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**Datasheet for the decision  
of 9 September 2010**

**Case Number:** T 0183/09 - 3.2.04

**Application Number:** 02250907.9

**Publication Number:** 1232715

**IPC:** A47K 10/36

**Language of the proceedings:** EN

**Title of invention:**

Paper towel dispenser

**Patentee:**

GEORGIA-PACIFIC CORPORATION

**Opponent:**

Ille Papier-Service GmbH

**Headword:**

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**Relevant legal provisions:**

EPC Art. 100(a), 56

**Relevant legal provisions (EPC 1973):**

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**Keyword:**

"Inventive step (no) (main, 1st auxiliary request)"

"Late filed requests - admitted (no) (auxiliary requests 2-4)"

**Decisions cited:**

T 0397/01

**Catchword:**

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**Case Number:** T 0183/09 - 3.2.04

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.04  
of 9 September 2010

<b>Appellant:</b> (Patent Proprietor)	GEORGIA-PACIFIC CORPORATION 133 Peachtree Street, N.E. Atlanta Georgia 30303 (US)
<b>Representative:</b>	Molnia, David df-mp Fünf Höfe Theatinerstrasse 16 D-80333 München (DE)
<b>Respondents:</b> (Opponent)	Ille Papier-Service GmbH Industriestrasse 28 D-63674 Altenstadt (DE)
<b>Representative:</b>	Stoffregen, Hans-Herbert Patentanwalt Postfach 21 44 D-63411 Hanau (DE)
<b>Decision under appeal:</b>	Decision of the Opposition Division of the European Patent Office posted 10 November 2008 revoking European patent No. 1232715 pursuant to Article 101(3)(b) EPC.

**Composition of the Board:**

**Chairman:** M. Ceyte  
**Members:** A. de Vries  
T. Bokor

## **Summary of Facts and Submissions**

I. On 7 January 2009 the Appellant (Proprietor) lodged an appeal against the Opposition Division's decision of 10 November 2008 to revoke European patent No. 1 232 715 and simultaneously paid the prescribed appeal fee. The grounds of appeal were filed on 3 March 2009.

Opposition was filed against the patent as a whole and based on Article 100(a) EPC in combination with Articles 54 and 56 for lack of novelty and inventive step.

The Opposition Division held that these grounds prejudiced maintenance of the patent having regard to the following documents:

D1: WO 99/58040  
D3: US-A-3 573 783  
D4: DE-A-3400575  
D5: US-A-3 836 828  
D6: US-A-3 743 865

II. The Appellant (Proprietor) requests that the decision under appeal be set aside and the patent be maintained as granted (main request), or, in the alternative, that the patent be maintained in amended form on the basis of a first auxiliary request filed with the grounds of appeal, or on the basis of any of the auxiliary requests 2 to 4 filed during oral proceedings before the Board.

The Respondent (Opponent) requests that the appeal be dismissed.

III. Oral proceedings before the Board were duly held on 9 September 2010.

IV. The wording of the independent claims of the requests is as follows:

**Main request**

1. "A method of dispensing paper from a roll dispenser (20) comprising detecting the proximity of a user's hand to the dispenser by sensing by means of an antenna (100) a change in a capacitance in the field of the antenna and dispensing paper from the roll in response to said detection."

8. "A paper roll dispenser (20) comprising an antenna, means for sensing a change in a capacitance in a field of the antenna (100) caused by the proximity of a user's hand to the dispenser, and means for dispensing paper from the roll in response to the sensed change in capacitance."

**Auxiliary Request 1**

Claim 1 is as in the main request but at the end adds the following wording: "and the change in the capacitance is sensed by comparing it with a reference capacitance".

Claim 7 is as claim 8 of the main request but at the end adds the following wording: "and comparator means

for comparing the capacitance sensed by the antenna with a reference capacitance".

**Auxiliary Request 2**

Claim 1 is as in the main request but at the end adds the following wording: ", wherein the method further comprises the step of selecting between levels of sensitivity for the sensing of the change in capacitance".

Claim 7 is as claim 8 in the main request but at the end adds the following wording: "wherein the dispenser further comprises a means for selecting between levels of sensitivity of the means for sensing".

**Auxiliary Request 3**

1. "A paper roll dispenser (20) comprising an antenna,  
means for sensing a change in a capacitance in a field of the antenna (100) caused by the proximity of a user's hand to the dispenser,  
means for dispensing paper from the roll in response to the sensed change in capacitance,  
wherein the means for sensing comprise comparator means for comparing the capacitance sensed by the antenna with a reference capacitance; wherein the comparator means is arranged to compare voltages developed across the sensed capacitance and the reference capacitance after charging thereof;  
means for producing an output signal based on the comparison, and

means for activating a paper-dispensing motor of the dispenser in response thereto;  
wherein the means for dispensing paper comprise a motor-controlling logic circuit including a flip-flop, and a motor switch which is activated when a change in an output state of the flip-flop has been detected; wherein the dispenser further comprises a means for producing an asymmetric oscillating signal and a means for sending an approximately uniform amount of charge to the antenna;  
a means for selecting between levels of sensitivity of the sensing means;  
an oscillator circuit comprising a first comparator adapted to provide an asymmetric signal as input to the sensing means;  
a first operational amplifier adapted to buffer said sensing means to a peak detector wherein said sensing means has high impedance and said peak detector has low impedance; a second operational amplifier adapted to provide a voltage offset to the output of the first operational amplifier and to output an amplified signal of said peak detector; and  
a second comparator adapted to produce an output pulse, in response to said output signal from said second operational amplifier."

**Auxiliary Request 4**

1. "A paper roll dispenser (20) comprising an antenna, means for sensing a change in a capacitance in a field of the antenna (100) caused by the proximity of a user's hand to the dispenser, means for dispensing paper from the roll in response to the sensed change in capacitance,

wherein the means for sensing comprise  
an asymmetric oscillator circuit having its on-period  
set by a resistor network including a plurality of  
fixed resistors and at least one variable resistor and  
having its off-period set by at least one fixed  
resistor and by at least one first single diode;  
a first static protection circuit including a first  
plurality of diodes, one said diode adapted to conduct  
away from ground, another said diode adapted to conduct  
toward the supply voltage;  
a reset path wherein a second single diode provides a  
discharge path for the antenna, wherein the antenna is  
discharged to the same voltage for every time period;  
the asymmetric oscillator being adapted to send an  
approximately uniform amount of charge during its on-  
period to said antenna;  
the antenna voltage being decreased when the  
capacitance of the antenna is increased by a detected  
object;  
a second static protection circuit comprising a second  
plurality of diodes, one said diode adapted to conduct  
away from ground, another said diode adapted to conduct  
toward the supply voltage;  
an antenna impedance buffer including operational  
amplifier operated as a unity gain follower with the  
output terminal of the operational amplifier being fed  
back to the inverting input terminal;  
a voltage peak detector including a third single diode,  
a current-limiting resistor, a peak storage capacitor  
and a bleed off resistor, the third single diode and  
said peak storage capacitor being adapted to capture  
the positive peak of the exponential waveforms, the  
current limiting resistor being adapted to limit  
current flow and to providing the antenna impedance

buffer output with more phase margin to prevent oscillation, the bleed-off resistor adapted to providing a discharge pathway for said peak storage capacitor;  
a low-pass filter adapted to filter out about 50 or about 60 Hz alternating current interference frequencies, the low-pass filter comprising an inline resistor and a capacitor with one side tied to ground; an amplifier with gain and voltage offset; an auto-compensation capacitor adapted to filter out changes in DC voltage levels of signals while allowing transient signals to pass through; a three-position switch adapted to provide three levels of detection sensitivity; and an output comparator adapted to generate an output on signal when the signal voltage, applied to the non-inverting input terminal of said comparator, is greater than the reference voltage, which is applied to the inverting input terminal of the comparator."

V. The Appellant argued as follows:

In D1 the presence of an object opposite the two folded open plates of a capacitor introduces a new dielectric medium and so changes capacitance. In the patent the object replaces earth as the electrode opposing the single electrode, that is the antenna producing a much larger change in capacitance. An antenna forms only part of a capacitor, whereas D1 includes the whole capacitor.

The capacitance changes in D1 are of the order of 5 to 10% allowing sensing only within a small distance range of about 30 mm. The use of an antenna in contrast

results in higher sensitivity, and a larger sensing range from 30 to 150 mm. The objective technical problem can be formulated as how to improve the system of D1. The claimed improvement is based on the realization that the hand can be used as second capacitor plate. There is no indication in D1 that one of the plates can be dispensed with.

Nor would the skilled person in the towel dispensing field consider any of D3 to D6. D3 and D5 disclose very sophisticated sensors where a high degree of reliability is required. D6, which does not measure capacitance but detects detuning of an oscillator, is too dissimilar from D1 to be considered. In any case it has a second electrode in the form of shield 17. For the same reason the skilled person would not consider D4 which is also based on detuning.

The use of a reference capacitor (auxiliary request 1) realizes the concept of claim 1 in a simple way. The skilled person would not consider the cited prior art for the reasons already mentioned.

Auxiliary requests 2 to 4 are valid attempts to address issues raised in the discussion of inventive step. Auxiliary requests 2 and 3 are merely directed at subject-matter already claimed in the granted patent. Claim 1 of the auxiliary request 4 corresponds word for word to the thirteenth aspect of the invention described in paragraph [0117] of the specification. As the appeal is the final instance for deciding the case, surely the patentee must be given an opportunity to file such amendments to ensure a fair balance of interests.

VI. The Respondent argued as follows:

The capacitor of D1 and the antenna of claim 1 are functionally identical, as also recognized explicitly in the specification. An antenna is merely part of a capacitor, the other part formed by earth or the object.

If novel, then the antenna is seen to address the problem of improving detection, for example with respect to dirt or water contamination. In the tap activation system of D6 with integrated capacitive proximity sensor the problem is solved the same way. An antenna or single electrode is also known from the capacitive proximity sensors of D3, D4 or D5. The skilled person, who has knowledge of proximity sensors, will draw on these teachings to arrive at the claimed invention.

There is no evidence that an improved sensitivity is linked to the claimed feature of an antenna or single electrode alone. If so, then the soap dispenser of D4 with the same feature must also exhibit the same effect.

Reference capacitors are shown in D4, but are in any case a feature of a bridge circuit, a commonly known way to measure capacitance changes, see also D3 and D5.

The new auxiliary requests are directed at completely new combinations and come as a surprise. They were prepared before the oral proceedings and could have been filed earlier. Finally, some of the material has not been searched.

## **Reasons for the Decision**

1. The appeal is admissible.

2. *Background*

The patent concerns a paper roll dispenser with a proximity sensor for actuating paper feed. The main idea is to sense the change in capacitance resulting from the insertion of a hand into the field of an antenna. In comparison to e.g. an optical proximity sensor such a capacitive proximity sensor is said to be a simpler, cheaper and more reliable way of sensing proximity, see paragraph [0013] of the patent specification.

3. *Main Request, Auxiliary Request 1 : Inventive Step*

3.1 It is common ground that D1 discloses the closest prior art for assessing inventive step. In particular, see the abstract and the paragraphs bridging pages 2 and 3 or 8 and 9 in conjunction with figures 2 and 3, it discloses a paper roll dispenser 10 with a capacitive proximity sensor 38 realized in the form of two electrode plates 40, 42 arranged side by side (figure 5) and forming a capacitor. A hand inserted into the electric field of the two plates produces a change in capacitance which then switches the paper dispensing mechanism, page 12, lines 7 to 11.

3.2 Both the proximity sensor of D1 and that of the patent function according to the same basic capacitive sensing principle, according to which capacitance changes

resulting from the proximity of the object in an electric field are sensed and converted into an electrical signal. In D1 the electric field is formed between a capacitor's two constituent electrodes, which together form the sensing element. In the method of claim 1 an antenna senses capacitance change. The skilled person, who is intent on making technical sense of the claims and gives the terms their proper meaning unless the description instructs him to do otherwise, reads the term "antenna" in its proper sense in the field of capacitive sensing as a *single* electrode, from which the electric field emanates into free space; see D3, D5 and D6 for examples of such use. There is no indication in the description or figures that anything else is meant: cf. specification paragraph [0058] referring to a "single wire", paragraph [0061], which discusses effects of the geometry of "the antenna", and paragraph [0075], where "the antenna 236 forms one conducting side of the capacitor".

The method of claim 1 is thus novel over D1 by virtue of this sole difference.

- 3.3 The technical significance of the use of an antenna or a single electrode instead of a two electrode capacitor as sensing element is not immediately apparent to the Board from a comparison of the patent and D1. The patent may mention a wider sensing range - up to six inches or 150 mm in specification paragraph [0066] - than the 30 mm of D1 (page 12, line 27). However, as stated in specification paragraph [0061] a wide sensitivity range is linked to the geometry of the antenna and the use of a reference capacitor, and is thus not simply the result of the use of an antenna per

se. In the same way D1 associates sensitivity with the relative dimensions of the plates, page 12, lines 22 onwards.

Failing any clear technical benefit the Board concludes that the use of an antenna represents an alternative means of sensing capacitance changes to the two plate capacitor used in D1. It formulates the objective technical problem accordingly, as how to provide an alternative means to sense capacitance changes in a paper dispensing method such as that of D1.

- 3.4 Capacitive proximity sensors that employ an antenna or single electrode as sensing element are well-known. D3, D4, D5 and D6 each provide examples of this type of sensing element in a capacitive proximity sensor.

D3, see figure 1, abstract and column 1, lines 3 to 14, shows an antenna 21 linked to a bridge circuit 14 with reference capacitance 20 to provide capacitive proximity sensing in a wide variety of applications that are critical to safety (where human life or well-being is at stake), though it also explicitly considers wider application.

D5 in figure 1 discloses a similar capacitive proximity sensing arrangement with sensing antenna 40, bridge 30 and oscillator 20 used to protect automatic machinery, but other applications are also contemplated, see column 1, lines 50 to 55.

In the capacitive proximity sensor of D4 (see title) the sensing element is a single electrode plate 71, see figure 14 and page 26, first and second paragraphs.

Here sensed proximity of a hand detunes oscillator 79 to produce a control signal for activating an automatic soap dispenser, see abstract.

In D6, finally, see figures 1 and 2 and abstract, an antenna 12 forms the sensing electrode, signals from which detune an oscillator 31. The sensor is shown as integrated into a tile 11 to control water flow from a tap. The sensor also includes a shield 17 connected via the braid 19 of a coaxial cable 14 to a reference point 22 to which glow lamp 16 of the oscillator 31 is also connected (column 2, first paragraph). This shield 17 is not an opposing electrode to antenna 12, but rather serves to shield the antenna from the circuitry and so focus the sensing field, much the same as the "guards" or "guarding electrodes" mentioned in the patent specification, column 15, lines 53 to 58.

- 3.5 For the skilled person, an engineer designing automatic paper dispensers which are sensor activated, a good working knowledge of tactile and proximity sensing is indispensable. He will therefore be familiar with the alternative types of capacitive proximity sensor illustrated by D3 to D6. Faced with the objective of providing an alternative means to sense capacitance changes he will as a matter of course draw on such knowledge to replace the capacitive sensing arrangement with two plate capacitor as in D1 by one with a single electrode element as sensing element and so arrive at the subject-matter of claim 1 as granted (main request) without an inventive step.
- 3.6 The Board adds that these known schemes are not so sophisticated - as the Appellant argues in respect to

D3 and D5 - nor is their underlying sensing principle so dissimilar - as he argues in the case of D4 and D6 - that the skilled person would not consider them.

- 3.6.1 Though D3 and D5 may pursue different aims to D1, namely improving safety as opposed to, say, avoiding paper wastage, they do so by addressing the same underlying concern, namely improving reliability of the sensor, cf. D3, column 1, lines 23 to 35; D5, column 1, lines 9 to 17, and D1, abstract. The skilled person who recognizes that the sensors are capacitive proximity sensors in each document, also recognizes this common concern. For him each of these documents thus offers a reliable alternative way of capacitive proximity sensing.

D3 and D5 themselves suggest other less critical applications, see D3, column 1, lines 13 to 15; D5, column 1, lines 54 to 55.

Finally, given developments in electronic circuitry in the intervening time, the Board is equally unconvinced that the skilled reader of D1, published in 1999, would still (assuming he had done so previously) regard the D3 and D5 circuits, published around 1970, as complex. Nor do those circuits seem any more complex than, for example, the paper dispensing sensing circuitry shown in the patent in suit, figures 10A to 10E.

- 3.6.2 Also in the case of D4 and D6, the skilled person easily recognizes that their proximity sensing arrangements are capacitive, see also the title and abstract of D4, abstract of D6. That they sense capacitance changes as the detuning of an oscillator

circuit rather than as the unbalancing of a bridge circuit (as in the patent) is immaterial. D1 itself does not intimate how exactly the capacitance changes are to be sensed. Nor is claim 1 limited to any particular way of converting sensed capacitance changes into an electrical signal.

- 3.7 Turning to the *auxiliary request 1*, D3 and D5 each use a so-called balanced bridge circuit to sense capacitance changes in the antenna field (D3, column 2, lines 10 and 11; D5, claim 1, first feature, and column 1, lines 55 to 65). These bridges operate in the same manner as the balanced bridge circuit of figure 8A, see patent specification paragraph [0052], with capacitance 20 (figure 1 of D3) or 260 (figure 2 of D5) serving the same purpose as reference capacitance CREF in figure 8A of the patent: when antenna and reference capacitances differ the arms do not balance out and an output signal is the result. The two capacitances are so effectively compared. This added feature of claim 1 of the auxiliary request is thus already known from D3 or D5. The skilled person would include it as a matter of course when obviously replacing the two-plate capacitor sensor as in D1 by the alternative sensor of D3 or D5, so that adding this feature also does not involve an inventive step.
- 3.8 The Board adds that the above reasoning applies equally to the independent device claim of either request (claim 8 in the main request, claim 7 in auxiliary request 1). Each is directed at the paper roll dispenser which carries out the method of the corresponding claim 1 and differs from the dispenser of D1 by the same features identified above.

4. *Admissibility of Auxiliary Requests 2 to 4*

4.1 Auxiliary requests 2 to 4 were filed at the oral proceedings before the Board, i.e. well after filing of the grounds of appeal. These amendments to the appellant's case are thus subject to discretion afforded the Boards under Article 13 of the Rules of Procedure of the Boards of Appeal. That discretion is to 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", Article 13(1). Amendments submitted after oral proceedings have been arranged are not admitted "if they raise issues which the Board or the other party ... cannot reasonably be expected to deal with without adjournment of the oral proceedings", Article 13(3).

The Boards have developed the following approach in exercising their discretion to admit late filed amendments:

Unless an amendment is *justified* by developments in the appeal proceedings - for example if it addresses objections or comments first raised in the proceedings - it will be admitted only if it does not extend the scope or framework of discussion as determined by the decision under appeal and the statement of the grounds of appeal, and is moreover *clearly allowable*, see the Case Law of the Boards of Appeal 6th edition, 2010 (or CLBA), VII.E.16.1.1 and the case law cited therein, in particular T 397/01, reasons 1. Amended claims are *clearly allowable* if the Board can quickly ascertain that they overcome all outstanding issues without

raising new ones, see CLBA, VII.E.16.4.1 and the case law cited therein.

From the above it may be inferred that procedural economy, that is the need to conclude proceedings swiftly and so create legal certainty, plays an increasingly dominant role as appeal proceedings progress towards their end. In the final stages of an appeal procedure it may in fact come to outweigh all other factors in the balance of interests that the Board must strike when deciding admissibility of new requests or of new facts and evidence. This shift in balance of interests towards legal certainty is a consequence of the judicial nature of an inter partes appeal procedure.

- 4.2 In the present case no sound reasons have been put forward, nor are such reasons evident to the Board, that might justify the late filing of three new auxiliary requests.

The requests were filed at the beginning of the oral proceedings and clearly therefore could not have been in response to a discussion that had yet to take place. Nor do they directly address specific points raised in the preceding written procedure other than that they represent three broad, different attempts to differentiate the invention from the prior art. Because they were obviously prepared in advance they could also clearly have been filed at an even earlier stage. That they were not, is a matter of choice, rather than that this was dictated by the circumstances of the case.

Nor has a justification been given for the filing of three new requests, where, at such a late stage of the proceedings, a single request would be appropriate.

- 4.3 Discussion of any of these new requests, if admitted, would moreover go beyond the scope of debate of the original appeal as defined by the appealed decision, the statement of grounds of appeal and subsequent written submissions. Each of the new requests pursues aspects of the invention or embodiments thereof that were neither subject of the present appeal proceedings nor of the preceding opposition proceedings and thus represents a shift away from the main line of debate. Whereas the procedure to date focussed on the feature of the antenna, these requests concern selection of levels of sensitivity (auxiliary request 2), and detail of the electronic circuitry involved in converting the sensed capacitance changes into a control signal for the dispenser (auxiliary requests 3 and 4). In the case of auxiliary request 4 this extensive detail has been lifted entirely from the description, paragraph [0117], and is completely new. As for the specific combinations of granted claims that are the subject of auxiliary requests 2 and 3, the Appellant has never before provided a specific, detailed defence of these particular feature combinations.
- 4.4 Finally, none of these requests is clearly allowable in the sense set out above. In the opposition proceedings the Respondent offered reasonably detailed, credible arguments against individual features of the claims combinations of auxiliary requests 2 and 3, where the Appellant offered no specific defence. The Board would need to thoroughly discuss these arguments before

possibly allowing the requests. Finally, auxiliary request 4 raises the new issue of whether its subject-matter, which is lifted in its entirety from the description, has been searched at all.

- 4.5 For the above reasons the Board has therefore decided not to admit the auxiliary requests 2 to 4 into the procedure.

5. *Conclusion*

As the subject-matter of the independent claims of the admissible requests - the main request and auxiliary request 1 - does not meet the requirement of inventive step, Article 52(1) with Article 56 and Article 100(a) EPC, these requests must fail. The Board therefore confirms the appealed decision to revoke the patent.

**Order**

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

The appeal is dismissed.

The Registrar

The Chairman

G. Magouliotis

M. Ceyte