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D E C I S I O N
of 15 December 2004

Case Number: T 0317/02 - 3.2.5

Application Number: 96105339.4

Publication Number: 0736367

IPC: B29C 49/64

Language of the proceedings: EN

Title of invention:

Preconditioning preforms on a reheat blow molding system

Patentee:

HUSKY INJECTION MOLDING SYSTEMS LTD.

Opponent:

SIG Corpoplast GmbH & Co. KG

Headword:

-

Relevant legal provisions:

EPC Art. 56, 123(2)(3)

EPC R. 57a

Keyword:

"Inventive step (yes)"

"Allowability of amendments (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0317/02 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 15 December 2004

Appellant: HUSKY INJECTION MOLDING SYSTEMS LTD.
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Representative: Dearling, Bruce Clive
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Respondent: SIG Corpoplast GmbH & Co. KG
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Representative: Klickow, Hans-Henning, Dr.-Ing.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 25 January 2002
revoking European patent No. 0736367 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: W. Moser
Members: P. E. Michel
H. M. Schram

Summary of Facts and Submissions

I. The appellant (patentee) lodged an appeal against the decision of the Opposition Division revoking European Patent No. 0 736 367.

The Opposition Division held that the subject-matter of the independent claims of a main request and an auxiliary request of the appellant lacked novelty, so that neither the main request nor the auxiliary request was allowable.

II. Oral proceedings were held before the Board of Appeal on 15 December 2004.

III. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 18 presented during oral proceedings.

The respondent (opponent) requested that the appeal be dismissed.

IV. The following documents are referred to in the present decision:

E1: "Tätigkeitsbericht 1989", Fraunhofer-Gesellschaft, pages 178 to 181

E2: "Corpoplast FA Automatisierungsbaustein für die PET-Flaschenproduktion", Krupp Corpoplast

E6: EP-A-0 266 804

E9: US-A-5,322,651

E10: US-A-4,025,294

E11: DE-A-42 12 248

V. Claims 1 and 12 of the sole request of the appellant read as follows:

"1. A preconditioning system for preconditioning preforms (24, 124) prior to reheating said preforms (24, 124) in a reheat oven (18, 118) having heating elements arranged to condition the preforms for a subsequent blow molding operation, the preconditioning system comprising:

a temperature preconditioning section (16, 116) having an area (12, 112) for receiving finished preforms (24, 124), the temperature preconditioning section (16, 116) being separate from and upstream of the reheat oven (18, 118);

means for moving said preforms (24, 124) from said area (12, 112) through said temperature preconditioning section (16, 116) to the reheat oven (18, 118) and on to the blow molding operation such that, in use, preconditioned preforms (24, 124) from the temperature preconditioning section (16, 116) are conveyed by the means for moving into the reheat oven (18, 118) to undergo reheating by the heating elements;

means for uniformly preconditioning the temperature of said preforms (24, 124) in said temperature preconditioning section (16, 116) prior to reheating said preforms (24, 124) in the reheat oven (18, 118), wherein said preconditioning is defined by the heat energy contained by each preform (24, 124) being substantially the same and said heat energy being substantially uniformly distributed throughout each preform (24, 124), the uniformly preconditioning the temperature of said preforms also related to the

temperature variations of the preforms (24, 124) from one to another;

characterized by:

an air handling system (22) coupled between the reheat oven (18, 118) and the temperature preconditioning section (16, 116), the air handling system (22) having means for establishing and regulating air flow between said reheat oven (18, 118) and the temperature preconditioning section (16, 116), the means for establishing and regulating directing, in use, excess heat, arising in said reheat oven (18, 118) from reheating preforms (24, 124), to said temperature preconditioning section (16, 116), the excess heat communicated by air flow into and through the temperature preconditioning section (16, 116) to cause, in use, temperature preconditioning of said preforms (24, 124) in the temperature preconditioning section (16, 116)."

"12. A process of preconditioning preforms (24, 124) in advance of blow molding, the process comprising:

receiving said preforms (24, 124) on a conveying mechanism (14, 114) from a preform source (26, 126);

transporting said preforms (24, 124) on said conveying mechanism from a temperature preconditioning section (16, 116) to a blow molding station (20) via a reheat oven (18) that is separate from the preconditioning section (16, 116), the temperature preconditioning section (16, 116) arranged to precondition said preforms (24, 124) and the reheat oven arranged to reheat preconditioned preforms prior to blow molding the preforms in the blow molding station (20);

preconditioning the temperature of said preforms (24, 124) in said temperature preconditioning section (16, 116) prior to reheating said preforms (24, 124) in the reheat oven (18, 118), wherein said preconditioning is defined by the heat energy contained by each preform (24, 124) being substantially the same and said heat energy being substantially uniformly distributed throughout each preform (24, 124), the uniformly preconditioning the temperature of the preforms is also related to the temperature variations of the preforms (24, 124) from one to another; and

characterized by:

ducting excess heat from the reheat oven (18, 118) through an air handling system (22) arranged to provide fluid communication between the reheat oven (18, 118), where said preforms (24, 124) undergo reheating, and the temperature preconditioning section (16, 116);

regulating, in the air handling system (22), the temperature of air supplied to the temperature preconditioning section (16, 116) through the use of the excess heat obtained from the reheat oven (18, 118);

directing temperature regulated air into the temperature preconditioning section (16, 116) and against said preforms (24, 124) as the preforms are transported through the temperature preconditioning section (16, 116), wherein said air flow causes the heat energy in said preforms (24, 124) to be uniformly distributed upon exiting said temperature preconditioning section (16, 116); and

following preconditioning of preforms in the temperature preconditioning section (16, 116), conveying preconditioned preforms to said reheat oven positioned downstream of the temperature preconditioning section (16, 116), such that the

preconditioned preforms undergo reheating in the reheat oven."

VI. The appellant has argued substantially as follows:

The closest prior art is represented by document E6, which discloses a system having the features of the preamble of claim 1. The problem solved by the characterising features of claim 1 is to improve energy efficiency.

There are a number of alternatives which would occur to the person skilled in the art attempting to solve this problem, such as increasing the amount of insulation, using a fan to increase air circulation and reducing the tunnel volume. The prior art does not, however, suggest the claimed solution.

Document E10 discloses a system in which preforms are overheated in a first stage and then allowed to cool in a second stage. This is a different mode of operation from that of the system of document E6 and of the patent in suit. The teaching thus would not be combined with that of document E6.

Documents E1 and E2 disclose a buffering system to permit an injection moulding machine to operate together with a blow moulding machine.

Document E9 discloses an oven without a preconditioning section. Air is recirculated in the oven in order to avoid damage of the preforms.

The cited prior art thus does not suggest the subject-matter of claim 1. The subject-matter of claim 12 involves an inventive step for the same reasons.

VII. The respondent has argued substantially as follows:

The subject-matter of claim 1 is only distinguished over the disclosure of document E10 by the feature of transporting the preforms to a blow moulding station. The term "temperature preconditioning section" as used in claim 1 of the patent in suit includes within its scope the first heating section of the system of document E10. Heating to a temperature above the blow moulding temperature in the temperature preconditioning section is not excluded by the wording of claim 1. The person skilled in the art seeking to improve the energy efficiency of the system of document E6 would replace the oven by that of document E10 and thereby arrive at the system claimed in claim 1 of the patent in suit without the exercise of inventive ingenuity.

Insofar as the oven of document E10 is not regarded as having a separate temperature preconditioning section and reheat oven, reference is made to document E11, which discloses a system having three separate heaters in separate heating sections.

The combination of documents E6 and E9 also leads to the system claimed in claim 1 of the patent in suit without the exercise of inventive ingenuity. The oven of document E9 includes a preconditioning section and a reheat oven.

In addition, the combination of documents E10 and E11 also leads to the system claimed in claim 1 of the patent in suit without the exercise of inventive ingenuity, document E11 disclosing separate heating sections.

The subject-matter of claim 12 similarly lacks an inventive step, document E6 disclosing all the features of the preamble of the claim and document E10 disclosing all the features of the characterising portion of the claim.

Reasons for the Decision

1. *Amendments*

Claim 1 is amended as compared with claim 1 as granted by the introduction of features of the air handling system which are disclosed in the application as filed (published version), in particular at column 7, line 43 to column 9, line 3. The corresponding features in process claim 12, which corresponds to claim 17 as granted, are disclosed in the application as filed (published version) at column 9, line 52 to column 10, line 23.

The amendments restrict the scope of protection conferred and are made in order to overcome the grounds of opposition of Article 100(a) EPC.

The amendments thus comply with the requirements of Article 123(2) and (3) EPC as well as Rule 57a EPC. This was not disputed by the respondent.

2. *Inventive step*

The closest prior art is represented by document E6. The problem to be solved cannot be regarded as being to ensure uniformity of temperature distribution among the preforms, since this problem is solved by the system known from document E6 and is not addressed by the characterising features of the independent claims. The problem to be solved is accordingly regarded as being to improve the energy efficiency of the system.

This problem is solved by the provision of an air handling system coupled between the reheat oven and the temperature preconditioning section for supplying excess heat from the reheat oven to the temperature preconditioning section, as specified in claim 1.

Documents E1 and E2 are concerned with the provision of a buffer store between an injection moulding machine for producing preforms, which are then subjected to cooling, and a blow moulding machine. Whilst the preforms are supplied from the buffer to a reheat oven forming part of the blow moulding machine, there is no suggestion of an air handling system enabling the utilisation of excess heat from the reheat oven in a temperature preconditioning section.

Document E9 proposes an oven in which at least part of a cooling air flow is recycled, the recycled hot air being mixed with fresh air at ambient temperature in order to attain a desired temperature. There is no mention of a temperature preconditioning section, and there is accordingly no suggestion of an air handling

system enabling the utilisation of excess heat from a reheat oven in a temperature preconditioning section.

Document E10 discloses an oven divided into two sections, exhaust hot air from each of which is discharged into an exhaust chamber, from which air is drawn for recirculation to each of the two sections. In the first section, the preforms are heated to a temperature above the blow moulding temperature, and in the second section, the preforms are allowed to cool to the blow moulding temperature. Such a method is excluded by claim 1 of the patent in suit, which requires that after leaving the preconditioning section, the preforms are reheated in the reheat oven as opposed to being allowed to cool ("means for uniformly preconditioning the temperature of said preforms (24, 124) in said temperature preconditioning section (16, 116) prior to reheating said preforms (24, 124) in the reheat oven (18, 118)").

There is thus no suggestion in document E10 of an air handling system enabling the utilisation of excess heat from the reheat oven in a temperature preconditioning section.

Document E11 relates to a system for reheating preforms comprising three separate heating units. There is no suggestion of an air handling system enabling the utilisation of excess heat from one of the heating units in another heating unit. A combination of this document with document E10 thus also does not contain a suggestion of this feature.

Thus, none of the cited prior art documents suggest to the person skilled in the art that the system of document E6 should be modified by the provision of an air handling system enabling the utilisation of excess heat from the reheat oven in a temperature preconditioning section in order to improve the energy efficiency of the system.

The solution to the above problem as claimed in claim 1 is thus not suggested by the prior art and the subject-matter of claim 1 involves an inventive step.

As regards claim 12, the subject-matter of this claim is distinguished over the disclosure of document E6 by the features of the characterising portion of the claim which specify ducting excess heat from the reheat oven through an air handling system arranged to provide fluid communication between the reheat oven and the temperature preconditioning section.

The subject-matter of this claim is thus directed to the solution to the above problem as claimed in claim 1 but expressed in terms of a process. The subject-matter of claim 12 accordingly involves an inventive step for the same reasons as given above in respect of claim 1.

Claims 2 to 11 and 13 to 18 relate to preferred embodiments of the system according to claim 1 and the process according to claim 12, respectively. The subject-matter of these claims thus similarly involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents:
 - (a) claims 1 to 18 presented during oral proceedings;

 - (b) description: pages 2, 3, insert pages I to IV, and pages 4 to 7, presented during oral proceedings;

 - (c) drawings: Figures 1 to 6 as granted.

The Registrar:

The Chairman:

M. Dainese

W. Moser