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Datasheet for the decision of 19 March 2019

Case Number: T 2305/15 - 3.2.04

Application Number: 06791216.2

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IPC: A47L9/16

Language of the proceedings: EN

Title of invention:
CYCLONE SEPARATING DEVICE OF A CLEANER

Patent Proprietor:
Ecovacs Robotics Co., Ltd.

Opponent:
Dyson Technology Limited

Headword:

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
Novelty - main request (no)
Inventive step - auxiliary request (no)

Decisions cited:
T 0896/92, T 0204/83, T 1488/10

Catchword:

Europäisches Patentamt
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Beschwerdekammern

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Case Number: T 2305/15 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 19 March 2019

Appellant: (Patent Proprietor)	Ecovacs Robotics Co., Ltd. Shihu West Road 108 Wuzhong District Suzhou City (CN)
Representative:	Laufhütte, Dieter Lorenz Seidler Gossel Rechtsanwälte Patentanwälte Partnerschaft mbB Widenmayerstraße 23 80538 München ALLEMAGNE
Respondent: (Opponent)	Dyson Technology Limited Tetbury Hill Malmesbury, Wiltshire SN16 0RP (GB)
Representative:	Lobban, Colin Dyson Technology Limited Intellectual Property Department Tetbury Hill Malmesbury, Wiltshire SN16 0RP (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 9 October 2015 revoking European patent No. 1961356 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	A. de Vries
Members:	J. Wright
	T. Bokor

Summary of Facts and Submissions

I. The appellant-proprietor lodged an appeal, received on 8 December 2015, against the decision of the Opposition Division posted on 9 October 2015 revoking European patent No. 1961356 pursuant to Article 101(2) EPC. The appeal fee was paid simultaneously. The statement setting out the grounds of appeal was received on 15 February 2016.

II. Opposition was filed against the patent as a whole and based, amongst other things, on Article 100(a) together with Article 54(2) EPC (lack of novelty) and with Article 56 EPC (lack of inventive step). The opposition division held, amongst other things, that the opposition ground of novelty prejudiced the maintenance of the patent as granted. The division considered the following documents, amongst others:

D1: WO 02/03845 A
D2: GB 2360719 A

III. Oral proceedings were duly held on 19 March 2019.

IV. The appellant-proprietor requested that the decision under appeal be set aside and the patent be maintained as granted (main request) or that it be maintained in an amended form on the basis of the auxiliary request filed with the grounds of appeal.

The respondent-opponent requested that the appeal be dismissed.

V. The wording of claim 1 of the requests is as follows:

Main request (as granted):

"A cyclone separating device of a cleaner comprising: an upstream separating device (1') having a first cyclone barrel (6'); and

a downstream cyclone separating device (2'), communicating with said upstream separating device (1') through a gas passage (3'), said downstream separating device (2') having at least one second cyclone barrel (8'); wherein said downstream separating device (2') is recumbently and wholly mounted above said upstream separating device (1') and said first cyclone barrel (6') possesses a first axis (18') and said second cyclone barrel (8') possesses a second axis (17'),

characterized in that between the first axis (18') and the second axis (17') a spatial angle (α) is formed ranging from 120 to 145 degree, a dust outlet (11') of the second cyclone barrel (8') being positioned lower than a gas outlet (10') of the second cyclone barrel (8')".

Claim 1 of the auxiliary request reads as for the main request but for the following wording added to the end of the claim:

"wherein the downstream separating device (2') comprises a plurality of paratactic cyclone barrels (8')".

VI. The appellant-proprietor argued as follows:

Regarding the main request, D1 does not take away novelty of claim 1 because it does not disclose the following features:

- that the downstream separator is mounted wholly above the upstream separating device,
- that the spatial angle between first and second axes is in the range 120° to 145°, and
- that the dust outlet of the second cyclone barrel is positioned lower than a gas outlet of the second cyclone barrel.

In particular, in use, the orientation of the cyclone separating device of D1 is not as is claimed so that it does not read onto the claim. Furthermore, no angle between the axes of the downstream and upstream cyclone barrels is disclosed in D1 because the angle read from a drawing is not representative of an angle on an actual device.

Regarding the auxiliary request, the word paratactic means mounted in parallel. Starting from D1, it would not be obvious for the skilled person to combine it with D2 and arrive at the claimed invention because D2 teaches a different solution to the problem of reducing height, namely to mount the downstream cyclone barrels partly inside the upstream barrel. The arrangements of D1 and D2 are therefore incompatible for combination.

VII. The respondent-opponent argued as follows:

Regarding the main request, D1 takes away novelty of claim 1. The implied vertical and horizontal in claim 1 have no significance so the device of D1, figure 15 can be considered in any orientation when comparing it to the claim. The opposition division was correct to consider D1, figure 15 to disclose the claimed angle between the axes of the separator barrels.

Regarding the auxiliary request, even if paratactic was taken to mean parallel, this feature was known from D2 so claim 1 was obvious over the combination of D1 and D2.

Reasons for the Decision

1. The appeal is admissible.

2. Background

The patent relates to the cyclone separating device of a cleaner. Two stage cyclone separation is known to include a downstream separator device for large particles and an upstream separator device for fine dust (see published patent specification, paragraphs [0001] and [0002]). The patent (see paragraph [0013]) aims, amongst other things, to realise a cyclone separating device of reduced height.

3. The Board finds it useful to start by interpreting certain aspects of claim 1 of the main request.

3.1 Implied orientation of the claimed cyclone separating device

3.1.1 Some features of claim 1 make implicit reference to a particular orientation of the device ("above", "positioned lower"). For example, the downstream separating device is *recumbently* (the Board reads this as "in a lying or reclined manner") mounted *above* the upstream separating device. Thus, it is defined with reference to an implied horizontal and vertical frame of reference.

3.1.2 This frame of reference could be considered as the horizontal and vertical directions when the cleaner is in use. The appellant-proprietor has argued that this amounts to a structurally limiting feature of the device which must be taken into account when assessing the prior art. The Board disagrees.

3.1.3 It is common ground that the claim is not limited to any particular kind of vacuum cleaner. Although, some vacuum cleaners, such as one mounted on wheels and pulled behind the user, may have an essentially constant orientation with respect to the floor, this is not true of others. For example, a hand-held vacuum cleaner can be used pointing upwards to clean a ceiling, downwards to clean the floor or horizontally to clean under a chair. Therefore, its dust separating elements can be orientated in practically any way with respect to the floor when the cleaner is in use.

3.1.4 Consequently, the horizontal and vertical directions implied in the claim impose no structural limitations on the cyclone separator itself, to the extent they refer to its orientation in use with respect to an external reference framework, for example the floor (horizontal) and perpendicular to the floor (vertical). The skilled person rather reads the spatially defined features of claim 1 (recumbent, above, lower) as being merely defined with respect to two mutually perpendicular (arbitrary) reference directions. The prior art must be considered with this in mind.

3.1.5 In the light of the above, in the discussion that follows, where the Board uses spatial terms such as *above, upward, highest* and *vertical*, it does so merely in order to follow the convention of the claim language and without implying any particular orientation of the

claimed device with respect to any external frame of reference.

3.2 The feature: [the] *downstream separating device is ... wholly mounted above said upstream separating device*

3.2.1 The appellant-proprietor has argued that the "wholly mounted above" feature should be interpreted to mean that, when mounted (oriented as shown in figures 6 and 7) all of the downstream separating device is above the highest point on the upstream separating device *and* that, all of the downstream separating device lies within a volume defined by the upward projection of the upstream separating device's outline. The Board disagrees with the latter part of this interpretation.

3.2.2 In the Board's view, defining that the downstream separating device is mounted above the upstream separating device does nothing more than specify the order of the two separators in the vertical direction. That said, the claim qualifies the "mounted above" with the word "wholly". In the Board's view, the skilled person reads this qualification to mean that the whole, that is each and every component, of the downstream separator is higher up than each and every component of the upstream separator. This interpretation corresponds to the first part of the appellant-proprietor's interpretation (downstream separator entirely above highest point of upstream separator).

3.2.3 Regarding the further restriction that the appellant-proprietor reads into the feature (whole of downstream device within a volume defined by the upward projection of the upstream separating device's outline), the Board notes that the claim itself says nothing about the lateral extent of either the upstream or downstream

separator, only the angle between the axes of their barrels is defined. Therefore, this restricted interpretation appears not to be derivable from the other features of the claim itself.

3.2.4 Nor is such a restricted interpretation apparent from the description or figures. In this respect, the parties have referred to paragraph [0016], which uses similar wording to the claim feature: "[t]he whole downstream cyclone separating device 2 sleeps [*sic*] above the upstream cyclone separating device 1 recumbently". In the Board's view, this formulation also does not support the appellant-proprietor's interpretation. Here the downstream cyclone separating device "sleeps" - rather than merely "being mounted" - above the upstream device, but as to whether it does so whilst not extending laterally beyond the upward projection of the upstream device's outline, the skilled person is none the wiser. In any case, the paragraph refers only to devices shown in figures 1 to 5, which are not according to the claimed invention (see column 3, lines 5 to 6).

3.2.5 The corresponding description of the embodiment (see column 4, lines 32 to 37 with figures 6 and 7) is more general than the claim. Again the downstream device "sleeps" above the upstream device, but this time without any mention of it being the *whole* downstream device that does so.

3.2.6 Thus, read in the light of the description, the skilled person would not interpret the "wholly mounted" feature of claim 1 in the restricted way the appellant-proprietor suggests.

3.2.7 Nor, in the Board's view, would the skilled person arrive at the more restricted interpretation in the light of figures 6 and 7. In these figures it can indeed be said that the whole of the downstream device is mounted within the vertical projection of the upstream device's outline.

3.2.8 However, the Board believes that the presence of the feature will be discernible only to an eye that is seeking to confirm it (rather than discover it for the first time), that is an eye that is already informed by the present discussion. The Board does not believe that the skilled person, approaching the figures and corresponding text (which makes no mention of the "whole" downstream device) without knowledge of the appellant-opponent's argument, would positively identify this feature, let alone see it as being significant for interpreting the claim.

3.2.9 Therefore, even if the skilled person were to interpret claim 1 in the light of the description and figures 6 and 7, they would not interpret the "wholly above" feature as narrowly as the appellant-proprietor has argued. Rather, they would consider that the feature merely defines that, once mounted, the whole of the downstream separator is above the highest point of the upstream separator.

4. Novelty, main request, claim 1 with respect to D1

4.1 It is not in dispute that D1 (see page 1, first paragraph) discloses a cyclone separating device of a cleaner. Considering the embodiment of figure 15, an upstream cyclone separator device, with its air intake "in", is shown lowermost on the page. Air that so enters, is swirled in a first cyclone barrel. Also

disclosed is a downstream separator device that communicates with the upstream separator device by way of a gas passage (see arrow next to words "suction air flow"). The downstream separator device swirls the air in (two) second cyclone barrels 40, 114.

4.2 In the Board's view, D1 (embodiment of figure 15) also discloses that the dust outlet of the second cyclone barrel is positioned lower than a gas outlet of the second cyclone barrel. Bearing in mind that the spatial terms lower, above etc. do not limit the claim to a particular state of use relative to an external frame of reference, the cyclone separator of D1 figure 15 can be considered in any orientation, regardless of what orientation it might adopt when in use.

When it is considered oriented such that both the arrows shown to the left and right sides of the part hemispherical skirt 56 of the upstream separator are pointing vertically down, then the dust outlet of (each) second cyclone barrel (see for example the line intersected by arrow below reference numeral 62) is positioned lower than its gas outlet (see for example arrow just above reference sign 120). Therefore, D1 discloses this (dust outlet lower than gas outlet) feature.

4.3 Continuing to view figure 15 in this same orientation (arrows to sides of skirt 56 pointing vertically down), and keeping in mind the Board's interpretation of the "wholly mounted above feature" (see 3.2 above), all of the downstream separator, with its housing 40, is above the highest point of the upstream separator, with its air input "in". Therefore, D1 also discloses the "wholly mounted above" feature.

4.4 Finally, the Board agrees with the opposition division's finding (see impugned decision, point 13), that D1 renders the spatial angle feature between the first and second cyclone barrels (120 to 145 degrees) known.

4.4.1 In appeal, the appellant-proprietor has argued that measuring the angle between the axes of upstream and downstream cyclone barrels (α, as it is denoted in claim 1) on figure 15 does not constitute the disclosure of a cyclone separating device having this angle, because such technical teaching cannot be derived from a drawing alone. The Board takes a different view.

4.4.2 In accordance with established jurisprudence (see Case Law of the Boards of Appeal, 8th edition, 2016 (CLBA) I.C.4.6), where a disclosure is shown solely in a drawing, not only should the structure of the feature be shown sufficiently clearly in the drawing, but also the technical function achieved should be derivable, see for example T896/92, reasons point 2.2).

4.4.3 In the Board's view, the feature of the angle between upstream and downstream separator stages, as shown in figure 15, is presented as having a particular technical function.

Although it is true that the description assigns no value to the angle, it explains (see page 21, penultimate paragraph) that stages are angled relative to each other (in figure 15 amongst others) in order to reduce the separator's height (as opposed to mounting them vertically one on top of the other, cf. figure 1). Therefore, the author of D1 will have chosen the angle shown in figure 15 purposefully. By the same token, the

skilled person, thus made aware of the significance of this angle, will look to figure 15 to give them some indication of what the angle should be when carrying out the teaching of D1 (making a separator of reduced height).

4.4.4 When they do so, the skilled person will find a clear and realistic representation of the angle in question. This is because figure 15 does not show a schematic or diagrammatic view merely meant to provide an outline or general scheme of the device and its component parts. Rather, it is a realistic technical cross-sectional representation that shows the construction of the separator in terms of its constituent parts. Though it is naturally not a blueprint providing precise dimensions and geometry, it is meant to convey to the skilled person information of relevant spatial relationships so as to assist them in realising such a multistage separator. In the case of figure 15 the angle is of particular significance as it is an important, if not the central aspect of that embodiment. Therefore, the skilled person understands that they are being presented with a realistic indication of the angular relationship between the upstream and downstream separators.

4.4.5 It follows that the purposefully chosen and realistically represented angle between separator devices in the technical drawing of figure 15 and measured to be 118°, or thereabouts, is a realistic indication of an angle value that the skilled person would consider when realising the teaching of D1. This is where they would start when carrying out D1's teaching. In conclusion D1 constitutes a disclosure of a device having the same angle.

In this respect, the present case is very different from decisions T0204/83 (see headnote and reasons, 6) and T1488/10 (see reasons 3.2 and 3.5), cited by the appellant-proprietor. In those decisions certain dimensions (not angles) of a device, which had not been described, and which were only represented in schematic drawings, were considered not to be disclosed. Therefore these decisions have no bearing on the present discussion.

4.4.6 Finally, the Board notes that, in the opposition proceedings (see impugned decision, point 13), the parties disputed whether the relevant angle between the axes of the separators in D1, figure 15 was 120° or 118°. 120° falls on the claimed range of 120° to 165°. Even if the measured angle was 118°, the division found that this would not be sufficiently far removed from the claimed range to render it novel. In appeal the parties have neither challenged the measurement of the angle actually shown in figure 15, nor the opposition division's approach. Nor does the Board see any reason to do so.

4.4.7 Therefore, the Board confirms the opposition division's finding that the claimed angle (α) is disclosed by D1.

4.5 From all of the above, the Board concludes that the subject matter of claim 1 is not novel in the light of D1.

5. Auxiliary request, inventive step of claim 1 starting from D1 with D2

5.1 The Board first notes that the skilled person reads the claim, giving the terms their usual meanings, with their mind willing to understand in order to try to

arrive at a technically sensible interpretation that takes into account the whole disclosure of the patent, see CLBA, II.A.6.1, and the decisions cited therein.

5.1.1 The final feature of claim 1 contains the word *paratactic*. The usual meaning (see Oxford English Dictionary - OED - on line) of *paratactic* is relating to or involving parataxis, which in turn means "the placing of propositions or clauses one after another, without indicating by connecting words the relation (of coordination or subordination) between them, as in Tell me, how are you?". Using such a grammatical term to define a plurality of cyclone barrels can therefore be considered unusual to say the least.

5.1.2 Where the skilled person encounters such difficulties, they will look to the rest of the published patent specification to interpret the claim.

The only place in the description (paragraph [0011]) the term is used, sheds no light on its meaning. It is used just as it is in claim 1, without further explanation.

The appellant-proprietor has argued that the term means parallel connected, as did the opposition division (see impugned decision, reasons, point 10). The Board finds this plausible. Figures 6 and 7 show a number of second cyclone barrels 8', connected in parallel flow (see published specification, paragraphs [0027] to [0029]). This idea of working in parallel, where all barrels perform the same task independently of each other is also analogous to the meaning of paratactic in its grammatical sense, where clauses have neither coordination or subordination.

5.1.3 Therefore, the Board accepts that the skilled person may well interpret the term paratactic in its claim context to mean that the plurality of cyclone barrels of the downstream separator barrels are connected in parallel.

5.2 This last feature of claim 1, namely the downstream separating device comprising a plurality of paratactic, that is connected in parallel, cyclone barrels, is not disclosed in D1. In D1 (see figure 15), although there is a downstream separator device with a plurality of barrels 40 and 114, these are connected in series.

5.3 According to the patent, the invention solves, amongst other problems, that of making a cyclone separator of reduced height and improved separation (see published patent specification, paragraphs [0006], [0011] to [0013] and paragraph [0028] with figures 6 and 7).

D1 (see page 21, penultimate paragraph with figure 15) is clearly also concerned with reducing height. This is achieved as in the present patent by angling the downstream separator relative to the upstream separator. Compared to a series arrangement the differing feature of arranging the *plurality* of downstream cyclone barrels *in parallel* (paratactically) results in a cyclone separating device having a height that is further reduced, while at least maintaining separation efficiency.

Therefore, the Board considers that the objective technical problem can be reformulated as: how to modify the cyclone separator of D1 to further reduce its height while at least maintaining separation efficiency.

5.4 The skilled person would be aware of the document D2, which relates to cyclone separators. D2 (see page 1, second paragraph) recognises the general idea of providing such a separator with a downstream separator device and an upstream separator device that comprises a plurality of cyclone separators arranged in parallel.

It is self-evident that such a parallel arrangement will have an overall reduced height compared to a series arrangement (compare D2, figure 1 with D1, figure 15).

5.5 In the Board's view, tasked with the above objective technical problem, the skilled person will draw on the general idea recognised in D2 and adopt a parallel arrangement of downstream cyclone separator devices, as a matter of obviousness. Therefore, the combination of D1 and D2 takes away inventive step of claim 1.

5.6 The Board acknowledges that D2 goes further than only suggesting parallel flow. It teaches that height can be reduced by having the downstream cyclone separator devices mounted at least partly inside the upstream (see for example the abstract and claim 1). However, the Board does not consider that this would deter the skilled person from combining the teachings of D1 and D2 in the way already explained.

In this regard, the Board considers that the skilled person would view the general idea of arranging downstream separators in parallel, from where D2 departs, and D2's further idea of mounting the downstream cyclone separator device at least partly inside the upstream device as independent ideas (for reducing height). Therefore, tasked with the above objective technical problem, the obviousness of

adopting the one idea (parallel arrangement) can be considered independently of the further idea.

5.7 Therefore, the subject matter of claim 1 of the auxiliary request lacks inventive step.

6. In conclusion, the Board holds that the subject matter of claim 1 of the appellant-proprietor's main request (patent as granted) lacks novelty, Article 52(1) with 54 EPC and claim 1 of the appellant-proprietor's first auxiliary request lacks an inventive step, Article 52(1) with 56 EPC. Therefore, both requests fail and the Board can but dismiss the appeal.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Magouliotis A. de Vries

Decision electronically authenticated