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Datasheet for the decision of 6 June 2012

Case Number: T 0793/10 - 3.2.07

Application Number: 99927023.4

Publication Number: 1085945

IPC: B04B 5/08, F01N 3/02, F01M 13/04

Language of the proceedings: EN

Title of invention:
Method and plant for cleaning of gases from a combusion engine

Patentee:
Alfa Laval Corporate AB

Opponent:
MAHLE International GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Consideration of D7 as further prior art - yes, features going beyond method of claim 1 no obstacle (cf. point 4.4.3)"
"Inventive step - no (both requests)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0793/10 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 6 June 2012

Appellant: (Opponent)
MAHLE International GmbH
Pragstrasse 26-46
D-70376 Stuttgart (DE)

Representative:
BRP Renaud & Partner
Rechtsanwälte Notare Patentanwälte
Königstrasse 28
D-70173 Stuttgart (DE)

Respondent: (Patent Proprietor)
Alfa Laval Corporate AB
Hans Stahles Väg
SE-147 80 Tumba (SE)

Representative:
Lerwill, John
A.A. Thornton & Co.
235 High Holborn
London WC1V 7LE (GB)

Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 1 March 2010 rejecting the opposition filed against European patent No. 1085945 pursuant to Article 101(2) EPC.

Composition of the Board:

Chairman: H. Meinders
Members: H.-P. Felgenhauer
E. Kossonakou

Summary of Facts and Submissions

I. The opponent (appellant) has filed an appeal against the decision of the opposition division rejecting the opposition against European patent No. 1 085 945.

It requested that the decision under appeal be set aside and the patent be revoked.

The respondent (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained according to either the first or the fifth auxiliary request as filed with letter of 4 May 2012.

Both parties auxiliarily requested oral proceedings.

II. Claim 1 according to the first auxiliary request defines

"A method for cleaning gases, which have been produced by a combustion engine (1), from solid and/or liquid particles suspended therein, the gases being conducted through a separation chamber wherein the gases are caused to rotate by a rotating member (R) so that particles are separated from the gases by means of centrifugal force, the combustion engine (1) being utilised for generating a pressure fluid other than that constituted by exhaust gases pressured in the combustion chamber of the combustion engine, the pressure fluid being used for driving the rotating member (R),

characterised in that

the rotating member has a generally hollow configuration with the separation chamber formed and surrounded by the rotating member (R) and with a stack of frustoconical discs (70) mounted in the rotating member to extend through the separation chamber from radially inner to radially outer extremities, the gases are caused to flow outwardly through the interspaces between the discs (70) in the direction from the inner edges of the discs to the outer edges of the discs".

Claim 1 according to the fifth auxiliary request defines

"A method for cleaning gases, which have been produced by a combustion engine (1), from solid and/or liquid particles suspended therein, the gases being conducted through a separation chamber wherein the gases are caused to rotate by a rotating member (R) so that particles are separated from the gases by means of centrifugal force, the combustion engine (1) being utilised for generating a pressure fluid other than that constituted by exhaust gases pressured in the combustion chamber of the combustion engine, the pressure fluid being used for driving the rotating member (R),

characterised in that

the rotating member has a generally hollow configuration with the separation chamber formed and surrounded by the rotating member (R) and with a stack of frustoconical discs (70) mounted in the rotating

member to extend through the separation chamber from radially inner to radially outer extremities, the gases are caused to flow outwardly through the interspaces between the discs (70) in the direction from the inner edges of the discs to the outer edges of the discs, and the pressure fluid rotates a turbine wheel connected, or coupled through a gear device, to the rotating member (R)".

III. The following documents, considered in the decision under appeal, are referred to:

D1 WO-A-99/56883 application as originally filed

D3 DE-A-43 11 906

D7 US-A-2 578 485.

IV. Impugned decision

According to the impugned decision claim 1 as granted fulfils the requirement of Article 123(2) EPC and involves an inventive step i.a. with respect to D3 and D7.

V. The arguments of the appellant can be summarized as follows:

(a) Claim 1 of the first auxiliary request does not involve an inventive step considering D3 as closest prior art and the method disclosed therein, in connection with the first embodiment as described in the context of figure 1 of D7 as further prior art.

(b) The drive means defined by the additional feature of claim 1 according to the fifth auxiliary request needs to be considered as being the result of an arbitrary selection among possible well-known drive means. It thus cannot be considered as leading to subject-matter involving inventive step.

VI. The arguments of the respondent can be summarized as follows:

(a) Claim 1 of the first auxiliary request involves inventive step considering D3 as closest prior art.

(b) The method disclosed in connection with the first embodiment as described in the context of figure 1 of D7 can only be considered as further prior art with hindsight being involved. The reason is that the methods of claim 1 and D3 differ substantially from the one of D7 concerning the gases to be cleaned, which correspondingly results in substantial differences with respect to the cleaning steps to be performed. Correspondingly the structures of the respective rotating members differ greatly.

(c) Due to these substantial differences D7, even if the embodiment disclosed in the context of figure 1 is taken into account, does not give any indication to modify the method according to D3 such that the method of claim 1 is rendered obvious.

(d) The drive means defined by the additional feature of claim 1 according to the fifth auxiliary request leads to certain advantages which, although not mentioned in the patent in suit, are evident for the skilled person, so lead his choice in this direction. Since the prior art does not give any indication of a provision of a turbine wheel as a drive means for the rotating member, such an approach cannot be considered as being the result of an arbitrary selection which does not involve inventive step.

VII. Oral proceedings before the Board were held 6 June 2012.

Reasons for the Decision

1. *Subject-matter of claim 1 of the first auxiliary request*

1.1 Claim 1 is directed to a method of cleaning gases, which have been produced by a combustion engine, from solid and/or liquid particles suspended therein. The gases are conducted through a separation chamber wherein they are caused to rotate by a rotating member so that particles are separated from the gases by means of centrifugal force.

1.2 It is common ground that the method defined by claim 1 encompasses two technical aspects distinguished from each other.

Accordingly the first aspect, based on the features of the entering clause of claim 1, relates essentially to

the manner in which the rotating member is driven, which rotating member causes the gases conducted through a separation chamber to rotate so that particles are removed therefrom by means of centrifugal force. The second aspect, based on the features of the charactering portion, concerns the structure of the separation chamber, the rotating member having a stack of frustoconical discs mounted therein and the manner in which the gases are caused to flow.

Concerning the first aspect, namely the manner in which the rotating member is driven, it is defined that the combustion engine is utilised for generating a pressure fluid other than that constituted by exhaust gases pressured in the combustion chamber of the combustion engine and that the pressure fluid is used for driving the rotating member.

Concerning the second aspect the gases to be cleaned are conducted through a separation chamber wherein they are caused to rotate by a rotating member so that particles are separated from the gases by means of centrifugal force.

The rotating member has a generally hollow configuration with the separation chamber formed and surrounded by the rotating member and with a stack of frustoconical discs mounted in the rotating member to extend through the separation chamber from radially inner to radially outer extremities.

The gases are caused to flow outwardly through the interspaces between the discs in the direction from the

inner edges of the discs to the outer edges of the discs.

2. *Closest prior art*

It is undisputed that D3 (cf. e.g. column 3, lines 33 - 57 and the only figure) discloses a method according to the entering clause of claim 1, as acknowledged in the patent in suit (cf. paragraphs [0002], [0003]).

The Board does not see any reason to not consider D3 as closest prior art.

2.1 *Disclosure of D3*

2.1.1 D3 discloses a method for cleaning gases, which have been produced by a combustion engine, from solid and/or liquid particles suspended therein (column 1, lines 3 - 5), corresponding with the features of the entering clause of claim 1

2.1.2 The gases are conducted through a separation chamber wherein they are caused to rotate by a rotating member so that particles are separated from the gases by means of centrifugal force.

According to D3 the separation chamber is formed as a ring-shaped space 56 between the outer wall of the rotating member (rotor) 20 and the inner wall of stationary housing 14 (cf. column 3, lines 47 - 64; figure). The gases, which are drawn off via an outlet 52 into the ring-shaped space, are distributed in the separation chamber in a turbulent manner (column 3, lines 47 - 54).

2.1.3 The combustion engine is utilised for generating a pressure fluid other than that constituted by exhaust gases pressured in the combustion chamber of the combustion engine and this pressure fluid is used for driving the rotating member.

Lubricating oil is used as generated pressure fluid (cf. column 3, lines 33 - 40).

This corresponds to the approach according to claim 8 of the patent in suit. Further corresponding to the approach according to claim 10 of the patent in suit the pressurized lubricating oil is caused to leave the rotor 20 (or, in the terminology of claim 10 a housing of the rotor) through an outlet 34, which is so directed and placed in relation to the rotational axis around which the housing is rotatable, that the pressurized oil flowing out through the outlet keeps the rotating member in rotation (cf. column 3, lines 33 - 40; figure: Freistrahlzentrifuge 12).

3. *Features distinguishing the method of claim 1 over the one according to D3, effect of the distinguishing features and technical problem resulting therefrom*

3.1 Based on the disclosure of D3 as indicated above the Board concurs with the respondent that the method of claim 1 differs from the one disclosed by D3 by the characterising features of claim 1.

According to the characterising features the rotating member has a generally hollow configuration with a stack of frustoconical discs mounted in it. The

separation chamber is formed and surrounded by the rotating member and the gases to be cleaned are caused to flow through interspaces between the discs of this stack, which extend through the separation chamber.

Provision of a stack of frustoconical discs thus leads to the effect that depending on the number of frustoconical discs contained in the stack the length of the flow path for the gases is increased and the area onto which particles centrifugally separated from the gases can settle, namely the undersides of the frustoconical discs (cf. paragraph [0049]), is enlarged.

3.2 According to the appellant D3 further discloses a frustoconical disc mounted in the rotating member, the disc being formed by the outer wall of the rotating member, to extend through the separation chamber from radially inner to radially outer extremities (cf. the figure of D3), this disclosure corresponding to a portion of the discussed claim's characterising features. The respondent counters this, arguing that the gases flow as a turbulent flow in the separation chamber (cf. D3, column 3, lines 47 - 54) and thus in a manner differing from the flow caused by the stack of frustoconical discs as defined by the characterising portion of claim 1. When examining inventive step none of the above assertions is of relevance, however, as can be derived from the following.

3.3 It is common ground that the effects of the distinguishing features cited above (point 3.1) allow the separation efficiency to be improved (cf. patent in suit, paragraphs [0003] and [0004]).

The problem solved by the method of claim 1, as compared to the one according to D3, thus can undisputedly be formulated as improving the separation efficiency of the method for cleaning gases which have been produced by a combustion engine as known from D3.

4. *Document D7*

4.1 *Disclosure of D7*

4.1.1 D7 discloses a first embodiment of a centrifugal separator described in connection with figure 1 and a second embodiment of a centrifugal separator described in connection with figure 3. Irrespective of the particular structure of the centrifugal separator (first or second embodiment) separation of solid, liquid or gaseous matter or mixtures thereof into two or more components is referred to (column 1, lines 1 - 12). The description concerning the first embodiment furthermore contains a reference to the purification of gases (column 2, lines 35 - 49).

4.1.2 For reasons which become apparent from the discussion on whether D7 would have been considered in combination with the method of D3 (cf. point 4.4.2 below) in the following only the first embodiment will be considered.

The separator disclosed in connection with this embodiment has a rotating member 52, 53 arranged vertically, with a generally hollow configuration with the separation chamber formed and surrounded by the rotating member. Two stacks of frustoconical discs 55, namely a lower and an upper stack separated by a partition 56, are mounted in the rotating member to

extend through the separation chamber from radially inner to radially outer extremities (column 3, lines 51 - 68; figure 1).

Concerning the method of cleaning gases utilizing the centrifugal separator according to the first embodiment (in the following: first method) the gases are caused in the lower stack to flow outwardly through the interspaces between the discs 55 in the direction from the inner edges of the discs to the outer edges of the discs as indicated by arrows in figure 1; in the upper stack the gases are caused to flow outwardly through the interspaces between the discs 55 in the direction from the outer edges of the discs to their inner edges.

4.1.3 The portion of the description concerning the first embodiment furthermore contains the statement "The interior of the separator body is provided with members in the form of discs 55, or eventually with one or several partitions 56, the discs or partitions dividing the interior of the drum into a series of chambers that communicate with each other through apertures 55a and 56a, thus increasing considerably the area over which the matter to be separated travels through the body" (column 3, lines 60 - 68).

4.2 *Consistency of the disclosure of D7 in relationship to the method as defined by claim 1*

4.2.1 From the above it can be derived that the first embodiment of D7 concerns a separator with a structure as defined by the characterising portion of claim 1 of the patent in suit.

In this respect it remained undisputed that the rotating member according to the first embodiment comprises - as its lower stack - a stack of frustoconical discs as defined in the characterising portion of claim 1. The gases are caused to flow radially outwardly through the interspaces between the discs of this stack.

4.2.2 According to the respondent the method of claim 1 differs from the first method in that according to claim 1 the gases to be cleaned are those which have been produced by a combustion engine and furthermore in that the rotor has the effect that it acts like a fan (cf. patent in suit, paragraph [0050]) whereas according to the first method the gases leaving the separation chamber need to be drawn out by external means.

4.2.3 It is common ground that the method of claim 1 concerns cleaning of combustion gases produced by a combustion engine whereas such gases are not explicitly referred to in D7 (cf. point 4.1.1 above).

According to the appellant the conditions mentioned in the patent in suit for the rotating member acting as a fan, namely the provision of pipes 74 and openings 75 through which gas to be cleaned is introduced and cleaned gas leaves the centrifugal separator (cf. paragraph [0050]), are not explicitly defined in claim 1.

4.2.4 As a consequence the further effect relied upon by the respondent, according to which the rotating member acts as a fan, cannot be considered as distinguishing the

method of claim 1 over the first method since the respondent, questioned in this respect during the oral proceedings, was unable to indicate a feature of claim 1 by which this effect is caused.

4.3 *Difference of the disclosure of D7 with respect to the methods of claim 1*

4.3.1 According to the respondent the rotating member according to the first method differs from the one defined by the characterising portion of claim 1 in that it comprises two stacks, a lower and an upper one, separated by a partition (column 3, lines 51 - 68; figure 1), as compared to the single stack defined by claim 1.

Moreover the flow in the upper stack in the first method is different from the one defined for the stack of claim 1.

4.3.2 The appellant expressed the opinion that the rotating member of the first method does not go beyond the one of claim 1 since this claim is not limited to one stack of frustoconical discs being mounted in the rotating member, nor to only radially outward flow.

4.3.3 The Board assumes in the following to the advantage of the respondent that according to claim 1 only one stack of frustoconical discs - however with an undefined number of discs - is mounted in the rotating member, taking into account that the flow of gases in the upper stack according to the first embodiment is different from the flow defined for the stack in claim 1.

4.4 *Consideration of the first embodiment of D7 as further prior art*

4.4.1 Referring to the different type of matter to be cleaned according to the method of claim 1 as well as the method according to D3 (cf. points 1.1 and 2.1.1 above) and the difference between the first method and the method defined by claim 1 (cf. point 4.3.3 above) it has been disputed by the respondent that the skilled person would at all have looked at, let alone considered, the first method of D7 in an attempt to solve, starting from the method of D3, the problem underlying the method of claim 1 (cf. point 3.3).

4.4.2 Its arguments in this respect are the following.

Due to substantial differences concerning the material to be cleaned, namely gases which have been produced by a combustion engine according to the method of D3 and the matter to be cleaned on an industrial scale according to D7 the skilled person would have had no reason to consider D7. The assumption that the skilled person is to be considered as expecting an indication from D7 concerning a solution for the problem to be solved is, due to the entirely different fields of utilisation of the method of claim 1 and the first method, tainted with hindsight.

In this context it also needs to be considered that volume of gases to be cleaned and the amount of particles to be separated are entirely different for the method of claim 1 and the methods disclosed in D7 in connection with its two embodiments. As indicated in the letter of 4 May 2012 and argued at the oral

proceedings the skilled person would readily recognise that in the method of claim 1 the rotor will typically separate 10 grams of oil/hour from contaminated crankcase gases (page 2, last paragraph) whereas the separators according to D7 will be used as heavy duty (large-sized) industrial separators continuously separating solids and/or heavy liquids from gases having a solids content higher than 10% (cf. page 3, first paragraph).

Furthermore it needs to be considered that D7 discloses two embodiments. Consideration of the first embodiment, for the reason that it may come closer to the method of claim 1 of the patent in suit than the second embodiment, can only be seen as the result of an inadmissible selection based on the knowledge of the claimed method, and thus on hindsight.

Even if the first embodiment would have been looked at by the skilled person it would have been immediately disregarded considering that as compared to the method of claim 1 it concerns the cleaning of fluids of a totally different nature and, resulting therefrom, is of different scale. Thus the first embodiment, like D7 in general, primarily concerns the cleaning of solid and liquid material on a large, industrial scale (column 1, lines 1 - 3; lines 35 - 50). Gaseous material referred to in D7 in this connection without further reference to a particular type of such material needs to be seen as being one to be cleaned on the same scale as the liquid material for which purification of waste water or sugar juice, etc., treatment of tank water of ships, the extraction or fraction of oils or

the treatment of combustible liquids are mentioned (column 2, lines 35 - 50).

Based on this understanding of the intended use of the first method of D7 it is evident for the skilled person that provision of two stacks of frustoconical discs and of narrow spaces filled with liquid or gas (cf. column 3, lines 51 - 68; figure 1) cannot be dispensed with.

According to the respondent it is thus apparent that the separator according to the first method is well suited to clean the solid, liquid or gaseous matters referred to in D7. For that reason the separator has a complicated structure owing to the fact that as a result of the cleaning process heavy substances have to be discharged (column 4, lines 8 - 12). Thus two stacks of frustoconical discs are needed which are separated by a partition (column 3, lines 51 - 68; figure 1). Furthermore, due to the amount and type of the material to be separated and discharged, narrow spaces for the fluid are provided such that separated matter can be counterbalanced (column 4, lines 34 - 48; column 5, lines 3 - 31; figure 1: narrow spaces 67, 68).

4.4.3 The Board considers, however, the argumentation of the appellant to be more convincing according to which the skilled person is not prevented from considering the first method of D7 as further prior art in his attempt to solve the problem underlying the method of claim 1 starting from the method of D3 as closest prior art.

Even if substantial differences concerning the material to be cleaned exist between the method of D3 and the

first method, and despite the fact that in claim 1 no particular type of combustion engine (i.e. no indication of the volume of gases to be cleaned) and no particular type of gas, like only crankcase gases, (i.e. no indication as to the amount of particles to be separated therefrom) is mentioned as well as despite the fact that in D7 purification of gases is in any case referred to, it is immediately apparent to the skilled person that with the first method of D7 gases can be cleaned irrespective of their volume and their nature, taking into account that, as indicated by the appellant, the first method has to be performed in a manner anyway satisfying the requirements imposed by the particular gases to be cleaned.

In this context the Board considers it evident that in reducing the first method of D7 to practice likewise the volume of gases to be cleaned and the amount of particles to be separated will have to be taken into account within the framework of the disclosure for this method.

It is true that D7 discloses two embodiments and that the selection of the first embodiment is the result of a choice using knowledge which does not have its origin in D7. Contrary to the understanding of the respondent this knowledge, however, does not come from the patent in suit, in which case the conclusion drawn by the respondent would be correct that the selection of the first embodiment as further prior art is based on hindsight. Instead, the selection of the first embodiment results from the knowledge of the method of D3, since it is this method which is to be rendered more efficient (cf. point 3.3 above). Based on the

method of D3 it is evident that the first method of D7 is considered and chosen, which is the one best suited for an improvement of the efficiency of the method of D3.

Since this choice is not dependent on knowledge of the method of claim 1 it cannot be considered as being based on hindsight.

Thus in the examination of inventive step next to the method of D3 as closest prior art the first method of D7 can be taken into account.

5. *Obviousness*

5.1 According to a first line of argument of the appellant it is obvious that, starting from the method of D3 to clean gases produced by a combustion engine, a solution for the problem to be solved, namely to improve the separation efficiency (cf. point 3.3 above), can be found by either replacing the rotating member of D3 by the one according to the first embodiment of D7 or by putting the rotor of the latter on top of the rotor of D3.

5.2 Taking either approach it is evident that the structure of the rotating member known for the first method of D7 has to be modified such that it appropriately serves the requirements imposed by the gases to be cleaned according to D3.

According to the appellant, even if it is considered that the volume of gases to be cleaned as well as the amount of particles to be separated are less for the

method of D3 than for the first method of D7, it is apparent that the second stack of frustoconical discs as well as the narrow spaces filled with fluid to counterbalance particles separated and collected may be omitted.

According to the respondent even if the first method of D7 is taken into account as further prior art substantial modification, for which no indication is given, would be required to make it compatible with the method of D3. The method of claim 1 thus cannot be considered as resulting in an obvious manner from the combined consideration of the method of D3 and the first method of D7.

5.3 The Board is not convinced by this argumentation of the respondent and finds the argumentation of the appellant to be more convincing.

5.3.1 As indicated above (cf. point 4.4.3) and also during the oral proceedings, the Board is of the opinion that starting from the method of cleaning of gases known from D3 there is no obstacle against consideration of the first method of D7 as further prior art.

The Board is further convinced that, in case the first method of D7 is taken into account as further prior art, it is evident that the method of separation disclosed in D3 (cf. point 2.1.2) can advantageously be replaced by a method based on the first method of D7.

5.3.2 It can be left open whether such an understanding can be arrived at solely considering the structure of the separator underlying the first method and general

technical knowledge, which has been objected to by the respondent for the reason that no evidence for this technical knowledge has been provided.

The reason is that in connection with the first method D7 gives a clear incentive for using a number of frustoconical discs. As stated under point 4.1.3 above the portion of the description concerning the first embodiment contains the statement "The interior of the separator body is provided with members in the form of discs 55, **or eventually** with one or several partitions 56, the discs or partitions dividing the interior of the drum into a series of chambers that communicate with each other through apertures 55a and 56a, thus increasing considerably the area over which the matter to be separated travels through the body" (column 3, lines 60 - 68).

The Board considers the opinion of the appellant to be correct that this statement gives a clear indication that it is important to have, depending on the circumstances (namely the gases to be cleaned), an appropriate number of appropriately sized frustoconical discs, such that an area of sufficient size is provided allowing the deposition of the separated particles. Since clearly the size of this area provided by the discs is relevant and not their arrangement in one or more stacks it is evident that in case less material is to be separated, as it is the case for the method of D3, only one stack of discs of appropriate number and diameter will suffice. In that case it is also immediately apparent that narrow spaces filled with fluid to counterbalance the effect of separated particles can be omitted as well.

5.3.3 Summarising, given the gases to be cleaned according to the method of D3 it is immediately apparent that considering the first method of D7 to improve the separation efficiency, the corresponding separator will not only be brought to scale based on the separator used according to D3 but it will also be modified in that its structure is simplified by arranging the discs in one stack only and at the same time omitting the narrow spaces. It is apparent that such a modification stays in line with the disclosure given concerning the first method and is even encouraged by the statements in D7 referred to above.

For the Board it is apparent that it is still within the framework of customary practice to adapt the **separator** disclosed in connection with the first method of D7 such that it can replace the **separator** used in the method according to D3.

In this case the approach according to D3 will naturally be maintained, according to which gases which have been produced by a combustion engine are cleaned and the rotating member is driven by a pressure fluid generated by the combustion engine.

5.3.4 The method of claim 1 thus does not involve an inventive step (Article 56 EPC) starting from the method of D3 and considering the first method of D7 as further prior art.

5.3.5 It can thus be left open whether combined consideration of the method of D3 and the first method of D7 can also be considered to lead in an obvious manner to the

method of claim 1 if, as alleged by the appellant, the rotating member used for the method of D3 is not replaced but modified by adding the rotating member used according to the first method of D7 on top of it, as indicated in point 5.1 above.

5.3.6 The above result with respect to lack of inventive step holds also considering the following arguments of the respondent.

The respondent appears to be of the opinion that taking the first method of D7 into consideration necessarily means that all structural elements of the rotating member in question are taken up. As indicated above such an assumption does not take account of customary design practice of the skilled person which has to be considered nor of the statement in D7 as referred to above (point 5.3.2) which gives a clear indication that frustoconical discs mounted on the rotating member can be modified with respect to size, number and arrangement (one or two stacks) as long as they provide an appropriate area for the deposition of separated particles.

The argument of the respondent that in the assessment of inventive step it needs to be taken into account that in the method according to claim 1 the rotating member acts in a fan-like manner cannot be considered due to the fact that claim 1 does not comprise a feature causing this alleged effect (cf. point 4.2.4 above).

6. *Claim 1 according to the fifth auxiliary request*

6.1 This claim 1 comprises, in addition to claim 1 of the first auxiliary request as referred to above, the features that the pressure fluid rotates a turbine wheel connected, or coupled through a gear device, to the rotating member.

6.2 According to the respondent use of a turbine wheel leads to various advantages over the drive according to D3 (cf. point 2.1.3 above) with respect to efficiency and in particular to space requirements due to the compact structure of a turbine wheel. Although these advantageous effects are admittedly not mentioned in the patent in suit they are immediately apparent for the skilled person.

6.3 According to the appellant the skilled person is not only aware of possible advantages resulting form the use of turbine wheels to drive the rotating member as compared to other drive means such as the drive according to D3, but it also has, due to its general technical knowledge relating not only to advantages of such drive means but also to their use in general, a drive means comprising a turbine wheel at its disposition. The skilled person has also the capability to select, without inventive step being involved, the drive means appropriate under the requirements of particular circumstances, depending e.g. on the type of combustion engine for which combustion gases are to be cleaned, the volume of gases to be cleaned and the space requirements to be fulfilled.

Reference to a turbine wheel in claim 1 thus needs to be seen as the result of an arbitrary selection among possible drive means, which cannot lead to inventive step being recognised.

6.4 The Board is of the opinion that starting from D3 to drive the rotating member in the method of cleaning gases, it needs to be taken into account that turbine wheels are well known as drive means, irrespective of whether or not the provision of a turbine wheel replacing the drive means according to D3 can be considered as having certain advantages, as this depends on the circumstances of the particular case. This knowledge comes from the same source, namely the general knowledge of the technical field concerned at present, as referred to by the respondent, and the knowledge or awareness of the advantages resulting from the use of turbine wheels.

6.5 Consequently it needs to be taken into account that depending on the specific circumstances to be considered in a particular case turbine wheels are among the known possible drive means for the rotating member from which a choice can be made to select the most appropriate one considering its use under the specific circumstances.

Since the feature according to which the pressure fluid rotates a turbine wheel thus does not contribute to subject-matter involving inventive step as indicated above and since the alternative feature according to which this turbine wheel can be coupled through a gear device has, upon questioning by the Board, not been relied upon for support of inventive step claim 1

according to the fifth auxiliary request does not involve an inventive step (Article 56 EPC).

For completeness sake it shall be indicated that the respondent, upon questioning by the Board, could not refer to a structural feature in claim 1 (or the disclosure of the patent in suit) suitable to specify a particular turbine wheel. Consequently the examination of inventive step had to be based on the general understanding concerning a possible use of a turbine wheel as generally known which leads to the result given above.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

A. Counillon H. Meinders