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**D E C I S I O N**  
**of 10 December 2002**

**Case Number:** T 0670/00 - 3.2.3

**Application Number:** 91121229.8

**Publication Number:** 0546210

**IPC:** B22D 29/00, B22D 31/00

**Language of the proceedings:** EN

**Title of invention:**  
Method and apparatus for heat treating metal castings

**Patentee:**  
CONSOLIDATED ENGINEERING COMPANY INC.

**Opponent:**  
General Kinematics Corporation

**Headword:**  
-

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

**Keyword:**  
"Novelty - public prior use - confidentiality (yes)"  
"Inventive step - (yes) after amendments"

**Decisions cited:**  
-

**Catchword:**  
-



Case Number: T 0670/00 - 3.2.3

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.3**  
**of 10 December 2002**

**Appellant:** CONSOLIDATED ENGINEERING COMPANY INC.  
(Proprietor of the patent) 2871 McCollum Parkway, N.W.  
Kennesaw, Georgia 30144 (US)

**Representative:** Schurack, Eduard F.  
Hofstetter, Schurack & Skora  
Patentanwälte  
Balanstrasse 57  
D-81541 München (DE)

**Respondent:** General Kinematics Corporation  
(Opponent) 777 Lake Zurich Road  
Barrington, IL 60010 (US)

**Representative:** Isenbruck, Günter, Dr.  
Patent- und Rechtsanwälte  
Bardehle, Pagenberg und Partner  
Postfach 86 06 20  
D-81633 München (DE)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office dated 12 April 2000,  
posted 10 May 2000, revoking European patent  
No. 0 546 210 pursuant to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** C. T. Wilson  
**Members:** F. Brösamle  
J. P. Seitz

## Summary of Facts and Submissions

I. With decision issued at the end of the oral proceedings of 12 April 2000 - the written decision according to Article 102(1) EPC was posted on 10 May 2000 - the opposition division revoked European patent No. 0 546 210 for lack of novelty in the light of a sale by the patentee - appellant in the following - making the claimed subject-matter "available to the public before the date of filing of the application". The evidence for the sale submitted by the opponent - respondent in the following - is *inter alia* constituted by

(D4) Declaration of Crafton (Inventor) et al. to US Patent Application Ser. No. 705 626 and,

(D10) ISD with enclosed reference "P".

II. Against the above decision of the Opposition Division the appellant lodged an appeal on 16 June 2000 paying the fee on the same day and filing the statement of grounds of appeal on 11 September 2000.

III. Following the board's Communication pursuant to Article 11(2) RPBA in which the board gave its provisional opinion of the case with respect to Articles 100(a) and 100(c) EPC oral proceedings were held on 10 December 2002 in which the appellant filed three sets of claims according to his **main-, first- and second auxiliary request.**

IV. The independent claims thereof read as follows:

(a) **main request**

- "1. Apparatus (10, 110) for heat treating a metal casting having a sand core and reclaiming sand from the sand core, the sand core comprising sand bound by a binder, said sand core defining a cavity within said casting, and said apparatus comprising:  
a furnace (11, 111) defining a work chamber (15) for receiving said casting therewithin;  
heating means (18) for heating said work chamber (15, 130) to a temperature sufficient to heat treat the casting and to combust said binder of said sand core, whereby portions of said sand core are loosened from said sand core,  
characterized by  
further comprising:  
retaining means (52) for retaining portions of the sand core which become dislodged from the casting prior to said binder being combusted therefrom, said retaining means (52) being in heat and gaseous communication with the furnace (11,111) and substantially promoting further combustion of the portions of the sand core which become dislodged from the casting prior to the binder being combusted therefrom."
- "19. A method for heat treating a metal casting having a sand core and reclaiming sand from the sand core, the sand core comprising sand particles bound together by a binder material, the sand core defining a cavity within the casting, and the method comprising the steps of:  
introducing a casting with at least a portion of the sand core therein into a furnace (11, 111), wherein the furnace (11, 111) comprises a work

chamber (15, 130), heat treating the casting at a temperature sufficient to combust binder material of the sand core while the casting is disposed within the work chamber (15, 130), whereby portions of the sand core are dislodged from the casting

characterized by

further comprising the steps of reclaiming, with a retaining means (52) within the furnace (11, 111), said retaining means (52) being in heat and gaseous communication with the heat treating region (15, 130), at least some sand from portions of the dislodged sand core portions, whereby the reclaiming is accomplished through additional burning of binder material of, at least, portions of the dislodged sand core portions."

(b) **first auxiliary request**

claim 1: following the words "loosened from said sand core" in the preamble of claim 1 of the **main request** the words "air flow means for directing a flow of air over said casting while said casting is in said furnace (11, 111)" are added;

claim 19: in the preamble of claim 19 of the **main request** following the words "whereby portions of the sand cone one dislodged from the casting", the works "directing a flow of air over said casting while said casting is in laid furnace (11, 111) are added.

(c) **second auxiliary request**

claim 1: following the feature "airflow means...in said furnace (11, 111)" of claim 1 of the **first auxiliary request** the words "so as to dislodge a portion of said sand from said casting" are added;

claim 19: following the feature "directing a flow of air over said casting...in said furnace (11, 111)" of claim 1 of the **first auxiliary request** the words "so as to dislodge a portion of said sand from said casting" are added.

V. In the oral proceedings before the board the parties essentially argued as follows:

(a) appellant:

- the feature with respect to air flow means directing a flow of air over the casting is seen as an additional, however, not an essential feature of the invention which could be omitted from the claims, see (D21-P) statement of Ingvar L. Svensson and (D22-P) statement of Ken P. Harris; air flow means - even if not contained in the granted independent claims - have not been abandoned from the patent so that this feature could be reintroduced to the independent claims of the auxiliary requests;
- the alleged prior use, namely sale of an apparatus as claimed by the appellant to Teksid Aluminium Foundry ("Teksid") delivering cast products to Ford Motor Company ("Ford") was not public since there existed a testing and development cooperation, see (D20) and (D25), namely

affidavits of Giovanni Barbero - signed on 12 December 2001 and on 8 December 2002, respectively - being a production director with Teksid who stated that there existed confidentiality agreements between Teksid and the appellant excluding access to the apparatus even to Ford which company had not been interested in the apparatus itself, rather in the castings produced by it;

- the revolutionary claimed apparatus led to remarkable economic advantages which were kept secret by Teksid and Ford; contrary to respondent's findings Teksid did prove by (D20/D25) that confidentiality was agreed on by the parties involved;
  
- with respect to the issue of inventive step it has to be observed that the respondent argued *ex post*; from the prior art such as (D1), (D2) and (D3), namely JP-A-5 825 860, JP-A-59 219 410 and JP-A-5 653 867, respectively, no retaining means - to be distinguished from simple conveying means for the castings - were known so that the crucial advantage of the claimed subject-matter, namely immediate reuse of reclaimed sand was not known before the filing day of the present invention;
  
- even if claims 1 and 19 of the second auxiliary request are broadly worded by not specifying in detail the retaining means, the teachings of these claims are clear since it is defined that the retaining means are **additional** means (to the conveyor of the castings) and promote the **further** combustion of the sand's binder by temporarily keeping the clumps of sand loosened from the cavity of the castings and falling on the retaining means.

(b) respondent:

- by rewording the claims the respondent had carried out a generalisation of features only disclosed in combination, namely air flow means dislodging sand from the casting;
- with respect to the issue of a prior use it had to be considered that according to general experience a purchaser, like Ford/Teksid, would not accept any confidentiality requirements;
- even if (D25) submitted by the appellant in the oral proceedings were accepted as further evidence to the issue of public prior use of the claimed invention, (D25) was silent about essential elements of any sworn statement such as when confidentiality had been agreed on and how long it should be maintained;
- it cannot be accepted that Ford had no access to the production line since Ford was the buyer of the cast products; Ford as the central company within the issue of public availability had not provided for any statement of an agreement to keep confidentiality;
- even if a security wall surrounding the delivered production line of the appellant existed it could not be a bar to get knowledge of the details of the claimed production line, in the present case the feature of sand recovery by using retaining means on which clumps of sand were collected and its binder substantially burnt;
- summarising the above considerations based on a real life approach the public availability of the purchased apparatus had to be accepted;



- claims 1 and 19 of the second auxiliary request did not define in detail the retaining means so that any conveying means could be interpreted as retaining means, namely temporarily keeping clumps of sand loosened from the cavity of any casting and carrying out burning of any remaining binder of the sand clumps; under these circumstances (D1) and its subject-matter could anticipate the claimed subject-matter.

- VI. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of either his **main request** or of one of his **auxiliary requests** filed during the oral proceedings.
- VII. The respondent requested that the appeal be dismissed.

### Reasons for the Decision

- 1. The appeal is admissible.
- 2. *Amendments*

#### *Main request*

- 2.1 Claim 1 of the **main request** does not contain the **essential feature** of originally filed claim 1, namely "air flow means for directing a flow of air...so as to dislodge a portion of said sand from said casting", see also EP-A1-0 546 210, column 3, lines 11 to 14, column 18, lines 1 to 3 and column 19, line 57, to column 20, line 2. These findings are furthermore supported by the originally filed documents according to EP-A1-0 546 210, column 7, lines 14 to 30, column 12, lines 31 to 46 in combination with Figures 2 and 3 which make clear that both heat **and** airflow

within the furnace contribute to burn off the binder and to loosen and dislodge the sand from the casting.

- 2.2 Appellant's evidence in form of (D21-P) and (D22-P), statements of Ingvar L. Svensson and Ken P. Harris, respectively, do not take into account that the originally disclosed documents themselves clearly point to, and teach the synergistic effect of a heat **and** airflow application with respect to the burning of the binder and the loosening/dislodging of sand from the casting. Therefore expert opinions cannot serve as evidence that the air flow means could be deleted from the independent claims without contravening the requirements of Articles 123(2) and 100(c) EPC.
- 2.3 Since the **main request** has to be seen as a whole it had to be rejected under Article 100(c) EPC.

*First auxiliary request*

3. In claims 1 and 19 air flow means are contained without, however, making it unambiguously clear that they are a must for dislodging sand from the casting. Since the dislodging effect supported not only by heat, but also by air flow means is an essential teaching for a skilled person reading the originally filed documents it could not be deleted from the independent apparatus and method claims.

Summarising the above considerations the **first auxiliary request** does not meet the requirements of Articles 123(2) and 100(c) EPC and is likewise not allowable since an essential feature originally disclosed is missing, namely the feature of air flow means.

*Second auxiliary request*

4. Claims 1 and 19 as the independent claims of the **second auxiliary request** are restricted to air flow means and to their effect of dislodging a portion of the sand from a casting. Claims 1 and 19 also contain the feature that the retaining means are in "heat and gaseous communication with the furnace" so that all requirements for achieving a complete combustion of the sand's binder are met.

Since the feature of air flow means always was part of the patent specification - see Figures 2, 3, 5 and 6 and its related description, for instance see EP-B1-0 546 210, column 6, lines 46 to 59, column 10, lines 47 to 57, and column 11, lines 33 to 47, it could be reintroduced to the independent apparatus/method claims without contravening the requirements of the EPC.

Summarising, the **second auxiliary request** is not open to objections under Articles 123(2) and 100(c) EPC and since the reintroduction of the air flow feature does not extend the scope of protection sought the requirements of Articles 123(3) EPC are also met.

5. *Novelty*

- 5.1 The crucial issue in this respect is the alleged prior use in form of a single purchase of a production line from the appellant to Teksid producing castings for Ford. The respondent argued that a purchaser of a production line worth millions of dollars never accepted any restrictions in form of agreements with respect to confidentiality. Whether there existed a security wall surrounding the production line installed on Ford's site or not according to the respondent is no indication that the production line and its interesting constituents should be kept secret and confidential. The respondent furthermore rejected appellant's

argument that even Ford had an interest to keep economic advantages achieved by appellant's new technology used in the production line secret.

5.2 With respect to the issue of public availability of the production line sold by the appellant to Teksid the board does not rely on arguments such as real life approach, general practice in industry...as done by the respondent, rather on proven facts for instance by written and sworn statements of parties involved in the purchase of the production line, namely by Giovanni Barbero, Production Director at Teksid, see (D20) and (D25).

5.3 From (D20) and (D25) it can clearly be seen that **Teksid** (not Ford) was the purchaser of the production line delivered by appellant's company. Under these circumstances it is **believable** that the appellant (CEC) and Teksid arranged secrecy arrangements even against Ford which company was the receiver of the castings produced by Teksid. (D20) and (D25), see remarks 5.1, 5.2 and 5.3, define the circumstances under which the production line was dealt with by stating that CEC and Teksid were involved in a "testing and development cooperation" "working together to manufacture a common product for the benefit of Ford Motor Company", see remark 5.3 of (D20/D25). It is believable for the board that the new technology used in the purchased production line, namely completely burning the sand's binder and immediately reclaiming/reusing the remaining sand for further castings in combination with heat treating the castings should be kept confidential/secret since it was still under investigation.

5.4 Even Ford's position to accept to be excluded from details as to structural elements (retaining means...) of the production line and to be satisfied to obtain

high quality and low priced castings without knowing every step of their production cycle is followed by the board and is considered to be entirely consistent with the evidence filed.

Under these circumstances (D20) and (D25) have to be accepted as a clear support that a purchase of a production line has been carried out **without**, however, being **publicly available** for instance to Ford.

(D20/D25) are clearly defining the circumstances of the issue of confidentiality so that it is irrelevant that no time-limit is given for the agreement and that the date of signature of the agreement is not derivable therefrom.

In this context it has to be underlined that the respondent did not produce a statement from Ford informing the board that the production line **was not confidential**.

5.5 Summarising, the above considerations lead to the findings that the purchase of a production line to Teksid cannot be seen as prior art within the meaning of Article 54 EPC so that it is not novelty destroying prior art and need not be considered in the following.

5.6 The respondent argued that claim 1 of the **second auxiliary request** is anticipated for instance by (D1) since the **retaining means** of claim 1 are not specified in detail so that any **conveying means** - roller tables, moving bars, belts - would function as retaining means and destroy novelty of the subject-matter of claim 1.

5.7 It has to be observed that claim 1 of the **second auxiliary request** is based on a **two-step combustion** of the sand's binder, the **second step** being carried out on the **retaining means**, see features in the characterising clause "**further comprising** retaining means..." and

"substantially promoting **further combustion** of the portions of the sand core..." (stress added).

A **two-step combustion** of the sand's binder is clearly not derivable from (D1) so that respondent's argument that a **conveying means** as in (D1) is equivalent to the claimed retaining means is not to be followed for the above reasons. The novelty-objection is therefore not substantiated, Article 54 EPC.

5.8 Claim 1 of the **second auxiliary request** being based on a completely new concept, namely applying a first and a **further stage of combustion**, can clearly be worded in general terms, see "retaining means for...promoting further combustion" without being unclear or speculative since (D1) is not based on a concept to **temporarily keep clumps of sand** loosened from the cavity of any casting on means for carrying out further combustion.

5.9 With respect to (D1) and its closely related (D2) and (D3) it is observed that they are not novelty destroying with respect to the subject-matter of claims 1 and 19 of the **second auxiliary request**, Articles 54 and 100(a) EPC.

6. *Inventive step*

6.1 The claimed subject-matter being novel the crucial issue to be decided is inventive step. For the reasons set out in above remarks 5.6 to 5.8 the nearest prior art (D1) is restricted to a **one-step** combustion of the sand's binder, see the baskets "1" being conveyed on a roller table "5" through a furnace "3". It is obvious that any loosened sand clumps can fall through the rolls of the roller table into the troughs "10" where no further combustion is possible.

- 6.2 The object of the invention is therefore to provide an improved method and apparatus for heat treating metal castings as set out in EP-B1-0 546 210, see column 3, lines 43 to 45.
- 6.3 The solution to the above problem is laid down in claims 1 and 19 of the **second auxiliary request** in that provisions are made that a more complete combustion of the sand's binder is achieved, namely by further providing - below the known conveying means - retaining means for **temporarily keeping clumps of sand** falling out of the cavity of the casting on them to substantially promote further combustion of the binder. Thereafter the sand is free of binder and can **immediately be reused** so that no additional sand treatment is necessary.
- 6.4 From (D1) to (D3), see above remarks 5.6 to 5.8, no retaining means can be seen so that the claimed subject-matter is the result of an inventive endeavour of a skilled person starting from (D1) and being confronted with the above object to be solved. Respondent's findings that the prior art would render obvious the claimed invention has to be rejected since it is an argumentation knowing the claimed invention i.e. an *ex post facto* analysis.
- 6.5 Summarising, the subject-matter of claim 1 (apparatus) and of claim 19 (method) is inventive so that these claims are valid, Articles 56 and 100(a) EPC.
- 6.6 This is also true for the dependent claims 2 to 18 and 20 to 32 which relate to embodiments of valid claims 1 and 19 so that they are likewise valid.

**Order**

**For these reasons it is decided:**

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to grant a patent with the following documents:

**Claims:** 1, 7, 12, 17, 18, 19, 20, 21, 23, 27 to 30, as filed during the oral proceedings as the second auxiliary request, together with claims 2 to 6, 8 to 11, 13 to 16, 22, 24 to 26, 31 to 32 as granted.

**Description:** columns 3 and 4 filed during the oral proceedings, together with columns 1 to 2, 5 to 17 as granted.

**Drawings:** 1 to 6 as granted.

The Registrar:

The Chairman:

A. Counillon

C. T. Wilson