. Otherwise, in the terms of claim 1 of the main request, D1 discloses:

A portable computing device accessory identification system, comprising: an accessory (floppy disk drive 110) configured to be disposed in the portable computing device (see expansion bay 73), the accessory having a first sensor connector (111) uniquely configured to transmit a binary signal indicative of an identity of the accessory (ID1-ID3), wherein the first sensor connector (111) comprises a plurality of sensor connector elements (ID1-ID3),

wherein one of the plurality of sensor connector elements (a ground return is implicit in figure 23) is configured as a ground element and the remaining connector elements (ID1-ID3) are configured as signal elements couplable to a voltage source (the expansion device does not contain a voltage source, so it must be in the notebook), wherein selected ones of the signal elements (the grounded ones) are bridged to the ground element (GND) to transmit a unique binary signal indicative of the identity of the accessory, and wherein the first sensor connector (111) is couplable to a second sensor connector (45) disposed in the portable computing device (12).

3.2 Document D2 (EP 1 503 450 A1)

3.2.1 D2 discloses an insertable PCMCIA (Personal Computer Memory Card International Association) IEEE 802.1b (the board interprets this as IEEE 802.11b, i.e. "WiFi", a type of WLAN) or Bluetooth radio LAN accessory (see [5]) for a portable computer, the accessory comprising two antennas, namely an inverted F-type (11) and a meander line (13) (see figure 8 and [32]), which are flush with the outer casing of the computer when the accessory is inserted into it; see figure 7.

3.2.2 The board understands the PCMCIA card to comprise not only the antenna but also the corresponding wireless module; see [45] and figure 10; RF module 35. There is no disclosure of how the accessory is identified to the computer.

4. Main request, inventive step, Article 56 EPC 1973

4.1 The appellant has not commented on the board's provisional opinion concerning the main request, and

the board sees no reason to deviate from that assessment, set out below.

4.2 According to the appealed decision, the subject-matter of claim 1 (the same as claim 1 of the present main request) differed from the disclosure of D1 in the identification system identifying an antenna. Extending the teaching of D1 to the identification of an antenna connected to the portable computing device would have been a usual matter of design for the skilled person, since an antenna can also be considered to be a device accessory. D1, in particular figure 23, which showed a removable accessory, did not disclose many details regarding the connector and ID network circuit. Starting from figure 23, the skilled person, for example an electronics engineer, would have known how to implement the ID network, for instance using DIP (Dual In-line Package) switches, figure 23 disclosing the relevant elements, namely the connection to ground, the pull-down (or pull-up) resistors and their presence in the accessory device. Hence D1 disclosed how the ID network was implemented. It was also at least implicit in D1 that the ID lines were available in the connectors, so that the device could identify the inserted accessory.

4.3 The appellant has argued that D1 does not disclose the circuitry in the expansion device, such as a floppy disk drive (110), that was connected to the three ID lines, so that there was no explicit disclosure in D1 of a binary identification signal passing to the notebook. In D1 this signal was generated inside the notebook in the discriminating device shown in figure 23. In the light of the arrow in figure 23, the appellant argued that the expansion device caused all but one of the pull-up resistors to pull the signal

level on the respective ID line to a high level. The board understands this to mean that the expansion device presents an open circuit to all but one line, that line being shorted to ground. On this interpretation, so the appellant, the approach of D1 was disadvantageous in requiring more circuitry in the expansion devices and in that a failure of one of the pull-up resistors caused the expansion device to be incorrectly identified. The invention provided a simpler and more reliable identification system than that known from D1 because the functionality of generating the antenna ID signal was in the antenna portion. According to the invention, the first sensor connector (see figure 2; 70) did not comprise switches which had to be set in accordance with the antenna type. Instead, the contacts 70<sub>1</sub>-70<sub>4</sub> were wired as a ground element 70<sub>1</sub> and three signal elements 70<sub>2</sub>-70<sub>4</sub> so that they yielded three high or low signals when they were connected to a voltage source. By bridging the appropriate signal elements to the ground element, a binary antenna identification code was produced; see figures 3A to 3C. These signals were passed by cable 74 to the wireless module 24 to identify the antenna portion 60.

- 4.4 Turning to the auxiliary request, which further set out the wireless module, cable, antenna portion and identification portion, the appellant argued that these features provided a more detailed definition of the inventive approach of moving the functionality of generating the antenna identity signal into the antenna.
- 4.5 The board finds that there is no difference between the subject-matter of claim 1 and D1 regarding the derivation of a binary ID signal, since both use a

potential divider with the voltage source being in the notebook. Moreover both arrangements would produce the wrong binary output signal (an intermediate floating value rather than high), if a pull-up resistor in the notebook failed (by going open circuit). The only difference between the subject-matter of claim 1 of the main request and the disclosure of D1 is that the accessory is an antenna. This was also the finding of the examining division.

4.6 The question arises of whether it would have been obvious at the priority date to provide a notebook with exchangeable antenna accessories. In view of D2, the board finds that accessories comprising antennas for portable computers were known at the priority date and would have been a matter of common general knowledge for the skilled person. Hence the skilled person would, as a usual matter of design, have extended the teaching of D1 to not only identify a drive or power adapter but also identify an accessory with one or more antennas, thus arriving at the subject-matter of claim 1 of the main request.

5. The auxiliary request

5.1 The amendments to this request are an amendment to the appellant's case. Under Article 25(1) RPBA 2020, the RPBA 2020 apply to any appeal, including this one, which was pending on 1 January 2020. According to Article 25(3) RPBA 2020, as the summons was notified on 27 May 2021, again after 1 January 2020, the amendment to the appellant's case is governed by Article 13(2) RPBA 2020, according to which the amendments shall, in principle, not be taken into account unless there are exceptional reasons, which have been justified with cogent reasons by the party concerned.

- 5.2 Although the appellant has provided no arguments as to why the present circumstances are exceptional, the board notes that claim 1 only differs from the previous version of 21 March 2014, in added features "i" and "vii", namely the replacement of the term "disposed" by "integrated" and the insertion of the expression "directly", respectively.
- 5.3 Regarding the first amendment, in the response of 19 July 2021 the appellant argued (see page 1, last paragraph) that the replacement of the term "disposed" by "integrated" in the expression in claim 1 "an antenna (26) configured to be disposed in the portable computing device (12)" was based on original claim 2. The skilled person would understand from figure 2 that the antenna was integrated within the computing device. The amendment clarified the above expression in the light of the board's provisional opinion (point 6.1), stating that the above expression was understood to mean that the antenna was disposed in a peripheral part of the computing device.
- 5.4 The appellant argued in the same response that the second amendment was based on figure 2 and paragraph [12] of the description, which refers to the connection and alignment between connector elements 70<sub>1-4</sub> and 72<sub>1-4</sub>.
- 5.5 The appellant has argued that the amendments overcome the obviousness objection in the summons because the connector 111 of the floppy disk drive 110 in D1 is not connected directly to the connector (45) notebook; see figures 3 and 11. Instead the bay housing (70) (see figures 2 and 7) was interposed between the notebook and the floppy disk drive, connector 83 of the bay



housing connecting to connector 111 of the floppy disk drive, and connector 95 of the bay housing connecting to connector 45 of the notebook. Hence the subject-matter of claim 1 differed from the subject-matter of D1 in that:

- a. the first sensor connector was directly connectable to the second sensor connector and
- b. the expansion device was integrated in the personal computer.

According to the appellant, the two differences were linked because "the antenna is integrated in the portable computer by connecting a first sensor connector of the antenna to a second sensor connector of the portable computing device". Starting from D1, the objective technical problem was how to improve the reliability of the antenna identification system without increasing the implementation complexity of the system, this problem being solved by features "a" and "b", neither D1 nor D2 mentioning improving the robustness of the connector or directly connecting the expansion device to the personal computer.

- 5.6 The amendments to this request are aimed at restricting claim 1 to overcome an objection of lack of inventive step by the board and in response to the board's interpretation of the location of the antenna set out in the claims. As the amendments are minor in nature and thus can be readily understood and considered without unduly prolonging the procedure, the board finds that the present circumstances are exceptional, Article 13(2) RPBA 2020, and admits the auxiliary request (See T 1294/16, reasons point 18.4).

- 5.7 If connector 83 in the bay housing 70 in D1 (see figure 7) is considered to be the second sensor connector in the claim, and connector 111 in the floppy disk drive (see figures 9A and 9B) is seen as a first sensor connector, then the bay housing can be regarded as part of the mobile computer and, as the first sensor connector (111) is directly couplable to the second sensor connector (83), difference feature "a" does not exist.
- 5.8 Moreover the replacement of the term in claim 1 "disclosed" by "integrated" merely makes explicit what was implicit in the board's understanding of the claim; see point 6.1 of the summons. Hence the board does not accept that difference feature "b" exists either.
- 5.9 Consequently, compared to claim 1 of the main request, claim 1 of this request merely further sets out the wireless module, cable, antenna portion and identification portion.
- 5.10 The skilled person considering the adaption of the accessory of D2 to be inserted into, and recognised by, the mobile computer known from D1 would have arrived at the claimed subject-matter as a matter of usual design.
- 5.11 Hence the features added in the auxiliary request are unable to lend inventive step to claim 1.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



L. Stridde

M. Müller

Decision electronically authenticated