Unified Patent Court
Einheitliches Patentgericht
Juridiction unifiée du brevet

UPC_CFI_239/2023
App_549536/2023
CC_588768/2023

DECISION ON THE MERITS
of the Court of First Instance of the Unified Patent Court
Local Division The Hague
delivered on 22 November 2024
concerning EP2137782

Headnotes:

1. The patent is valid and infringed by equivalence.

2. The scope of protection in the case of infringement is assessed in two steps, applying Art. 69 EPC and the Protocol. The first step evaluates 'literal' infringement of the features of the patent in view of the claim construction is evaluated. In a second step, if the patent is not judged to have been literally infringed, equivalence is assessed.

3. The test applied to the assessment of infringement by equivalence is based on the case law in various national jurisdictions, as proposed by both parties in this case. This entails that a variation is equivalent to an element specified in the claim if the following four questions are answered in the affirmative.
    1) Technical equivalence: does the variation solve (essentially) the same problem that the patented invention solves and perform (essentially) the same function in this context?
    2) Farir protection for patentee: Is extending the protection of the claim to the equivalent proportionate to a fair protection for the patentee?
    3) Reasonable legal certainty for third parties: does the skilled person understand from the patent that the scope of the invention is broader than what is claimed literally?
    4) Is the allegedly infringing product novel and inventive over the prior art?

4. The court can order a specific wording for a letter to be sent to customers or to be published on the website of the infringer based on Art. 64 UPCA and Union law.

Keywords:

Validity. Infringement by equivalence. Text for recall letter/publication on website.

CLAIMANT

1) **Plant-e Knowledge B.V.**
Claimant in the infringement proceedings
Defendant in the counterclaim proceedings
Renkum – the Netherlands

2) **Plant-e B.V.**
Claimant in the infringement proceedings
Defendant in the counterclaim proceedings
Renkum – the Netherlands

referred to collectively as "**Plant-e**" and
separately as "**Claimant 1**" and "**Claimant 2**"

Represented by:
Oscar Lamme, R.D. Verweij, D.M.Termeulen, Dr. P. Meyer, J. Renes, X. Huang and A. van Stralen (Simmons & Simmons)

DEFENDANT

Arkyne Technologies S.L.
(Defendant in the infringement proceedings
Claimant in the counterclaim proceedings
Barcelona – ES,

referred to as: "**Bioo**"

Represented by

Joran Spauwen, Alfred Meijboom, M.L. Rondhuis (Kennedy Van der Laan), Patrick Busch and Wouter Mooij (De Vries & Metman) and X. Fabrega, attorney at Rousaud Costas Duran S.L.P.

PATENT AT ISSUE

Patent no.	*Proprietor(s)*
EP2137782	Plant-e Knowledge B.V.

DECIDING JUDGES

Presiding judge	**Edger Brinkman**
Legally qualified judge	**Samuel Granata**
Technically qualified judge	**Simon Walker**
Judge-rapporteur ("JR")	**Margot Kokke**

LANGUAGE OF THE PROCEEDINGS: English[1]

ORAL HEARING: 30 September 2024

[1] The language of the proceedings was changed from Dutch to English by a R.323-order of the President of the Court of First Instance dated 4 October 2023

I. SUMMARY OF FACTS

5. Claimant 1 is the proprietor of European Patent EP 2 137 782, entitled "*Device and Method for Converting Light Energy into Electrical Energy*" ("EP 782" or "the patent") and Claimant 2 its licensee. The patent was granted on 15 November 2017, upon an international application filed on 17 April 2008 (publication number WO 2008/127109, "WO 109" or "the Application"), claiming priority of Dutch national application number NL 2000598 of 17 April 2007 (the "Priority Application" or "NL 598").

6. No opposition was filed.

7. EP 782 is in force in the following Contracting Member States: the Netherlands, Belgium, Luxembourg, Germany, France and Italy.

8. The patent relates to a device (claims 1-10) and a method (claims 11-16). In the original English language of the patent, the independent device claim 1 and method claims 11-16 read as follows:

> **1.** Device for converting light energy into electrical energy and/or hydrogen comprising a reactor, wherein the reactor comprises an anode compartment (2) comprising an anodic material and a cathode compartment and where the anode compartment comprises a) an anodophilic micro-organism capable of oxidizing an electron donor compound, and b) a living plant (7) or part thereof, capable of converting light energy by means of photosynthesis into the electron donor compound, wherein the root (8) zone of the plant is essentially placed in the anodic material.
>
> **11.** Method for converting light energy into electrical energy and/or hydrogen, wherein a feedstock is introduced into a device that comprises a reactor, where the reactor comprises an anode compartment (2) and a cathode compartment and wherein the anode compartment comprises a) an anodophilic micro- organism capable of oxidizing an electron donor compound, and b) a living plant (7) or part thereof, capable of converting light energy by means of photosynthesis into the electron donor compound, wherein the microorganism lives around the root (8) zone of the plant or part thereof.
>
> **12.** Method according to claim 11, wherein the electron donor compound is an organic compound.
>
> **13.** Method according to claim 11 or 12, wherein the plant is an energy plant.
>
> **14.** Method according to any one of claims 11 - 13, wherein the electron donor compound is an exudate, a secretion, a lysate, vegetable matter from dead parts of plants, a gas and/or a gum of plant origin.
>
> **15.** Method according to any one of claims 11 - 14, wherein the feedstock comprises one or more micro and/or macronutrients.
>
> **16.** Method according to any one of claims 11 - 15, wherein the anode compartment comprises a redox mediator.

9. The two figures of the patent specification are shown below:

Fig 1

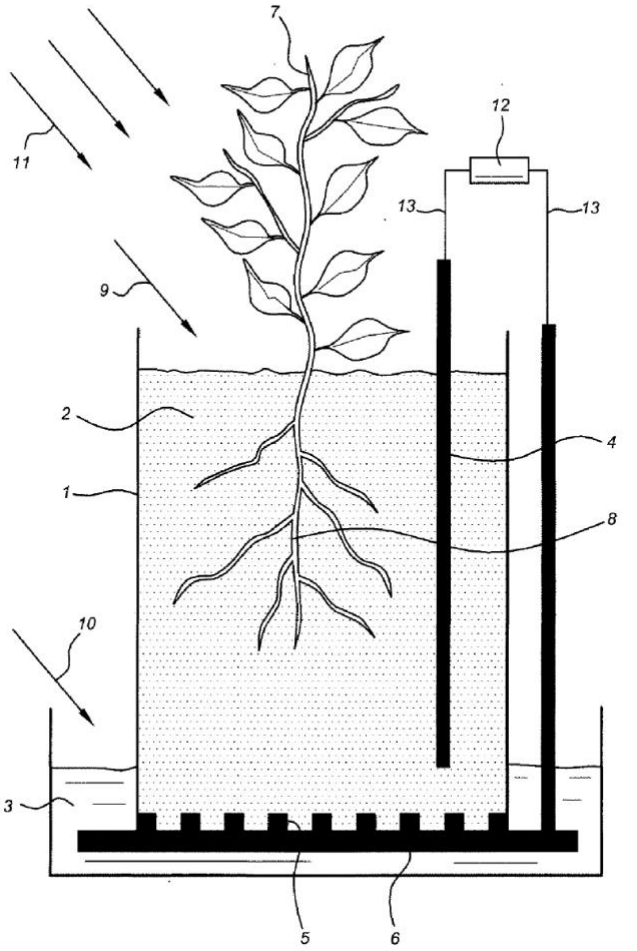
7
11
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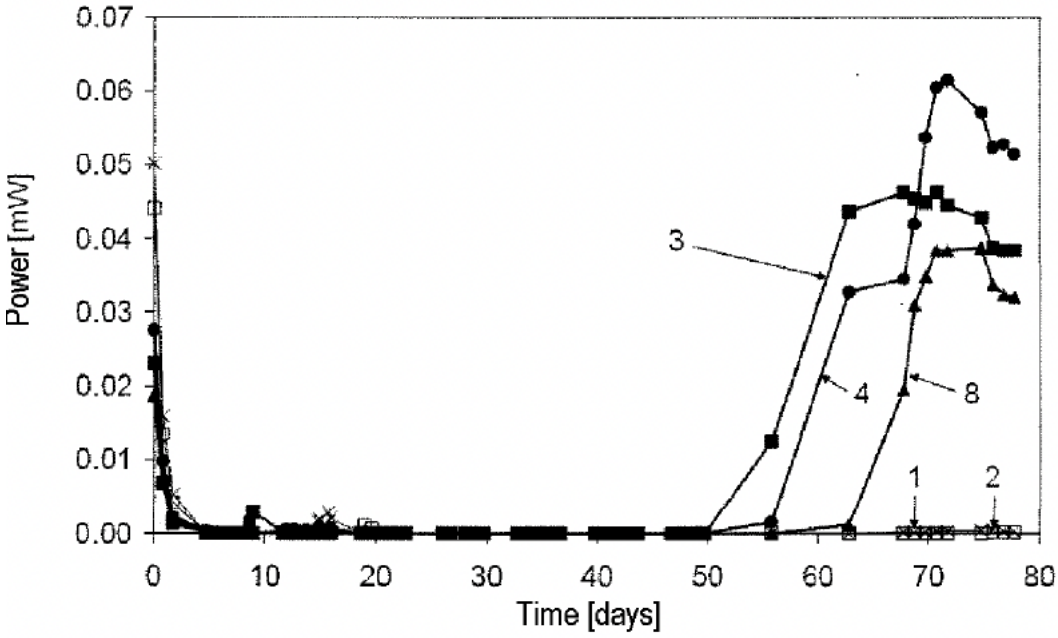
Fig 2


0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Power [mW]
0
10
20
30
40
50
60
70
80
Time [days]
3
4
8
1
2

10. The description of the patent contains inter alia the following paragraphs:

[0001] The present invention relates to a device and a method for converting light energy into electrical energy and/or hydrogen by using a living plant for converting light energy into a feedstock for a microbial fuel cell.

Background to the invention

[0002] Microbial fuel cells are known from the prior art. For example, WO 2007/006107 discloses a microbial fuel cell that comprises a reactor, and each reactor comprises an anode compartment, a cathode compartment and a membrane, where the membrane separates the anode compartment and the cathode compartment from each other. The anode compartment contains micro-organisms capable of oxidizing organic electron donor compounds, the electrons being supplied to the anode in the anode compartment. According to WO 2007/006107, the organic electron donor compound in question can be glucose, sucrose, an acetate or a reducing compound of the type occurring for example in domestic sewage and the effluent of bio-refineries.

[0003] Other microbial fuel cells are described for example in: Logan et al., 2006, Lovley, 2006a; Lovley, 2006b; Rabaey and Verstraete, 2005, and Verstraete and Rabaey, 2006. The oxidation of the electron donor compounds can be catalysed for example by anodophilic and/or cathodophilic micro-organisms and redox enzymes. In some applications, hydrogen is produced in the cathode compartment as an energy carrier, instead of electricity (Liu et al., 2005; Rozendal et al., 2006).

[0007] A disadvantage of the microbial fuel cells according to WO 2007/006107 is that an effluent stream such as domestic waste water is used. Effluent streams are not sustainable or renewable, and cannot be sustainably obtained, due to transport, for example. A great deal of energy is invested before effluent streams are obtained, and this involves a large CO_2 emission from fuels, for example fossil fuels or radioactive waste released in the generation of nuclear energy. It is true that by increasing the production of effluent streams, more energy can be produced by fuel cells, but such a method does not offer a sustainable or renewable solution for the increasing world consumption of electrical energy. It is therefore better to generate or regenerate energy in a sustainable or renewable way. The present invention provides a solution for the problem of reducing non-sustainable and non-renewable energy.

Summary of the invention

[0008] The present invention relates to a device that comprises a reactor, where the reactor comprises an anode compartment and a cathode compartment and where the anode compartment comprises a) an anodophilic micro-organism capable of oxidizing an electron donor compound, and b) a living plant or part thereof.

[0009] The present invention also relates to a method for converting light energy into electrical energy and/or hydrogen, where a feedstock comprising an electron donor compound is introduced into a device that comprises a reactor, where the reactor comprises an anode compartment and a cathode compartment and where the anode compartment comprises a) an anodophilic micro-organism capable of oxidizing an electron donor compound, and b) a living plant or part thereof

(…)

[0011] The term "living plant or part thereof" is used in this document in the sense of a plant (or any part thereof) belonging to the Plant Kingdom (*Plantae*) and comprising at least one eucaryotic cell with a cell membrane, capable of converting light energy into an electron donor compound by means of photosynthesis. The term "living plant or part thereof" therefore also covers separate, possibly undifferentiated plant cells that are obtained for example by tissue culture and are capable of converting light energy, by means of photosynthesis, into an electron donor compound, and algae.

[0012] According to the invention, the electron donor compound is converted into electrical energy and/or chemical energy, preferably in the form of hydrogen, with the aid of an anodophilic micro-organism.

[0013] According to the invention, the electron donor compound is preferably an organic compound.

[0014] A membrane that can transport ions selectively can be used to separate the anode compartment from the cathode compartment. It is also possible to employ electrically non-conducting, non-ion-selective porous materials. Examples of these materials are glass and plastic. However, a membrane that can transport ions selectively is preferred. The membrane is preferably a cation-selective membrane and more preferably a proton-selective membrane.

[0015] The plant or its part is preferably derived from what is called an energy plant. An energy plant is a living plant that contributes to sustainable energy: solar energy is present during the daytime and can be stored by living plants or their parts for example in the form of an electron donor compound, while CO_2 is absorbed from the atmosphere. Hence, an energy plant is to be understood as a living plant capable of converting light energy into chemical energy.

[0016] Various parts of a plant, for example fallen leaves or roots that have not been harvested, can be used as an energy plant. These parts are lost from renewable energy supply. A large part of the solar energy stored by the plant leaves the plant under the ground, due to the roots dying and respiring and by the release of an exudate. This process stimulates the growth of soil micro-organisms. These processes are defined as rhizodeposition. It has been established that nearly all types of chemical components of a plant can be lost by root losses. These components are for example carbohydrates such as sugars, amino acids, organic acids, hormones and vitamins. These components are classified into 4 groups, depending on their origin: exudates, secretions, lysates and gases. Exudates seep out of the root without the involvement of metabolic energy, while in the case of secretions, proper metabolic processes take place in the plant. Lysates are due to the root dying off. Gases also come from the roots of the plant (Lynch, 1990). Rhizodeposition depends for example on the type of the plant, its age and circumstances of life. Cast-off plant parts such as fruits, branches and leaves can contribute to the increase of organic matter in the soil. It is therefore preferred according to the invention that the plant or part thereof is an energy plant or a part thereof, in which case the living plant or part thereof converts light energy into at least an electron donor compound, which is subsequently converted into electrical energy and/or hydrogen, preferably by the root system of a living plant, in cooperation with a micro-organism.

[0017] According to the invention, the electron donor compound can be present in exudates, secretions, lysates, vegetable matter from dead plant parts, gases and/or a gum of plant origin, derived from the root system of a plant or a part thereof. The electrons produced by micro-organisms are transported from the anode first to a resistance or a device that consumes electrical energy, and then to the cathode. Oxygen, especially oxygen from the atmosphere, is used as the terminal electron acceptor.

[0018] According to an embodiment of the present invention, the anode preferably comprises an anodic material, said anodic material preferably being selected from the group consisting of graphite granules, graphite felt, graphite rods, other graphite-containing electron conductors and combinations of one or more of such materials, the root zone of a living plant essentially being present in the anodic material. This means in particular that the roots of the living plant are mainly placed in the anodic material. The added advantage of this is that the plant has a grip.

[0019] The micro-organism that converts the electron donor compound of the plant or part thereof preferably lives around the root zone of the living plant (called the rhizosphere), so the micro-organism can release electrons to the anode more easily.

[0020] In another embodiment according to the present invention, the reactor comprises a number of anode compartments, which are closed off from the surroundings (the atmosphere).

[0021] In yet another embodiment according to the present invention, the reactor comprises an anode compartment that can be opened, so that it can be in contact with the surroundings thereof. This has the advantage that the living conditions of the living plant, such as temperature, light and/or moisture, can be regulated.

[0022] According to the invention, the feedstock for the anode compartment can be one or more micro- and/or macronutrients and/or water for the living plant or part thereof or for the micro-organism. The feedstock is preferably a balanced amount of micro- and/or macronutrients and water.

(...)

[0025] Living plants evaporate water that has been taken up for example by the root system. Therefore, an embodiment of the device according to the invention is equipped with an overflow for the removal of excess feedstock introduced into the anode compartment. In another preferred embodiment, this overflow leads from the anode compartment to the cathode compartment.

[0026] The invention is explained in more detail with the aid of Fig. 1. Fig. 1 shows a reactor 1 that is provided with an anode compartment 2 and a cathode compartment 3. The anode compartment 2 contains an anode 4, and the cathode compartment 3 contains a cathode 5. The anode compartment 2 and the cathode compartment 3 are separated from each other by a membrane 6. The anode compartment 2 accommodates a living plant 7, placed in it in such a way that the roots 8 of the living plant are surrounded by the anodic material in granular form. Both the anode compartment and the cathode compartment are in contact with the surroundings - see the arrows 9 and 10. Light energy 11, for example sunlight, can reach the living plant directly. Oxygen (coming from the atmosphere) can diffuse into the cathode compartment. The anode and the cathode are connected electrically with each other by a resistance or a device that consumes electrical energy (12), with the aid of electrical connections 13.

11. Plant-e is a Dutch start-up, founded in 2009 as a spin-off company from Wageningen University, The Netherlands. It develops and sells products in which light energy is converted into electricity using living plants.

12. Based on its technology, it has developed three product lines: a small biofuel cell for educational purposes, a biofuel cell for use with a sensor (particularly for use in agriculture) and a biofuel cell with lighting that can be installed in the ground for use in gardens and parks.

13. Bioo is a Spanish start-up company established in Barcelona in 2015. According to its own submissions, it researches, manufactures and markets, inter alia, products that extract energy from nature, and more specifically energy produced by microorganisms in the soil. Like Plant-e, Bioo received grants from the European Union under the Horizon 2020 and Horizon Europe innovation programs.

14. Bioo has offered or is still offering for sale and selling a small biofuel cell for educational purposes (the 'Bioo Ed'), a small biofuel cell for use with a sensor (the 'Bioo Sensor') as well as a large biofuel cell with lighting that can be buried in the ground for use in gardens and parks (the 'Bioo Panel'), and the 'Bioo Bench' which incorporates three Bioo Panels.

15. In 2017 Bioo obtained funding from the European Union ("EU") for a project called '*Green Electricity from plants' photosynthesis*'. The objective of the project contains the following information:

"(…) With BIOO we are exploiting the Plant-Microbial Fuel Cell (PMFC), which is characterised by the fact that the generation of such electricity is done by means of anaerobic bacteriological synthesis of the organic matter produced during plants' photosynthesis. The introduction of BIOO panel into the market will have a positive impact on: i) the environment, by means of creating the greenest electricity ever, ii) the economy of our customers, by allowing them to obtain enough electricity for residential use at lower pay-backs than competitors (…)"

In the Reporting information (Reporting period:2020-06-01 to 2020-12-31, *'Summary of the context and overall objectives of the project')* the following is mentioned:
"(…) Arkyne Technologies wants to join and participate in this green movement. To do so, our product Bioo Panel is an alternative energy source through bio-electrochemical batteries: exploiting Plant-Microbial Fuel Cells we aim to generate electricity by means of electrochemically active bacteria which consume organic matter present naturally in soil and produced by plants during their life cycle. The use of Bioo Panel for electrical energy generation has 3 main benefits. First one, it is 100% green energy, since the fuel comes from CO2 fixed by the plants and organic matter present in the soil. Second, the surface where the device is placed it is profitable, for example it can be a green roof or a garden. Finally, this product creates social and environmental awareness by promoting the use of plants. (…)"

16. Plant-e became aware of allegedly infringing acts by Bioo when Bioo set up a crowdfunding for the Bioo Ed in 2017. After Plant-e approached Bioo, the parties agreed on a non-exclusive licence for the sale of the Bioo Ed on 3 August 2018.

17. Effective 29 March 2019, Bioo terminated the licence agreement, in its own words due to disappointing sales.

18. On 18 September 2020 Bioo filed a patent application with the EPO (EP 20282828 A1), which became the priority application for an international patent application published on 24 March 2022 with publication number WO 2022/058500, "WO 500". The application is titled '*Device for producing energy and use thereof*'. The description of WO 500 contains the following information:

BACKGROUND[2]

The principle of electricity generation by microbial degradation has been adopted in terms of different methodologies and technologies. The so-called Soil-MFC (SMFC) and Plant-MFC (PMFC) are two of the most attractive since they allow to obtain energy from nature itself, soil or plant respectively, at a low cost and without damaging the environment. However, these systems have certain disadvantages. In the natural environment, it has been shown that PMFCs can produce more power than SMFCs since plants provide nutrients that are used by the electrogenic microorganisms for energy production, creating an inexhaustible source of energy. On contrary, in the case of SMFCs, the continuous supply of organic matter is still a challenge to sustain long-term operations. However, PMFCs are limited to non-portable systems and the technology should be adapted to the place where it will be used. Thus, for closed and portable power devices, PMFCs are not useful due to the growth of the roots that ends up providing oxygen to the anode as well as causing damage to the electrode.

<u>Double -layer biobatteries and advantages thereof</u>

The present invention is focused on double-layer biobatteries. Double-layer biobatteries are capable of producing electricity by feeding on natural soil and using plants to maintain the ecosystem without damaging it.
The device consists of a self-containing fuel cell architecture for optimal transference of the battery from the laboratory to the field. This integral solution consists of a pot-like cell design where soil

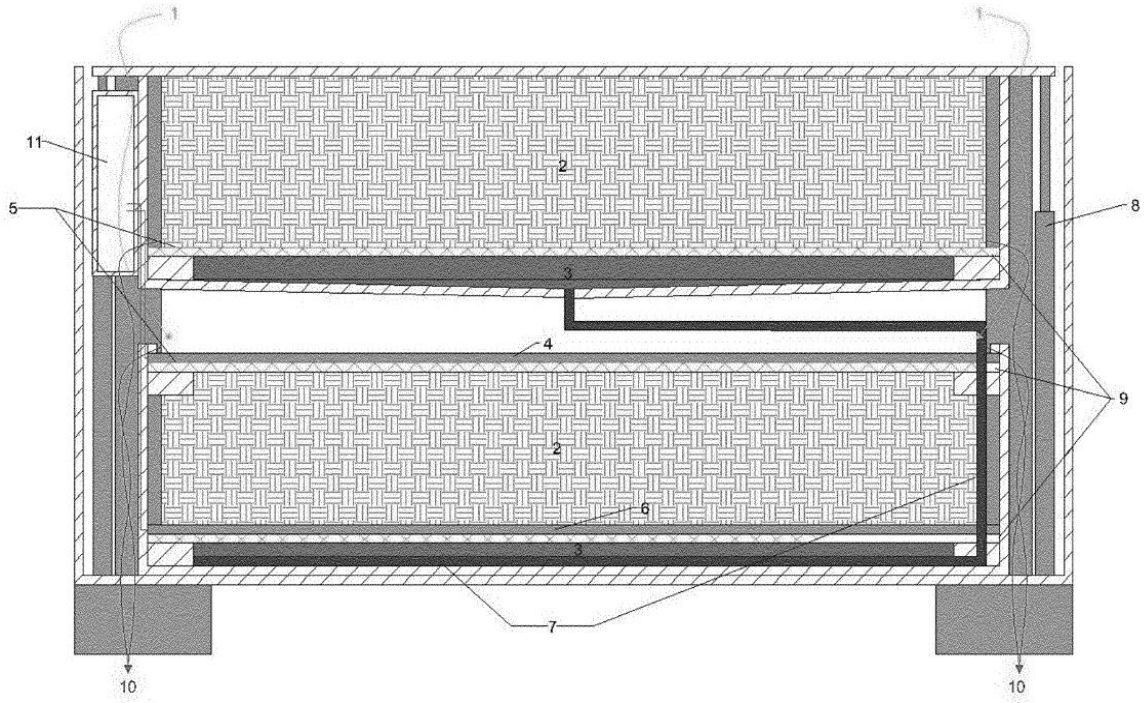
[2] WO 500 p.1

previously selected in the lab is introduced, and maintained under optimal conditions, with the same soil used in the lab and in a close device.
The double-layer battery has two independent compartments assembled in a single device. In the lower part is the biological battery, formed by the anode and the cathode separated by the soil. The last provides the organic matter and microorganisms needed to produce current. At the anode, microorganisms feed on organic matter producing protons, and electrons. (…)
(…)
For closed and portable power devices, soil powered batteries have several problems related to the continuous supply of organic matter above all, to sustain long-term operations. Besides, the battery performance depends on the microbial and organic matter quality of the soil.
The double-layer battery as developed is a device suitable for producing and/or storing energy with several advantages over traditional soil biobatteries. The device as disclosed herein with a double compartment allows to obtain a clean and non-polluting form of energy. (…) The double compartment protects the device from erosion by roots or soil organisms, the contact between plant root (if present) and anode is avoided, and its configuration (upper compartment) allows an extra supply of nutrients and microorganisms. Thus, the depletion of nutrients is prevented, being a system capable of producing energy continuously.
(…)
Furthermore, the double-layer battery has two independent compartments assembled in a single device. In the lower part is the biological battery, formed by the anode and the cathode separated by the soil. The upper part includes a selected plant or plants that grow naturally in the battery installation environment. Plants and the battery are connected in such a way that rainwater and irrigation leach nutrients and microorganisms from the soil are led to the battery, while avoiding contact between plant root (if present) and anode. Without the compartment in charge of protecting and disposing of organic matter, we would not have the advantages to which it gives rise. Thus, the present invention relates to a self-containing fuel cell architecture for optimal transference of the battery from the laboratory to the field. This integral solution consists of a pot-like cell design where soil previously selected in the lab is introduced, and maintained under optimal conditions, with the same soil used in the lab and in a close device. (…)
(…)
Furthermore, the lower compartment is configured so that it allows a greater control over the variability of the operation, achieving thereby a more stable and controlled energy production. This device allows to obtain a ready-to-use technology that can be used in any environment and place, without the need to adapt the system to the existing soil conditions.

SUMMARY OF THE INVENTION
(…)
CLAIMS
1. Device for producing energy, comprising:
- a lower compartment, having said compartment a lower part which is the anode and a higher part which is the cathode, and further containing wet substrate between said lower part and said higher part, wherein said wet substrate contains at least one electrogenic microorganism and at least one electron donor;
- an outdoor opened upper compartment in contact with an environment capable of supplying at least one electron donor and configured to transfer a liquid to the lower compartment through conductive means and;
- conductive means for delivering at least one electron acceptor from outdoors to said cathode of the lower compartment through a gap between the lower and the upper compartment.
2. Device for producing energy according to claim 1, wherein said outdoor opened upper compartment is configured to transfer to the lower compartment through conductive means a liquid selected from water, leachate from the substrate or a combination thereof.
(…)

19. In the patent specification of application WO 500 the following figure is disclosed:

Figure 1

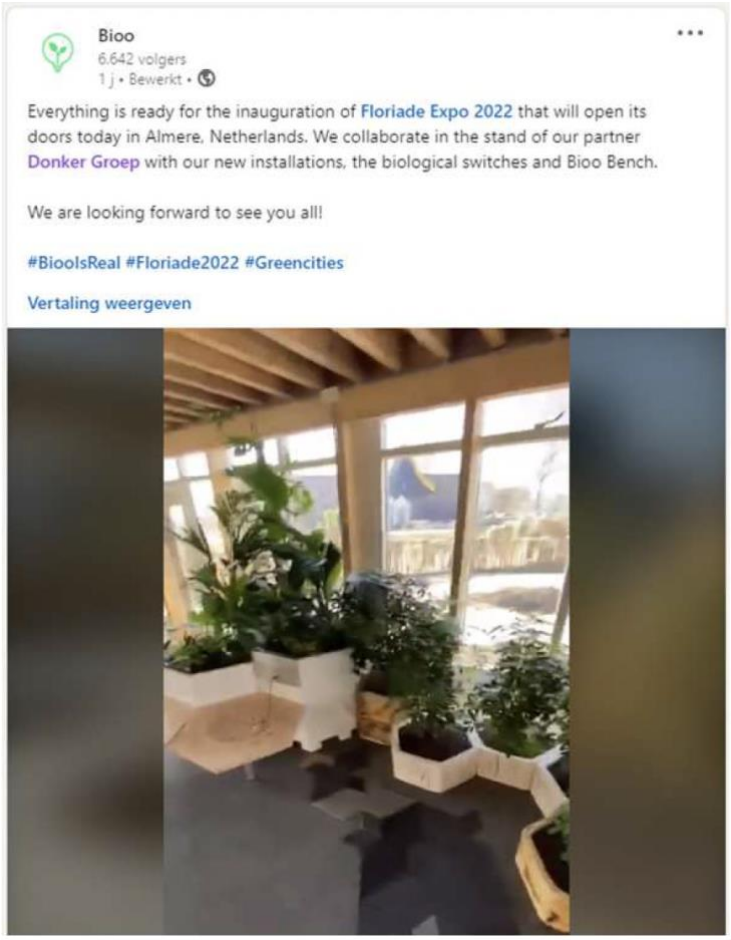


The following explanatory texts relates to this figure:

BRIEF DESCRIPTION OF DRAWINGS

Fig. 1 shows schematically an example of a device according to the present invention including optional elements. wherein: 1. Air inlet; 2. Soil; 3. Leachate; 4. Cathode; 5. Filter; 6. Anode; 7. Leachate distribution pipes; 8. Piston; 9. Plastic Grill; 10. Excess leachate outlet; 11. Electronics. In this case, the battery designed in a larger size is formed in its upper compartment by soil and/or plants and can be used for example on roofs, terraces or gardens, being able to power self-watering systems or light points. (WO 500, p. 5, lines 4-7).

20. Between 14 April and 9 October 2022, Bioo exhibited a working "Bioo Bench" at the Floriade Expo 2022, a horticultural exhibition that took place in Almere, the Netherlands.



21. In October 2022, Bioo and the Dutch company Donker Group ("Donker") announced that Donker would bring Bioo's products, including the Bioo Panel, to the Dutch market:

In the announcement, Donker mentions that the Bioo Panel contains a biological battery, with "plants, soil and water providing charging".

22. The data sheet for the Bioo Panel contains the following information:

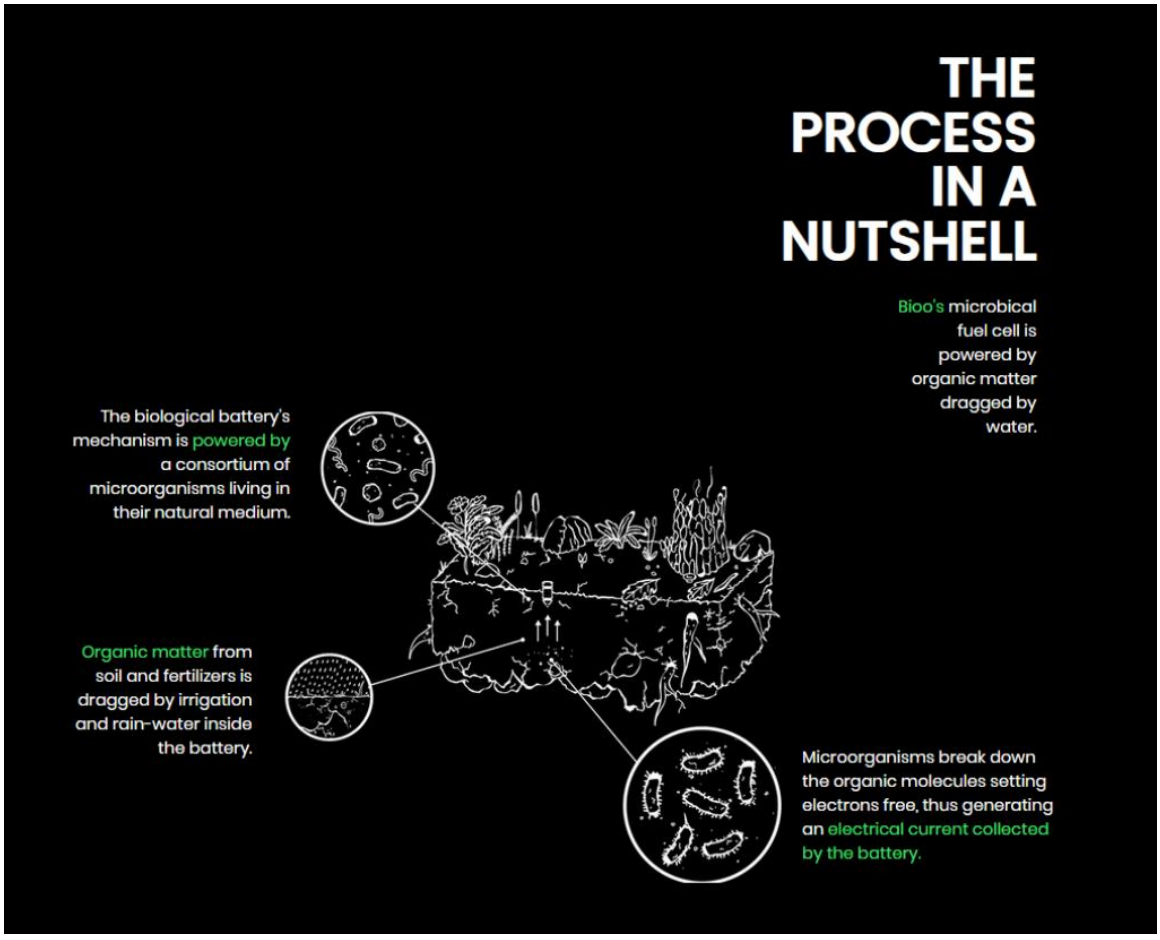
How it works?

Bioo Panel is a biological battery capable of producing electricity by feeding on natural soil and using plants to maintain the ecosystem without damaging it. Bioo Panel is composed of a soil area in the upper part (acting as an extra source of organic matter) and the Microbial Fuel Cell (MFC), located in the lower part. The MFC generates electricity by a Redox reaction happening in the soil of the second layer, between the anode, where the bacteria is fuelled by the organic matter of the soil, and the cathode in contact with the oxygen from the air. The only residue is water.

biootech.com

Bioo
Powered by nature

23. On its website, Bioo explains the process of the Bioo Panel ‘in a nutshell’ as follows:



II. REMEDIES SOUGHT AND SUBMISSIONS

24. Arguing that Bioo directly and indirectly infringes method claim 11 of the patent in UPC-territory with its products Bioo Ed, Bioo Panel and Bioo Bench, Plant-e requests that the court:

Primarily:

I. prohibit Bioo with immediate effect from infringing (directly and/or indirectly) EP 2 137 782 B1 or being involved in it in any way;

In the alternative:

II. prohibit Bioo with immediate effect from infringing (directly and/or indirectly) EP 2 137 782 B1 or being in any way involved therein, in particular by (i) applying a method for converting light energy into electrical energy and/or hydrogen, wherein a feedstock is introduced into a device that comprises a reactor where the reactor comprises an anode compartment and a cathode compartment and wherein the anode compartment comprises (a) an anodophilic micro-organism capable of oxidising an electron donor compound and (b) a living plant or part thereof, capable of converting light energy by means of photosynthesis into the electron donor compound wherein the micro-organism lives around the root zone of the plant or part thereof or (ii) Offering or supplying Infringing Products, or by offering or supplying other products which constitute an essential component for the application of a method for converting light energy into electrical energy and/or hydrogen, wherein a feedstock is introduced into a device that comprises a reactor where the reactor comprises an anode compartment and a cathode compartment and wherein the anode compartment comprises (a) an anodophilic micro-organism capable of oxidising an electron donor compound and (b) a living plant, or part thereof, capable of converting light energy by means of photosynthesis into the electron donor

compound, wherein the micro-organism lives around the root -zone of the plant or part thereof;

Both primarily and in the alternative:

III. rule that the Infringing Products are means which constitute an essential element of the invention according to EP 2 137 782 B1;

IV. order Bioo, at its own expense, to recall, permanently withdraw from the market and destroy the infringing Products and/or other the means comprising an essential element of the invention, and to this end to write a registered and non-registered letter to its professional purchasers containing only the following content, or a translation into another language understood by purchasers, without caption:
"*Dear customer,*
By decision of [date], the Unified Patent Court ruled that Bioo (Arkyne Technologies) has infringed the patent (EP 2 137 782) of the Dutch company Plant-e by, inter alia by supplying or offering to supply Bioo Panel, Bioo Ed and Bioo Bench products.
Bioo will therefore no longer commercialise the Bioo Panel, Bioo Ed or Bioo Bench products and hereby requests that you no longer offer these (whether it is online or offline) and return any of these products in your possession to Bioo for destruction within 7 days from the date of this letter.
Bioo will refund you the purchase price and all costs associated with the return of these products.
Bioo apologises for the inconvenience.
Bioo";

V. order Bioo to provide Plant-e information on:
- the distribution channels of the Infringing Products and application of the infringing method;
- the quantities produced, manufactured, delivered, received or ordered, as well as the price paid for Infringing Products, and
- the identity of third parties involved in the production or distribution of the Infringing Products or in the application of the infringing method;

VI. order Bioo to place the following text for two months on the homepage of its website, without a caption and with a link to the decision, in an easily readable frame covering at least 50% of the surface of the homepage and immediately visible when visiting the website:
"Dear visitor,
By decision of [date], the Unified Patent Court ruled that Bioo (Arkyne Technologies) has infringed the patent (EP2137782) of the Dutch company Plant-e by, inter alia by supplying or offering to supply Bioo Panel, Bioo Ed and Bioo Bench products.
Bioo will therefore no longer commercialize these products. If you obtained these products from us, you may return these for a full refund."

VII. order Bioo to pay a penalty of EUR 5,000 for each product concerned, or for each day, part of a day for a whole counted, that Bioo directly or indirectly infringes EP 2 137 782 B1 after judgment has been rendered, or fails to comply fully and/or improperly with the aforementioned orders under I, II, III, IV, V or VI;

VIII. order Bioo to compensate Plant-e for the damage it has suffered and will unexpectedly still suffer as a result of Bioo's infringements of EP 2 137 782 B1, the details of which are to be set out in separate proceedings for damages;

IX. order Bioo to pay provisional damages of EUR 100,000 for the costs Plant-e expects to incur in the proceedings for the award of its damages and costs;

X. order Bioo to pay Plant-e's legal costs.

25. Plant-e argues that it is clear from publicly available information that the Bioo Panel and the Bioo Ed apply the method of claim 11 directly and literally, or in any case by equivalence. As the Bioo Bench comprises several Bioo Panels, Plant-e further argues that the Bioo Bench is also an infringing product. Should the Court not establish that Bioo itself uses the Bioo Ed

and/or the Bioo Panel and/or the Bioo Bench (thus applying the method), Plant- e argues that in any case offering and supplying these products to customers implies that Bioo indirectly infringes claim 11 of the patent as these devices are means, relating to an essential element of the invention, within the meaning of Art. 26(1) UPCA (Agreement on a Unified Patent Court) for the method of the invention of claim 11. During the oral hearing, Plant-e stated that in these proceedings it no longer asserts that Bioo Sensors infringe the patent.

26. Bioo requests that the court dismiss the claim, submitting that it does not infringe claim 11 (nor any other claim) of the patent because none of the features of the claim are met in the Bioo devices.

27. Furthermore, Bioo argues that the patent cannot be infringed as it should be revoked. In line with this argumentation, Bioo filed a counterclaim for revocation of the patent, arguing that the patent is invalid for the following reasons:

    27.1. the priority is not valid which means that (a) De Schamphelaire et al., published on 26 August 2007 ("De Schamphelaire") and (b) Strik et al., published on 2 January 2008 ("Strik") are relevant prior art. The patent is not novel over these documents.
    27.2. If the priority is valid, the patent is in any case not novel with respect to (c) Tender et al., *"Harnessing microbially generated power on the seafloor",* published on 1 July 2002 ("Tender") and (g) US 3,477,879 ("US 879"), published 11 November 1969
    27.3. Alternatively, the patent is not inventive over the prior art, whereby Bioo argues that "*the claims relied on by Plant-e are void for lack of inventive step based on one or more individual or combined documents of the prior art discussed above* [in the SoD/counterclaim for revocation, the court] *((a)-(c) and (g))* and/or in conjunction with common general knowledge."[3]
    27.4. Bioo discusses the following specific inventive-step-attacks:
        27.4.1. Claims 11, 13, 15 and 16 are invalid for lack of inventive step with respect to Niessen et al., *"Heat treated soil as convenient and versatile source of bacterial communities for microbial electricity generation"* published on 25 March 2006 ("Niessen") combined with JP200232891A ("JP 891") published August 29, 2000;
        27.4.2. Claim 11 is invalid for lack of inventive step with respect to Niessen combined with "*Plant root excretions in relation to the rhizosphere effect'* by A.D. Rovira, published in Plant and Soil VII, no 2, January 1956 ("Rovira");
        27.4.3. Claims 11-16 are invalid for lack of invalid step compared to DE19511734A ("DE 734") published 2 October 1996 in combination with US 879;
    27.5. Further in the alternative: claims 11-16 of the patent are invalid for insufficient disclosure over the full width of the claim;
    27.6. Still further in the alternative: claims 11-16 of the patent are invalid for added matter;
    27.7. Product claims 1 – 10 are also invalid. The grounds for invalidity of the process claims 11 through 16 as set forth in chapters 18 through 21 apply mutatis mutandis to the product claims 1 through 10 of the Patent. Claims 1 and 2 essentially correspond to claims 11 and 12. Claim 6 corresponds to claim 13.

28. Bioo thus requests that the court:
    <u>in the main proceedings:</u>
    1. dismiss Plant-e's claims.
    <u>In the counterclaim:</u>

[3] As not all these attacks were substantiated or maintained in later documents, not all are mentioned here.

2. revoke European Patent EP 2 137 782 B1 in its entirety, or alternatively, claims 11 through 16 of European Patent EP 2 137 782 B1.

In the main proceedings and counterclaim:

3. order Plant-e to pay Bioo's legal costs pursuant to Article 69 UPCA.

29. As defendants in the counterclaim, Plant-e requests that the court dismiss the counterclaim and order Bioo to pay the legal costs pursuant to Art. 69 UPCA. It argues that the claims of the Patent are entitled to priority because the subject matter is directly and unambiguously derivable, when combined with common general knowledge, from the disclosure of the Priority Application (NL 598) as a whole. As Bioo uses the same arguments for its added matter attack, and the same test applies there, the patent also does not contain added matter. The subject matter of claims 1 to 16 of the Patent is furthermore novel and inventive over the prior art documents invoked by Bioo and the patent discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

30. During the interim phase, both parties requested to submit further evidence (Plant-e in App_32392) and Plant-e filed an application (App_24703/2024) pursuant to R.190 RoP (Rules of Procedure) requesting that the JR order Bioo to provide four Bioo Panels. These requests were decided, among other things, during the Interim Conference held on 5 June 2024. Part of the R.105.5 order of 6 June 2024 confirming the decisions taken is quoted below.

(…)

II. Parties are given the opportunity to upload further documents and evidence in this workflow within two weeks from today in order to complete the file concerning (only) the following:

*- An English translation of Plant-e'**R.262.2 application** (App_549606/2023), which is only on file in Dutch, where necessary (Plant-e)*

- (further) information (apart from redacted information) that should be kept confidential from third parties (including the specific reasons thereto) (R.262.2)

- substitute information that was only included as a link to a website in the submissions by an exhibit

-parts of the prosecution file that was referenced in the submissions but not uploaded as an exhibit (i.e. in addition to Exhibit GP17, to be numbered GP17a, b etc)

*III.The value of the action as specified in R.104(i) and R.370.6RoP is set at **EUR 500,000.-.***

*IV.The value of the infringement proceeding as specified in R.140(j) and R.150.2 RoP is set at **EUR 500,000.-.***

*V.The value of the counterclaim proceedings as specified in R.140(j) and R 150.2 RoP is set at **EUR 700,000.-.***

VI.The following schedule for further progress of the proceedings was determined at the interim conference:

*-Bioo is ordered to make available to Plant-e on or before **13 June 2024** in Barcelona two complete Bioo Panels for inspection and testing purposes as specified in 5. above, subject to the confidentiality regime specified in order 15573/2024 of 15 May 2024.*

*-Plant-e can make a written submission [if possible in this workflow] on or before **1 August 2025*** [2024, the court] *of 4,000 words (maximum) concerning only the following: (a) a response to exhibits GP36 and GP39 (as requested with submission E21); (b) further evidence in reply to GP9 (as requested with submission E22) and (c) the findings of its analyses/testing of the Bioo Panels.*

-Bioo can make a written submission [if possible in this workflow] in reply to Plant-e's submission referred to sub VIII only, on or before ***13 September 2025*** [2024, the court] *of 4,000 words (maximum).*
-Plant-e's request R. 104g RoP) to hear Bioo's two experts as well as the two authors of its exhibit GP36 in a separate hearing before the oral hearing, is dismissed.
-Parties can submit a preliminary estimate of the legal costs that they will seek to recover until two weeks before the oral hearing, i.e. on ***16 September 2024*** *at the latest.*
-Parties shall be given the opportunity to present oral pleadings at the oral hearing for 45 minutes. Participation at the oral hearing of the experts by video-connection shall be facilitated in any case for the expert who cannot travel. Further instructions will be sent out before the oral hearing.

31. On 1 August 2024, Plant-e introduced a further submission based on their analysis of the Bioo Panels. Bioo replied to this by submission of 13 September 2024. The Oral Hearing was held on 30 September 2024.

III. GROUNDS FOR THE DECISION

III.A – SUMMARY AND POINTS AT ISSUE

32. The subject-matter of the proceedings is, on the one hand, the alleged infringement of the patent and, on the other hand, its alleged invalidity as argued in the counterclaim. The jurisdiction of (this local division of) the UPC is not in dispute and can be based on the place of residence of Bioo (Art. 33.1 (b) UPCA).

33. As the assessment of both infringement and validity depends on claim construction, on which parties have rather diverging opinions, this will be addressed first below (in part III.B.), together with a discussion of the general understanding of the patent. The skilled person is also defined there. This part will be followed by the assessment of validity in part III.C. and Infringement in part III.D. In part III.E., the implications of the decisions taken in the other chapters for the remedies sought will be discussed, including proportionality. As the case was not bifurcated, the claim and counterclaim will be dealt with together where possible.

34. The patent is held to be valid and to have been infringed, not literally but by equivalence, both directly and indirectly.

III.B – THE PATENT, TEACHING AND CLAIM CONSTRUCTION

35. The patent relates to a so-called Plant-based-Microbial Fuel Cell ("P-MFC"). In the background section of the description of the patent specification, Microbial Fuel Cells ("MFCs") are described as known in the prior art. An MFC generally comprises a reactor, and the reactor comprises an anode compartment and a cathode compartment, wherein the anode compartment contains anodophilic micro-organisms capable of oxidizing organic electron donor compounds, the electrons being supplied to the anode in the anode compartment (patent [0002]-[0003]). A disadvantage of MFCs is described as the need of the (reactor of the) MFC to be, in short, supplied with external fuel. The generation and/or transport of such fuel generally involves large CO_2 emissions and is not very sustainable or renewable. The invention provides a solution by way of a device that reduces non-sustainable and non-renewable energy

(patent [0007]). This is achieved by incorporating a living plant or part thereof into the device as a supplier of fuel for the process.

36. The court considers the teaching of the patent to create an MFC that is essentially independent of external fuel by introducing a living plant, that converts (sun)light into nutrients (organic material) by photosynthesis, into the system as a constant supplier of organic material to the anodophilic micro-organisms in the reactor, thus creating a P-MFC. Bioo's pleading that the teaching of the patent is to convert light energy (directly) into electrical energy, is therefore dismissed. The concept of converting chemical energy (organic compounds) directly into electrical energy with the use of anodophilic micro-organisms was well known and applied in MFCs at the priority date. In MFCs, organic compounds are used to generate electricity. The teaching of the patent is to include a plant in the device to supply (additional) organic material (produced by the plant through photosynthesis) as feedstock to the fuel cell for the anodophilic micro-organisms in the reactor, which is new.

37. Only infringement of method claims 11-16 of the patent is at issue, with the debate focusing on infringement of the independent method claim 11. Claim 11 can be divided into the following features:

    11.1 Method for converting light energy into electrical energy and/or hydrogen
    11.2 wherein a feedstock is introduced into a device that comprises a reactor
    11.3 where the reactor comprises an anode compartment (2) and a cathode compartment
    11.4 and wherein the anode compartment comprises a) an anodophilic microorganism capable of oxidizing an electron donor compound
    11.5 and b) a living plant (7) or part thereof, capable of converting light energy by means of photosynthesis into the electron donor compound
    11.6 wherein the microorganism lives around the root (8) zone of the plant or part thereof.

38. Parties disagree on the proper interpretation of several features of claim 11. The UPCA contains no provision on the scope of protection of a patent, but guidance can be found in Art. 69 European Patent Convention ("EPC") which is a source of law pursuant to Art. 24 (1) UPCA, and in the Protocol on the interpretation of Article 69 EPC (the "Protocol"). The Court of Appeal of the UPC ("CoA")[4] set out the following principles regarding interpretation of a patent claim according to Art. 69 EPC:

    The patent claim is not only the starting point, but the decisive basis for determining the protective scope of a European patent. The interpretation of a patent claim does not depend solely on the strict, literal meaning of the wording used (…). Rather, the description and the drawings must always be used as explanatory aids for the interpretation of the patent claim and not only to resolve any ambiguities in the patent claim. However, this does not mean that the patent claim merely serves as a guideline and that its subject-matter also extends to what, after examination of the description and drawings, appears to be the subject-matter for which the patent proprietor seeks protection. The patent claim is to be interpreted from the point of view of a person skilled in the art.

    The CoA also clarified (i) that the principles for interpreting a patent claim apply equally to the assessment of the infringement and to the validity of a European patent and (ii) that a patent must be interpreted from the point of view of the average person skilled in the art (the "skilled person").

[4] Order of the CoA of 11 March 2024 in case CoA 335/2023, Nanostring/10 x Genomics, page 24

39. Applying these principles in this case, leads to the following claim construction of (claim 11 of) EP 782, whereby the court will consider the skilled person in the present case to be an individual (or a team) with a scientific background (PhD) in biochemistry, electrochemistry, and possibly microbiology or environmental engineering and about 3 to 4 years of working experience in the technical field of microbial fuel cells, as proposed by Plant-e's expert and not objected to by Bioo. Contrary to what Bioo asserts, the prosecution files of patents in general do not form part of the common general knowledge of the skilled person.

39.1. Regarding feature 11.1, Bioo argues that the '***Method for converting light energy into electrical energy***' should be read to mean direct conversion of light into electrical energy only, excluding a method wherein light energy is first converted to chemical energy which is then converted into electrical energy. Plant-e correctly argues that the skilled person reading this feature in light of the claim and the description will understand, for instance from [0011] and [0012] of the patent, that the teaching of the patent is that light energy is used by plants to generate organic material ('electron donor compounds') by photosynthesis, which material is a source of chemical energy which is converted into electrical energy by specialised anodophilic micro-organisms:

> **[0011]** *The term "living plant or part thereof" is used in this document in the sense of a plant (or any part thereof) belonging to the Plant Kingdom (Plantae) (…), capable of converting light energy into an electron donor compound by means of photosynthesis. (…)*
> **[0012**] *According to the invention, the electron donor compound is converted into electrical energy and/or chemical energy, (…), with the aid of an anodophilic micro-organism.*

This feature is thus to be interpreted to refer to indirect conversion of light energy into electrical energy, with the use of chemical energy (from an electron donor compound).

39.2. The interpretation of the word '***feedstock***' in feature 11.2 is also in dispute. With reference to the prosecution history, Bioo asserts that 'feedstock' must be understood to exclude electron donor compounds because the phrase mentioning this ('*comprises an electron donor')* was removed from claim 11 during prosecution. As mentioned above, the prosecution file is generally not part of common general knowledge of the skilled person. Why the prosecution file in the present case is relevant for interpretation, is not substantiated by Bioo, especially because the interpretation given to it is contrary to the teaching of the patent. The skilled person reads in the description of the patent:

> *[0009] The present invention also relates to a method for converting light energy into electrical energy and/or hydrogen, where a feedstock comprising an electron donor compound is introduced into a device that comprises (…)*
> *[0022] According to the invention, the feedstock for the anode compartment can be one or more micro- and/or macronutrients and/or water for the living plant or part thereof or for the micro-organism. The feedstock is preferably a balanced amount of micro- and/or macronutrients and water.* [emphasis added by the court]

This teaches the skilled person that a feedstock may (optionally) contain electron donor compounds. and preferably does. No other interpretation makes sense.

39.3. Parties further disagree on the interpretation of the word **'*reactor*'** in feature 11.2. [0009] of the patent specification cited above, continues as follows:

> **[0009]** (…) '*a device that comprises a reactor, where the reactor comprises an anode compartment and a cathode compartment and where the anode compartment comprises a) an anodophilic micro-organism capable of oxidizing an electron donor compound, and b) a living plant or part thereof*'

In the patent 'reactor' is also defined with reference to figure 1:

> **[0026]** *The invention is explained in more detail with the aid of Fig. 1. Fig. 1 shows a reactor 1 that is provided with an anode compartment 2 and a cathode compartment 3.* (…)

The skilled person will thus understand this feature to mean the entire installation depicted in figure 1, including the living plant which is part of the process as generator/supplier of electron donor compounds. That the plant is part of the reactor also follows from claim 11, because the anode compartment is taught to comprise a living plant (features 11.4 and 5) and the anode compartment is in turn part of the reactor (feature 11.3).

39.4. Regarding features 11.3 and 4, Bioo argues that '***compartment***' is to be interpreted such that the anode and cathode compartments are *physically* separated by a divide. According to Bioo, the skilled person would understand that this is required to avoid direct contact between the anode and cathode and that it is also clear from the description of the patent:

> **[0026]** *(…) The anode compartment 2 and the cathode compartment 3 are separated from each other by a membrane 6.*

Plant-e's position is that there is no requirement in the patent that the anode and cathode compartment should be physically separated by a membrane or other separator, as long as the anode and cathode are functionally separate to avoid short-circuiting. There is no wording in the claims to this effect and in paragraph [0014] of the Patent the word "can" is used, teaching that a membrane that can transport ions selectively or that employs electrically non-conducting, non-ion-selective porous materials is optional.

> **[0014]** *A membrane that can transport ions selectively can be used to separate the anode compartment from the cathode compartment. It is also possible to employ electrically non-conducting, non-ion-selective porous materials. Examples of these materials are glass and plastic. However, a membrane that can transport ions selectively is preferred. The membrane is preferably a cation-selective membrane and more preferably a proton-selective membrane.* [emphasis added by the court]

As argued by Plant-e, the compartmentalization can be conceptual. The skilled person knows the purpose of separation and understands that this can be achieved either by a membrane or by other means, such as e.g. soil. As the claims do not require separation by a membrane or the like, the skilled person will not read this requirement into the claim in view of the description at [0014], where such is optional. Furthermore, to the extent Fig.1 of the patent is correctly annotated, the court notes that in Fig. 1 the membrane is indicated to be under the cathode at the bottom of the drawing, so that also in the figure this part of the cathode and the anode are not separated by a physical membrane (as seems to be the case on the righthand side of the figure), but only by the soil that is present around the roots of the plant.

39.5. Bioo further argues that the terms '***living plant'*** (in claim 11) and '***energy plant'*** (in claim 13) have the same meaning in the patent, whereas Plant-e argues that the definitions, in [0011] and [0015] respectively, differ. Although the definitions are indeed different, the skilled person will understand that the term 'living plant' mentioned in claim 11 of EP 782 has to be an energy plant as defined in [0015]:

> *'an energy plant is to be understood as a living plant capable of converting light energy into chemical energy.'*

On a side note in this context: Plant-e correctly points out that the first sentence of [0016] contains an error due to translation from the Dutch priority application:

> **[0016]** *Various parts of a plant, for example fallen leaves or roots that have not been harvested, can be used as an energy plant. These parts are lost from renewable energy supply.*

The corresponding text in NL 598, translates as '*Various parts of a plant, for example fallen leaves or roots that have not been harvested, are not used as an energy plant.*' (emphasis added by the court). This makes sense in view of the following sentence which states that these parts are lost as energy suppliers. The skilled person will understand this, especially

also because an important part of the description thereafter focuses on how such parts are recovered and used as energy source in the invention claimed in the patent.

III.C – VALIDITY

40. The burden of presentation and proof for facts concerning the lack of validity of the patent and other circumstances allegedly supporting Bioo's position lies with Bioo.

Priority

41. Bioo's assertion that the patent cannot validly claim an earlier priority than the date of filing (17 april 2008), is dismissed. It is based on an incorrect application of the relevant test for the 'same invention' as meant in art. 87 EPC and on an incorrect interpretation of the claim.

42. In accordance with Article 87 EPC, any person who has duly filed an application for a patent, or his successor in title, shall enjoy, for the purpose of filing a European patent application in respect of the same invention, a right of priority during a period of twelve months from the date of filing of the first application. As also argued by the parties, the requirement of "the same invention" in Article 87 EPC is met if the skilled person can derive the subject-matter of the claim of an invention directly and unambiguously, using common general knowledge, from the previous application as a whole (the so-called 'gold standard'), in line with EPO case law and the standard used in several Contracting Member States.[5]

43. Bioo's main argument that the priority is not valid is that claim 13 of the priority document NL 598 discloses feedstock that contains an electron donor compound whereas in the corresponding claim 11 of EP 782 the phrase 'an electron donor compound' is not mentioned as a feature of the feedstock. Plant-e correctly pointed out that the subject matter of claim 11 of the patent should be directly and unambiguously derivable, using common general knowledge, from the previous application as a whole, rather than from the claims of the previous application only, as Bioo argued. As discussed above (at 39.2), it is optional for the feedstock to contain an electron donor compound. This is also the teaching of NL 598 as a whole; its description contains a paragraph (in Dutch) which is identical to [0022] of EP 782 cited above:

> *Volgens de uitvinding kan de voeding voor het anode-compartiment een of meer micro- en/of macro-nutriënten en/of water voor de levende plant of een deel daarvan of voor het micro-organisme omvatten. Bij voorkeur omvat de voeding een uitgebalanceerde hoeveelheid van micro- en/of macro-nutriënten en water.*

The skilled person thus learns that it is optional for the feedstock to contain an electron donor compound which is in line with claim 11 of the patent as understood by the skilled person. That person also learns from both the patent (see 39.2 above) and from the priority document (e.g. p. 3, r. 13-14 "*voeding die een electron-donerende verbinding omvat*" and p. 5, r. 30-33) that the feedstock for the micro-organisms preferably does contain an electron donor compound. Hence, there is no discrepancy between claim 11 of EP 782 vis-à-vis the disclosure of NL 598; both relate to the same invention. The priority date is therefore 17 April 2007.

[5] cf. EPO Enlarged Board of Appeal 31 May 2001, G2/98, ECLI:EP:BA:2001:G000298.20010531. "The subject matter of a claim in a European application may enjoy the priority of a previous application only if the skilled person can derive the subject matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole." See also UPC CFI 1/2023, CD Munich, 16 July 2024 Sanofi/Amgen, para 7.6

44. The court sees no need to address the other two priority attacks (concerning (i) living plant versus energy plant and (ii) the definitions of 'electron donor compound') in this context as these arguments cannot result in the priority being invalid. The attacks, if these should be considered maintained by Bioo at all in later submissions, are based on interpretations of terms in the patent that are not in line with the reading of the patent in a way willing to understand and/or refer to phrases that are not relevant for the claim at issue.

Added matter

45. The added matter attack, argued in the alternative, fails for similar reasons as the main priority attack. According to Art. 138(1) (c) EPC, a European patent may be revoked (with effect for the relevant UPC territory) if the subject-matter of the European patent extends beyond the content of the application as filed (Art. 123(2) EPC). Such unallowable extension of subject-matter is generally referred to (also herein) as "added matter". The aforementioned "gold standard" disclosure test is also to be applied in this context. Hence, any amendment to the parts of a European patent application relating to the disclosure (the description, claims and drawings) can therefore, irrespective of the context of the amendment made, only be made within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from the whole of the application. After the amendment, the skilled person may not be presented with new technical information.[6]

46. Bioo contends that the subject matter of claim 11 of EP 782 extends beyond the content of the Application as originally filed (WO 109, Bioo's exhibit GP20), arguing that by deleting the phrase "comprising an electron donor compound" after "feedstock" from claim 12 of WO 109, resulting in claim 11 of the patent as granted, the scope of the claim is extended because the feedstock does no longer need to include an electron donor compound. However, this is an incorrect application of the relevant test as the subject matter of the claim must be derivable from the disclosure of the relevant application as a whole, and not just from one claim. Plant-e stated that the description of the patent as filed, WO 109, is an English translation of the description of the Priority Application NL 598, with the only addition being a paragraph on page 3 of WO 109 regarding patent drafting terminology (corresponding with [0010] of the patent as granted) which does not change the content of the disclosure. This was not contested by Bioo and the court assumes this to be correct. The disclosure of the patent as filed is thus the same as that of the Priority Application. As discussed above the disclosure of claim 11 is directly and unambiguously derivable from NL 598, and hence also from WO 109. The patent as granted therefore contains no subject matter that extends beyond the scope of the Application as filed.

Novelty

47. An invention is considered new if it does not form part of the state of the art (Art. 54 EPC). It is only considered part of the prior art if all claim features of an invention are disclosed integrally, directly and unambiguously in one single piece of the prior art. The standard for the disclosure content of a publication is what an average person skilled in the relevant field can and may know and understand. Again, the aforementioned "gold standard" applies.

48. As established above, the relevant priority date of the patent is 17 April 2007. The consequence of this is that several novelty attacks of Bioo based on the assumption that the relevant date

[6] Cf Case Law of the Boards of Appeal (also "CLBA"), 10th edition 2022, II.E.1.1 and i.a. G 3/89, OJ 1993, 117; G 11/91, OJ 1993, 125 and G2/10. See also UPC CFI LD The Hague 18 June 2024, UPC_CFI_131/2024 (Abbott/ Sibio)

should be the date of filing, do not form part of the prior art and are disregarded. The only remaining novelty attack is based on a publication titled "*Harnessing microbially generated power on the seafloor*" by Tender et al., published on 1 July 2002 (Bioo's exhibit GP23, "Tender").[7] Bioo argues that Tender discloses all features 11.1 – 6 of claim 11 of the patent and therefore represents a novelty-destroying disclosure.

49. Tender relates to a sediment-based or benthic microbial fuel cell (also referred to as a B-MFC), in which carbon rich sediments arising from the decay of dead plants, phytoplankton and algae are converted into electrical energy by means of anodophilic micro-organisms. Tender teaches that the B-MFC is to be placed on the seafloor, at a mid-tide depth of about 4 meters, whereby the anode is located in the sediment (about 15cm below the sediment surface) and the cathode is located in the overlying seawater (about 15cm above the sediment surface).

50. Plant-e contests that Tender discloses features 11.5 and 11.6 because it does not disclose that a living plant or part thereof as part of the reactor, more specifically a plant that is rooted in the sediment of the fuel cell (where the anode is located) nor that the micro-organisms that oxidize the electron donor compound live in the root zone of a plant. The court agrees with this. Bioo has not been able to demonstrate that the presence of living sea grass rooted in the fuel cells described by Tender is unambiguously disclosed in Tender. At best, such a living plant might coincidentally be present. Furthermore, Plant-e argues convincingly that the containers disclosed by Tender are not suitable for the generation of energy by photosynthesis because they are submerged at a depth of about 4 meters below mid-tide sea level. There is no mention in Tender of power generation from a living plant. The subject matter of claim 11 is therefore not anticipated by Tender.

Inventive step

51. In (its statement of claim in) the counterclaim (paragraph 19.1), Bioo mentioned a number of combinations of documents as a reason for the patent being obvious and thus invalid for lack of an inventive step. The court will only consider the inventive-step attacks concerning method claim 11 (and some dependant claims) that were sufficiently substantiated, as only these can be considered to have been debated. These attacks are the following:
    i. Tender as such and in combination with common general knowledge.
    ii. "*Heat treated soil as convenient and versatile source of bacterial communities for microbial electricity generation*" by Niessen et al., published 25 March 2006 ("Niessen"; Bioo's exhibit GP24) in combination with Japanese patent application JP200232891 published 29 August 2000 ("JP 891", of which an unofficial translation of the description was submitted by Bioo as exhibit GP25).
    iii. Niessen in combination with "*Plant root excretions in relation to the rhizosphere effect"* by A.D. Rovira, published in Plant and Soil VII, no 2, January 1956 ("Rovira", Bioo exhibit GP28).
    iv. German patent application DE19511734 A1 published 2 October 1996 ("DE 734", Bioo exhibit GP26) combined with US 3,477,879 granted 11 November 1969 ("US 879", Bioo exhibit GP27) with both prior art documents argued as a starting point.

52. According to Art. 56 EPC, an invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art. An objective approach must be taken to the assessment of inventive step. The subjective ideas of the

[7] After Plant-e's defence in the counterclaim, Bioo did not pursue another novelty attack, based on a US patent granted in 1969.

applicant or inventor are irrelevant. Inventive step is to be assessed from the point of view of the skilled person on the basis of the state of the art as a whole, including the skilled person´s common general knowledge. The skilled person is assumed to have had access to the entire publicly available art on the relevant date. The decisive factor is whether the claimed subject matter follows from the prior art in such a way that the skilled person would have found it on the basis of that person's knowledge and skills, for example by obvious modifications of what was already known. In order to assess whether or not a claimed invention was obvious to a skilled person, the court will follow the problem and solution approach as suggested by the parties and as also used by the EPO, as a tool to assess obviousness. In this context it is necessary to determine a realistic starting point in the state of the art. There has to be a justification as to why the skilled person would consider a particular document in the state of the art as a realistic starting point. In selecting the starting point, the first consideration is that it must be directed to a similar purpose or similar effect as the invention or at least belong to the same or a closely related technical field as the claimed invention. In practice, such prior art is generally that which corresponds to a similar use and requires minimal structural and functional modifications to arrive at the claimed invention.

53. As set out above (see 35), the invention relates to the technical field of MFCs. As it is undisputed that the invention claimed in EP 782 pertains to the first P(lant)-MFC, the starting point must be in the related technical field of MFCs. Furthermore, the teaching of the patent is to reduce non-sustainable and non-renewable energy in an MFC, which is achieved by incorporating a living plant or part thereof into the device as a continuous supplier of fuel for the process, whereby light energy/photosynthesis is used, without the need for ex-situ replenishment of organic matter (see 36). From any prior art document selected as a realistic starting point, features 11.5 and 11.6, which require the presence of a living plant as part of the reactor, are missing. No pointer whatsoever has been brought to the attention of the court that would prompt the skilled person to introduce a living plant into an MFC-reactor. Inventiveness is not affected by the mere presence of living plants in other prior art disclosures or the general knowledge that plants excrete organic material through their roots (the rhizosphere effect). It is also not a question of mosaicking, as Bioo seems to argue. There has to be an incentive for the skilled person to combine two items of prior art. If this incentive is lacking, the combination is almost invariably not obvious for the skilled person, which in this case makes the patent inventive over all prior art. This applies to all claims of the patent as features 11.5 and 11.6 of claim 11 are directly (device claim 1) or indirectly (all dependant claims) part of every claim. Bioo's individual inventive-step attacks are addressed in more detail below.

54. The starting point in the prior art of attack (i), Tender, concerns an MFC on the seafloor as discussed above at "novelty". At least features 11.5 and 11.6 are not present in Tender. Bioo, who has the burden of presentation and proof, did not demonstrate convincingly how a skilled person, starting from Tender *would* (not *could*) arrive at the invention without any inventive step. These steps would involve, among other things, the decision to take the device of Tender off the seafloor and use soil instead of sediment as fuel and to introduce a living plant into the system/reactor. EP 782 is therefore inventive over Tender.

55. Regarding attacks (ii) and (iii): even if Niessen could be considered a realistic starting point in the prior art for the skilled person, the device described therein in any case does not disclose features 11.5 and 11.6. Also in this case, Bioo failed to explain in a convincing way (i) how the person looking to make the device of Niessen less dependent on ex-situ replenishment of organic matter/fuel would combine Niessen with either JP 891 or Rovira without a pointer and

(ii) how the skilled person would thus inevitably (would not could) arrive at a method of the invention, involving a device with the features 11.5 and 11.6. Plant-e pointed out that JP 891 does not pertain to the use of living plants, but rather to harvested plants. Rovira is a textbook (dating already from 1956) in which the rhizosphere effect is described; it is understood to represent common general knowledge. The question is however, whether the skilled person in the field of MFCs, would consult a textbook relating to "how plants work" when trying to solve the problem of substrate exhaustion identified by Niessen, especially since no P-MFCs existed at the priority date. Niessen itself simply solves the problem by replenishing (adding more) substrate. Therefore, the suggested combination with Rovira seems to be the result of hindsight. The court also deems the patent inventive starting from Niessen.

56. DE 734, the starting point in attack (iv), teaches how the potentially available energy in organic waste and other biological residues can be used for the production of biogas or for the generation of electricity. The purpose of the document seems to be to efficiently and usefully handle organic waste, in the course of which a way to break down metallic residues in the waste is also addressed. Several methods/processes are proposed in this application in very broadly worded claims. In one of the claims, the use of oxygen-producing green plants at the cathode are mentioned as one possible source of oxygen needed for a version of the process. The device described in DE 734 has a very different purpose which is to process mostly organic waste of several origins (and does so in a different way) and would not prompt the skilled person to replace the source of material (the waste) with an in-situ source (a plant). The court does not consider this patent application a realistic starting point as it concerns a different technical field. Even if it is taken as a starting point, it is not apparent why the skilled person would be inclined to combine DE 734 (which according to Bioo discloses features 11.1-3) with US 879 (which allegedly discloses features 11.4-6). Even if a skilled person were to attempt a combination of US 879 with DE 734, that person would not arrive at the invention of claim 11 because at least features 11.5 and 11.6 are not disclosed in either of the documents. The MFC of US 879 uses dead algae as source of organic material. It teaches away from including a living/photosynthesizing plant in the anode compartment, which must maintain anaerobic conditions to function. In such anaerobic conditions of US 879, a living plant would not be able to survive. Also, the combination of DE 734 and US 879, with either as starting point, therefore does not make the invention of EP 782 obvious.

Insufficiency

57. Bioo contends that the patent does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art, as Art. 83 EPC requires, because the following is not (fully) disclosed (i) the anodophilic micro-organism; (ii) the 'living plant' and (iii) a suitable material for the anode and cathode. The scope of the claims is therefore very broad and cannot be carried out over the whole scope of the claim without undue burden using common general knowledge.

58. The skilled person wishing to implement the claimed invention would read the claims in a technically sensible manner. An objection of insufficient disclosure of the invention is therefore not to be based on embodiments that are meaningless and not consistent with the teaching of the application as a whole (see T 521/12). The purpose of the provisions of Art. 83 is: (i) to ensure that the application contains sufficient technical information to enable a skilled person to put the invention as claimed into practice; and (ii) to enable the skilled person to understand the contribution to the art which the invention as claimed has made.

59. The anodophilic micro-organism, anode and cathode are described in a manner sufficiently clear to be carried out by the skilled person based on the relevant common general knowledge. MFCs were part of the state of the art at the priority date. MFCs, which are explicitly referred to in the description of EP 782 (see 10 above), comprise anodophilic micro-organisms and cathodes and anodes made of suitable materials. This information was available to the skilled person at the priority date. The skilled person would rely on the understanding of the known basic set up requirements for an MFC which will enable that person to make suitable choices for the implementation of the method of claim 11 of the patent regarding these components. Bioo has not argued that – and, if so, why – the skilled person would reasonably expect the anodophilic micro-organisms, anode and cathode to be different in a P-MFC, and not be able to make modifications where necessary to those of MFCs known in the prior art. The skilled person would also know how to obtain a suitable mix of micro-organisms for use in an MFC, even without knowing which exact micro-organism(s) is or are actually functional.

60. Bioo rightly points out that the term 'living plant' is defined broadly in the patent and it is not explained which plants will actually work (best) in a P-MFC. As set out above (at 39.5), the skilled person will interpret the term as energy plant in the sense of a plant that produces organic compounds as electron donors. Bioo's assertion that the skilled person cannot carry out the invention of EP 782 because it only works with a plant that is able to withstand waterlogging and can only be a certain species of grass, which information is not disclosed in the patent, cannot be followed. The type of living plant for use with the claimed method and device will depend on the specific application and situation, such as environmental conditions. The requirements that Bioo mentions (withstand waterlogging, grass) are based on a report published by Plant-e in 2014 regarding use in wetlands, as is apparent from that report. This therefore relates to a specific environment that does not apply to other applications of the invention.

Finding on validity

61. The conclusion from the above is that the patent is valid.

III.D – INFRINGEMENT

62. The burden of presentation and proof of facts allegedly establishing the infringement or imminent infringement of the patent, as well as for any other circumstances allegedly supporting its position, lies with Plant-e. It primarily argues literal infringement of the method of claim 11, and alternatively, in case claim 11 is not deemed literally infringed, infringement by equivalence.

63. The court will assess the scope of protection in the case of infringement in two steps, applying Art. 69 EPC and the Protocol, as seems to be common ground in most contracting member states (including France, Germany, Italy, Belgium, The Netherlands). In a first step, 'literal' infringement of the features of (claim 11 of) the patent in view of the claim construction is evaluated. In case claim 11 of the patent is not judged to be literally infringed, equivalence is assessed in a second step.

1. Literal infringement?

64. Plant-e argues – and Bioo contests – that the Bioo Panel falls within in the scope of protection of claim 11 because all claim features are present therein.

Claim features 11.1 – 11.4

65. These features are present in the Bioo Panel for the following reasons. A picture of the Bioo Panel (taken from the Bioo Panel data sheet) is shown here once more for ease of reference.

66. The Bioo Panel is presented by Bioo as a double-layer battery (wording of WO 500) or system (wording used in the statement of defence) that has two independent compartments assembled in a single device. The entire Bioo Panel is therefore considered to be a device comprising a reactor. The Bioo Panel contains a cathode (number 4 in the picture) and an anode (number 5). The cathode and the anode are in the bottom part of the device. As discussed above, the cathode and anode compartments do not require physical separation of the compartments (e.g. by a membrane). The area surrounding the cathode and anode respectively are considered as the compartments. These are located at different positions (4 and 5) in the Bioo Panel, whereby they are separated by soil, which ensures that there is no short-circuiting.

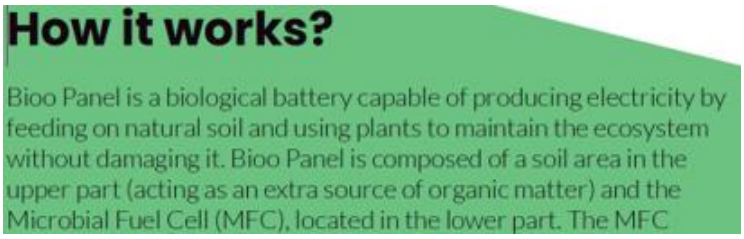
67. Furthermore, the Bioo Panel is, according to Bioo's publicly available information cited above (see 15, 22 and 23), a 'biological battery', capable of generating an electrical current through (anodophilic) micro-organisms present near the anode that break down (oxidize) organic molecules (feedstock) present in the soil that is introduced into the reactor. According to information on Bioo's website (see 23 above) organic material from soil and fertilizers is (also) dragged into the battery (which is situated in the lower part of the Bioo Panel according to Bioo) by irrigation and rainwater. This is feedstock for the micro-organisms as meant in the patent. Features 11.2, 11.3 and 11.4 are met. The chemical energy of the organic material (electron donating compounds) is converted into electrical energy in the battery. This organic material, also present in the soil originally introduced in the Bioo Panel, originates from/is generated by plants through photosynthesis. Thus, also feature 11.1 as interpreted by the skilled person (see 39.5 above) is present.

68. Bioo's arguments contesting features 11.1-11.4 are based on an interpretation of the claim features which is not in line with the claim construction above.

Features 11.5 and 11.6 – living plant in anode compartment

69. In dispute is whether features 11.5 and 11.6 are present in the Bioo Panel. These features require the presence of a living plant in the device. Bioo's main argument is that the Bioo Panel does not require a plant to operate. Bioo has argued that the Bioo Panel is a system that is completely different from the claimed invention because it is a so-called soil based MFC (S-MFC) instead of a P-MFC. Having a plant at the top is optional, and for esthetical purposes and/or to protect the system from weather. A plant is not required for the functioning of the Bioo Panel, i.e. for the generation of energy in the lower compartment. The Bioo Panel can also function in the dark, according to Bioo and hence a plant is not part of the biological battery.

70. The court finds Bioo's position in these proceedings that there is no role for plants in its Bioo Panel, not tenable. Firstly, this position is contradictory to what Bioo publicly stated and states about the Panels. In the data sheet for the Bioo Panel (cited in 22 above), Bioo explains that plants are used to maintain the ecosystem.

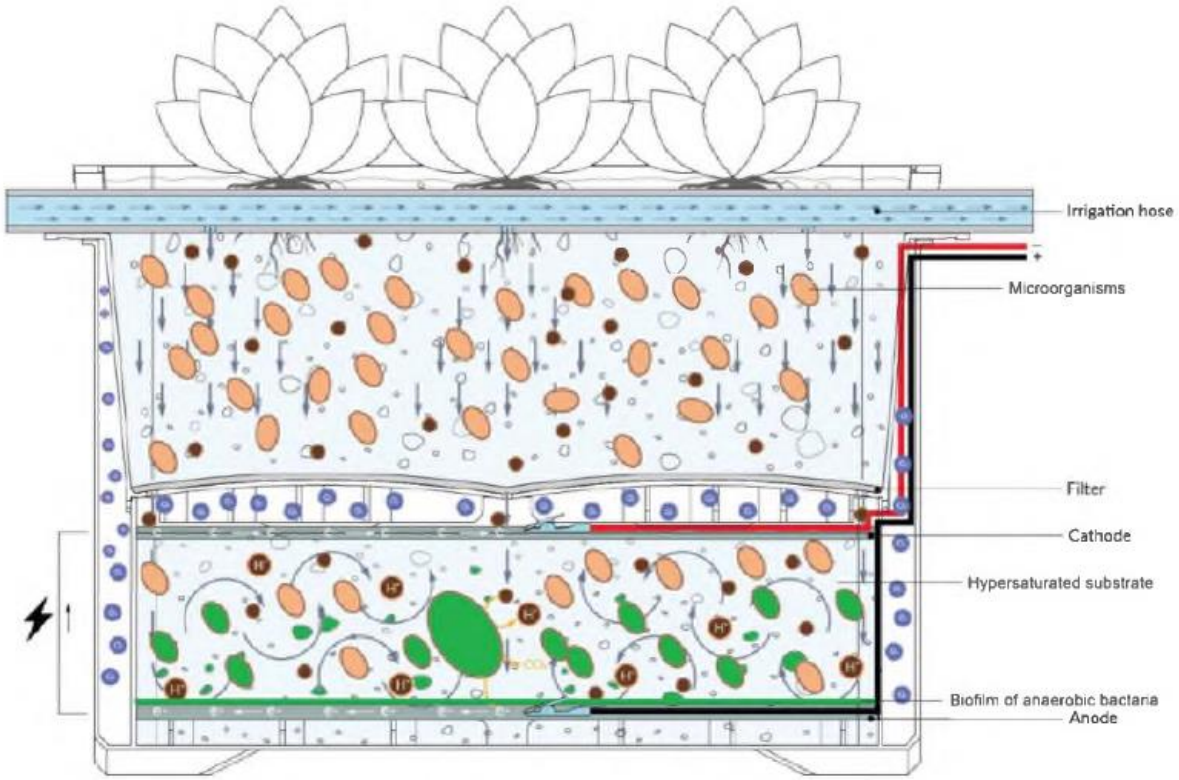


Its assertion that it now uses a different data sheet, is not convincing and this is also not substantiated with any documents.

71. Furthermore, in Bioo's application for EU funding, the role of plants in the Bioo Panel was emphasised, namely as the providers of fuel (see 15 above):
"(…) our product Bioo Panel is an alternative energy source through bio-electrochemical batteries: exploiting Plant-Microbial Fuel Cells we aim to generate electricity by means of electrochemically active bacteria which consume organic matter present naturally in soil and produced by plants during their life cycle. (…) it is 100% green energy, since the fuel comes from CO2 fixed by the plants and organic matter present in the soil." [emphasis added by the court]

Further, the other publicly available communications originating from third parties regarding the Bioo Panel and the Bioo Bench (including those cited in 20 and 21 above) confirm the role of plants in the device. It is reasonable to assume that this information originates from Bioo.

72. In these proceedings, Bioo furthermore maintains that the Bioo Panel is a double-layered system, consisting of two separate, independent compartments, which is 'patented' in application WO 500 (see 18 and 19 above, examination in progress). It explained the operation of the Bioo Panel with reference to the text of WO 500 and to Fig 1 thereof (shown in 19 above). Reference is made to inter alia paragraphs 4.5, 7.2-7.6 SoD. The court thus assumes that what is disclosed in WO 500 also applies to the Bioo Panel unless Bioo explicitly pointed out differences. Bioo also submitted the following cross-section (the "cross-section") of the Bioo Panel (with 'optional plants') to explain the functioning of the Bioo Panel:



73. The difference between figure 1 of WO 500 and the above cross section seems to be that in WO 500 leachate pipes are shown (as number 7), which seem to be missing in the cross section. In the cross-section, plants are clearly visible.

74. A reasonable understanding of WO 500 by the skilled person is that a plant is necessary and thus present in the double-layered system of WO 500:

> *'(…) its configuration (upper compartment) allows an extra supply of nutrients and microorganisms. Thus, the depletion of nutrients is prevented, being a system capable of producing energy continuously.*
>
> *(…) the double-layer battery has two independent compartments assembled in a single device. In the lower part is the biological battery, formed by the anode and the cathode separated by the soil. The upper part includes a selected plant or plants that grow naturally in the battery installation environment. Plants and the battery are connected in such a way that rainwater and irrigation leach nutrients and microorganisms from the soil are led to the battery, (…).'* [emphasis added by the court]

75. From all the above taken together, Plant-e has reasonably proven that the Bioo Panel contains a living plant as part of the set up in the upper compartment.

76. Bioo's arguments that this is not the case are not conclusive. To substantiate its position that plants are not part of the Bioo Panel, because these are *not necessary* for the functioning of the Bioo Panels and thus optional, Bioo submitted two reports with experimental data. One report, dated February 2024, titled "*Assessment of Bioo Panel Performance*" (Bioo's exhibit GP36) concerns an experiment wherein the performance of three Bioo Panel set ups is compared: a Panel with and a Panel without plants and a third Panel with plants kept in the dark (underground) during the whole experiment. The results, measured over a period of 28 days, illustrate that there is no significant difference in performance (maximum daily electricity generation/power measured in µW) between the three. The court finds these data unconvincing. As discussed above, there is no direct conversion from light energy to electricity.

Electricity is generated by the oxidation of organic material (chemical energy) generated by plants through photosynthesis. This means that the output of electricity is NOT directly influenced by the available amount of light. Hence, Bioo's assertion that its experiments show that there is no direct connection between daylight and the output of the Bioo Panels merely reflects that there is no direct conversion but does not prove Bioo's point that there is no role for plants in its devices.

77. As Plant-e pointed out, a substrate with organic matter was already present in the soil that is in the Bioo Panels. This substrate/feedstock was probably the same in all three Panels of the experimental set up. A possible contribution of plants to the organic material in the soil, can only be measured once the presence of sufficient organic material becomes a limiting factor in the soil of the reactor for the survival and growth of the micro-organisms that produce electric power. Plant-e argued that in this type of experiment, Bioo should have omitted the substrate, so that this was the starting scenario, e.g. by washing organic material out of the soil (if at all possible). In the present set up no difference was to be expected in the time interval of one month as such period is clearly too short for the substrate already present in the soil to run out. This is all the more so as Bioo has asserted that it uses a special substrate, which it is assumed was also used for these experiments. It is clear that in the present set up there is enough "fuel" in the soil of all three Bioo Panels at the start, which is also enough to last throughout the 28 days the experiment lasted. This is not surprising as Bioo asserts that its special substrate can last much longer than that. In contrast, the example described in the patent was set up such that the substrate (graphite granules) was cleaned and washed to remove residual organic matter as much as possible, and therefore the micro-organisms in the microbial fuel cells could only rely upon organic matter produced by the plants for power generation. In such a set up, there is a lag time (or delay) in power output, which represents the time needed for the plant(s) to generate enough organic matter and for the micro-organisms to metabolise the organic matter as illustrated in Figure 2 of the patent reproduced at 9 above.

78. Bioo relies on a second report, "*In field validation Bioo sensor*", in which results are shown of Bioo Sensors working in a crop field powered by 'biobatteries' over a period of more than one year (Bioo's exhibit GP39). The setup in this experiment is unclear. However, the parties seem to agree that this report concerns Bioo Panels and not Bioo Sensors, which are no longer the subject of these proceedings. From the report (on page 5) it is clear that irrigation was important for the working of the Bioo Panels in the crop field:

    'However, in the last few months, there is significant instability in the current values, with continuous fluctuations, probably due to poor cable connections and irrigation issues, (…)'

    It is not explained which materials were fed to the batteries with irrigation, but from Bioo's publication regarding the operation of the Bioo Panel, e.g. on its website, it can be derived that with irrigation organic material is dragged into the battery (see above at 23).

79. Also, the latest experiment submitted by Bioo (as exhibit GP46) cannot support its position that plants are not necessary for the functioning of the Bioo Panel. These experiments also concern a setup of a Bioo Panel with and without a plant, just like in GP36, but measured over a longer period of time. The experiment has the same flaw at the EP36 set up: as the presence of electron donor compound is not the limiting factor, the experiment is unsuitable to conclude anything about the contribution of plants to the Bioo Panel.

80. From the above the court concludes that feature 11.5 "*and b) a living plant (7) or part thereof, capable of converting light energy by means of photosynthesis into the electron donor compound*" is applied to the letter in the Bioo Panel as it is meant to include a plant.

81. However, all features must be read in the context of the claim. Although feature 11.5 as such (a living plant) is deemed present in the Bioo Panel, feature 11.5 read in the context of the claim also teaches the skilled person that the plant should be located in the anode compartment. Plant-e has argued that the upper and lower compartments can be considered as one anode compartment, especially because the upper compartment is functionally the same as the lower compartment of the Bioo Panel as it also includes organic material and micro-organisms and there is a connection between the two. This interpretation is not followed as there is no factual or functional basis to broaden the term 'anode compartment' in such a way. The skilled person would not find this implied part of feature 11.5 applied in the Bioo Panel.

82. A similar situation holds for feature 11.6, which teaches: *'wherein the micro-organism lives around the root (8) zone of the plant or part thereof*.' It was established above that the Bioo Panel is meant to operate with a plant. The skilled person also knows that the roots of the plant are surrounded by soil which is full of naturally present micro-organisms, as is also apparent from the depicted cross-section. However, read in the context of the claim and the description and drawings, the skilled person will understand that the micro-organism referred to here are the anodophilic micro-organisms that are capable of oxidizing the organic electron-donor compounds that are secreted by the roots. Bioo rightly argues that this means the feature thus requires that the roots must be in the anode compartment and that the anodophilic micro-organism lives around those roots. This is in line with what the skilled person will understand from the patent specification. The skilled person, reading the patent as a whole, will understand that feature 11.6 claims what is described as a preferred option in [0019] of the patent:

> *[0019] The micro-organism that converts the electron donor compound of the plant or part thereof preferably lives around the root zone of the living plant (called the rhizosphere), so the micro-organism can release electrons to the anode more easily.*

This is also apparent from figure 1 of EP 782.

83. In the Bioo Panel, the roots of the plant are not in the anode compartment. Bioo explained that it came to a different design as compared to Plant-e because in practice the presence of roots near or in the anode does not work well, e.g. because the roots as they grow tend to damage the anode and also disrupt the anaerobic conditions. It has therefore come up with an allegedly improved set up with two compartments wherein the plant and the roots are not in the compartment of the anode, for which it has filed a patent application (WO 500). In WO 500 this is explained:

> *The double compartment protects the device from erosion by roots or soil organisms, the contact between plant root (if present) and anode is avoided, and its configuration (upper compartment) allows an extra supply of nutrients and microorganisms. Thus, the depletion of nutrients is prevented, being a system capable of producing energy continuously.*
> *(…)*
> *Furthermore, the double-layer battery has two independent compartments assembled in a single device. In the lower part is the biological battery, formed by the anode and the cathode separated by the soil. The upper part includes a selected plant or plants that grow naturally in the battery installation environment. Plants and the battery are connected in such a way that rainwater and*

irrigation leach nutrients and microorganisms from the soil are led to the battery, while avoiding contact between plant root (if present) and anode.

84. Plant-e's argument that eventually the roots will reach the anode compartment because there are openings in the filter between the two compartments and the filter is not root-proof, and thus feature 11.6 will be effected in full in the Bioo Panel at some point, is dismissed. Bioo asserts that this does not occur, because the Bioo Panels are checked regularly, at least once a year, to avoid precisely that. Whatever the case may be, Plant-e, on whom the burden of presentation and proof rests, did not substantiate this argument sufficiently to convince the court. Therefore, also feature 11.6, read in the context of the claim, is not completely fulfilled in the Bioo Panel. It cannot be established that the roots of the plant are in the anode compartment where anodophilic micro-organisms (mainly) live and the Bioo Panel is not set up for this.

Conclusion: no literal infringement

85. The Bioo Panel literally applies all features of the claim except for the location of the plant and its roots (together with the micro-organisms) in the anode department. In the Bioo Panel the (roots of the) plant are in an upper compartment, whereas the anode (with the micro-organism), and thus the anode compartment, is located at the bottom of the lower compartment. Whether these variations are equivalent to what is specified in the claims and falls within the scope of protection of the claim 11, will be assessed below in the second step.

2. Infringement by equivalence?

86. The UPCA contains no provision on the doctrine of equivalence. Art. 2 of the Protocol to Art. 69 EPC makes clear that equivalence must be considered when assessing the scope of protection:
Equivalence
"For the purpose of determining the extent of protection conferred by a European patent, due account shall be taken of any element which is equivalent to an element specified in the claims."

This second step thus involves assessing whether, in the perception of the skilled person, the claims, read in the light of the description and drawings, leave room for equivalents, given, on the one hand, equitable protection for the patentee and, on the other hand, a reasonable degree of legal certainty for third parties.

87. The question to be answered here is whether, according to the skilled person, the Bioo Panel falls within the scope of protection of claim 11 by equivalence, as argued by Plant-e in the alternative. More specifically, it will need to be established whether the setup of the Bioo Panel with two compartments, wherein the plant with its roots is located on top of and/or in the upper compartment, which is not the anode compartment, is equivalent to the method claimed which requires the plant and its roots to be in the anode compartment (with the micro-organism).

88. In the absence of guidance within the applicable sources of law on the actual test to be used for taking equivalent elements into account, the court will apply a test based on the practice in various national jurisdictions, in line with what both parties proposed (partly upon questioning by the court) in this case. This entails that a variation is equivalent to an element specified in the claim if the following four questions are answered in the affirmative.

i. **Technical equivalence:** does the variation solve (essentially) the same problem that the patented invention solves and performs (essentially) the same function in this context?
ii. Is extending the protection of the claim to the equivalent proportionate to **a fair protection for the patentee:** in view of his contribution to the art and is it obvious to the skilled person **from the patent publication** how to apply the equivalent element (at the time of infringement)?
iii. **Reasonable legal certainty for third parties:** does the skilled person understand **from the patent** that the scope of the invention is broader than what is claimed literally?
iv. Is the allegedly infringing product **novel and inventive** over the prior art? (i.e. no successful Gillette/Formstein defence)[8]

Ad 1. Technical equivalence

89. As discussed above at 36, the teaching of the patent is to create an MFC that is independent of externally furnished fuel. This is achieved by introducing a living plant into the system as a constant supplier of organic material to the reactor, thus creating a P-MFC. The court is convinced that the Bioo Panel is designed to achieve the same for the following reasons.

90. Bioo initially took the position that the upper and lower compartments of the Bioo Panel are not in contact with each other so that it is not possible for nutrients/material/feedstock from the upper part to reach the lower part of the Panel where the anode and cathode are located. Plant-e submitted (as exhibit EP32) the results of tests performed with the two Bioo Panels that it received from Bioo (as instructed by the JR in the interim conference). Some parts from this report are quoted here:

> 6. Each Bioo panel is a square box approximately 37.5×37.5×20cm (L×W×H). The Bioo Panel essentially consists of two containers nested within each other. A larger container, which in its lower half has an anode at the bottom with a substrate over it and a cathode on top of the substrate. The substrate appears to be a mixture of regular garden soil/turf and sludge. The electrodes are one layer of carbon cloth each and connected to wires.
>
> 7. A smaller container can be placed inside the larger one, sitting on top of the cathode carbon cloth. There are holes in the bottom of this smaller container. This is the container where plants would be placed.
>
> 8. Each container has two recesses on the opposing side for receiving irrigation pipes. The upper container contains what appears to be soil with chips. Underneath the soil in the upper container, there are two layers of cloth.
>
> (...)
>
> **B) Does water flow freely from the upper part of the Bioo panel to the lower part?**
>
> (...)
>
> 21. First, I tested to what extent the upper container would hold water. In other words, if it gets irrigated (for example by rain), will the water flow through the holes, out of the bottom into the lower container. I found that the upper container of the Bioo panel does not hold water at all. Watering the upper container (with a water can, just like watering a plant) leads the water to freely flow into the lower container directly. A video (which Plant-e will submit as Annex D) was taken during this testing (performed on Bioo panel A) which clearly shows the instant flow of water when water is poured into the upper container from a water can.
>
> 22. The "water flow" test was done with 1.5L water (tap water). Once all water is poured in, the Bioo panel was left to set for 15 minutes. I could then be observed that the soil in the upper container already looked dry (indicating minimum water retention in the upper container), and the substrate of the lower container was completely hydrated (with little to no water remaining on top of the cathode carbon cloth). There was no visible water retained at the top of the substrate either.
>
> **C) If so, do organic compounds get transported with that water to the lower part of the panel?**

[8] See e.g. The Hague Court of Appeal, 27 Nov 2020 Eli Lilly/Fresenius, ECLI:NL:GHDHA:2020:2052 https://ipkitten.blogspot.com/2020/10/hague-court-of-appeal-sets-dutch.html

(...)

24. For this test, sodium acetate was chosen as an exemplary nutrient because it has good solubility and is easy to detect (with Gas Chromatography (GC)). Prior to the test, the substrate of Bioo Panel B was moisturized so that liquid samples can be taken at 3 different locations (top left, center, lower middle right). Two samples were taken at each location (labelled B1 top corner, B2 center, B3 middle) as references. 20.5 gram of sodium acetate was dissolved in 1.5L of water contained in a water can. The (soil of the) upper container of a Bioo panel was then watered with the 1.5L sodium acetate solution prepared. When watering, care was taken to apply the solution evenly across the soil.

(...)

27. The substrate in the lower container appeared hydrated. Liquid samples were taken at the same location as the references (two samples were taken at each location, labelled as T1 top corner, T2 center, T3 middle).

28. Samples were analyzed with Gas Chromatography (GC), and results are shown in the Table 1 below.[2]

(...)

29. The result clearly shows that 1) the original substrate contained in the lower container of Bioo panels contains little to no acetate; 2) the acetate contained in the solution applied to the upper container of the Bioo panel arrived at the bottom of the lower container within 15 minutes; and 3) the substrate is reasonably homogenous both before and after the test.

30. The test clearly demonstrates that dissolved organic matter (present in or generated by plants) in the upper container of the Bioo panel will easily reach the bottom of the lower container.

D) If so, will these organic compounds reach the anode near the bottom of the panel?

31. As the anode is located at the bottom of the bottom container, that is easily reached by the acetate as shown above, the answer to the final question is also positive.

91. These experiments involved measuring the transmission of acetate ions (organic material) in water from the upper compartment to the lower compartment of a Bioo Panel. The results show that this organic material (acetate is one of the possible electron donor compounds identified in the patent) can travel from the upper compartment of the Bioo Panel into the lower compartment, where it reaches the anode and where the anodophilic micro-organisms are present.

92. After the filing of these results, Bioo abandoned its position that organic material from the top compartment of the Bioo Panel cannot reach the lower compartment. It changed to what might be coined a *de minimus* argument: even though it is not entirely impossible that materials excreted by a plant in the top part reach the bottom part, this will only occur sporadically, is negligible in quantity, and is not intended. Bioo's expert Dr. Gunse (Bioo's exhibit GP45) reacted to the quantitative data (concerning the transmission of acetate ions) in Plant-e's test report, supporting Bioo's statement that the quantities of acetate that would reach the bottom is negligible. These calculations were in turn refuted by Plant-e during the oral hearing, pointing out that it is wrong by several factors, among other reasons because he focuses on the total amount of carbon produced in one year by plants in the upper compartment of a Bioo Panel which is compared with the total amount of carbon present in the substrate of the lower compartment, whereas the relevant factor for an MFC is the amount of carbon that is available to micro-organisms for oxidation (which is not all carbon). This is not a correct comparison. But whatever the case may be, these calculations are not relevant. The question to be answered is whether organic material excreted by plants in the upper compartment becomes available for plants in the lower compartment.

93. The court is convinced that in the Bioo Panel, nutrients and micro-organisms can pass through the filter from the upper compartment to the lower compartment. The Bioo Panel is designed

to make this possible. This follows from the above experiment and is also visible in the cross-section shown above. This is furthermore in line with the inspection by the court of the (empty) Bioo Panel that Bioo showed during the hearing: there were holes visible in the bottom of the upper compartment, in any case in the corners between the two layers, permitting such access.

94. Bioo's assertion that the passage of nutrients to the lower compartment does not occur because nutrients in the upper compartment are readily absorbed (there) and because the environment in the lower compartment is not ideal for aerobic micro-organisms, and in any case the distribution of such material to the process is negligible, is not substantiated and not tenable. It is therefore dismissed.

95. Furthermore, the position that the living plant does indeed contribute to the organic material in the lower compartment is in line with the teaching of WO 500, as is apparent from figure 1 of WO 500. In the preferred embodiment of WO 500, claimed in claims 1 and 2, the outer (upper) compartment (i.e. with the plant) is capable of supplying 'at least one electron donor' and configured to transfer this to the lower compartment. This is also referred to as leachate, and the transfer is done through 'leachate distribution pipes' (7) in the figure 1 of WO 500. This confirms that there is indeed a foreseen function of the plant as donor of organic material for the battery in the lower compartment. According to Bioo's own submission, the Bioo Panel is 'patented' in WO 500, hence the same must hold for the Bioo Panel.

96. The position in these proceedings that a plant in the Bioo Panel, if present, has no function because of its unique substrate that can last for a long time without the need to be replenished, is not in line with the teaching of WO 500 nor with all documentation used by Bioo to promote or describe its panels (see 23, 70 and 71). Plant-e disputes that such substrate exists. It also does not strike the court as very realistic as this would in fact amount to a *perpetuum mobile*. The skilled person knows that this does not exist. On pictures and a video submitted by Bioo of the Barcelona roof top installation, the court noticed regular bags of soil used for the installation of the Bioo Panels there. Bioo confirmed to have obtained these from a third party. There is no proof whatsoever of a unique super saturated soil nor what it would contain.

97. The set up of the Bioo Panel is thus considered technically equivalent to the teaching of the patent as the plant is part of the reactor and is a source of additional organic material for the battery. The effect of this is that the device is substantially independent of external fuel for the generation of electricity. The plant in the Bioo Panel has the same function as in the claim and solves the same problem. It does this in a similar way, the only difference being an extra compartment which does not affect the function of the plant and is deemed to be equivalent. The same applies to the location of the roots/micro-organism.

Ad 2 Fair protection for the patentee

98. The patent claims a new category of microbial fuel cells, by introducing a plant into the device/reactor and to obtain electricity from organic material originating from the photosynthesis by that plant and thus from light energy. Plant-e's invention has since been given its own name, the P-MFC. A fairly broad scope of protection is therefore in line with the contribution to the art. It is in these circumstances appropriate and proportionate that the protection extend through equivalence to the Bioo Panel in which exactly that principle is implemented. It is also obvious to the skilled person how to apply the equivalent element, i.e. by separating the plant with roots from the anode compartment, while ensuring that the leachate/organic material produced in the upper compartment reaches the lower anode compartment as feedstock for the micro-organisms around the anode.

99. Bioo explained that it terminated the license agreement with Plant-e because it found that the method claimed in (claim 11 of) the patent did not work. It came up with a different, allegedly improved, design with two compartments wherein the plant and the roots are not in the anode compartment, as in practice the presence of roots near or in the anode tends to hinder the functioning thereof. This is so because e.g. the roots tend to damage the anode and also disrupt the anaerobic conditions of the anode as they grow, according to Bioo. However, the variation that Bioo applied in the Bioo Panel still applies the teaching of the patent.

Ad 3 Legal certainty for third parties

100. The requirement of legal certainty is met if the skilled person understands that the patent claim leaves room for equivalents because the teaching of the patent is (clearly) broader than the wording of the claim and there is, still in the eyes of the skilled person, no good reason to limit the scope of protection of the claim to a (method using a) device as claimed. This requirement is met. The teaching of the patent is to add a plant to a an MFC to provide (additional) feedstock to make the MFC independent of externally provided feedstock. The skilled person will understand that the variation of the Bioo Panel is another way to obtain this result in a similar way.

Ad 4. Bioo Panel inventive and novel?

101. At the priority date, the Bioo Panel would have been novel and inventive over the prior art because of the introduction of a plant as part of the device as a supplier of additional fuel for the battery/reactor. Parties did not argue otherwise (or differently).

Conclusion on infringement

102. The court finds that the Bioo Panel is a device falling within in the scope of claim 11 of the patent and the use of this device to create energy directly infringes method claim 11. As the Bioo Bench contains several Bioo Panels, it follows that the Bioo Bench equally infringes. In so far as Bioo uses the Bioo Panel/Bioo Bench itself, as was for example the case at the Floriade in the Netherlands, Bioo directly infringes the patent (by way of equivalence). Bioo has also provided Bioo Panels and Bioo Benches to third parties. In that case Bioo indirectly infringes claim 11 because it does not apply the method itself, yet it provides Bioo Panels or Benches, which are an essential part for applying the method of claim 11. The essentiality of the means was not disputed by Bioo, nor that the other requisites of art. 26 UPCA are met.

103. Plant-e also argued that Bioo infringes claim 11 with its Bioo Ed product. Bioo disputes this only insofar as it argues that the Bioo Ed is not an infringing product because the manual no longer mentions that a plant must be put in the cylinder of the Bioo Ed. This argument is dismissed. From a video made available online by Bioo about the Bioo Ed, it is clear that the Bioo Ed is a P-MFC and that a plant is required (exhibit EP26). Also, the packaging of the Bioo Ed encourages users to use plants with the Bioo Ed. The Bioo Ed only has one compartment, so all features of claim 11 are met literally. For similar reasons and in a similar way as the Bioo Panel, also the (offering for) sale of the Bioo Ed is considered to indirectly infringe claim 11 of the patent. It is a device that is suitable and intended for putting the invention into effect. Plant-e has not provided evidence of direct infringement by Bioo with the Bioo Ed.

104. Plant-e based its claims exclusively on the method claims. Apart from claim 11, Plant-e has also argued infringement of dependent method claims 12-16. As infringement of claim 11 is

already sufficient ground for an injunction, there is no need to establish whether the dependent claims are subsequently infringed.

III.E - REMEDIES

105. As infringement by Bioo within UPC-territory has been established, it is appropriate to grant an injunction, subject to a recurring penalty payment (Artt. 25, 26 and 63 UPCA). No facts or circumstances have been brought to the attention of the court that would make an injunction disproportionate. The injunction shall be granted for the UPC-territory where the patent is valid, that being the Benelux, France, Germany, and Italy (Art. 34 UPCA).

106. The request to rule that the Bioo Panel, Bioo Ed and Bioo Bench (jointly: the infringing goods) constitute an essential element of the invention shall also be granted in relation to claim 11 of the patent.

107. Plant-e is entitled to an order to recall of the (indirectly or directly) infringing goods and their final removal from the channels of commerce according to Art. 64.1 and 2 (b) and (d) UPCA. Plant-e is further entitled to demand, in application of Art. 64 (2) (e) UPCA, the destruction of the infringing goods in Bioo's possession in the above mentioned UPC countries. The court finds these requests justified and proportionate, taking into consideration the requested limitation to purchases by professional customers. Bioo Panels and Bioo Benches that are installed in the ground are also exempted from the recall (but not from damage payments). Bioo's request to limit this order to removing the plants from the infringing products, is dismissed: this is not deemed an effective way to stop infringement as plants could easily be added (by the customer) or weeds could grow in later. A time frame will be put on this request, as well as to other requested orders.

108. Bioo contests that the court can impose a text for the recall letter because this is not stated in Art. 64 UPCA. The court disagrees. The wording of Art. 64 UPCA is based on Art. 10 Enforcement Directive (2004/48/EG). The court shall apply Union law in its entirety (Art. 20 UPCA) and can also use national law, in which the Enforcement Directive has often been implemented, as a source of law (Art. 24 UPCA). The remedies provided should be determined, taking into account the specific characteristics of a case. The use of a specific text is ordered for a recall letter and/or for publication on a website to ensure that the measure is effective and to avoid a situation in which unclear or confusing messages are spread. In this case, it is deemed appropriate to impose a specific text for the recall letter. The same applies for the text to be displayed on Bioo's website discussed below. The text proposed by Plant-e will be slightly adapted to reflect, among other things, the territorial limitation of the order. The request to add 'without caption' to the order is understood to mean 'any additional or alternative text'. The court will also allow the letters to be sent by email if that is the way Bioo normally communicates with its customers. The sending of a letter both by registered and by unregistered mail is deemed superfluous; Bioo can choose either or email if that is an option. Bioo will be ordered to provide copies to Plant-e's representative (who cannot share this information with his client) for verification purposes.

109. According to Art. 64 (3) UPCA, the Court shall order that the measures of Art. 64.1 and 2 be carried out at the expense of the infringer, here Bioo, unless particular reasons are invoked for not doing so. As no particular reasons for not doing so have been relied on here, Bioo will have to bear the expenses of these measures, as requested by Plant-e.

110. Plant-e's request for information pursuant to Art. 67 (1) UPCA in combination with R. 191 RoP is justified and proportionate. The claim for information serves inter alia to obtain information on the distribution channels of the infringing embodiment and the quantities and prices of the products delivered. Furthermore, the identity of third parties involved in the distribution of the infringing embodiment is of particular relevance to Plant-e in order to effectively enforce its exclusive rights.

111. Plant-e has a legitimate interest in having the decision published on Bioo's website pursuant to Art. 80 UPCA. The text proposed therefor by Plant-e is appropriate, with some amendments (e.g. explaining the territorial limitation of the decision) and limited to one month. Especially in view of the fact that Bioo is Plant-e's former licensee, this measure is considered proportionate; Plant-e has a legitimate interest to inform the market.

112. According to R 354.3 RoP, the Court's decisions and orders may provide for periodic penalty payments payable to the Court in the event that a party fails to comply with the terms of the order or an earlier order. The value of such payments shall be set by the Court having regard to the importance of the order in question. In the case at hand a periodic fine of up to EUR 2,000 for each product concerned or for each day of delay up to a maximum amount of EUR 200,000 seems reasonable.

113. Plant-e is entitled to damages under Art. 68 UPCA in combination with R. 118.1 RoP because Bioo, as a former licensee, acted knowingly or with reasonable grounds to know. Since Plant-e is not yet able to quantify the damage incurred, it has a legitimate interest in having Bioo's liability for damages determined.

114. In addition, Plant-e is entitled to payment of preliminary damages in accordance with Art. 68 UPCA in combination with R. 119 RoP. Bioo's request to limit the requested amount (EUR 100,000) is partly granted. EUR 35,000 seems reasonable, taking into account the expected costs of the procedure for the award of damages and the expected actual damages which Plant-e has incurred. The final determination of the amount of damages should be the subject of separate proceedings.

115. As the unsuccessful party, Bioo should be held to pay the costs of the proceedings according to Art. 69 (1) UPCA. Plant-e submitted a preliminary estimate of its legal costs (in workflow 51979/2024) of EUR 200,000, which is above the ceiling for recoverable costs given the value set for the infringement and counterclaim proceedings (these ceilings are EUR 56,000 and EUR 112,000 respectively). The preliminary cost estimate submitted by Bioo incidentally amounts to the same amount (EUR 200,000). The ceilings to the recoverable costs will be applied.

116. This decision is immediately and directly enforceable from the date of service in each Contracting Member State (R 354.1 RoP). Bioo did not request that the order be made subject to the rendering of security (Art. 82.2 UPCA, R 352.2 RoP). The court also sees no reason to do so *ex officio*.

IV. DECISION

For all these reasons and after having heard the parties the court:

I. Orders Bioo to cease and desist with immediate effect from infringing directly and/or indirectly EP 2 137 782 B1, in the Benelux, France, Germany, and Italy by (i) applying the method of claim 11 for converting light energy into electrical energy and/or hydrogen, wherein a feedstock is introduced into a device that comprises a reactor, where the reactor comprises an anode compartment and a cathode compartment and wherein the anode compartment comprises (a) an anodophilic micro-organism capable of oxidising an electron donor compound and (b) a living plant, or part thereof, capable of converting light energy by means of photosynthesis into the electron donor compound wherein the micro-organism lives around the root zone of the plant or part thereof or by (ii) offering or supplying Bioo Panels, Bioo Benches or the Bioo Ed (together the "Infringing Products") for use in the method of claim 11 as described above.

II. Rules that the Infringing Products each constitute an essential component for the application of the method of claim 11 of EP 2 137 782 B1;

III. Orders Bioo to recall, permanently withdraw from the market and destroy the Infringing Products delivered to professional purchasers for use in the Benelux, France, Germany, and Italy, within two weeks from the date of service of this decision and to this end to write a (registered) letter or email (with cc to Plant-e's lawyer) to its professional purchasers containing the following content, or a translation into another language understood by its purchasers, without any additional or alternative text:

> "*Dear customer,*
> *By decision of 22 November 2024, the Court of First Instance of the Unified Patent Court ruled that Bioo (Arkyne Technologies) has infringed the patent (EP 2 137 782) of the Dutch company Plant-e by supplying or offering to supply Bioo Panel, Bioo Ed and Bioo Bench products in the Benelux, France, Germany, and Italy.*
> *Bioo will therefore no longer market the Bioo Panel, Bioo Ed or Bioo Bench products in these countries and hereby requests that you no longer offer these (whether online or offline) and return any of these products in your possession to Bioo for destruction within 7 days from the date of this letter. Any products already installed/put in the ground are exempted from this.*
> *Bioo will refund the purchase price and all costs associated with the return of these products.*
> *Bioo apologises for the inconvenience.*
> *Bioo*";

and to provide copies of the communications to Plant-e's representative for verification purposes;

IV. Orders Bioo to provide Plant-e within three weeks from the date of service of this decision, with information on:

- the distribution channels of the Infringing Products and application of the infringing method;
- the quantities produced, manufactured, delivered, received or ordered, as well as the price paid for Infringing Products, and

- the identity of third parties involved in the production or distribution of the Infringing Products or in the application of the infringing method

in the Benelux, France, Germany, and Italy;

V. Orders Bioo to place the following text on the homepage of its website within two weeks after the service of this decision and for a period of one month, without additional or alternative text and with a link to the decision, in an easily readable frame covering at least 10% of the surface of the homepage and immediately visible when visiting the website:

"Dear visitor,
By decision of 22 November 2024, the Court of First Instance, Local Division The Hague, of the Unified Patent Court ruled that Bioo (Arkyne Technologies) has infringed the patent (EP2137782) of the Dutch company Plant-e by supplying or offering to supply Bioo Panel, Bioo Ed and Bioo Bench products in the Benelux, France, Germany, and Italy.
Bioo will therefore no longer market these products in those countries. If you obtained these products from us, you may return these for a full refund."

VI. Orders Bioo to pay a penalty of up to EUR 2,000 for each product concerned, or for each instance of Bioo directly or indirectly infringing EP 2 137 782 B1 in the Benelux, France, Germany, and Italy after this decision has been served or for each day, a part day being counted as a whole day, that Bioo fails to comply fully and/or improperly with the aforementioned orders under III, IV, or V, up to a maximum of EUR 200,000;

VII. Orders Bioo to compensate Plant-e for the damage it has suffered and fears it will yet suffer as a result of Bioo's infringements of EP 2 137 782 B1 in the Benelux, France, Germany, and Italy, the details of which are to be set out in separate proceedings for damages;

VIII. Orders Bioo to pay provisional damages of EUR 35,000 to Plant-e within three weeks from the date of service of this decision;

IX. Orders Bioo to pay the costs of the proceedings up to the ceilings set out, and those relating to the measures ordered above.

X. All other applications and request of the parties are rejected and dismissed.

XI. This decision is immediately and directly enforceable in the Benelux, France, Germany, and Italy as from the date of service. The enforcement is not subject to a security payment.

Done and delivered in The Hague on 22 November 2024

Brinkman Presiding Judge	Edger Frank BRINKMAN Digitally signed by Edger Frank BRINKMAN Date: 2024.11.21 18:58:27 -03'00'
Granata Legally qualified judge	Samuel Rocco M Granata Digitally signed by Samuel Rocco M Granata Date: 2024.11.21 21:25:40 +01'00'
Kokke Legally qualified judge and Judge rapporteur	Margot Elsa KOKKE Digitally signed by Margot Elsa KOKKE Date: 2024.11.21 21:00:53 +01'00'
Walker Technically qualified judge	Simon Robert Walker Digitally signed by Simon Robert Walker Date: 2024.11.22 02:55:25 +02'00'
for the Deputy Registrar	Nikki Swinkels Digitaal ondertekend door Nikki Swinkels Datum: 2024.11.22 11:48:48 +01'00'

INFORMATION ABOUT APPEAL

An appeal against the present Decision may be lodged at the Court of Appeal, by any party which has been unsuccessful, in whole or in part, in its submissions, within two months of the date of its notification (Art. 73(1) UPCA, R. 220.1(a), 224.1(a) RoP).

INFORMATION ABOUT ENFORCEMENT

(Art. 82 UPCA, Art. Art. 37(2) UPCS, R. 118.8, 158.2, 354, 355.4 RoP)

An authentic copy of the enforcement of the decision will be issued by the Deputy-Registrar upon request of the enforcing party, R. 69 RegR (Rules governing the Registry of the UPC).

Details of the Order

UPC case number: UPC_CFI_239/2023

main proceeding CMS no's: ACT_549536/2023 (claim) and CC_588768/2023 (counterclaim)