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D E C I S I O N
of 26 November 1996

Case Number: T 1022/92 - 3.2.2

Application Number: 84306954.3

Publication Number: 0138583

IPC: B25J 19/00

Language of the proceedings: EN

Title of invention:
Remote manipulators for steam generators

Patentee:
THE BABCOCK & WILCOX COMPANY

Opponent:
ABB Patent GmbH
Vermaat Pieter Huibrecht

Headword:
-

Relevant legal provisions:
EPC Art. 108, 54, 56

Keyword:
"Novelty - yes"
"Inventive step - yes"
"Form of appeal - fee - refund of amount paid in excess"

Decisions cited:
T 0389/86, T 0167/84

Catchword:
-



Case Number: T 1022/92 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 26 November 1996

Appellant I:
(Opponent 01)

ABB Patent GmbH
Kallstadter Strasse I
DE - 68309 Mannheim (DE)

Representative:

Rupprecht, Klaus, Dipl. -Ing.
c/o ABB Patent GmbH
Postfach 10 03 51
DE - 68128 Mannheim (DE)

Appellant II:
(Opponent 02)

Vermaat Pieter Huibrecht
Moolhoek 8
NL - 3235 XK Rockanje (NL)

Representative:

Vellekoop, Herman
Octrooibureau Vriesendorp & Gaade
Dr. Kuyperstraat 6, Postbus 266
NL - 2501 AW 's-Gravenhage (NL)

Respondent:
(Proprietor of the patent)

THE BABCOCK & WILCOX COMPANY
1010 Common Street
P.O. Box 60035
US - New Orleans, Louisiana 70160 (US)

Representative:

Pilch, Adam John Michael
D. Young & Co.
10 Staple Inn
GB - London WC1V 7RD (GB)

Decision under appeal:

Decision of the Opposition Division of the
European Patent Office posted 5 October 1992
rejecting the opposition filed against European
patent No. 0 138 583 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: H. J. Seidenschwarz
Members: P. Alting Van Geusau
J. C. M. De Preter

Summary of Facts and Submissions

- I. European patent No. 0 138 583 was granted with effect from 20 December 1989 on the basis of the European patent application No. 84 306 954.3 filed on 11 October 1984, claiming a priority date of 11 October 1983 based on the United States application No. 540221.

Independent Claims 1 and 5 of the patent as granted read as follows:

"1. A method of installing a remote manipulator (20) within the head (16; 90) of a steam generator (10; 88), the manipulator (20) comprising a mast (22; 80), an articulating arm (36) releasable attachable to the mast (22; 80) by means of a trolley plate (34) for movement along the mast, and means (30) for detachably connecting tools to the articulating arm (36), the method being characterised by:

attaching one end of a cable (62) to the interior of the head (16; 90) of the steam generator (10; 88);

hoisting the mast (22; 80) of the manipulator (20) along the cable (62) into a substantially perpendicular position against a tubesheet (12; 104) of the steam generator (10; 88);

fixedly securing the mast (22; 80), when positioned in the perpendicular position, against the tubesheet (12;104);

hoisting the articulating arm (36) into position against the mast (22; 80); and

locking the articulating arm (36) releasable on the trolley plate (34)."

"5. A remote manipulator for installation within the head (16; 90) of a steam generator (10; 88) by a method according to claim 1, the manipulator (20) comprising:

a mast (22, 80);

means for installing the mast (22; 80) in a substantially perpendicular position against a tubesheet (12; 104) within the head (16; 90) of the steam generator (10; 88);

means (24) for fixedly securing the mast (22; 80) against the tubesheet (12; 104), when the mast (22; 80) is positioned in the perpendicular position;

an articulating arm (36) moveable along the mast (22; 80);

means (30) for detachably connecting tools to the articulating arm (36); and

means (49, 57; 84) for providing rotational movement of the articulating (36) about the mast (22; 80):

characterised by:

a trolley plate (34) carried by the mast (22; 80) for guided lengthwise movement along the mast (22; 80);

means (38) for detachably locking the articulating arm (36) on to the trolley plate (34);

means (32, 55) for controllably moving the trolley plate (34) lengthwise along the mast (22, 80) so as to provide controlled perpendicular movement of the articulating arm (36); and

means (72) for attaching the mast (22, 80) and the articulating arm (36) to a hoisting mechanism for installation within the head (16, 90), such that, during installation, firstly the mast (22; 80) can be hoisted along a cable (62) having one end attached to the interior of the head (16; 90) of the steam generator (10; 88) to allow the mast (22; 80) to be fixedly secured to the tubesheet (12; 104), and secondly the articulating arm (36) can be hoisted into position against the mast (22; 80)."

- II. Notices of opposition were filed by the appellants 01 and 02 (opponents 01 and 02, respectively). They requested revocation of the patent in its entirety on the grounds that its subject-matter lacked novelty (opponent 01) and/or an inventive step (both opponents) with respect to the state of the art (Article 100(a) EPC).

The oppositions were based on the following prior art patent document and related alleged prior use:

- D1: EP-A-0 066 791
- D2: Manipulator-Manual BBR BFF/HF btv 1540, by Brown Boveri Reaktor GmbH (BBR)
- D3: Babcock & Wilcock Purchase order No. 040981LB
- D4: Invoice No 28 dated 18 February 1983 in respect of D3
- D6: BBR order (dated 18 November 1982) for construction, manufacture and delivery of a Multipurpose-Manipulator (B&W), LOI dated 28 October 1992 No.10/0116, FS dated 9 November 1982 No.10/0221BBR

D7: two copies of bills from the Lynchburg Hilton

D8: two copies of a tackle drawing of "Vermaat
Technics Holland"

III. By its decision given at the oral proceedings on 11 September 1992 and issued in writing on 5 October 1992 the opposition division rejected the oppositions. The opposition division held that the subject-matter of the Claims 1 and 5 of the patent was novel and could not be derived in an obvious manner either from the cited prior art or the related prior use, and consequently the grounds of opposition did not prejudice maintenance of the patent in its granted form.

IV. Notices of appeal were filed by appellant 01 on 27 November 1992 and by appellant 02 on 14 December 1992.

Appellant 01 paid DM 1000.-- on 29 September 1992, an amount that equalled the appeal fee in force on that date, and a further amount of DM 1000.-- on 26 November 1992 as a precautionary measure having regard to the new amounts of fees binding on payments made on or after 1 October 1992 (see Decision of the Administrative Council of 5 June 1992 amending the Rules relating to Fees, OJ EPO 1992, 344, by which decision the appeal fee was raised from DM 1000.-- to DM 2000.--).

Appellant 02 paid the appeal fee of DM 2000.-- on 14 December 1992.

Both appellants requested the decision under appeal be set aside and the patent revoked in its entirety.

Appellant 01 additionally requested reimbursement of the extra amount of DM 1000,--.

The statement of grounds of appeal were filed on 5 December 1992 (appellant 01) and on 15 February 1993 (appellant 02).

With its statement appellant 01 filed further evidence relating to the alleged prior use:

D9: BBR publication No. D BBR 1138 84 E "Manipulator for Inspection and Repair of U-Tube Steam Generators"

D10: Signed declaration by Mr Heiko Förch in respect of D9

Appellant D2 filed together with its statement of grounds of appeal the following further evidence:

D11: Drawing "Leg Robot VM3" by Vermaat-Technics-Holland

D12: Material specification list of document D11

V. In a communication for the preparation of oral proceedings, the Board expressed the provisional opinion that the alleged prior use appeared to be sufficiently substantiated and was apparently the most relevant prior art since it disclosed most of the features of Claim 1 of the patent except for the feature of

(i) hoisting the articulating arm into position against the mast.

It was noted that the respondent (patent proprietor) considered that the prior use did not show a trolley plate comparable to the trolley plate in accordance with the patent, mainly because the known plate was not suitable for vertical positioning and fixing of the arm to the mast. However, in the Board's provisional view, only the fixing mechanism of the trolley plate and the mast, which appeared to be implied by Claim 1 of the patent in suit but which was not further defined, should be suitable for vertical assembly of the arm and mast rather than the trolley plate itself being different from a constructional point of view.

An important issue to be discussed at the oral proceedings appeared to be whether the skilled person was led by the prior art or his common knowledge to omit the guide rail present in the prior use, and instead would use the existing hoisting arrangement to position the arm to the mast as well.

The Board further informed the parties that the request for reimbursement of the extra amount of the appeal fee paid by appellant 01 would appear to be allowable.

VI. Oral proceedings were held on 26 November 1996 in the presence of the appellant 01 and the respondent.

By a letter dated 6 August 1996 appellant 02 had informed the Board that he would not attend the oral proceedings. In accordance with Rule 71(2) EPC the oral proceedings were continued without him.

VII. In support of their requests for revocation of the patent the appellants essentially relied on the following submissions:

The single difference found on comparing the method of installing a remote manipulator within the head of a steam generator in accordance with Claim 1 of the patent and the method derivable from the prior use was the hoisting of the articulating arm into position against the mast.

In the method in accordance with the prior use at least some lifting of the arm was necessary, as was apparent from the drawing on page 3 of document D9, so as to enable the sliding of the arm coupling plate into the mast coupling device. Such lifting was most probably carried out by means of a pole but could also have been done by means of the hoisting arrangement available for installation of the mast. Therefore, if the slide rail for guiding the arm from the manhole to the mast in the prior used arrangement was missing, the skilled person would immediately recognise the possibility of using the hoisting arrangement as a support and guidance for the arm and would use the available hoisting arrangement as an alternative tool replacing the missing slide rail when coupling the arm to the mast.

Such alternative was also considered obvious in view of the fact that part of the manipulator (the mast) was hoisted into position and the hoisting of another part of the manipulator amounted to a mere repetition of the former operation.

In any event, hoisting parts of an assembly into the right position for mounting it onto the assembly was a common, widely used technique, for example when assembling a tower crane, and thus the method of Claim 1 lacked an inventive step for this reason too.

The manipulator defined in Claim 5 of the patent in suit lacked an inventive step essentially for the same reasons as put forward against the method of Claim 1.

Appellant 01 referred to the decision T 0389/86 (OJ 1988, 87) in which it was set out that the appeal fee could be paid directly after proclamation of the decision at the oral proceedings.

In the present case the appeal fee was paid on 29 September 1992 and the amount paid was in agreement with the amount prescribed by the then valid Rules relating to Fees.

The additional part of the appeal fee (DM 1000,--) paid on 26 November 1996 as a precautionary measure should therefore be reimbursed.

VIII. The respondent requesting the dismissal of the appeals disputed the appellants' views and in support of its request relied on the following submissions:

It was agreed with the Opposition Division that for a sensible construction of the claims the trolley plate and detachable locking means were designed in a manner such as to allow the arm to be assembled with the mast simply by hoisting the arm into position against the mast.

The connection mechanism and locking means shown in the documents relating to the prior use relied upon by the appellants was clearly not suitable for this manner of assembly and for this reason alone the skilled person would not be led to apply the hoisting step defined in Claim 1 of the patent in suit.

Furthermore there was not the slightest indication in the evidence relating to the prior use that the arm could be connected to the mast by hoisting.

Documents D1 and D9 specifically taught that the use of a slide rail was necessary to effect the connection between the arm and the mast. Such necessity was a direct consequence of the type of connection means used, e.g. the rail-guided sideward push-in mechanical connection, and would prejudice the skilled person against departing from this known solution.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty*

2.1 The closest prior art is represented by the method and manipulator for inspection and repair of U-tube steam generators described and shown in document D9 and for which further constructional and installation details as well as the public availability of this prior use are apparent from the documents D3, D4, D6 and D10.

The respondent did not dispute that the prior use was part of the prior art in accordance with Article 54 (2) EPC but only that the manipulator manual (document D2) was not part of the prior art (see also letter dated 10 June 1991, filed during the opposition proceedings).

2.2 The method of installing a remote manipulator within the head of a steam generator and the remote manipulator for installation within the head of a steam generator defined in Claims 1 and 5, respectively, of the patent in suit differ from the disclosures of this prior use in that

in respect of the method of claim 1:

(a) the articulating arm is hoisted into position against the mast,

and

in respect to the manipulator of claim 5:

(b) the articulating arm comprises means for attachment to a hoisting mechanism for installation within the head such that the articulating arm can be hoisted into position against the mast.

Therefore, since the available prior art document or the prior use does not disclose such features either in themselves or in combination with other features of Claims 1 or 5, the subject-matter of these claims is novel.

2.3 Appellant 01 expressed the opinion that the articulating arm of the arrangement in accordance with the prior use (see in particular document D9) should be lifted from the slide rail in order to bring the connecting plate of the articulating arm in a position so that it could be pushed into the V-shaped receptor plate (trolley plate) on the mast. Since such lifting was a direct equivalent to hoisting, the method of claim 1 lacked novelty.

It is to be noted that none of the documents in support of the prior use explicitly discloses a lifting movement, as was admitted by appellant 01 during the oral proceedings.

Furthermore, in contrast to the appellant's opinion that the skilled person would derive a lifting movement as being necessary from the functioning of the assembly

of the mast and articulating arm and thus that the disclosure of a lifting movement is implicit from the method of installation, the Board observes that the slide rail end is mounted to the trolley plate in an exact position, so as to enable the connection between the mast and the articulating arm to be made by a guided pushing movement of the articulating arm only, and thus without any lifting or lowering of the articulating arm end (see in particular the figures on page 3 of document D9). Such installation conforms exactly with what is described in document D2 in the paragraph "Installation of the manipulator arms". The appellant's allegations concerning an apparent lifting step are therefore not convincing.

Moreover, in accordance with the case law of the boards of appeal (see T 0167/84 OJ 1987, 369) the disclosure of a prior art document or prior use does not include equivalents. Equivalents can only be taken into account when it comes to considering inventive step.

3. *Inventive step*

3.1 Starting from the method and remote manipulator for installation within the head of a steam generator as known from the prior use the object to be solved by the subject-matter of Claims 1 and 5 of the present patent can be seen in a simplification of the known installation procedure.

3.2 This object is solved by the subject-matter of Claims 1 and 5 essentially by the introduction of the features (a) and (b) (see point 2.2 above), respectively.

These features provide that after the mast has been hoisted into position in the steam generator, the arm can be hoisted into position against the trolley plate, and the locking means activated. This requires minimal

strength and dexterity on the part of the operator and thus greatly facilitates installation of the manipulator.

- 3.3 The appellants argued that, if the skilled person did not have the slide rail available in the arrangement in accordance with the prior use, he would obviously use the hoisting mechanism already available for insertion of the mast for positioning of the arm too.

However, considering that coupling of the arm to the mast is carried out by horizontally sliding of the arm on a slide rail whereby the coupling plate is precisely guided into a V-shaped receptor plate on the mast, in such an arrangement the slide rail is essential for the coupling between the arm and the mast and in the absence of any objective reason to abandon this assembling principle, there was nothing leading the skilled person to the available hoisting arrangement.

Moreover, it is to be noted that in the prior use arrangement the arm is horizontally inserted into the steam generator head and is connected to the mast by a horizontal sliding movement.

For these reasons and contrary to the appellants' opinion, the use of the hoisting tool, which involves mere vertical insertion and coupling movements without accurate guiding means and in which the connecting coupling of the mast and arm must itself be suitable for such assembling method, is not obvious.

In this respect it is evident to the skilled person that the coupling arrangement of the prior use is not suitable for vertical coupling and, because of the horizontal hoisting of the articulate arm, great difficulties would be encountered in respect of balancing the weight of the arm so as to accurately

introduce the coupling plate in the V-shaped groove, in particular when considering the limited space that is available for insertion into and the assembly of the arms in the steam generator head.

Therefore, the prior art on file does not give any teaching regarding hoisting the articulating arm into position against the mast.

- 3.4 The appellants also submitted that the skilled person was well aware of the assembly of tower cranes by using the mast for hoisting the crane arm and would use this principle in accordance with the prevailing circumstances.

However, in the present case such known solution does not have any link with the underlying problem to be solved by the present patent, in which totally different circumstances such as the limited space and radiation level are of importance. The solution proposed in the patent is also different, in that hoisting is performed from the interior of the steam generator head rather than from the mast, which solution involves the mast itself being hoisted into position.

Therefore, the skilled person is neither led to consider the different field of technique for finding a solution to the stated problem nor is he led to the specific solution proposed in the Claims 1 and 5 of the patent in suit.

- 3.5 In summary, in the Board's judgment, the proposed solution to the technical problem underlying the patent in suit as defined in the Claims 1 and 5 is inventive

and therefore these claims as well as their dependent claims 2 to 4 and 6 to 19, relating to particular embodiments of the invention in accordance with Rule 29(3) EPC, are acceptable.

4. *Request for reimbursement of part of the appeal fee*

4.1 According to Article 108 EPC the notice of appeal must be filed and the fee for the appeal be paid within two months after the date of notification of the decision appealed from. The notice shall not be deemed to have been filed until after the fee for the appeal has been paid.

4.2 With reference to decision T 0389/86, this requirement does not exclude an appeal which is filed after announcement of the decision in oral proceedings but before notification of the decision duly substantiated in writing from complying with the said time limit.

Since the EPC also requires no particular sequence in the filing of the notice of appeal and payment of the appeal fee, it is the Board's opinion that payment of the appeal fee can in fact be effected at any moment and independent from the notice of appeal, after announcement of the decision against which the appellant intends to appeal, but subject to such payment taking effect only if the notice of appeal is filed within two months of the date of notification of the said decision.

4.3 In the present case the decision rejecting the oppositions was announced at the oral proceedings held on 11 September 1992 and appellant 01 paid DM 1000.-- on 29 September 1992. The decision of the Opposition Division was sent to the parties on 5 October 1992. The appellant's 01 notice of appeal was filed on 27 November 1992.

These facts demonstrate that the payment by appellant 01 of DM 1000,-- on 29 September 1992, which amount was equal to the prescribed appeal fee on that date, and the subsequent filing of the notice of appeal on 27 November 1992, meet the requirements of Article 108 EPC.

The further amount of DM 1000,-- paid on 26 November 1992 as a precautionary measure in view of the corresponding increase in the appeal fee with effect from 1 October 1992, therefore exceeds the required amount and accordingly should be reimbursed to appellant 01.

Order

For these reasons it is decided that:

1. The appeal is dismissed.
2. The reimbursement of part of the appeal fee to appellant 01 (DM 1000,--) is ordered.

The Registrar:



S. Fabiani

The Chairman:



H. Seidenschwarz

