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**Datasheet for the decision
of 17 August 2023**

Case Number: T 2069/21 - 3.3.05

Application Number: 15166210.3

Publication Number: 2921214

IPC: B01D21/26, B01D53/14, C02F1/38,
F01N3/04

Language of the proceedings: EN

Title of invention:
EXHAUST GAS AND GAS SCRUBBER FLUID CLEANING EQUIPMENT AND
METHOD

Patent Proprietor:
Alfa Laval Corporate AB

Opponent:
GEA Mechanical Equipment GmbH

Headword:
Scrubber fluid cleaning equipment/ALFA LAVAL

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - main request (no) - auxiliary request (no) -
obvious combination of known features

Decisions cited:

Catchword:



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Case Number: T 2069/21 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 17 August 2023

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 30 September
2021 revoking European patent No. 2921214
pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman E. Bendl
Members: T. Burkhardt
O. Loizou

Summary of Facts and Submissions

- I. The appeal of the patent proprietor (appellant) is against the opposition division's decision to revoke European patent No. 2 921 214 B.
- II. The following documents were among those discussed at the opposition stage:
- | | |
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| D1 | JP 3868352 B2 |
| D1' | English translation of D1 |
| D2 | US 4,286,971 A |
| D6 | "Separatoren und Dekanter für die Aufbereitung von Betriebsmitteln", GEA Westfalia Separator Mineraloil Systems GmbH, 1999, 2-19 |
| D17 | W H Stahl, "Fest-Flüssig-Trennung, Band II, Industrie-Zentrifugen", DrM Press, 2004, 726-728 |
| D18 | "Wet separators, Waste gas cleaning by absorption (Scrubbers)", VDI-Richtlinien, VDI 3679, Part 2, 1999 |
- III. The opposition division held, *inter alia*, that none of the requests then pending and now on file met the requirements of Article 56 EPC.
- IV. Independent claim 1 of the main request in the appeal proceedings reads as follows:
- "1. An exhaust gas cleaning equipment for a diesel engine, comprising

a gas scrubber (1) for cleaning exhaust gas whereby the gas scrubber produces polluted scrubber fluid comprising pollutant particles and oil, a scrubber fluid cleaning equipment connected to the gas scrubber for cleaning said polluted scrubber fluid, said scrubber fluid cleaning equipment comprising a centrifugal separator (9), which centrifugal separator comprises a separation space (12), and a separator inlet (8) for polluted scrubber fluid extending into said separation space, which scrubber fluid cleaning equipment further comprises means for conducting polluted scrubber fluid from the exhaust gas scrubber to the separator inlet, characterised in that the centrifugal separator is arranged for separating a pollutant phase comprising pollutant particles and oil, and a cleaned scrubber fluid from said polluted scrubber fluid, the pollutant phase having a higher density than the cleaned scrubber fluid, wherein the centrifugal separator further comprises a rotor (11) enclosing the separation space (12) with a stack of separating discs (13), a first separator outlet (14) for cleaned scrubber fluid extending from said separation space, and a second separator outlet (15) for said pollutant phase extending from said separation space, and wherein the scrubber fluid cleaning equipment further comprises means for conducting cleaned scrubber fluid from the first separator outlet to the exhaust gas scrubber."

- V. Claim 1 of the first auxiliary request further specifies that the oil is "adhered to the particles".
- VI. As compared with the main request, claim 1 of the second auxiliary request further specifies that "said gas scrubber compris[es] an inlet for exhaust gas, a

humidifying device for providing a scrubber fluid to the exhaust gas and a droplet separator for removing polluted scrubber fluid from the exhaust gas".

- VII. As compared with the main request, the expression "comprising a gas scrubber (1) for cleaning exhaust gas" in claim 1 of the third auxiliary request is followed by " wherein a scrubber fluid is water, and".
- VIII. As compared with the main request, the feature ", wherein the exhaust gas cleaning equipment further comprises a buffer tank (6), and wherein the means for conducting cleaned scrubber fluid from the first separator outlet to the exhaust gas scrubber are arranged for conducting cleaned scrubber fluid from the first separator outlet (14) to the exhaust gas scrubber (1) via the buffer tank" has been added at the end of claim 1 of the fourth auxiliary request.
- IX. The fifth auxiliary request combines the amendments of the second and fourth auxiliary requests.
- X. The sixth auxiliary request combines the amendments of the second, third and fourth auxiliary requests.
- XI. The seventh auxiliary request combines the amendments of the first and second auxiliary requests.
- XII. The eighth auxiliary request combines the amendments of the first and third auxiliary requests.
- XIII. The ninth auxiliary request combines the amendments of the first and fourth auxiliary requests.
- XIV. The tenth auxiliary request combines the amendments of the first, second and fourth auxiliary requests.

- XV. The eleventh auxiliary request combines the amendments of the first, second, third and fourth auxiliary requests.
- XVI. The appellant's arguments at the appeal stage, where relevant to the present decision, can be summarised as follows:
- D1 was the closest prior art to the subject-matter of claim 1 of the main request.
 - The opposition division determined an incorrect technical problem to be solved.
 - The distinguishing features had the following effects:
 - A centrifugal separator with a stack of separating discs was compact and had a high separation capacity.
 - A second separator outlet allowed for continuous operation.
 - When starting from D1, the skilled person may have contemplated D18. At most, they may also have considered the embodiment on page 13 of D6. None of these combinations resulted in the subject-matter of claim 1, however.
 - The amendments in the auxiliary requests aimed at overcoming objections under Article 83, Article 87 and Article 100(c) EPC as well as objections in view of document D2.
- XVII. The arguments of the opponent (respondent) at the appeal stage are reflected in the reasons below.
- XVIII. By letter dated 19 June 2023, the appellant withdrew its request for oral proceedings.

XIX. The appellant requested that the decision under appeal be set aside and a patent be maintained in amended form on the basis of a main request, submitted with the reply to the grounds for opposition. Alternatively, they requested that a patent be maintained in amended form on the basis of one of the first to eleventh auxiliary requests, submitted on 27 August 2020. All requests were re-submitted with the grounds of appeal.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

Main request

1. Inventive step

The main request does not fulfil the requirements of Article 56 EPC for the reasons set out below.

1.1 The invention relates to exhaust gas cleaning equipment for a diesel engine.

1.2 It has not been contested that **D1** (see, in particular, Figure 2) discloses exhaust gas cleaning equipment for a diesel engine (see paragraph [0002]) comprising

- a gas scrubber 13 using seawater and producing polluted scrubber fluid 15-1/15-2, which comprises pollutant particles and oil (see paragraphs [0004] and [0012])
- scrubber fluid cleaning equipment 7 comprising a centrifugal separator 22 with an inlet 15-3 and a

first separator outlet 15-7 for cleaned scrubber fluid

- means for conducting cleaned scrubber fluid from the first separator outlet to the exhaust gas scrubber (15-7, 15-14, 15-6, 15-15, 18-3)

Particles are removed from separator 22 "whenever a fixed amount accumulates" (see paragraph [0048]). This pollutant phase has a higher density than seawater.

It has not been disputed that D1 can be considered the closest prior art. Since D1 has the same purpose as the patent in suit and numerous features in common with claim 1, it is indeed an appropriate starting point for assessing inventive step.

1.3 According to the patent in suit, the problem to be solved is to provide exhaust gas cleaning equipment with improved environmental aspects, improved efficiency in exhaust gas treatment procedures, a minimised need for service and a more reliable operation (see, for example, paragraphs [0008] and [0009]).

1.4 Claim 1 proposes solving this problem by means of the exhaust gas cleaning equipment of claim 1, characterised at most in:

- the details of the centrifugal separator, i.e. the rotor with a stack of separating discs
- a second separator outlet for the pollutant phase comprising pollutant particles and oil

The opposition division identified the same distinguishing features (see point II.9.2 of the decision under appeal).

The respondent disputes that the stack of separating discs and the second separator outlet are distinguishing features, but it will be demonstrated below that there is a lack of inventive step even if these are accepted as distinguishing features.

- 1.5 With its statement of grounds of appeal, the appellant submitted that a centrifugal separator with a stack of separating discs is compact and has a high separation capacity (see the fifth paragraph on page 11). Moreover, a second separator outlet allowed for continuous operation (see the seventh paragraph on the same page).

The application as originally filed is silent on compactness, but the appellant refers to page 15 of the respondent's submission of 3 June 2020 in this regard, which refers to the common general knowledge in **D17** (see, in particular, the end of page 726).

The appellant has not claimed a synergistic effect relating to the combination of using separating discs and a second separator outlet. The board could not identify such an effect either, nor are the distinguishing features necessarily interrelated.

- 1.6 The two partial problems to be solved are therefore
- 1) to provide a more compact separator that still has a high separation efficiency
 - 2) to provide exhaust gas cleaning equipment that allows for continuous operation.
- 1.7 The claimed solution is obvious, however, for the reasons set out below.

As regards partial problem 1: if the skilled person is able to derive the problem to be solved from the common general knowledge in **D17** (compactness not being addressed in the patent in suit itself), then this common general knowledge also proves that the claimed solution (stack of separating discs) does not require inventive skill.

As regards partial problem 2: document **D6** discloses on page 17 (see the figure in the top right-hand corner) a centrifugal separator with a rotor having a stack of separating discs 4 and, besides a first outlet 2 for the light aqueous phase, a second outlet 5 for a pollutant phase containing particles (and inevitably also at least a portion of the oil).

On page 17, D6 also discloses that the use of this type of centrifugal separator allows for continuous operation ("*Kontinuierlicher Arbeitsablauf*") since the separator is "self-emptying" ("*Selbstentleerende ...*").

The separator disclosed on page 17 of D6 is also compatible with the application of D1. Page 17 of D6 discloses that the device is usually used for cleaning very alkaline or acidic cleaning fluids ("*Der Einsatzbereich umfaßt überwiegend die Reinigung und Entölung von stark alkalischen und sauren Reinigungsflüssigkeiten*"). A second and even a third outlet are entirely compatible with the process of D1, since particles and oil have to be removed anyway (see paragraphs [0012] and [0048] of D1).

The skilled person would therefore use the separator disclosed on page 17 of D6 in the process of D1. In this case, at least a portion of the oil inevitably leaves the centrifugal separator of D6 together with

the solids via line 5. Indeed, while the majority of oil might leave the separator via outlet 13, a separation is never entirely complete.

Under these circumstances, it is irrelevant whether or not a combination of D1 with **D18** results in the claimed subject-matter.

By contrast, the skilled person would not, as argued by the appellant, consider the separator embodiment on page 13 of **D6** to solve the problem posed since it works intermittently ("*diskontinuierlich arbeitende Separatoren*").

- 1.8 Consequently, the subject-matter of claim 1 lacks inventive step (Article 56 EPC).

Auxiliary requests

2. On pages 19 and 20 of the statement of grounds of appeal, the appellant indicates which objections are intended to be overcome with the auxiliary requests. The inventive-step objection in view of D1 in combination with D6 is, however, not mentioned.

The board cannot see how the amendments in the auxiliary requests could help overcome the inventive-step objection against the main request.

Hence, for these reasons, none of the auxiliary requests meets the requirements of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated