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**Datasheet for the decision  
of 10 March 2017**

**Case Number:** T 0091/16 - 3.3.05

**Application Number:** 05778924.0

**Publication Number:** 1778384

**IPC:** B01D46/02, B01D46/52,  
F02M35/024

**Language of the proceedings:** EN

**Title of invention:**  
AIR FILTER ASSEMBLY

**Patent Proprietor:**  
DONALDSON COMPANY, INC.

**Opponent:**  
MANN + HUMMEL GmbH

**Headword:**  
Sealing arrangement with trough/DONALDSON

**Relevant legal provisions:**  
EPC Art. 54(1), 54(2), 56, 123(2), 123(3)

**Keyword:**  
Amendments - allowable (yes)  
Novelty - (yes)  
Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
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Case Number: T 0091/16 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 10 March 2017**

**Appellant:** DONALDSON COMPANY, INC.  
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**Decision under appeal:** **Interlocutory decision of the Opposition**  
**Division of the European Patent Office posted on**  
**6 November 2015 concerning maintenance of the**  
**European Patent No. 1778384 in amended form.**

**Composition of the Board:**

**Chairman** E. Bendl  
**Members:** A. Haderlein  
O. Loizou

## Summary of Facts and Submissions

- I. The present appeal of the proprietor (appellant) lies from the opposition division's interlocutory decision finding that European patent No. 1 778 384 in amended form and the invention to which it relates meet the requirements of the EPC.
- II. In its decision, the opposition division held that the ground for opposition set forth in Article 100(c) EPC prejudiced the maintenance of the patent as granted. Auxiliary requests 1 and 2 were found not to comply with Article 123(2) EPC, whereas the claims according to auxiliary request 3 underlying the impugned decision were *inter alia* found to comply with the requirements of novelty and inventive step. In particular, the subject-matter of claim 1 of that request was found to be novel in view of

D1: DE 41 41 823 A1.

This subject-matter was also found to involve an inventive step in view of *inter alia* the following documents:

D2: US 5 222 488 A

D4: US 5 820 646 A

D8: US 5 772 883 A

D11: EP 0 982 062 A2

D12: US 2002/0096247 A1.

- III. With its statement of grounds of appeal dated 16 March 2016 the appellant requested that the patent be maintained as granted and *inter alia* filed auxiliary request I.

IV. At the oral proceedings before the board, the appellant withdrew its then pending main request and declared its auxiliary request I to be its main request.

V. The wording of the sole independent claim of the main request (previously auxiliary request I) is as follows (amendments with respect to claim 1 of the patent as granted underlined or struck through):

"1. An air cleaner (800) comprising:

(a) a housing (800a) having an inlet section and an outlet section, and including a first housing part (801) and a second housing part (802); and

(b) a filter cartridge arrangement (300, 820), wherein the filter cartridge arrangement comprises:

(i) a media pack (301, 821)

(ii) a housing seal arrangement (310, 829) molded into the filter cartridge arrangement,

(iii) a molded side panel arrangement comprising at least first and second, opposite, molded panels (302, 303, 826, 827) molded directly to, and in sealing coverage over, a first set of two opposite sides of the media;

characterized by

(iv) the filter media pack (301, 821) comprising a stacked construction of individual strips (200, 202) of media each comprising a fluted sheet (66) secured to facing sheet (64) to define inlet and outlet flow channels extending between first and second, opposite, flow surfaces (210, 211, 305, 306); by

(v) said first set of two opposite sides of the media pack being defined by lead ends and tail ends (209a, 209b) of the strips of media; by

(vi) said housing including a seal flange (831) on the second housing part (802); the seal flange

including a projection (831a), sized to project into a trough (310b, 829b, 895), with interference to facilitate sealing and securing of the cartridge (300, 820) in place; and by (vii) the sealing arrangement (310, 829) being a seal member (829) pinched between the seal flange (831) on the second housing part (802) and a seal flange (832) on the first housing part (801) to form an axial pinch seal;

(viii) the sealing arrangement (310, 829) including (A) the trough (310b, 829b, 895) provided along the media pack (301, 821) and surrounding said pack; (B) a contoured surface (310a) with a recess on the trough (310b), facing in the same direction as one of the flow surfaces (210, 211; 305, 306) ~~(C) a seal member (829), pinched between the seal flange (831) on the second housing part (802) and a seal flange (832) on the first housing part (801) to form an axial pinch seal.~~"

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

*Amendments*

The subject-matter of claim 1 did not go beyond the content of the application documents as filed. In particular, the fact that the outlet and inlet sections were in opposite parts of the housing was not essential for the core of the invention, i.e. the axial pinch seal. The same applied to the other features that the respondent alleged to be inextricably linked with the features present in claim 1.

*Novelty*

D1 was not novelty-destroying, because it disclosed neither filter media nor a trough as called for in claim 1.

*Inventive step*

The subject-matter of claim 1 was not obvious in view of the cited prior art. The use of fluted sheet filters provided for a filtration capacity increase in any of the filters of D1, D2 and D11, cited as closest prior art.

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

*Amendments*

The application documents as filed did not provide a basis for a housing having two parts without specifying that the outlet was in one part and the inlet was in the other part. Claim 16 as filed required the filter cartridge to be positioned within the housing; this feature was not present in claim 1 of the main request. The exact shape of the sealing arrangement and in particular of the tapered region beneath the seal were essential for the functioning of the filter cartridge, as could be seen from the passage on page 19, lines 10 et seq. These features being absent from claim 1, Article 123(2) EPC was not complied with.

*Novelty*

D1 was novelty-destroying for the subject-matter of claim 1. While it did not explicitly disclose filter

media as called for in claim 1, such filter media were inherently disclosed because D1 was directed not only to liquid filtration but to gas filtration and thus taught to use a number of different filtration media. While D1 did not disclose a trough in the sealing arrangement prior to its fixation to form a pinch seal, such a trough was present in the filter after assembly, as could readily be seen from Figure 5 of D1.

*Inventive step*

D1, D2 or D11 could serve as the closest prior art. In particular, D1 was to be considered the closest prior art because the patent related not only to air filters but also to liquid filters, i.e. it was directed to the same purpose as the patent in suit. The subject-matter of claim 1 differed therefrom only in the filtration media used. Using fluted sheet filter media as disclosed in D4, D8 or D12 in a filter as disclosed D1, however, was obvious for the skilled person. Likewise, when starting from D11 the skilled person would readily replace the filtration media of D11 with fluted sheet media as disclosed for instance in D12. D12 disclosed first and second, opposite, panels 86 and 88 which were provided or "formed" onto the media. It was therefore obvious to arrive at the subject-matter of claim 1.

VIII. Requests

The appellant requested that the patent be maintained in amended form on the basis of the set of claims of the main request (previously on file as auxiliary request I).

The respondent requested that the appeal be dismissed.



## **Reasons for the Decision**

1. Amendments - Article 123(2) EPC
  - 1.1 The respondent is of the opinion that the originally filed documents disclose the concept of a housing having two parts only in combination with the outlet being in one part of the housing and the inlet being in the other part. As these features are not included in claim 1, the subject-matter of claim 1 goes beyond the content of the application documents as filed. For instance, claim 1 now comprises embodiments having the inlet and outlet sections in the same part of the housing.
    - 1.1.1 The board is not persuaded by this argument. Claim 16 as filed, which forms one of the bases of claim 1, discloses a housing having inlet and outlet sections in general. No mention is made of the inlet and outlet sections being in different parts. While the figures only show housings having the inlet and outlet sections in two different parts thereof, the position of the inlet and outlet is not presented as being inextricably linked with the concept of two housing parts. In this context the board particularly observes that the housing parts are designated in the description as "bottom, base or body" and "removable access cover" (see for instance page 22, lines 14 and 15; page 24, lines 7 to 9), i.e. it is clear to the skilled person that the primary goal of providing the air cleaner with two parts is to make it accessible for servicing (cf. page 1, line 31; page 7, lines 16 et seq.; page 25, line 29) and that the position of the inlet and the outlet therein is not relevant for such accessibility. The board notes that this service

accessibility is provided for in the air cleaner according to claim 1 by virtue of the pinch seal between the seal flanges of the two housing parts.

- 1.1.2 For the above reasons, the absence of the exact position of the inlet and outlet sections of the housing in claim 1 does not infringe Article 123(2) EPC.
- 1.2 The respondent is of the opinion that the sealing arrangement called for in claim 1 is disclosed in the originally filed documents only in combination with a specific shape thereof; in particular, the trough (310b, 829b, 895) is disclosed only in combination with the tapered region (310c).
  - 1.2.1 The board agrees with the respondent only insofar as the figures disclosing a trough also show a tapered region (numeral 310c in Figure 10). For the skilled person, however, it is clear that the tapered region does not serve the purpose of an axial seal. Its purpose may be, as argued by the respondent, to facilitate the assembly of the air cleaner. But its function is not discussed anywhere in the application documents as filed. While the passage on page 19, lines 10 et seq., lists several characteristics of the seal arrangement shown in Figure 10, including the contoured surface with the recess on the trough, this passage does not disclose a functional relationship between these characteristics and in particular does not disclose a functional relationship between the trough and the tapered region. The application documents as filed therefore do not disclose the trough and the tapered region as being inextricably linked.

1.2.2 Also, the exact shape of the sealing arrangement depicted in the figures of the application documents as filed is not presented as being crucial. In this context the board observes that, according to the passage on page 33, lines 7 et seq., the mold cavity that is used for manufacturing the sealing arrangement (cf. Figures 66 and 68, reference numeral 1023), i.e. that is responsible for determining the exact shape of the sealing arrangement, can have a variety of shapes.

1.2.3 Therefore, the absence in claim 1 of features defining the exact shape of the sealing arrangement (including the tapered region) depicted in the figures of the application as filed does not go beyond the content of the application as filed.

1.3 According to another of the respondent's arguments, claim 16 as filed requires the filter cartridge to be positioned within the housing, with the housing sealing arrangement being pinched to seal against undesired levels of unfiltered air flow between the inlet and outlet sections, and omitting this feature from claim 1 goes beyond the content of the application as filed.

The board does not see why this feature was omitted in claim 1. It is true that claim 1 does not explicitly say that the filter cartridge is positioned within the housing, but it does require the sealing arrangement, which forms an axial pinch seal between the two housing parts, to be molded onto the filter media. In this way claim 1 at least implicitly requires the filter cartridge to be positioned within the housing as required in originally filed claim 16.

1.4 The board thus concludes that the requirements of Article 123(2) EPC are met for the sole independent

claim 1.

The dependent claims are not objected to by the respondent under Article 123(2) EPC, and the board sees no reason to take a different stance.

The requirement of Article 123(3) EPC is met as well, because the sole independent claim 1 includes all the features of claim 1 as granted.

## 2. Novelty

2.1 D1 discloses a filter comprising filter media in zig-zag shape (column 4, lines 20 and 21, and Figure 5, numeral 42). No mention is made of fluted sheets. Whether or not D1 taught to use a number of filter media and it was therefore obvious to use fluted sheets in a filter according to D1, as argued by the respondent, is a matter of inventive step and cannot cast the novelty of the subject-matter of claim 1 into question.

2.2 Moreover, the board agrees with the appellant that D1 does not disclose a trough as called for in claim 1.

It is common ground that D1 does not disclose a trough in the sealing arrangement prior to assembly of the filter. Rather, a trough-like indentation is formed in the seal by the pressing action of protrusions in the two housing parts (10 and 11).

Claim 1 of the main request however requires that the seal member comprises a trough prior to assembly of the air cleaner. This claim construction is supported in particular by the wording "including a projection sized to project into a trough, with interference". This

means that a trough is present prior to assembly of the filter housing, which is deformed to a certain extent by the projection when in the mounted state.

2.3 It follows that the subject-matter of claim 1 is new (Article 54(1), (2) EPC).

3. Inventive step

3.1 The invention relates to an air cleaner.

3.2 As to the closest prior art, the respondent proposes any one of D1, D2 and D11.

D1 relates to liquid filters (see column 1, lines 2 and 3 and 48 to 54; claims 1 to 11). While the patent in suit mentions liquid filters when discussing the prior art (see paragraph [0003]), its purpose is clearly a gas or an air filter (see paragraph [0001]). In particular, claim 1 at issue is directed to an "air cleaner". Whether D1 is in the same technical field as the patent in suit is therefore immaterial, because even if it were, they are not directed to the same purpose, i.e. D1 is directed to liquid filtration and the patent to gas filtration. Moreover, D1 does not disclose a trough as required in claim 1, as set out in 2.2 *supra*.

D2, while being directed to gas filtration (column 1, lines 5 et seq.), does not disclose a trough in the sense of claim 1. The sealing lip 34 in D2 is compressed between the sealing rings 24 and 46, i.e. indentations in the sealing lip are formed only upon compression thereof. There is no disclosure of a trough as called for in claim 1 of the main request, because the latter requires that it is present also prior to

assembly of the air cleaner housing (cf. the discussion in 2.2 *supra*).

Turning now to D11, this document relates to an air cleaner (see paragraph [0001]) and also discloses a pinch seal using a trough and a projection (see Figures 2 to 10), as called for in claim 1. The subject-matter of claim 1 differs therefrom only in the specific type of filter medium (feature iv of claim 1), including the molded side panel arrangement (feature iii of claim 1).

For the above reasons, the board considers D11 to be the most promising starting point for assessing inventive step.

- 3.3 According to the appellant, as submitted at the oral proceedings, the problem to be solved was to increase the filtration capacity, since fluted filter provided for such an increased capacity, as was generally known by the skilled person.
- 3.4 As a solution to the above problem, the patent proposes an air cleaner according to claim 1 of the main request, characterised by a filter media pack comprising a stacked construction of individual strips of media each comprising a fluted sheet secured to a facing sheet to define inlet and outlet flow channels extending between first and second, opposite, flow surfaces; by the first set of two opposite sides of the media pack being defined by lead ends and tail ends of the strips of media; and by a molded side panel arrangement comprising first and second, opposite, molded panels molded directly to, and in sealing coverage over, a first set of two opposite sides of the media.

3.5 As to the success of the solution, the board notes that, as it is common general knowledge that fluted sheet filters provide for an increased filtration capacity, it is credible that by using such a filter the problem of increasing filtration capacity is indeed solved.

3.6 As to obviousness, the respondent is of the opinion that the solution is taught in any one of D4, D8 and D12, leading the skilled person to the subject-matter of claim 1 in an obvious manner.

The board observes that, while D4, D8 and D12 all disclose filter media packs made of fluted sheets and having two opposite sides (see D4 and D8: Figures 3 and 4; D12: Fig. 12), none of these documents discloses a molded side panel arrangement which is directly molded onto the filter media. D12 discloses only that the side panels 84 and 86 of housing 80 can be made of plastic or of a resin-like coating (see paragraph [0105]), neither of which is a disclosure of a side panel directly molded onto the filter media. So, even if the skilled person replaced the filter disclosed in D11 with the one of D12, he would not arrive at the claimed subject-matter. Moreover, a core feature of D11 is that the pleated filtering portion and the sealing arrangement are integrally formed from the same material (cf. paragraph [0024] and claim 1). The skilled person faced with the problem of increasing the filtration capacity of the air cleaner disclosed in D11 would however not have deviated from this core feature, i.e. by replacing the integrally formed filter media of D11 with different filter media such as those disclosed in D12.

It was therefore not obvious to arrive at the subject-

matter of claim 1 when starting from the closest prior art, i.e. D11.

3.7 For the sake of completeness, the board also observes that even a combination of D1 with D4, as mainly argued by the respondent at the oral proceedings before the board, would not lead to the subject-matter of claim 1, in particular because neither document discloses a trough as called for in claim 1 (cf. 2.2 *supra*).

3.8 The board thus concludes that the requirement of inventive step set forth in Article 56 EPC is met.



## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the following:

Description of the patent as granted.

Claims:

Nos. 1-18 of the main request (previously on file as auxiliary request I filed with the statement of grounds of appeal dated 16 March 2016).

Drawings:

Figures of the patent as granted.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated