

Notice of opposition

Notice of opposition is filed against "EP 4 150 561 B1 (A1)", entitled "Device for Purifying Air".

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Opponent: BreezyPeasy SARL; 4, Rue des Folles Brises; 85800 Saint-Gilles-Croix-de-Vie; France

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Extent of opposition: patent in its entirety (claims 1-3 in part 1)

Grounds of opposition: A100(a) EPC for lack of novelty and inventive step

Opposition fee = paid by deposit account

If OD intends to reach decision other than revocation of A1 in its entirety, oral proceedings are requested.

Signature representative: //Mr Art Vandelay//

1. Effective dates

A1 (paragraphs [0001] to [0017] of the description, figures 1 to 3, and claims 1 to 3) filed on 8/10/2020 (FD) claims prio from ES2732945 (P) filed 11/10/2019 (PRD).

However, P only contains paragraphs [0001] to [0011], figure 1 and claim 1 of A1.

It is submitted that [0008], of A1/P referring to rotating means (101) and sound insulation material (103) in general does not provide direct and unambiguous basis for the specific means (101) and material (103) referred to in claims 2 and 3 and [0012-0015], Fig 2 of A1, respectively. Moreover, P does not disclose the optical navigation unit (110) of claim 3 and [0016-0017], Fig 3 of A1.

Hence, the effective date of:

- *claim 1, [0001-0011], Fig1 the PRD: 11/10/2019; and,*

- *claims 2,3; [0012-0017], Fig2-3 the FD: 8/10/2020.*

2. Prior art

A4 and A5 are patent documents published before the effective dates of claims 1-3, so are prior art within meaning A54(2) EPC for claims 1-3.

A3 is a US patent document published before the effective date of claims 2-3 (8/10/2020), but after the effective date of claim 1 (11/10/2019). Hence, A3 can only be prior art under A54(2) EPC for claims 2 and 3. For completeness: since A3 is a US patent doc, it cannot be A54(3) EPC prior art.

A2 is an article published in "Clean Air Monthly" on February 2020, so before the effective date of claims 2-3 (8/10/2020), but after the effective date of claim 1 (11/10/2019). Hence, the article of A2 can only be prior art under A54(2) EPC against claims 2 and 3.

However, A2 further discloses that a sale took place of the Soudy Purifier Cool device disclosed therein on the European market last spring (i.e., around March 2019-June 2019), selling over 20 000 items within the first three weeks. Hence, this public sale (not bound by confidentiality and actual sale; not testing) is the disclosure date. This is evidence of a public prior use of the device before the effective date of all claims 1-3 - GL, G-IV, 7.2. The skilled person could therefore obtain all features of the device from an external examination and those revealed by a further analysis - G1/92 and G1/23. Hence, the public prior use of the Soudy Purifier Cool device in A2 (referred to herein as A2-prior) is A54(2) EPC prior art for all claims 1-3.

3. Attacks

Claim 1 lacks inventive step over A2-prior+A4, infringing A56 EPC

A2-prior is considered CPA as it is the only prior art disclosing an actual air purification unit with the most structural features in common to that of claim 1, which have a suitable functional arrangement.

A3 cannot be used as prior art against claim 1.

A4 relates to an air conditioning system comprising a plurality of fixed airco units co-operating with a smart unit and separate pet robot - [0001], A4. While the pet robot and airco units operate interdependently, A4 explicitly teaches in [0012] that for any kind of air treatment, a dust sensor (= preferred example of means for measuring air quality; [0010], A1) should be integrated into the pet robot (i.e., not in the same casing as the means for purification and control unit), which remains separate from the air treatment components. Hence, the skilled person would have to modify against A4's teaching to arrive at claim 1, which makes it a less suitable starting point than D2-prior.

A5 relates to the field of air treatment, but discloses a humidifying robot (= not air purification device according to [0002], [0003] A1) - [0001], A4. In addition, device of A5 has less structural features in common.

A2 discloses the features:

a device for purifying air (100) comprising - [0001], A2: "Soudy Purifier Cool – device that combines advanced air purification with efficient cooling"; This corresponds to the definition of a device for purifying air as defined in [0002], A1.

- *rotating means (101) for displacing the device*; - [0007], A2: "effortlessly moved by our patented tilt-and-go functionality, which comprises two wheels". Two wheels is a preferred example of a rotating means according to [0012], A1.

- *a casing (102)* - [0002], A2: "Built with a robust aluminium casing"

the casing (102) further comprising: -

- *a means for measuring air quality (105)*; - [0003], A2: "Equipped with a solid-state formaldehyde sensor, the Soudy Purifier Cool detects formaldehyde, a pollutant whose

molecules are 500 times smaller than 0.1 microns." In preferred example means for measuring air quality = sensor; [0010], A1. Not limited to any particular sensor in claim. In addition, present sensor measures air quality by detecting pollutants.

- *a means for purifying air (104)*; and -[0004], A2: "Sondy Purifier Cool's removable catalytic filter breaks down the formaldehyde molecules, leaving just water and CO₂ behind." In preferred example means for purifying air = filter; [0010], A1. Not limited to any particular filter in claim. In addition, the pollutants are broken down and removed from the air = purified.

- *a control unit (106) configured to control the device (100) based on data received from the means for measuring air quality (105)*. - [0005], A2: "Each Sondy Purifier Cool comprises a smart unit which offers remote support, ... You can choose between automatic mode, in which the smart unit controls the device based on sensor readings." A smart unit = control unit according to [0014], A4. The smart unit controls the Sondy device based on data received from the sensor readings (= means for measuring air quality).

A2-prior does not disclose that the casing is coated with a sound insulation material (103).

The technical effect thereof is that this reduces the maximum operational noise to a level of 45 dB. Such a low noise level is particularly advantageous for use in the healthcare sector and, more generally, for use in noise-sensitive environments - [0008-0009], A1.

The objective technical problem (OTP) can therefore be worded as: "*How to provide a device for purifying air for use in the healthcare sector and, more generally, for use in noise-sensitive environments?*"

A4 is a document that the skilled person would be aware of as it relates to the related field of air conditioning systems designed to treat a given volume and reduce dust concentrations (= a device for purifying air according to [0002], A1) - [0001], [0005-0006], A4.

The skilled person would be motivated to consult D4 as it specifically deals with the OTP at hand, in particular relating to a system specifically intended for use in environments such as hospitals and clinics, where strict requirements govern noise levels, air quality and hygiene - [0002], A4.

A4 teaches in [0008] that "To render the air conditioning units 410 of the system suitable for use in hospitals and clinics, where a maximum noise level of 45 dB is required by law, the inner surface of the casing 411 is coated with a sound-absorbing material 418 to reduce the noise generated by the fan 417 during operation." Hence, providing a solution to the present problem. Said solution effectively corresponds to that of claim 1.

The skilled person would therefore be prompted to apply this teaching of A4 to the Sondy device of A2-prior.

Integrating said teaching would not require any other modification as the aluminium casing of A2-prior simply needs to be coated with the sound-absorbing material 418 disclosed in A4. No other structural features of the device have to be adapted to integrate this.

Hence, when applying the teaching of A4 into A2-prior, the skilled person would readily arrive

at the matter of claim 1.

In view of above, claim 1 lacks inventive step under A56 EPC in view of A2-prior + A4.

Claim 2 lacks novelty over A3, infringing A54(1),(2) EPC

Claim 2, dependents on claim 1.

A3 discloses the following features:

a device for purifying air (100) comprising - [0003] and Fig 2, A3 "vacuum cleaner 300"; [0008], [0010], A3: "vacuum cleaner 300 sucks in air containing dust from the floor into a cyclonic separation chamber the dust particles rotate in the air vortex and are pushed towards the walls

of the cyclonic separation chamber 309 by centrifugal force. When they reach the walls, the dust particles lose momentum and slide down into a collection tank 313...The clean air current is finally directed towards an air outlet 316". This corresponds to the definition of a device for purifying air as defined in [0002], A1. The device only needs to be suitable for doing so - GL, F-IV, 4.13.1.

- rotating means (101) for displacing the device; wherein the rotating means (101) comprises two wheels and a wheel driving unit (108) - [0005], A3: "To move, the vacuum cleaner comprises a left wheel 303, a right wheel 304 and one auxiliary wheel 305 for stably supporting the body 301". Hence, the vacuum cleaner comprises two wheels 303, 304. [0005], A3: "The vacuum cleaner

also comprises a left wheel motor 303a which drives the left wheel 303, and a right wheel motor 304a which drives the right wheel 304". The motors 303a, 304a correspond to wheel driving units according to [0013], A4.

- a casing (102) coated with a sound insulation material (103), - [0007], A3: "The body 301 of the vacuum cleaner includes a casing 307". [0011], A3: "For sound insulation, the inner surface of the casing 307 is coated with an MLV 317. The MLV consists of PVC loaded with calcium carbonate in a range from 5 to 50 weight percent based on the total weight of the MLV". An MLV 317 corresponds to a specific example of a sound insulation material according to [0013], A1.

the casing (102) further comprising: -

- a means for measuring air quality (105); - [0009], A3: "An optical air pollution sensor 314, located in the cyclonic separation chamber 309, provides a pollution level signal based on the amount of light scattered by dust particles. This indicates the quantity of dust drawn into the suction port 311." According to Fig2, A3 the cyclonic separation chamber 309 is positioned in the casing 307 and so the sensor 314 too. This sensor is a dust sensor, which corresponds to the preferred example of the means for measuring air quality in [0010], A1.

- a means for purifying air (104); and -[0008], [0010], A3: "vacuum cleaner 300 sucks in air containing dust from the floor into a cyclonic separation chamber 309 the dust particles rotate in the air vortex and are pushed towards the walls of the cyclonic separation chamber 309 by

centrifugal force. When they reach the walls, the dust particles lose momentum and slide down into a collection tank 313...The clean air current is finally directed towards an air outlet 316". Hence, the cyclonic separation chamber 309 acts as a means of removing dust from the air and discharges clean air = purifying according to [0002], A1.

- *a control unit (106) configured to control the device (100) based on data received from the means for measuring air quality (105).* - [0010], A3: "The pollution level signal is transmitted through a wired connection from the air pollution sensor 314 to a smart unit 315 of the suction fan 310, which adjusts the speed of the suction fan 310 based on the sensor readings to achieve an optimal cleaning effect." A smart unit = control unit according to [0014], A4. The smart unit controls the vacuum cleaner based on data received from the sensor 314 (= means for measuring air quality).

In view of the above, claim 2 lacks novelty over A3 within meaning A54(1), (2) EPC.

Claim 3 lacks inventive step over A3+A4 and A3+A5, infringing A56 EPC

Claim 3 is dependent on claim 2, which in itself is dependent on claim 1.

A3 now becomes prior art for assessing inventive step (was not possible for claim 1). As mentioned for claim 2 above, the vacuum cleaner is a device suitable for air purification. In addition, A3 is CPA as it is a prior art closer to claim 3 compared to A2-prior since it is an autonomous device - [0003], A3. This corresponds to the general purpose of the device of A1 - [0001], A1. Moreover, A3 has the most structural features in common with claim 3.

The remaining prior art A4 and A5 are less suitable starting points for the reasons mentioned above for claim 1.

A3 discloses all features of claims 1 and 2 (see above).

In addition, A3 discloses the following features of claim 3:

- *wherein the sound insulation material (103) is a mass loaded vinyl* - [0011], A3: "For sound insulation, the inner surface of the casing 307 is coated with an MLV 317. The MLV consists of PVC loaded with calcium carbonate in a range from 5 to 50 weight percent based on the total weight of the MLV". MLV 317 corresponds to a mass loaded vinyl according to [0013], A1.

Claim 3 differs from A3 in that A3 does not disclose that:

- (i) the mass loaded vinyl comprises barium sulfate in a range from 19 to 27 weight percent based on the total weight of the mass loaded vinyl; and,
- (ii) the device further comprises an optical navigation unit (110).

The technical effects thereof are:

- (i) "The inventors have found that superior sound insulation with improved thermal conductivity is obtained when the sound insulating material contains particles of barium sulfate in a range from 19 to 27 weight percent based on the total weight of MLV. The operational noise of the air purifier is thus lowered to 35 dB without impairing the dissipation of heat" - [0015], A1.

(ii) "The optical navigation unit of the invention offers higher resolution compared to conventional navigation units and can detect also smaller objects such as toys on the floor. This enables a more detailed mapping of the environment and more accurate movement" - [0017], A1.

Differences (i) and (ii) are therefore not synergistically linked, because the sound insulation and thermal conductivity is not related to navigation. Therefore, partial problems approach can be used to assess inventive step - GL, G-VII, 5.2, 6.

Partial problem 1

The OTP can be formulated as "How to lower operational noise of the device without impairing heat dissipation?"

A4 is a document that the skilled person would be aware of as it relates to the related field of air conditioning systems designed to treat a given volume and reduce dust concentrations (= a device for purifying air according to [0002], A1) - [0001], [0005-0006], A4.

The skilled person would be motivated to consult D4 as it deals with a system specifically intended for use in environments such as hospitals and clinics, where strict requirements govern noise levels, air quality and hygiene - [0002], A4.

In addition, A4 teaches in [0008] that "Although structured polymer foams are commonly used for coating the casing 411 with sound-absorbing material 418 to reduce the noise generated by the fan 417 during operation, they have the disadvantage of being thermally insulating, which can impede the dissipation of heat generated by the fan motor.". Hence, A4 refers to the present OTP, namely balancing lowering operational noise without impairing heat dissipation.

In addition, A4 offers a solution to this problem by: "using a specific mass loaded vinyl (MLV) is as sound-absorbing material because MLV is known for its sound insulation properties while exhibiting low thermal insulation characteristics." - [0009], A4.

In particular, A4 teaches to apply: "MLV consisting of vinyl loaded with particles selected from calcium-magnesium carbonate ($\text{CaMg}(\text{CO}_3)_2$), calcium carbonate (CaCO_3), calcium sulfate (CaSO_4) and barium sulfate (BaSO_4). Among these, barium sulfate, in a concentration ranging from 20 to 25 weight percent based on the total weight of the MLV, provides the optimal compromise of sound and thermal insulation" - [0010], A4.

It should be noted that this preferred option refers to the solution of difference (i) in claim 3 above because it refers to barium sulfate as particle and the end-point value of 25 of concentration based on total weight MLV anticipates the range 19-27 of claim 3 - GL, G-VI, 7.

The skilled person would therefore be prompted to apply this teaching of A4 to the device of A3. Since the device of A3 already discloses a type of MLV applying a similar particle (calcium carbonate (CaCO_3)) in a broad overall range of 5-50 weight percent, the skilled person would readily modify A3's teaching with that of A4 as it simply requires replacing the type of particle used and operating within a weight percentage range falling in the broader range of A3,

[0011]. No other modifications are required to incorporate this teaching.

Hence, when applying the teaching of A4 into A3, the skilled person would readily arrive at the matter of (i) of claim 3.

Partial problem 2

The OTP can be formulated as "How to provide a device enabling more detailed mapping of the environment and more accurate movement?"

A5 is a document that the skilled person would be aware of as it relates to the field of air treatment - [0001], A5. In addition, the device of A5 is also an autonomously operating device like that of A3 - [0005], A5.

A5 teaches that "The humidifying robot 500 (= device of A5) is further equipped with a highly modern laser navigation unit 502 which surpasses conventional ultrasound units in accuracy." Hence, referring to the problem identified in [0017], A1 of conventional ultrasound units and offering the same solution as described in [0016], A1 also referring to the unit comprising a laser.

Hence, the skilled person would have to replace the navigation unit 302 of A3 ([0004], A3) comprising an ultrasonic component with the laser navigation unit 502 of A5. The skilled person would be prompted to do so since this solves the problem of difference (ii) and A5 clearly refers to the advantages over the ultrasonic component.

This will still allow the device of A3 to detect barriers such as sofas and walls. This allows the vacuum cleaner 300 to navigate the space avoiding large obstacles. As the ultrasonic part is only a component in A3, it can be readily replaced with a laser component; no further modification would be required.

Hence, when applying the teaching of A5 into A3, the skilled person would readily arrive at the matter of (ii) of claim 3.

In view of the above, claim 3 lacks inventive step within meaning A56 EPC over A3+A4 and A3+A5.

Notice of opposition

This is a continuation to the notice of opposition of part 1 submitted earlier so the opposition details are as provided earlier.

In addition:

Extent of opposition: patent in its entirety (claims 4-8 in part 2)

Grounds of opposition: A100(a) EPC for lack of novelty and inventive step; A100(c) EPC for extension of subject-matter.

Signature representative: //Mr Art Vandelay//

Claim interpretation

Claim 7 contains a preferable part and can therefore be conceptually divided into two parts: 7a and 7b directed to:

7a: Application program comprising instructions which, when executed by a smart device, command a mobile air purifier (100) to recharge when the battery level is below a first threshold.

7b: Application program comprising instructions which, when executed by a smart device, command a mobile air purifier (100) to recharge when the battery level is below a first threshold being 20%.

Claim 8 contains an "or" part and can therefore be conceptually divided into two parts: 8a and 8b directed to:

8a. Application program comprising instructions which, when executed by a smart device, command a mobile air purifier (100) to recharge when the battery level is below a first threshold.

This is effectively identical in scope to claim 7a above.

8b. Application program comprising instructions which, when executed by a smart device, command a mobile air purifier (100) to recharge when a measured dust concentration is below a second threshold.

Effective date claims

A1 filed on 8/10/2020 (FD) claims prio from ES2732945 (P) filed on 11/10/2019 (PRD).

However, P contains only paragraphs [0018] to [0022] and claims 4 and 5 of A1. The additional matter introduced in [0023] to [0026] and claims 6-8 cannot be directly and unambiguously derived from the more generic computer program description in [0021-0022] of P. Hence, said matter is not entitled to prio within meaning A87(1) EPC.

The effective date are therefore:

- for claims 4-5 and [0018-0022] the PRD: 11/10/2019; and,
- for claims 6, 7a, 7b, 8a and [0023-0026] the FD: 8/10/2020.

Claims 7a, 7b, and 8a were not present in the claims of A1 as filed, but direct and unambiguous basis for claims 7a-7b and 8a can be found in [0025], A1 as filed.

Claim 8b extends beyond the content of the application as filed and therefore has no effective date (see analysis below).

Prior art

The discussion of suitability of A2-A5 of part 1 applies mutatis mutandis to the claims of part 2.

A2 was published before effective date claims 6, 7a, 7b, 8a and is therefore prior art under A54(2) EPC against said claims, but not for claims 4-5.

A2-prior use (see analysis part 1) was published before effective date of all claims and is therefore prior art under A54(2) EPC for said claims.

A3 was published before effective date claims 6, 7a, 7b, 8a and is therefore prior art under A54(2) EPC against said claims, but not for claims 4-5.

A4 to A6 are patent documents published before the effective date of all claims and is therefore prior art under A54(2) EPC for said claims.

A7 is a screenshot of an internet disclosure of the Appshop downloaded and printed on 20 February 2026. However, the screenshot contains a timestamp of 1 July 2019 of last update of app and text; ie resulting in a disclosure date before the effective date of all claims. Such an explicit timestamp is generally considered reliable and accepted at face value - GL, G-IV, 7.5.2 and 7.5.3.3. The disclosure as it currently stands could be publicly accessed through the internet at least from said time stamp. Hence, is prior art under A54(2) EPC against all claims. In addition, the app was publicly available in the current format at least from said date. Hence, resulting in a public prior use of the app too - GL, G-IV, 7.2.

Attacks

Claim 4 lacks an inventive step over A6+A5, infringing A56 EPC

A6 is CPA to claim 4 as it is the only prior art available describing a moving air purifier ([0001], A6) used for the purpose of air purification/dust reduction as required in claim 4.

A2-prior does not disclose a method for reducing dust concentration. A3 cannot be cited against claim 4 as not available as prior art for said claim.

A4 relates to an air conditioning system, but in the case of A4 the sensor-containing pet robot is the mobile part of the system and the air conditioning/purifying unit is fixed to a wall of a room to be treated - [0001], [0004], A4. This is further removed from the concept of claim 4 than A6. Moreover, A4 explicitly teaches not to include the dust sensor on the air treatment unit further distancing itself from claim 4 - [0012], A4.

A5 relates to a humidifying robot, which is not an air purifier.

A6 discloses:

A method for reducing dust concentration in the air of an indoor space comprising the steps of: - [0003], A6: "air purification is performed by a HEPA filter 602 and a catalytic filter 603 which are installed in the casing". HEPA filters are highly effective at removing/reducing dust in the air according to [0006], A4. [0002], A6: "air purifier is able to autonomously navigate through any multi-room indoor space".

- *measuring dust concentration in the air of the indoor space* ; - [0006], [0007], A6: "sensors are ... a particle sensor. The particle sensor detects the concentration of particles ranging in size from 1 to 100 μm .". Dust refers to particles of matter with a size range from 1 to 500 μm - [0006], A4. Hence, the particle sensor will measure dust particles; i.e. act as a dust sensor. The sensor is incorporated in a sensing station 650, which monitors the conditions of air in a room in which the station is located (= indoor space) - [0005], A6.

- *based on the measured dust concentration, controlling the movement of the moving air purifier (100)* - [0007], A6: "From the data obtained by the particle sensor, ... a microprocessor in the sensing station 650 calculates an air quality index (AQI) for the room. The electronic board also comprises a transmitting unit for transmitting the AQI calculated by the microprocessor to the air purifier." [0010], A6: "Through the receiving unit, the control unit of the air purifier periodically receives the AQI from the various sensing stations, compares them, ranks them in order of need for purification and controls the wheels 601 to move the air purifier 600 towards 30 the room which needs purification the most." Hence, based on the measured dust concentration from the particle sensor, the moving air purifier's movement is controlled.

A6 does not disclose:

that the dust concentration is measured by means of the moving air purifier (100).

The technical effect thereof is that: "By applying this method, the air purifier can detect contaminants throughout the entire space being purified without the need to interact with sensors external to the air purifier. Housing all components within the air purifier itself allows the device to operate fully autonomously." - [0020], A1.

The objective technical problem (OTP) can therefore be formulated as: "How to provide a fully autonomously operating air purifier to operate in the dust reduction method?"

A5 is a document the skilled person would be aware of as it relates to the same technical field of air treatment - [0001], A5.

A5 teaches that the robot 500 (= device) disclosed therein is able to work fully autonomous and operate on its own, requiring no human intervention during its operation when incorporating the proper sensors - [0005], [0011], A5. Hence, the skilled person would be motivated to consult A5 as it addresses the present OTP by housing the necessary components within the same device.

[0010], A5 teaches that the robot disclosed therein may be modified by: "In addition to the humidity sensor 504, the robot 500 may be provided with one or more sensors of the types

commonly employed in air conditioning systems for monitoring environmental conditions and may further be configured to communicate with a network of fixed sensors placed at various locations within the environment. This allows the robot to gather more comprehensive environmental data". A4, [0011], teaches that such commonly employed sensors include a temperature sensor 422, a humidity sensor 423 and a dust sensor 424. These correspond to sensors already present in A6 mounted in the sensing station 650, [0006]: a temperature sensor, a humidity sensor, a particle sensor (= dust sensor, see above). Hence, A5 effectively teaches to apply the sensors into the moving device to obtain a fully automated, autonomously operating method. According to A5 this applies to all technical areas of air treatment and is therefore not restricted to the one disclosed in A5 - [0011], A5.

This will prompt the skilled person to apply A5's teachings to A6's air purifier and include the necessary sensors into the device. Since this still allows to communicate with the sensing stations - [0010], A5 this would require no further modification of A6's air purifier used in the method. Moreover, the air purifier 600 of A6 comprises a socket 607 into which a cartridge 608 can be plugged, which is also large enough to incorporate further electrical components, such as the required sensors - [0008], [0009], A6.

In addition, the air purifier 600 of A6 already includes an air humidification unit so this aspect of the device in A5 will also not interfere with the device of A6 - [0003], A6. This is also supported by [0003], A1 showing that the air purifier disclosed therein may also contain an integrated humidification unit and additional electronic components such as sensors.

Hence, when integrating the required sensors into the air purifier of A6 as taught in A5, the skilled person readily arrives at the matter of claim 4.

In view of the above, claim 4 lacks inventive step within meaning A56 EPC over A6+A5.

Claim 5 lacks inventive step over A4, infringing A56 EPC

A4 is the closest prior art to claim 5 as it is the only prior art disclosing a computer program and it has many execution steps in common - [0015], A4.

Claim 5 is a mixed-type invention and comprises both technical and non-technical features. The COMVIK approach is applied herein - GL, G-VII, 5.4 and G1/19.

The non-technical features are:

- generating a virtual map of the dust concentration in the indoor space;
- causing a screen of a user interface to display the generated virtual map.

It is clear from [0021-0022], A1 that the visual map and its display on a screen solely relates to a presentation of information. In particular, user convenience or preferences cannot support a technical effect over the prior art - GL, G-II, 3.7.

A4 discloses:

A computer program comprising instructions which, when the program is executed by a computer, cause the computer to carry out the following steps - [0015], A4: "The smart unit

comprises a computer program for controlling the movement of the pet robot which, when executed..."; [0014], A4: "The smart unit is a type of control unit configured to exchange data with external devices and networks." [0021], A1 teaches that the computer program according to claim 5 can be executed by a control unit 106. Hence, the smart unit serves as a computer in present context.

- *dividing an indoor space into a plurality of regions*; - [0015], A4: "divides the indoor space into a plurality of regions".

- *controlling the movement of a device (100)*; - [0015], A4: "The smart unit comprises a computer program for controlling the movement of the pet robot which". The pet robot is a device that measures the dust concentration with a dust sensor - [0012]; A4. The device is not restricted to an air purifier in claim 5.

- *for each of the regions, receiving dust concentration data measured by the device (100)*; [0015], A4: "the smart unit receives environmental data from the pet robot for each region while it moves". This includes dust concentration data - [0012], A4.

A4 does not disclose the non-technical features:

- generating a virtual map of the dust concentration in the indoor space;
- causing a screen of a user interface to display the generated virtual map.

The choice of one or another manner of displaying info is not considered to have a technical effect. No further technical advantages are described in A1 to support anything other than user convenience - [0022], A1.

As the above differences do not make a technical contribution over A4, claim 5 therefore lacks an inventive step within meaning A56 EPC over A4.

Claim 6 lacks inventive step over A4, infringing A56 EPC

A4 is the closest prior art to claim 5 as it is the only prior art disclosing a computer program and it has many execution steps in common - [0015], A4.

Claim 6, dependent on claim 5, is a mixed-type invention and comprises both technical and non-technical features. The COMVIK approach is applied herein - GL, G-VII, 5.4 and G1/19.

The non-technical features are those of claim 5 detailed above.

A4 further discloses all features of claim 6:

- *ranking the plurality of regions according to their need for purification based on the dust concentration data received from the device*;
- *causing the device to move to the first-ranked region*. - [0016], A4: "For those regions wherein purification mode is determined to be the most appropriate, the smart unit ranks these regions based on dust concentration level, thereby establishing a hierarchy of purification priority. The pet robot is then directed to the highest-priority region to monitor the purification process."

Should be noted that claim 6 is not restricted in terms of what the device should do in said region (i.e., actual purification or not) and what type of device should be used (not restricted to air purifier).

Hence, claim 6 lacks inventive step within meaning A56 EPC over A4 for same reasons as described above for claim 5.

Claim 7a lacks novelty over A7, infringing A54(1),(2) EPC

A7 discloses:

An application program comprising instructions which, when executed by a smart device, - A7, p.1, l.5-8: "MyAirQualityTM app to remotely get your mobile air purifier to clean the air in your flat" App controlled by smartpone in Fig 2 of A7. Smartphone = smart device - [0022], A1.

command a mobile air purifier (100) to recharge when the battery level is below a first threshold - A7, p.1, l.12: "app allows to decide the battery level at which to send the mobile air purifier to recharge". The air purifier shown in Fig1-3 of A7 has wheels mounted under the device = mobile. In addition explicitly disclosed in A7, p.1, l.7 "mobile".

In view of above, claim 7a lacks novelty in view of A7 under A54(1), (2) EPC.

Claim 7b lacks inventive step over A7+A3, infringing A56 EPC

In event proprietor would submitted an amended claim incorporating the preferable feature of claim 7 (= claim 7b), the opponent submits following:

A7 is CPA since it is the only prior art disclosing an application program.

As mentioned above, A7 discloses all non-preferrable features of claim 7 (= claim 7a).

A7 does not disclose:

- the first threshold being 20%.

The technical effect thereof is that "This proactive recharge strategy extends battery lifespan because deep discharges are prevented." - [0025], A1.

The objective technical problem can therefore be formulated as "How to provide an application program that allows for a proactive recharge strategy extending battery lifespan?"

A3 is a document the skilled person would be aware of as it relates to an autonomously moving device (= vacuum cleaner) used to clean a floor in an interior space - [0001], A3. This belongs to a related technical field of the mobile air purifier.

A3 teaches that "The vacuum cleaner is powered by a rechargeable battery and automatically returns to its charging station when the battery level is below 18%. This prevents deep discharges, thereby extending battery lifespan, an important issue for autonomous devices." - [0006], A3. Hence, the skilled person would be motivated to consult A3 as it refers to the OTP and the same technical effect/improvement mentioned in [0025], A1.

When applying the teaching of A3 in A7, the skilled person would set the battery level at which to send the mobile air purifier to recharge to below 18%, this is a value below the first

threshold of 20% of claim 7b. Hence, the skilled person would readily arrive at the matter claimed without exercising inventive skill.

No further modifications need to be made as the app simply allows to set such a threshold value. Since the prior art motivates the skilled person to do so in expectation of the extending battery lifespan improvement, claim 7b would lack inventive step within meaning A56 EPC over A7+A3.

Claim 8 extends beyond the content of A1 as filed, infringing A123(2) EPC

Claim 8 as granted referst to:

"an application program comprising instructions which, when executed by a smart device, command a mobile air purifier (100) to recharge when the battery level is below a first threshold **or** when a measured dust concentration is below a second threshold."

Said claim was not present in A1 as filed. Moreover, [0026], A1 teaches that: "In some embodiments, the recharge is made additionally conditional upon the dust concentration being below a second threshold. This means that in the case of a low battery level and low dust concentration, the mobile air purifier recharges but in the case of a low battery level and high dust concentration, the mobile air purifier does not recharge and simply keeps cleaning until a lower battery level is reached."

Hence, A1 as filed only teaches to apply the recharging when both the battery level and dust concentration is low. Not if either one would be low. Hence, the "or" part of claim 8 (=claim 8b) constitutes an unallowable intermediate generalization of [0026], A1, infringing A123(2) EPC - GL, H-V, 3.2.1. In particular, both features are inextricably linked and disclosed in combination. The "or" part of the claim is expressly dissuaded. The overall disclosure therefore does not justify isolating said disclosure from the original combination.

Claim 8 therefore extends beyond content of A1 as filed, infringing A123(2) EPC.

In event proprietor would submitted an amended claim deleting the part of measured dust concentration (= claim 8b), they would arrive at an identical claim as claim 7a above. This lacks novelty over A7 within meaning A54 EPC so will not be allowable.