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**Datasheet for the decision  
of 11 October 2018**

**Case Number:** T 1242/14 - 3.2.06

**Application Number:** 03754582.9

**Publication Number:** 1542635

**IPC:** A61F13/42, H01H35/42, A61F13/20

**Language of the proceedings:** EN

**Title of invention:**  
DISPOSABLE ARTICLES HAVING A FAILURE DETECTION SYSTEM

**Patent Proprietor:**  
McNeil-PPC, Inc.

**Opponent:**  
Bent Thorning Bensen A/S

**Headword:**

**Relevant legal provisions:**  
EPC Art. 83, 54, 56  
RPBA Art. 12(2), 12(4)

**Keyword:**

Sufficiency of disclosure - main request (yes)

Novelty - main request (yes)

Inventive step - main request (yes)

Late-filed document - reliance on document in party's case (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 1242/14 - 3.2.06

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.06**  
**of 11 October 2018**

**Appellant:** Bent Thorning Bensen A/S  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 4 April 2014  
rejecting the opposition filed against European  
patent No. 1542635 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman** M. Harrison  
**Members:** P. Cipriano  
W. Ungler

## Summary of Facts and Submissions

- I. An appeal was filed by the appellant (opponent) against the decision of the opposition division rejecting the opposition to European patent no. 1 542 635. It requested that the decision be set aside and the patent be revoked.
- II. In its reply, the respondent (proprietor) requested that the appeal be dismissed. It also filed six auxiliary requests.
- III. The following documents, referred to by the appellant in its grounds of appeal, are relevant to the present decision:
- |    |              |
|----|--------------|
| D1 | US 6 063 042 |
| D2 | WO 99/33037  |
| D9 | US 6 210 368 |
- IV. The Board issued a summons and a subsequent communication to oral proceedings containing its provisional opinion, in which it indicated *inter alia* that the invention according to claim 1 of the main request seemed to be sufficiently disclosed, the subject-matter of claim 1 novel over D2 and that it might need to be discussed if the combination of D1 with the teaching of D2 would lead the skilled person to the subject-matter of claim 1.
- V. With letter dated 11 September 2018, the respondent filed new auxiliary requests 1 to 8 and former auxiliary requests 1 to 6 were renumbered as auxiliary requests 9 to 14.

- VI. With its letter dated 9 October 2018, the appellant informed the Board that it would not be present or represented at the oral proceedings.
- VII. Oral proceedings were held before the Board on 11 October 2018 in the absence of the appellant, during which the main request and auxiliary requests 2 to 14 were withdrawn.

The respondent (patent proprietor) requested finally that the patent be maintained in the following version:  
Description: Pages 2 to 5 of the patent specification.  
Claims: 1 to 16 of auxiliary request 1 filed with letter of 11 September 2018.  
Drawings: Figures 1 to 4 of the patent specification.

- VIII. Claim 1 of the main request reads as follows:  
"A system for detecting wetness in an absorbent article, the system comprising: an absorbent structure; at least one sensor (i) in contact with the absorbent structure, which sensor (1) is adapted to provide a variable electrical output dependent upon an amount of aqueous liquid associated with the absorbent structure; a remote interrogating device (20) capable of detecting changes in the variable electrical out put of the at least one sensor (1); and a reporting element (30) coupled to the interrogating device (20) characterized in that,  
the at least one sensor (1) comprises an electrical circuit (10) having an inductor (14) and a variable capacitor (12) electrically connected in parallel, the capacitor (12) has plates (16) that are adapted to move apart when absorbent material (18) located between them absorbs fluid and swells, and that are adapted to move closer together when absorbent material (18) located between them is susceptible to wet collapse or

shrinkage, wherein the variable capacitor (12) has a capacitance that changes with the amount of aqueous liquid associated with the absorbent reservoir, wherein the electrical circuit (10) has a resonance frequency that changes with the amount of aqueous liquid associated with the absorbent reservoir, and wherein the interrogating device is (20) capable of detecting a resonance frequency of the electrical circuit (10)."

Claim 8 of the main request reads as follows:

"A method of controlling liquid bodily exudates comprising the steps of:

- a) placing a first disposable article in proximity to a source of liquid bodily exudates, the disposable article including a system for detecting wetness according to any of the aforementioned claims
- b) allowing the absorbent structure to absorb liquid bodily exudates;
- c) transmitting a signal from a remote interrogating device;
- d) detecting a change in the variable electrical output of the at least one sensor; and
- e) reporting information based upon the signal detected."

Claim 16 of the main request reads as follows:

"The method of claim 8 wherein the step of detecting a change in the variable electrical output comprises transmitting signal having a frequency of less than about 300 kHz to determine a phase shift caused by magnetic properties of the at least one sensor."

IX. The arguments of the appellant may be summarised as follows:

*Sufficiency of disclosure*

The description of the patent did not allow the skilled person to understand how the variable capacitor of claim 1 worked.

An essential feature regarding the contribution to the dielectric effect of replacing air in the absorbent liquid with aqueous liquid was missing from claim 1 as the use of the expression "alternately" in paragraph [0035] seemed to suggest.

It was not clear from the wording of claim 1 and paragraph [0035] if the plates from the capacitor should move apart and close together in the same or in different embodiments. Further, no materials capable of wet shrinkage were disclosed in the patent.

The patent also did not disclose sufficiently the term "absorptive wave meter" of paragraph [0035] in a way that allowed the skilled person to know what such a wave meter was.

Claim 16 implicitly used a magnetic sensor that lacked any disclosure. The description gave no details to a skilled person how to arrive at a magnetic sensor detecting both a resonance frequency and a phase shift.

*Novelty*

The subject-matter of claim 1 was not novel over D2, because page 21, lines 22-23 together with page 23, line 32, page 24, line 7, page 26, lines 4-15 and corresponding figures 2A, 3A and 4A disclosed a capacitor having plates that were adapted to move apart when absorbent material located between them absorbed

fluid and swelled, and that were adapted to move closer together when absorbent material located between them was susceptible to wet collapse or shrinkage.

*Inventive step*

The subject-matter of claim 1 did not involve an inventive step when starting from D1 and combining this with the teaching of D2 in light of the objective technical problem to be solved, which was to provide a passive sensor that did not require a power source. The skilled person would consider D2 because it was directed to this problem and disclosed a resonant circuit that did not require a power source with the features of the sensor of claim 1.

*Admittance of document D9*

D9 supported the appellant's view of lack of inventive step and disclosed variable capacitors.

- X. The arguments of the respondent may be summarised as follows:

*Sufficiency of disclosure*

The term "variable capacitor" was a well established term and paragraph [0035] provided a fully enabling disclosure for the person skilled in the art of what a variable capacitor is.

An absorption wave meter was also known to the person skilled in the art as attested by an article in Wikipedia on absorption wave meters. Paragraph [0035] also disclosed what an absorptive wave meter should include. In addition, the invention claimed did not



include a wave meter, such that arguments concerning a wave meter were not relevant for the assessment of sufficiency of disclosure of the invention.

Regarding claim 16, sensors and metallic elements having magnetic properties that changed with the amount of liquid were well known in the art as paragraphs [0044] to [0046] also explained.

#### *Novelty*

The subject-matter of claim 1 was novel over D2. D2 required that the fluid be in direct contact with resonant circuit so that the reception of electromagnetic energy of the resonant circuit was changed (see for example claims 1 and 6 of D2), which did not correspond to detecting wetness but simply the presence of fluid.

Further, and as acknowledged by the opposition division, none of the embodiments in D2 disclosed a capacitor having plates that were adapted to move apart when absorbent material located between them absorbed fluid and swelled, and that were adapted to move closer together when absorbent material located between them was susceptible to wet collapse or shrinkage.

#### *Inventive step*

The subject-matter of claim 1 did involve an inventive step when starting from D1 and combining this with the teaching of D2 in light of the objective technical problem to be solved, which was to provide a detection failure system that signalled the user to change the disposable article prior to soiling the user's clothing or, alternatively, to allow the user to have a more

accurate detection and to provide a system that worked over a broader range of absorbent materials. Also the problem mentioned by the Board in the oral proceedings, of being an alternative way of detecting wetness in an absorbent structure, could be accepted.

None of the embodiments in D2 disclosed the missing features from claim 1 regarding the sensor, i.e. a sensor with moving plates due to the swelling or shrinking of absorbent material located between them. The embodiment of Figures 10A and 10B just addressed an apparatus for detecting the level of an infusion liquid in a plastic container that collapsed during emptying thereof; this was not an absorbent structure.

*Admittance of document D9*

D9 did not disclose a capacitor with moving parts nor related to the problem underlying the claimed invention.

**Reasons for the Decision**

1. Sufficiency of disclosure
  - 1.1 In its preliminary opinion the Board stated, in regard to the first aspect of the appellant's objection relating to an alleged impossibility of the skilled person to understand how a variable capacitor works, that paragraphs [0035] together with paragraphs [0029] to [0031] explained the mechanisms that allowed the distance between the plates or the dielectric constant of the fluid to change.

None of the appellant's other arguments on this matter affected the opinion reached by the Board and since no further arguments were received in reply to its preliminary opinion, the Board sees no reason to alter its provisional opinion, which is thus confirmed herewith.

- 1.2 Concerning the second aspect of the appellant's objection, the Board stated in its preliminary opinion that the terminology "wave meter" was not part of the claimed invention, since it was simply used in the description and not required by the claims. As such, it is not required to use a wave meter for performing the invention across the whole scope of the invention as defined by the claims. It goes from the explanation on paragraph [0035] and the knowledge of the skilled person that an LC circuit with an inductor and a variable capacitor are sufficient to make the sensor according to the invention work. Although the Board mentioned in its communication that it might nevertheless be discussed whether a term used only in the description could affect this, the appellant did not comment on this in writing nor did it appear at oral proceedings to discuss the issue.

The appellant had argued in writing that the explanation given in paragraph [0035] of the description and a reference in a dictionary were not sufficient to allow the skilled person to understand what a wave meter was and that it had not been able to find any plausible techniques to make such an absorptive wave meter suitable for a resonance witness sensor fitting in an absorbent article - these do not change the foregoing, because they do not relate to the fact that the sensor defined in the claims does not necessarily comprise an absorptive wave meter nor is a

wave meter needed to carry out the invention as discussed in the paragraph above.

- 1.3 The appellant raised further objections against the sufficiency of the disclosure of the claimed invention on the basis of the absence of an essential feature in claim 1 and of the interpretation of claim 1 regarding the number of possible plate movements. In as far as the objection can be understood to relate to Art 83 EPC, the Board finds that a sufficiently clear and complete disclosure has been provided for the following reasons:

The appellant's argument that an essential feature regarding the change of the dielectric properties of the fluid was missing from claim 1 does not convince the Board. First, the absence of a feature only in a claim is not by itself decisive for answering the question of whether a skilled person can carry out the invention. The whole disclosure must be considered, also in light of the skilled person's general knowledge. Paragraph [0035] explains to the skilled person that a change in the distance of the plates or ("alternately") a change in the dielectric nature of the fluid changes the resonance frequency of the circuit. In fact, the skilled person knows from their common general knowledge of electromagnetism that the resonance frequency is a function of the capacitance, which in turn is a function of the dielectric constant of the material between the plates and of the distance between the plates. Thus, when reading paragraph [0035] the skilled person would understand that, in the context of this paragraph, the term "alternately" presents simply an alternative possibility to the change the resonance frequency of the circuit and not

that the change of dielectric constant alternates with the change of distance within the same embodiment.

- 1.4 The appellant's argument that it was not clear from the wording of claim 1 and paragraph [0035] if the plates from the capacitor should move apart and close together in the same or in different embodiments and that no materials capable of wet shrinkage are disclosed in the patent, are not accepted by the Board either. The wording of claim 1 defines plates that are "adapted to move apart" when the absorbent material located between them absorbs fluid and swells and that "are adapted to move closer together" when the absorbent material located between them shrinks or wet collapses. The same plates will thus be able to move apart or closer together depending on the behaviour of the absorbent material located between them.

Further, it is immaterial if paragraphs [0029], [0030] and [0031] explicitly disclose an absorbent material that collapses or wet-shrinks, since the skilled person knows absorbent materials that possess these properties and, as stated in paragraph [0031], the list of materials is non-limiting and other fibres in addition to the fibres listed in this paragraph may be included to add desirable characteristics to the absorbent body.

- 1.5 The appellant further argued that claim 16 implicitly used a magnetic sensor that was not sufficiently disclosed. Method claim 16 determines a phase shift caused by magnetic properties of the claimed at least one sensor. Whilst the claimed sensor comprises an LC circuit with a resonance frequency that can change (due to the dependency of claim 16 on claim 8 (granted claim 9) which is further dependent on claim 1), paragraphs [0045] and [0046] of the description disclose how the

received signal will be delayed when compared to the transmitted signal and how this delay is generally a function of the resistance and inductance of the conductor in the circuit, the latter corresponding to a magnetic property of the sensor. Thus, in the absence of any argument to the contrary, the respondent's argument can be accepted that the movement of the plates in the sensor causes a change in the inductance that is reflected in a delay change between the received and the transmitted signal, i.e. a phase shift between both signals occurs.

1.6 The invention thus meets the requirement of Article 83 EPC.

2. Novelty

2.1 In the communication containing its preliminary opinion, the Board had stated that the requirement of Article 54 EPC appeared to be met, since D2 did not seem to disclose at least the features

"the capacitor (12) has plates (16) that are adapted to move apart when absorbent material (18) located between them absorbs fluid and swells, and that are adapted to move closer together when absorbent material (18) located between them is susceptible to wet collapse or shrinkage".

2.2 The Board stated further that D2 seemed to disclose several embodiments of resonant circuits that detect fluid. It was disclosed on page 21, lines 14-24 that the substrates were folded and that the degree of folding changed the distance between the plates, thereby providing a variable capacitance. This folding step however seemed to occur during the production of

the sensor and not during its later operation (in contact with fluid) as could seemingly be derived from page 22, line 14 onwards and Figures 2H, 2I and 2J.

Also the embodiment of Figure 4A and the paragraph bridging pages 23 and 24 seemed to involve only a change of dielectric constant due to the presence of fluid, but no kind of motion between the plates; at least there was no unambiguous disclosure of this. Additionally, whilst the embodiment of Figure 10 disclosed container sides that collapsed against each other changing the distance between the plates, this embodiment dealt with an infusion bag that did not seem to be an absorbent structure.

The appellant did not submit any comments or counter-arguments in reply to this provisional opinion. The Board has therefore no reason to reach a different conclusion, and confirms its preliminary opinion herewith.

- 2.3 Since at least the features discussed under item 2.1 above are lacking in D2, and since no further novelty attacks have been made by the appellant, the subject-matter of claim 1 is novel (Article 54 EPC).
- 3. Inventive step
  - 3.1 It was not contested that D1 discloses all the features of the preamble of claim 1. The Board also finds no reason to disagree.
  - 3.2 The subject-matter of claim 1 thus differs from D1 through the features of the characterizing portion relating to the underlying construction and functioning of the sensor, namely in that

"the at least one sensor (1) comprises an electrical circuit (10) having an inductor (14) and a variable capacitor (12) electrically connected in parallel, the capacitor (12) has plates (16) that are adapted to move apart when absorbent material (18) located between them absorbs fluid and swells, and that are adapted to move closer together when absorbent material (18) located between them is susceptible to wet collapse or shrinkage, wherein the variable capacitor (12) has a capacitance that changes with the amount of aqueous liquid associated with the absorbent reservoir, wherein the electrical circuit (10) has a resonance frequency that changes with the amount of aqueous liquid associated with the absorbent reservoir, and wherein the interrogating device is (20) capable of detecting a resonance frequency of the electrical circuit (10)".

3.3 The objective problem is to provide an alternative way of detecting wetness in an absorbent structure, since no additional technical effect is provided by the differing features.

The argument from the appellant that the different features from claim 1 in relation to the sensor of D1 provided a passive sensor that solved the problem of not requiring a power supply, is not accepted by the Board. As described in D1, column 6, lines 4-10, the sensor of D1 can also be remotely energized by radio frequency and thus, in such a case, it would not require a connection to a power source.

Further and as the Board stated in its communication, D1 already discloses a detection failure system that signals the user to change the disposable article prior to soiling the user's clothing (see column 6, lines



11-13, referring to alerting the user that the capacity to further absorb menses is low and the article should be replaced). Thus, this effect is also provided already by the system of D1.

The other possible effects alluded by the respondent - to allow the used to have a more accurate detection and to provide a system that works over a broader range of absorbent materials - also do not seem to correspond to the differing features defined in claim 1. The respondent did not bring forward any evidence demonstrating these effects, such that the Board is not convinced that a system relying on the conductivity of electrical current as described in D1 would be less accurate or work with fewer materials than the claimed one relying on the capacitance of an LC circuit. Indeed, claim 1 is not limited to an interrogating device which can detect continuously or otherwise changes in resonance frequency, but merely one capable of detecting "a resonance frequency" of the circuit, such that in the context of the claim it may merely be required to detect a single change due to a particular amount of liquid associated with the absorbent reservoir.

3.4 The skilled person would look for an alternative way of detecting wetness in an absorbent structure in the teaching of D2, since, contrary to the argument of the respondent, D2 is directed *inter alia* to absorbent articles (for example in Figure 6, which discloses a sensing resonant circuit embedded in a diaper or bandage 60 able to absorb fluid). The embodiments of Figures 4A and 4B in D2 disclose two ways of sensing wetness in these articles, but none of them corresponds to the claimed solution, since the plates of the capacitor do not move. As explained on page 24, lines

1-7, in the embodiment of Figure 4A the change of resonance frequency will occur through a change in dielectric constant of the material between the plates when the material "absorbs fluid" (i.e. becomes wet) and not of the distance between said plates. This is the only effect that is unambiguously disclosed through the terminology "the fluid substantially changes the dielectric constant" and there is no other passage relating to the embodiment of Figure 4A that unambiguously implies a movement of the capacitor plates.

It is generally disclosed on page 21, lines 14-24 that the substrates are folded and that the degree of folding changes the distance between the plates, thereby providing a variable capacitance. However, this folding step occurs during the production of the sensor and not during its later operation (in contact with fluid) as can seemingly be derived from page 22, line 14 onwards and Figures 2H, 2I and 2J. Thus the sensor with a capacitor in these embodiments of D2 does not have plates that are adapted to move apart when absorbent material located between them absorbs fluid and swells, and that are adapted to move closer together when absorbent material located between them is susceptible to wet collapse or shrinkage.

The skilled person starting from D1 and trying to solve the objective problem would, when faced with the teaching of the embodiment of Figure 4A of D2, replace the conductive sensor from D1 with the resonance circuit according to Figure 4A (that relies only on the change of the dielectric constant) and thus would not arrive at a system for detecting wetness according to claim 1.

3.5 In addition, whilst the embodiment on page 26, lines 4 to 15, corresponding to Figures 10A and 10B, discloses container sides that collapse against each other and thus plates that do move towards each other, this embodiment is not directed to detecting wetness in an absorbent material but to indicating when an infusion bag, which is not an absorbent structure, is empty.

In fact, as indicated when considering the embodiment of Figure 6, when it comes to absorbent articles, D2 clearly teaches the skilled person to use a resonant circuit completely folded and embedded in its inside, which can only use the effect of change the dielectric constant of the material. The embodiments of Figures 11, 12A and 12B (see page 26, line 17 to page 27, line 13) further attest to this, since they employ a resonant circuit in different ways according to the required function (e.g. for partly covering wounds, embedded in absorbent articles, for detecting fluid level in a drain, for monitoring when infusion containers are empty, for taking body temperature) and in all the embodiments the absorbent article employs the configuration of Figure 6.

The skilled person faced with D2 would thus not select the resonant circuit used in empty infusion container detector from the embodiment of Figures 10A and 10B and adapt it to detect wetness in an absorbent article, since D2 consistently uses a different resonant circuit for absorbent articles and thus already teaches the skilled person a different solution to the problem.

3.6 For the above reasons, the subject-matter of claim 1 of the main request involves an inventive step (Article 56 EPC) when starting from D1 and given the technical

problem to be solved, when considering the teaching of D2.

4. Admittance of D9

4.1 Article 12(4) RPBA requires the Board to take into account everything presented by the parties under Article 12(1) RPBA if and to the extent that it relates to the case under appeal and meets the requirements in Article 12(2) RPBA. However, according to Article 12(4) RPBA, the Board has the discretionary power to hold inadmissible facts, evidence and requests that could have been presented or were not admitted in the first instance proceedings.

4.2 As the Board stated in its communication, the appellant did not seem to rely on D9 in its complete case to reason why it is requested that the decision under appeal should be reversed. The appellant did not submit any comments or counter-arguments in reply to this provisional opinion. The Board has therefore no reason to reach a different conclusion, and confirms its preliminary opinion herewith. On page 11 of its statement of grounds and contrary to the appellant's own declared intention, the appellant simply discusses the general disclosure of D9, without submitting any reason as to why the opposition division should have admitted D9 or even why, taking into consideration D9, the subject-matter of claim 1 does not involve an inventive step.

4.3 D9 is thus not admitted into the proceedings (Article 12(4) RPBA).

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:  
Description: Pages 2 to 5 of the patent specification.  
Claims: 1 to 16 of auxiliary request 1 filed with letter of 11 September 2018.  
Drawings: Figures 1 to 4 of the patent specification.

The Registrar:

The Chairman:



M. H. A. Patin

M. Harrison

Decision electronically authenticated