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**Datasheet for the decision  
of 8 August 2022**

**Case Number:** T 1778/19 - 3.3.05

**Application Number:** 16205278.1

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**IPC:** C02F1/00, C02F1/28, B01D35/06,  
B01D24/00, C02F1/42

**Language of the proceedings:** EN

**Title of invention:**  
PURIFICATION DEVICE

**Applicant:**  
Nordaq Water Filter Systems AB

**Headword:**  
Purification device/NORDAQ

**Relevant legal provisions:**  
EPC Art. 56

**Keyword:**  
Inventive step - (no) - partial problems - obvious  
modification - effect not made credible within the whole scope  
of claim

**Decisions cited:**

**Catchword:**



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Case Number: T 1778/19 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 8 August 2022**

**Appellant:** Nordaq Water Filter Systems AB  
(Applicant) Sveavägen 166  
113 46 Stockholm (SE)

**Representative:** Groth & Co. KB  
P.O. Box 6107  
102 32 Stockholm (SE)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 12 February  
2019 refusing European patent application No.  
16205278.1 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** E. Bendl  
**Members:** T. Burkhardt  
O. Loizou

## Summary of Facts and Submissions

I. The applicant's (appellant's) appeal is against the examining division's decision to refuse European patent application No. 16 205 278.1.

II. The following documents were among those discussed at the examining stage:

D1 JP 2005-334750 A and a translation of D1 submitted by the appellant by letter dated 21 March 2018

D4 "Galvanic series (electrochemical series)", retrieved from [https://structx.com/Material\\_Properties\\_001.html](https://structx.com/Material_Properties_001.html)

III. The examining division held, *inter alia*, that the then main request did not fulfil the requirements of Article 56 EPC in view of D1.

IV. At the beginning of the appeal stage, the appellant requested that a patent be granted based on one of the requests on file (i.e. the main request and auxiliary requests 1 and 2 underlying the impugned decision), but during the oral proceedings it withdrew auxiliary requests 1 and 2.

V. Claim 1 of the main request (sole request) reads as follows:

"1. A purification device for purifying a liquid comprising a container (1) having an inlet (8) for the liquid and an outlet (9) for the liquid and a filter

(10) arranged in the container (1), said filter (10) comprising activated carbon and precious metal particles and/or semi-precious metal particles and/or valve metal particles distributed in the activated carbon, the filter (10) being placed in a flow path of the liquid, the flow path of the liquid being chosen so that the liquid enters the container (1) via the inlet (8), enters the filter (10), at least partially passes through the filter (10) and then flows out of the purification device via the outlet (9), wherein the liquid is exposed to a galvanic voltage at least on a part of the flow path and wherein the container (1) comprises metal at least on an inner side so that the metal is in contact with the liquid when the purification device is in use, wherein the galvanic voltage is generated by the metal and the precious metal particles and/or the semi-precious metal particles and/or the valve metal particles in the filter (10) and wherein the flow path of the liquid is chosen so that the liquid enters the filter (10) via a lateral surface (15) and flows radially inwards towards an inside of the filter (10) and then out of the purification device via the outlet (9), wherein the amount of precious metal particles and/or semiprecious metal particles and/or valve metal particles in the filter (10) is in a range of 0.01 % to 5 % by weight, characterized in that the galvanic voltage is in a range of 0.08 V to 1.1 V and in that the filter (10) further comprises an adhesive that holds the filter (10) together as a solid piece of material."

VI. The appellant's arguments at the appeal stage relevant to the present decision can be summarised as follows.

The requirements of Article 56 EPC were fulfilled.

Compared with D1, the electrochemical reaction of the invention occurred at a different location. While silver acted as the cathode in D1, it acted as the anode in the current application. As a consequence, the invention allowed omitting the separate ceramic layer 42 in the device of D1.

The invention solved the problem of providing an easy-to-build filter with an improved quality of the filtered liquid due to the formation of OH<sup>-</sup> ions.

- VII. The appellant requested that the decision under appeal be set aside and that a European patent be granted on the basis of the main request filed with the statement setting out the grounds of appeal.

## **Reasons for the Decision**

### *Main request*

#### 1. Inventive step

For the reasons set out below, the main request does not fulfil the requirements of Article 56 EPC.

- 1.1 The invention relates to a purification device for purifying a liquid.
- 1.2 It has not been contested that D1 (Figure 1, paragraphs [0015] to [0024]) discloses a purification device for purifying a liquid which comprises a metal container (stainless steel [0016]), precious metal particles

distributed in an activated carbon filter (paragraph [0018]) and a radial flow arrangement.

Since D1 relates to the same technical field and has a quite similar aim and several features in common with the subject-matter of claim 1, it is a suitable starting point for assessing inventive step.

1.3 The problem to be solved according to the application "is to provide a purification device that is efficient, easy to manufacture and reduced in complexity" (page 2, lines 9 to 10).

1.4 It is proposed to solve this problem by means of the purification device of claim 1 characterised in:

- (a) an amount of precious, semi-precious and/or valve metal particles in the filter in the range of 0.01 to 5 wt.%
- (b) the galvanic voltage between the metal of the container and the precious, semi-precious and/or valve metal particles in the range of 0.08 to 1.1 V
- (c) the presence of an adhesive to hold together the filter as a solid piece of material

D1 is silent on the amount of silver in the activated carbon and does not mention the use of an adhesive.

With regard to difference (b), the first table of D4 indicates that the potential of stainless steel depends on the type of the alloy (see, for example, lines 19, 30 and 32). In specific cases, the resulting galvanic voltage could thus be outside the range of claim 1; for example, if stainless steel 304 is used in D1 (having a potential between -0.13 and -0.05 V according to line 30 in the first table of D4) and silver having a

potential of -0.09 V (upper limit according to D4), the difference lies outside the range of 0.08 to 1.1 V.

1.5 For the reasons set out below, the subjective problem indicated above under point 1.3 is only partially solved.

1.5.1 Firstly, the appellant argues that differences (a) and (b) result in an improved quality of the filtered liquid due to the formation of  $\text{OH}^-$  ions following the known electrolysis of water.

However, an improved quality of the filtered liquid has not been proven. The application does not contain evidence in this regard, nor does claim 1 define which of the electrodes forms the anode and which the cathode, and nor has the appellant provided experimental results. While the skilled person knows that the silver of D1 (see paragraph [0020]) has a strong antibacterial effect, it is not credible that any type of precious, semi-precious and/or valve metal particles resulting in the claimed galvanic voltage with the metal of the container improves the quality of the filtered liquid. This is not least due to the fact that not only the precious/valve metal but also the steel composition (and therefore the reference value) can vary quite a lot (see the last paragraph of point 1.4 above).

Moreover, device claim 1 does not require that the electrolysis of water take place but only the presence of a galvanic voltage.

This part of the technical problem posed has thus not been successfully solved.



Secondly, the appellant argues that difference (c) is related to an easier manufacture of the filter.

It is credible that the use of an adhesive to hold together the filter as a solid piece of material simplifies the assembly of the purification device and/or the replacement of the filter.

This part of the technical problem posed has thus been successfully solved.

- 1.5.2 A synergistic effect related to differences (a), (b) and (c) was neither pleaded nor could be identified by the Board. This is in line with the examining division's findings (see point 2.3 of the decision under appeal).
- 1.6 The technical problem to be solved has therefore to be reformulated, namely as the provision of a purification device that can be manufactured more easily.
- 1.7 For the following reasons, the subject-matter of claim 1 does not involve an inventive step (Article 56 EPC).

With regard to feature (a), a metal concentration in the claimed range is obvious, as argued by the examining division. The appellant has notably failed to provide evidence to refute the examining division's statement that "[c]ommercial silver doped activated carbon is known to have a concentration of silver around 0.2%" (see point 2.4 of the decision under appeal).

With regard to feature (b), the table of D4 shows that silver and certain stainless steel grades have galvanic

voltage ranges that overlap with that of claim 1 (see lines 19 and 29 of the table). In the absence of a surprising or unexpected effect, the galvanic voltage range of claim 1 is thus an arbitrary selection.

With regard to feature (c), the use of an adhesive for simplifying the manufacture and replacement of the filter is obvious. The examining division argued the same (see point 2.5 of the decision under appeal), and the appellant has not refuted this.

In its statement setting out the grounds of appeal, the appellant provides arguments on the feature "galvanic voltage" but none on why the two distinguishing features (a) and (c) mentioned above confer an inventive step.

- 1.8 In the appellant's view, the device of claim 1 allowed for the absence of a Ca- and Mg-comprising ceramic layer, such as layer 42 of D1. The skilled person starting from D1 had no incentive to remove the layer from the device of D1.

However, claim 1 only requires a specific galvanic voltage between the metal particles containing activated carbon and the container. Claim 1 does not exclude the presence of further layers, and the application even envisages the possibility of a further layer (see, for example, page 10, lines 27 to 31).

- 1.9 The appellant further argues that the chemical reactions in D1 occurred at a different location than in the application, namely between the Ca- and Mg-containing ceramic resin layer 42 and the silver-containing activated carbon layer 41 (see the figure and paragraphs [0020] and [0024]). By contrast, claim 1

required that the reaction occurred between the metal of the container and the activated carbon.

This argument is not convincing either. The "galvanic voltage" in claim 1 is the difference in potential between the metal particles distributed in the activated carbon and the metal of the container. This potential difference exclusively depends on the potential of the two metals involved. The fact that the device of D1 has a galvanic voltage between activated carbon layer 41 and ceramic layer 42 does not preclude a *further* galvanic voltage between activated carbon layer 41 and stainless steel container 20. This has not been contested by the appellant.

- 1.10 The appellant also argues that in D1 calcium and magnesium corresponded to the (corroding) anode and silver to the (protected) cathode, whereas in the application silver corroded and stainless steel protected (page 4, lines 30 to 34).

However, this observation has no bearing since claim 1 does not state that:

- the container has to be the cathode and made of stainless steel
- the precious metal has to be silver and the anode

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated