BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [ ] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 1 March 2012

Case Number: T 0295/10 - 3.2.03

Application Number: 00975066.2

Publication Number: 1226334

IPC: E21B 44/00

Language of the proceedings: EN

Title of invention:
Method and device of controlling a rock drilling machine

Patentee:
Atlas Copco Rock Drills AB

Opponent:
Sandvik Mining and Construction Oy

Headword:
-

Relevant legal provisions:
EPC Art. 100(a), 100(b), 54, 56

Keyword:
"Sufficiency of disclosure (yes)"
"Novelty (yes)"
"Inventive step (no)"

Decisions cited:
G 0010/91, T 0608/07

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0295/10 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 1 March 2012

Appellant: (Opponent)	Sandvik Mining and Construction Oy Pihtisulunkatu 9 FI-33330 Tampere (FI)
Representative:	Köppen, Manfred WSL Patentanwälte Kaiser-Friedrich-Ring 98 D-65185 Wiesbaden (DE)
Respondent: (Patent Proprietor)	Atlas Copco Rock Drills AB S-701 91 Örebro (SE)
Representative:	Atlas Copco Rock Drills AB Patents S-701 91 Örebro (SE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted 29 December 2009 rejecting the opposition filed against European patent No. 1226334 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
I. Beckedorf

Summary of Facts and Submissions

I. European patent EP-B1-1 226 334 concerns a method and device for controlling a rock drilling machine. The granted patent was opposed for lack of inventive step (Article 100(a) EPC). After the nine month opposition period, the opponent raised further objections based on lack of novelty and insufficiency of disclosure (Articles 100(a) and 100(b) EPC). The opposition division was of the view that novelty was not *prima facie* relevant, so did not admit the ground into the proceedings. Insufficiency was, however, considered to be relevant and hence this ground was admitted into the proceedings. At the end of the oral proceedings the opposition division concluded that none of the grounds prejudiced maintenance of the patent and hence decided to reject the opposition. The decision was posted on 29 December 2009.

II. The opponent (the appellant in this case) filed notice of appeal on 13 February 2010, paying the appeal fee on the same day. A statement containing the grounds of appeal was filed on 28 April 2010.

III. Oral proceedings were held on 1 March 2012.

IV. Requests

The appellant requested that the decision of the opposition division be set aside and that the patent be revoked.

The respondent (the patent proprietor) requested that the appeal be dismissed.

V. Claims

Claim 1 of the granted patent reads as follows:

"1. Method of controlling a rock drilling machine (51), where the rock drilling machine comprises an impact device (5) for exerting a drilling tool (52) to impacts, a rotation motor (7) for rotating the drilling tool (52) and a feed motor (6) for feeding the drilling tool (52) against a ground (53),

comprising sensing (20) the pressure to an inlet (30) of the rotation motor (7) and reducing the pressure to an inlet (32) of the feed motor (6) when the pressure to the inlet (30) of the rotation motor exceeds a first predetermined value (41) in order to keep the pressure to the rotation motor substantially constant,

characterized in that

the pressure to the inlet (31) of the impact device (5) is controlled inversely proportionally to the pressure to the inlet of the rotation motor when this pressure exceeds a second predetermined value (42)."

Independent claim 2 is as follows:

"2. Device for controlling a rock drilling machine (51) comprising an impact device (5) for exerting a drilling tool (52) to impacts, a rotation motor (7) for rotating the drilling tool (52), a feed motor (6) for feeding the drilling tool (52) against a ground (53),

means (20) for sensing the pressure to an inlet (30) of the rotation motor (7) and means for reducing the pressure to an inlet (32) of the feed motor (6) in response to the means (20) for sensing the pressure to the inlet (30) of the rotation motor (7) sensing the exceeding of a first predetermined value (41)

characterized by

means (11) for reducing the pressure to an inlet (31) of the impact device (5) inversely proportionally to the pressure to the inlet (30) of the rotation motor (7) when the means (20) for sensing the pressure to the inlet (30) of the rotation motor (7) senses the exceeding of a second predetermined value (42)."

VI. Prior Art

Of the documents cited in the contested decision, only the following are relevant for this decision:

D3: JP-B2-3483018
D3a: JP-A-10-1875
D3b: English translation of D3a.

Paragraph [0002] of the disputed patent describes prior art, which the respondent acknowledged during the oral proceedings before the board as being publically available.

VII. Submissions of the Parties

(a) Sufficiency of Disclosure

The appellant referred to the feature in claims 1 and 2 that requires the pressure to an inlet of the impact device to be controlled inversely proportionally to the pressure to the inlet of the rotation motor. Such a relationship is hyperbolic whereas the embodiment of the invention shown in Figure 2 has a linear relationship. The appellant submitted that this contradiction means that the claimed expression "inversely proportional" merely means "a reduction", ie the claim defines an unduly broad range of relationships between the pressures to the impact device and the rotation motor, and the skilled person does not know which would provide the effect of the invention.

The respondent argued that "inversely proportional" should not be given the literal mathematical meaning, but in the art it is interpreted more broadly as meaning a linear correlation with a negative gradient.

(b) Documents D3, D3a and D3b

Japanese patent document D3 was filed with the notice of appeal, but was held by the opposition division not to be part of the state of the art, as it was published after the priority date of the disputed patent. Japanese patent application D3a was filed late in the opposition proceedings together with English translation D3b. The opposition division considered that D3a was prima facie relevant and, since it was

related to D3, was admitted into the proceedings. In the reply to the grounds of appeal, the respondent objected to the inclusion of D3a and D3b in the appeal proceedings, since it has not been proven that the cited application is an identical corresponding publication to the patent D3.

(c) Novelty

(i) The appellant referred to Figure 3 of D3a, which shows the pressure to the impact device to decrease linearly as the rotation pressure increases; it is also stated in paragraph [0025] of D3b that at this instance the thrust of the feed mechanism is reduced. The appellant submitted that "at this instance" does not mean at an identical time, but refers to the period in which the impact pressure is being reduced. Consequently, the requirement in claim 1, that the feed and impact pressures are reduced when different predetermined rotation pressures have been reached, is also disclosed in D3a.

(ii) The appellant also argued that, although the claims define a first and a second predetermined value for the pressure to the rotation motor, these values may be the same. Hence should it be concluded that D3a discloses the reduction of impact and feed pressures on reaching the same rotation pressure, this would fall within the scope of the claimed subject-matter.

(iii) Claim 2 is directed to a device for controlling a rock drill. Figure 4 of D3a shows a control system, in which the rotary mechanism is provided with two pressure switches (24), meaning that two rotational pressures can be measured and the pressures to the impact and feed devices can be adjusted accordingly. The system of Figure 4 is thus suitable for controlling the rock drill in the manner defined in claim 2, as it is merely a matter of different switch or program settings.

(iv) Consequently, neither the method of claim 1 nor the device of claim 2 are novel over D3a.

(v) The respondent submitted that, as the ground of lack of novelty was not raised within the opposition period and is not *prima facie* highly relevant, it should not be admitted into the appeal proceedings.

(vi) If D3a is nevertheless to be considered, the claimed subject-matter is novel. The respondent emphasised that the reason for defining a first and a second predetermined value for the rotational pressure is that they are different and this is fully supported in the description and drawings of the disputed patent. The requirement that there are two different rotational pressures at which the impact and feed pressures are respectively reduced is a feature of both

the method and the device and, given that this is not disclosed in D3a, the claimed subject-matter is novel.

(d) Inventive Step

(i) The appellant submitted that the claimed subject-matter lacks an inventive step over the combination of the prior art cited in the introduction to the disputed patent (paragraph [0002]) and document D3a/D3b. Compared with the method described in paragraph [0002], the method of claim 1 differs in that there is a proportional, rather than abrupt, reduction in impact pressure.

(ii) According to the appellant it is unlikely that an abrupt drop in impact pressure would result in jamming of the drilling rig, as described in the patent, however, it is plausible that the rig would nevertheless not run properly. An abrupt reduction in impact pressure is recognised in D3a as being disadvantageous, hence the document teaches that the impact pressure should be reduced continuously with increasing rotational pressure. Applying this teaching to the known method set out in the patent results in the claimed method and device.

(iii) The respondent explained that an abrupt drop in pressure to the impact device means that a high pressure still remains briefly in the

hydraulic system, and given that the same system is also used to supply pressure to the rotational and feed devices, there is a risk of jamming. The respondent went on to argue that the teaching of D3a is to reduce the impact and the feed pressures at the same rotational pressure; there is no indication that the feed pressure should be reduced on attaining a first predetermined rotational pressure and that the impact pressure reduced at a second predetermined value. Consequently, the skilled person would not consult D3a in expectation of solving the problem.

Reasons for the Decision

1. The appeal is admissible.

2. Sufficiency of Disclosure

2.1 The ground of lack of sufficient disclosure under Article 100(b) EPC was raised during the opposition proceedings by the appellant (then opponent) after the nine month opposition period set out in Article 99(1) EPC. The respondent submits that this ground should not be considered, since it was not invoked within the opposition period.

2.2 The opposition division has a discretion to admit late-filed grounds if it considers them to be *prima facie* relevant (see the Headnote of G 10/91). The opposition division reasoned that, in light of the arguments

brought forward by the opponent, it was necessary to investigate the ground further (see point 3.1.3 of the contested decision). As far as the Board is concerned, there is nothing improper in the manner by which the opposition division exercised its discretion and decided to admit this late-filed ground into the proceedings. On closer examination, the opposition division did not consider the ground to prejudice the maintenance of the patent. However, given that the ground was dealt with in the contested decision, the appellant now has the right to challenge the view of the opposition division in the appeal proceedings.

2.3 The alleged lack of sufficient disclosure arises out of the definition in claims 1 and 2 that "the pressure to an inlet of the impact device is controlled inversely proportionally to the pressure to the inlet of the rotation motor", and in particular the meaning of the expression "inversely proportional".

In mathematics, the graph of two parameters varying inversely is a hyperbola. However, this is not the relationship shown in the embodiment presented in Figure 2 of the disputed patent, where it is shown to be linear. The appellant therefore argues that the meaning of "inversely proportional" is unknown, so that the skilled person does not know how to vary the rotation and impact pressures in order to achieve the effect of the invention.

2.4 The Board agrees with the view of the opposition division set out in point 4.2 on page 7 of the disputed decision that the meaning of the expression is that "when the pressure at the inlet of the rotation motor

increases the pressure at the inlet of the impact decreases accordingly, ie not in an instantaneous manner as in the prior art acknowledged in the patent specification… in other words the more the rotation increases, the more the impact pressure is reduced".

2.5 The arguments put forward by the appellant go to show that the expression "inversely proportionally" and consequently the scope of protection provided by claims 1 and 2 are not clear. However, Article 84 EPC is no ground for opposition. In considering Article 100(b) EPC, the question is whether the invention has been sufficiently disclosed in the patent for a skilled person to be able to carry it out.

The embodiment in Figure 2 shows that when the rotation pressure increases beyond a given value (42), the pressure to the impact device decreases linearly to the collaring pressure (43). A skilled person is able to arrange the control system of a drilling device so that the effects shown in Figure 2 are achieved, and hence is able carry out the claimed invention. The Board concurs with the reasoning given in T 608/07 (at 2.5.2) that, in the context of Articles 83 and 100(b) EPC, it is not enough merely to show that an ambiguity in the claimed subject-matter exists, it is necessary to show that it deprives the skilled person of the promise of the invention. Given that the embodiment in Figure 2 allows the skilled person to put the invention into effect, the invention is not insufficiently disclosed within the meaning of Article 100(b) EPC.

3. Prior Art

3.1 The respondent agreed that the disclosure of prior art given in paragraph [0002] of the disputed patent is prior art according to Article 54(2) EPC and can thus be taken into consideration for assessing novelty and inventive step.

3.2 Japanese patent document D3 was filed with the notice of appeal, but is not part of the state of the art, as it was published after the priority date of the disputed patent. Japanese patent application D3a was published before the priority date, but was filed late in the opposition proceedings, together with English translation D3b. The opposition division concluded that application D3a corresponds to patent D3 and was state of the art under Article 54(2), hence admitted it into the proceedings (see paragraphs 1 to 3 on page 4 of the contested decision). The Board has no reason to question the discretion exercised by the opposition division and hence D3a and D3b will be considered in the appeal proceedings.

4. Novelty (Article 54 EPC)

4.1 The issue of novelty in respect of D3a was raised late in the opposition proceedings. The opposition division was of the view that D3a *prima facie* did not prejudice novelty, hence decided not to admit the ground. However, D3a was taken into consideration for the assessment of inventive step. This inevitably requires that differences, if any, between the claimed subject-matter and D3a have to be identified. Hence an assessment of

novelty in the context of determining inventive step is unavoidable.

4.2 D3a discloses a method of controlling a rock drilling machine having rotary, feed and impact devices. According to this method, when the rotary pressure exceeds a given pressure P2, the impact pressure is lowered whilst the rotation pressure continues to increase (see Figure 3 of D3a and paragraph [0025] of D3b). This corresponds to controlling the pressure to the impact device "inversely proportionally" to that of the rotation motor, as is defined in the claims of the disputed patent (see points 2.3 and 2.4 above).

4.3 Paragraph [0025] of D3b also states that the thrust of the feed mechanism is lowered "at this instance". The appellant argues that this phrase does not refer to a specific moment, but to the time interval during which the impact pressure is reduced and the rotary pressure is increased.

Given that "instance" means case or example, it is clear that the expression "at this instance" is a mistake in translation, with the correct expression being "at this instant", which means at a particular moment or point in time. The Board therefore agrees with the view of the opposition division (see first paragraph on page 10 of the contested decision) that "at this instance" refers to the specific moment when the controller actuates valve 8 in order to lower the impact pressure. Consequently, D3a discloses the lowering of both the impact pressure and the feed pressure at the same time, ie when the rotation pressure reaches P2.

4.4 The appellant also argues that the wording of claim 1 encompasses the situation where the first and second values of the rotation pressure are the same.

4.5 As argued by the respondent and opposition division, by explicitly defining in the claim first and second predetermined values, it is clear that the values are to be distinguished from each other. Although the first and second predetermined values of claim 1 are different from each other, the wording does not, however, define which of the two is greater. The arrangement of D3a, whereby the impact and feed pressures are reduced at the same rotation pressure, does not fall within the definition given in claim 1, and hence the method defined in this claim is novel.

4.6 The appellant further submits that the device of claim 2 lacks novelty, since the control system of D3a is suitable for operating in the manner defined in the claims. In particular, the arrangement of Figure 4 shows two pressure switches (24) connected to the hydraulic line supplying the rotation device. Since these switches can be set to operate at different pressures, the impact and feed pressures can be reduced in accordance with different rotation pressures.

Figure 4 shows that the two pressure switches for the rotation control (24), along with the control of valves supplying the impact and feed devices (indicated as (27 and (28) respectively), are linked to a control panel (29). However, there is no disclosure in D3a that the control panel is programmed or set up so that the feed and impact pressures are reduced at different rotation

pressures. Such an arrangement is a feature of the apparatus itself and not just of how it is used. It may or may not be the case that the control system of D3a can be modified easily to adjust the pressures as defined in the claims of the disputed patent, but the test for novelty is strict, and since the features of claim 2 are not directly derivable from D3a, the claimed device is novel.

5. Inventive Step (Article 56 EPC)

5.1 The starting point for the disputed invention is described in paragraph [0002] of the patent specification. According to the known method, pressure to the rotation device is kept constant up to a first predetermined value, after which the pressure to the feed motor is reduced. If the rotation pressure nevertheless continues to increase to a second predetermined value the pressure to the impact device is changed instantaneously to the collaring pressure.

5.2 The method of claim 1 differs from the known method by reducing the pressure to the impact device inversely proportionally to the rotation pressure instead of changing it instantaneously.

5.3 Starting from the known method, the problem to be solved as stated in the patent is how to reduce the risk of the rock drill jamming (see column 1, lines 27 to 29 and 33 to 36 of the patent).

5.4 The proposed solution is control the impact pressure inversely proportionally to the rotation pressure and thereby avoid an abrupt drop in pressure that can lead to jamming.

D3a discloses a method for controlling the impact pressure of a drilling device in response to rotational forces (see paragraph [0001] of D3b), hence is of interest to the skilled person. The aim of D3a is to control the impact pressure in view of reducing the shock waves that result from the hammering action of the drill (paragraph [0007] of D3b), and to prevent adverse effects when the rotational pressure increases in response to deteriorating drilling conditions (paragraph [0014] of D3b).

The solution taught in D3a is that, when a drilling defect is encountered, the impact pressure is lowered inversely proportionally to the rotation pressure (see paragraph [0025] of D3b and Figure 3 of D3a). In doing so, the effect described by the respondent, in which an abrupt reduction in impact pressure leaves a significant pressure in the hydraulic system that may cause jamming, is also avoided. Applying the teaching of D3a to the known method with a view to solving the objective problem results in the claimed method and device, hence there is a lack of inventive step.

5.5 The respondent argued that the skilled person would not consult D3a, as the teaching is to reduce both the impact and feed pressures on reaching the same rotational pressure.

The Board does not agree with the respondent's submission as, according to the known method that forms the starting point for the disputed invention, the feed and impact pressures are reduced at different rotational pressures in order to keep the rotational pressure substantially constant. The emphasis in D3a is on reducing the impact pressure in a certain way (paragraph [0001] of D3b), and the skilled person would not see the necessity of reducing the impact pressure at the same time as the feed pressure, which would forgo the advantage of the known method.

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:

D. Hampe U. Krause