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Datasheet for the decision of 30 June 2016

Case Number: T 1179/11 - 3.4.01

Application Number: 07251386.4

Publication Number: 1840790

IPC: G06K7/00, G06K7/08

Language of the proceedings: EN

Title of invention:
Transponder detector for an RFID system generating a progression of detection signals

Applicant:
ASSA ABLOY AB

Headword:

Relevant legal provisions:
EPC 1973 Art. 84, 56
EPC Art. 111(1)
RPBA Art. 13(1), 12(1)(a)

Keyword:
Late-filed auxiliary requests - admitted (no) - admitted (yes)
Claims - clarity (no)
Inventive step - (no)
Remittal to the department of first instance

Decisions cited:
T 0190/99

Catchword:

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Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 1179/11 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 30 June 2016

Appellant: (Applicant)	ASSA ABLOY AB P.O. Box 70340 107 23 Stockholm (SE)
Representative:	Grosfillier, Philippe ANDRE ROLAND SA Chemin des Charmettes 9 P.O. Box 5107 1002 Lausanne (CH)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 23 December 2010 refusing European patent application No. 07251386.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Assi
Members:	P. Fontenay
	F. Blumer

Summary of Facts and Submissions

I. The appeal lies from the decision of the examining division to refuse European patent application No. 07 251 386.4.

The impugned decision was remitted to the post on 23 December 2010.

II. In the "R*easons*" for the decision, the examining division held that the subject-matter of independent claims 1 and 7 of the sole request then pending was not clearly defined contrary to the requirements of Article 84 EPC 1973.

The examining division objected, more particularly, to the terminology used throughout the claims which, in its judgement, was misleading. In particular, the terms "*series resistance*" and "*parallel capacitance*" did not appear to reflect the disclosed configurations of a "*switched series resistor*" in parallel with a "*resistance switch*" and of a "*switched parallel capacitor*" in series with a "*capacitance switch*", respectively. Moreover, the terms "*resistance switch*" and "*capacitance switch*", intended to define switches present in the circuit to short-cut paths in the circuit incorporating resistors or, repectively, open paths portions of the circuit including capacitors, were ambiguous as such. In the opinion of the examining division, these concepts could have been interpreted as referring to a switch having a resistance and to a switch having a capacitance, respectively.

III. The notice of appeal was filed on 18 February 2011. The appeal fee was paid on the same day. The statement of grounds of appeal was filed on 21 April 2011.

IV. With the grounds of appeal, the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of a main request consisting of new claims 1 to 8 and accordingly amended pages of the description. As an alternative, the appellant requested the grant of a patent on the basis of a set of claims 1 to 8 according to an auxiliary request and description pages to be filed at a later stage of the appeal proceedings, should the claims be considered allowable. The claims of the auxiliary request defined, in essence, the same subject-matter as the claims of the main request but differed therefrom by the terminology employed.

V. In a communication pursuant to Article 15(1) RPBA issued on 13 May 2016, the appellant was informed of the provisional opinion of the Board with regard to the requests then on file.

The Board expressed the view that the objections regarding lack of clarity under Article 84 EPC 1973, relied upon by the examining division in its decision to refuse the application, were either not justified or obsolete in view of the amendments carried out in the independent claims.

In the Board's view, however, a lack of clarity resulted from the absence of an essential feature of the invention in the independent claims of both requests. The causality link which exists between the response signals and the detection signals was, namely, considered to constitute an essential aspect of the claimed transponder detector and method according to both requests on file.

Although the impugned decision did not comment on the issue of inventive step under article 56 EPC 1973, the Board dealt with this issue too, taking due account of the fact that this aspect had already been discussed in communications issued by the examining division in the course of the examination proceedings. Reference was made, in this regard, to documents EP-A-1 605 391 (D1), WO-A-00/42585 (D2) and EP-A-1 160 583 (D3). In the Board's preliminary view, the claimed transponder detector and method resulted in a straightforward manner from the disclosure of document D1 in combination with document D2. An alternative approach based on document D2 as closest prior art combined with the disclosure of document D1 led to the same preliminary finding.

VI. With a letter dated 6 June 2016, the appellant filed new auxiliary requests 2 to 9 taking account of the Board's remarks.

VII. Oral proceedings before the Board took place on 30 June 2016 in presence of the representative of the appellant. As a result of the discussion, the appellant submitted new requests.

Concretely, the appellant's final requests were as follows.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of:

a main request, filed with the statement setting out the grounds of appeal of 21 April 2011, or

auxiliary request 1, filed as auxiliary request 2 with the letter dated 6 June 2016, or

auxiliary request 2, filed during oral proceedings before the Board, or

auxiliary request 3, filed as auxiliary request 4 with the letter dated 6 June 2016, or

auxiliary request 4, filed during oral proceedings before the Board, or

auxiliary request 5, filed as auxiliary request 8 with the letter dated 6 June 2016.

VIII. Main request

Claim 1 of the main request reads:

"*1. A transponder detector, comprising:*
an antenna assembly (20) comprising an antenna coil,
a first circuit (26) coupled to said antenna assembly and configured to generate and transmit a detection signal progression via the antenna coil including a high frequency detection signal at a high frequency, a middle frequency detection signal at a middle frequency, and a low frequency detection signal at a low frequency;
a second circuit (42) coupled to said antenna assembly, said second circuit configured to receive a progression of response signals from said antenna assembly, said response signals having an identifying characteristic; and
a controller (24) operable to switch the detector between a detection mode and a data transaction mode, the controller further configured to detect the presence of a transponder having a transponder frequency in a proximal space of said transponder detector based on said identifying characteristic and upon such detection

to switch the detector into the data transaction mode, characterized in that:
said first circuit comprises a first switched series resistor (64), a first resistance switch (66), a second switched series resistor (68), and a second resistance switch (70), and further comprises a first switched parallel capacitor (74), a first capacitance switch (76), a second parallel capacitor (78), and a second capacitance switch (80), and said detection progression signal is generated by cooperatively controlling positions of said first and second resistance and capacitance switches (66, 70, 76, 80)".

Claims 2 to 6 of the main request depend on claim 1.

Independent claim 7 of the main request reads:

"*7. A frequency ranging method for transponder detection, comprising:*
generating and transmitting a detection progression signal including a first detection signal at a high frequency, a second detection signal at a middle frequency and a third detection signal at a low frequency via a first circuit (26) coupled to an antenna coil in an antenna assembly (20);
receiving, at a second circuit (42) coupled to said antenna assembly, a plurality of response signals from said antenna assembly resulting from transmission of said first, second and third detection signals, wherein said response signals have an identifying characteristic;
detecting a transponder (12) having a transponder frequency in a proximal space of said antenna assembly based on a change in value of said transponder identifying characteristic for said response signals;

determining a transponder type of said detected transponder by comparing said transponder frequency to a known transponder signature; and
activating an exciter/reader circuit to excite and read data from the transponder, characterized in that said first circuit comprises a first switched series resistor (64), a first resistance switch (66), a second switched series resistor (68), and a second resistance switch (70), and further comprises a first switched parallel capacitor (74), a first capacitance switch (76), a second parallel capacitor (78), and a second capacitance switch (80),
said detection progression signal is generated by cooperatively controlling positions of said first and second resistance and capacitance switches (66,70,76,80)"

Claim 8 of the main request depends on claim 7.

IX. Auxiliary request 1

Claim 1 of the auxiliary request 1 differs from claim 1 of the main request in that the feature regarding the second circuit has been specified to read:

"*a second circuit (42) coupled to said antenna assembly, said second circuit configured to receive a progression of response signals* ***resulting from transmission of the detection signal progression*** *from said antenna assembly, said response signals having an identifying characteristic*" (emphasis in bold added by the Board).

The other claims of auxiliary request 1 are identical to that of the main request.

X. Auxiliary request 2

Claim 1 of auxiliary request 2 reads:

"*1. A transponder detector, comprising:*

an antenna assembly (20) comprising an antenna coil,

a first circuit (26) coupled to said antenna assembly and configured to generate and transmit a detection signal progression via the antenna coil including a high frequency detection signal at a high frequency, a middle frequency detection signal at a middle frequency, and a low frequency detection signal at a low frequency;

a second circuit (42) coupled to said antenna assembly, said second circuit configured to receive a progression of response signals resulting from transmission of the detection signal progression from said antenna assembly, said response signals having an identifying characteristic; and

a controller (24) operable to switch the detector between a detection mode and a data transaction mode, the controller further configured to detect the presence of a transponder having a transponder frequency in a proximal space of said transponder detector based on said identifying characteristic and upon such detection to switch the detector into the data transaction mode, said first circuit comprises a first switched series resistor (64), a first resistance switch (66), a second switched series resistor (68), and a second resistance switch (70), and further comprises a first switched parallel capacitor (74), a first capacitance switch (76), a second parallel capacitor (78), and a second capacitance switch (80),

said transponder detector further including a ping output signal source to generate a ping signal and the detection signals;

wherein the first switched series resistor (64), the first resistance switch (66), the second switched series

resistor (68), the second resistance switch (70), the first switched parallel capacitor (74), the first capacitance switch (76), the second parallel capacitor (78), and the second capacitance switch (80) are connected between the ping output signal source and the antenna assembly so as to determine the frequency of the high, middle and low frequency detection signals, *and said detection progression signal is generated by cooperatively controlling positions of said first and second resistance and capacitance switches (66, 70, 76, 80),* ***and said first circuit is configured to generate the low or middle frequency detection signal by selectively increasing the capacitance and resistance in the circuit path of the ping signal.***" (emphasis in bold added by the Board).

Similar amendments were introduced in independent claim 7 of auxiliary request 2 with regard to claim 7 of auxiliary request 1. The other claims of auxiliary request 2 are identical to that of auxiliary request 1.

XI. Auxiliary request 3

Claim 1 of auxiliary request 3 differs from claim 1 of auxiliary request 1 in that it has been specified that the first circuit comprises an inverter. The corresponding feature reads:

"*said first circuit comprises a first switched series resistor (64), a first resistance switch (66), a second switched series resistor (68), and a second resistance switch (70), and further comprises a first switched parallel capacitor (74), a first capacitance switch (76), a second parallel capacitor (78), and a second capacitance switch (80),* ***and an inverter (82) connected between the first switched parallel capacitor (74) and***

the first series resistance (64) to shape the generated and transmitted signal temporally and in amplitude" (emphasis in bold added by the Board).

Similar amendments had been made in independent claim 7 of auxiliary request 3 with regard to the corresponding claim of auxiliary request 1.

XII. Auxiliary request 4

Claim 1 of auxiliary request 4 differs from claim 1 of auxiliary request 1 in that a further functionality of the controller has been specified. The corresponding feature reads:

"*a controller (24, **44**) operable to switch the detector between a detection mode and a data transaction mode, the controller further configured to detect the presence of a transponder having a transponder frequency in a proximal space of said transponder detector based on said identifying characteristic and upon such detection to switch the detector into the data transaction mode,* ***and the controller (22, 44) is further configured to evaluate a power level of the received progression of response signals and to assert a protection mechanism to protect the second circuit (42) from the incoming energy when an unsafe threshold level is exceeded***" (emphasis in bold added by the Board).

Independent claim 10 of auxiliary request 4 contains similar amendments with regard to claim 7 of auxiliary request 1. New claims 2 to 4 and 11 to 13, depending respectively on independent claims 1 and 10, have been added.

XIII. Auxiliary request 5

Claim 1 of auxiliary request 5 combines the amendments introduced in claim 1 of auxiliary requests 3 and 4. Similarly, claim 10 of auxiliary request 5 combines the amendments made with regard to claim 7 of auxiliary request 3 and claim 10 of auxiliary request 4.

Reasons for the Decision

1. Applicable law

It is noted that the revised version of the Convention (EPC 2000) does not apply to European patent applications pending at the time of its entry into force (13 December 2007), unless otherwise provided. In this decision, where Articles or Rules of the former version of the EPC apply, their citation is followed by the indication "1973".

2. *Admissibility of the appeal*

The appeal meets the requirements of Articles 106 to 108 EPC and Rule 99 EPC. It is thus admissible.

3. *Main request*

3.1 *Admissibility*

The main request was submitted with the grounds of appeal. Therefore, it is in the appeal proceedings (Article 12(1)(a) RPBA).

3.2 Clarity

3.2.1 In the Board's judgement, an essential feature of the claimed transponder is missing in claim 1 of the main

request. As recited in claim 1, the second circuit, which is coupled to the antenna assembly, is configured to receive a progression of response signals from said antenna assembly, said response signals having an identifying characteristic. There is, however, no mention in the claim of the fact that the progression of response signals results from transmission of a detection signal progression.

According to a preferred embodiment of the invention, the detection of a transponder in the read range of the transponder detector is performed by evaluating the decay rate of each response signal (cf. published application, paragraph [0075], Figures 6A and 6B). In effect, according to this preferred embodiment, the response signals are constituted by the detection signals themselves possibly distorted because of the electromagnetic coupling resulting from the presence in the read range of the transponder detector of the resonating circuit of a transponder.

While it is acknowledged that the description envisages other techniques for detecting the presence of a transponder in the read range (cf. paragraph [0074]), it does not suggest that the response signals could possibly be generated spontaneously, i.e. independently of any detection signals or in response to signals of a different origin. In other terms, the application as a whole is consistent about the fact that the response signals are signals that result from the generation and transmission by the transponder detector of the detection signal progression (cf. Figure 5, blocks 142, 144). It is further emphasized that it is also not disclosed how the identifying characteristic could be determined in the absence of any causal link between detection signals and response signals.

3.2.2 At the oral proceedings, the appellant did not comment on this issue.

3.2.3 It follows that claim 1 of the main request does not fulfill the requirements of Article 84 EPC 1973.

Therefore, the main request is not allowable.

4. *Auxiliary request 1*

4.1 *Admissibility*

4.1.1 Auxiliary Request 1 corresponds to auxiliary request 2 as filed on 6 June 2016 with the letter of reply to the communication of the Board pursuant to Article 15 RPBA.

4.1.2 Under Article 13(1) RPBA, "*Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject matter submitted, the current state of the proceedings and the need for procedural economy*". It is generally accepted practice that the claimed subject-matter of a late filed request must be so clear and straightforward that it can be easily understood and regarded as solving all the outstanding issues without giving rise to any new objection (cf. Case Law of the Boards of appeal of the EPO, 7th edition 2013, section IV.E.4.4.2, first paragraph).

4.1.3 Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that the feature regarding the second circuit has been specified so as to clarify that it is configured to receive a progression of response

signals resulting from transmission of the detection signal progression from said antenna assembly.
The feature that the Board considered to be essential for the definition of the invention and that was missing in claim 1 of the main request is thus explicitly recited in claim 1 of auxiliary request 1.

4.1.4 Moreover, claim 1 does not contain any reference to the "*series resistance*" or "*parallel capacitance*", which were objected to by the examining division in its decision to refuse the application.

4.1.5 The Board holds, contrary to the view of the examining division, that the concepts of "*first resistance switch*", "*second resistance switch*", "*first capacitance switch*" and "*second capacitance switch*" are clear as such. In this respect, it is reminded that the application must be construed by a mind willing to understand, not a mind desirous of misunderstanding (cf. decision T 190/99, not published). In the present context, claim 1 specifies that the first circuit is configured to generate and transmit signals of a high, middle and low frequency. The objected terms relate to switches associated to first and second resistors as well as first and second capacitors of said first circuit. It is well-known to the skilled person that the characteristics of a resonating circuit associated to a given inductance (antenna), i.e. the central resonating frequency and the resonating bandwidth, are defined by the resistors and capacitors it incorporates. The skilled person would thus have recognised that the desired resonance conditions are obtained by an appropriate selection, i.e. by switching, of said circuit elements. The interpretation suggesting that the switches might themselves incorporate resistors or

capacitors appears, in this respect, artificial and should therefore be rejected.

4.1.6 The Board thus concludes that it has been remedied to the outstanding clarity objections. Moreover, the amendment introduced in claim 1 is as such clear.

4.1.7 For these reasons, the first auxiliary request is admitted into the proceedings (Article 13(1) RPBA).

4.2 Inventive step

4.2.1 Document D1 discloses a transponder detector which shares a plurality of structural features and a common purpose with the claimed invention. For this reason, document D1 is considered to constitute a realistic starting prior art when deciding on the inventive merits of the subject-matter of claims 1 and 7 of auxiliary request 1.

4.2.2 The transponder detector according to claim 1 essentially differs from the known transponder detector in that the first circuit is configured to generate three detection signals of different frequencies whereas, in D1, the transponder detector generates two frequencies only. In the absence of any details in D1 as to the configuration of the circuits involved, the claimed arrangement further differs from the transponder detector of D1 in that the detection signals generated by the first circuit are obtained by appropriately switching resistors and capacitors in the resonating circuit incorporating the radiating antenna.

The claimed arrangement, with its multiple switchable resistors and capacitors, permits communication with a larger variety of transponders, in particular with

transponders operating in at least three different frequency bands. In the absence in claim 1 of any indication as to which resistor(s) or capacitor(s) should be switched, the sole effect which can be recognised would consist in that the Q-factor of the resonating circuit can be varied.

4.2.3 The problem of communicating with transponders resonating at various resonating frequencies is explicitly addressed in document D2 (cf. page 3, lines 2-14). In D2, a plurality of capacitors is foreseen, each of which is added, alone or in combination with other capacitors, in parallel to a main tuning capacitor, as it is the case for the present invention (cf. page 10, lines 1-11; Figure 4), so as to generate a sequence of detection signals of various resonating frequencies.

While document D2 privileges a solution including a multiplicity of resonating frequencies in order to maintain high sensitivity of the transponder detector, it nevertheless does not exclude the possibility to use low-Q antenna circuits in the detector (cf. page 4, lines 3-12; page 5, lines 1-3; page 14, lines 3-14). In the Board's judgement, this indication would constitute a clear hint for the skilled person to incorporate one or more resistances in the antenna circuit disclosed in document D1 so as to affect the Q-factor of the resonating circuit.

As put forward by the appellant, it is acknowledged that said Q-factor may also be affected by modifying the inductance. However, the Board holds that this option, should it not be excluded, would have not been privileged. A change of the inductance would indeed imply a shift of the resonating frequency only to be

avoided by simultaneously modifying the capacitance of the resonating circuit so that the product of inductance by capacitance be kept constant. Moreover, a change of inductance would be detrimental to a good functioning of the antenna since it would directly affect the magnetic field it generates and, as a consequence, its read range.

For these reasons, the skilled person would have undoubtedly selected a solution with switchable resistors which would neither affect the resonating frequency of the circuit nor the emitting characteristics of the antenna.

4.2.4 The subject-matter of claim 1 of auxiliary request 1, therefore, results in an obvious manner from a combination of documents D1 and D2 and is thus not inventive in the sense of article 56 EPC 1973.

As a consequence, auxiliary request 1 is not allowable.

5. Auxiliary request 2

5.1 Admissibility

5.1.1 Auxiliary request 2 was filed during the oral proceedings before the Board following the announcement by the Chairman that auxiliary request 1 does not meet the requirements of article 56 EPC 1973.

5.1.2 When exercising its discretion under Article 13(1) RPBA, the Board considered whether the amendments carried out affected the finding of lack of inventive step reached with regard to claim 1 of auxiliary request 1.

5.1.3 Firstly, the feature of a ping output signal source does not appear to define any additional difference between the claimed subject-matter of claim 1 and document D1, since D1 refers in paragraph [0027] explicitly to the emission of "*ring signals*" as disclosed, inter alia, in document US-A-6 476 708, i.e. the same document as the one referred to by reference in the present application when referring to the emission of the detection signals.

Secondly, the presence of the resistors and capacitors of the circuit between the excitation source (ping output signal source) and the antenna, appears to reflect one possibility among equally likely alternatives. It is stressed in this respect that the resonating characteristics of the circuit are, in particular, defined by the values of the resistance(s), capacitance(s) and inductance(s) as resulting from the presence in the serial circuit of the corresponding circuit elements.

Thirdly, the indication according to which the first circuit is configured to generate the low or middle frequency detection signal by selectively increasing the capacitance(s) and resistance(s) in the circuit path of the ping signal does also not appear to be sufficient to justify an inventive step. While it is acknowledged that the claimed feature implies that the bandwidth of the resonating circuit is larger for smaller frequencies than that for higher frequencies, the appellant did not indicate which advantages resulted therefrom. The Board is thus unable to identify any specific problem solved by the claimed arrangement on the basis of which the presence of an inventive step could have been assessed.

5.1.4 For these reasons, claim 1 of auxiliary request 2 does not appear to affect the finding regarding the lack of

an inventive step reached by the Board with regard to claim 1 of auxiliary request 1.

Auxiliary request 2 is therefore not admitted into the proceedings.

6. *Auxiliary request 3*

6.1 Admissibility

6.1.1 Auxiliary request 3 corresponds to auxiliary request 4 as filed on 6 June 2016 with the letter of reply to the communication of the Board.

6.1.2 Claim 1 of auxiliary request 3 includes the amendment concerning "*an inverter (82) connected between the first switched parallel capacitor (74) and the first series resistance (64) to shape the generated and transmitted signal temporally and in amplitude*".

The claimed feature defines an unallowable generalisation of a specific embodiment of the invention, as disclosed with regard to Figure 4 and paragraph [0053] of the published application, contrary to Article 123(2) EPC. According to said embodiment of the invention, an inverter is connected between the series resistances 62, 64, 68 and the parallel capacitances 72, 74, 78. The claimed wording now covers various alternatives as, for example, a configuration with an inverter between the switched series resistance (64) and resistance 62 or between capacitance 72 and switched capacitance 74. There is no indication to be found in the description suggesting that the specific configuration of Figure 4 could be modified without affecting the functionality of the resonating circuit.

6.1.3 The appellant did not comment on the objection raised by the Board.

6.1.4 Therefore, auxiliary request 3 is not admitted into the appeal proceedings (Article 13(1) RPBA).

7. *Auxiliary request 4*

7.1 *Admissibility*

7.1.1 Auxiliary request 4 was filed during the oral proceedings before the Board.

7.1.2 Claim 1 of auxiliary request 4 differs from claim 1 of auxiliary request 1 in that it has been specified that "*the controller (22, 44) is further configured to evaluate a power level of the received progression of response signals and to assert a protection mechanism to protect the second circuit(42) from the incoming energy when an unsafe threshold level is exceeded*".

The added features derive directly and unambiguously from Figure 4 and paragraphs [0085] to [0087] of the published application.

7.1.3 The claims of auxiliary request 4 overcome all outstanding objections without giving rise to any new objection. In particular, the Board is satisfied that claim 1 meets the requirements of Article 84 EPC 1973, Article 123(2) EPC and Article 83 EPC 1973.

7.1.4 Therefore, auxiliary request 4 is admitted into the appeal proceedings (Article 13(1) RPBA).

7.2 Decision in respect of the appeal

7.2.1 The new features in independent claims 1 and 10 of auxiliary request 4 are not disclosed in any of the documents presently available. The added features permit to identify any surge of energy potentially dangerous to the second circuit and to react accordingly. The analysis relied upon by the Board to justify the objection of lack of an inventive step of the subject-matter of claim 1 of auxiliary request 1 therefore does not apply to claims 1 and 10 of auxiliary request 4.

7.2.2 Moreover, it is underlined that said new features derive from the description. For this reason, the Board holds that it would be expedient to remit the case to the examining division for further prosecution (Article 111(1) EPC). During the oral proceedings, the appellant agreed to the remittal of the case.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division for further prosecution on the basis of auxiliary request 4 as filed during oral proceedings of 30 June 2016 before the Board.

The Registrar: The Chairman:

D. Hampe G. Assi

Decision electronically authenticated