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Datasheet for the decision of 24 April 2007

Case Number: T 0831/06 - 3.2.05

Application Number: 98114160.9

Publication Number: 0947304

IPC: B29C 45/72

Language of the proceedings: EN

Title of invention:
Preform post-mold cooling method and apparatus

Patentee:
HUSKY INJECTION MOLDING SYSTEMS LTD.

Opponent:
Netstal-Maschinen AG

Headword:
-

Relevant legal provisions:
EPC Art. 111, 123(2), 123(3)

Keyword:
"Extension beyond the contents of the application as filed: main request - yes; first auxiliary request - no"
"Extension of the scope of protection - no"
"Remittal to the department of the first instance - yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0831/06 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 24 April 2007

Appellant: (Patent Proprietor)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 30 March 2006 revoking European patent No. 0947304 pursuant to Article 102(1) EPC.

Composition of the Board:

Chairman: W. Zellhuber
Members: H. Schram
T. Bokor
W. Widmeier
J. Willems

Summary of Facts and Submissions

I. The appellant (patent proprietor) lodged an appeal against the decision of the Opposition Division dated 30 March 2006 revoking European patent No. 0 947 304 on the grounds that the subject-matter of claims 1 and 8 of the patent as granted and of the appellant's first and second auxiliary requests did not meet the requirements of Article 123(2) EPC.

Opposition was filed against the patent as a whole on the basis of Article 100(a) EPC (lack of novelty, Article 54 EPC, and lack of inventive step, Article 56 EPC) and of Article 100(c) EPC (extension beyond the content of the application as filed, Article 123(2) EPC).

II. Oral proceedings were held before the Board of Appeal on 24 April 2007.

III. The appellant requested that the decision under appeal be set aside and the patent be maintained as granted, as main request. Alternatively, he requested maintenance of the patent on the basis of claims 1 and 8 filed as first auxiliary request, or claims 1 and 8 of the second auxiliary request, or claims 1 and 8 of the third auxiliary request, or claims 1 and 8 of the fourth auxiliary request, all filed with letter of 23 March 2007. In the event that the appeal was successful as regards the issue of added matter (Article 123(2) EPC), that the case be remitted to the first instance for further prosecution.

The respondent (opponent) requested that the appeal be dismissed, or auxiliarily, remittal to the first instance for decision on questions of novelty and inventive step.

IV. The following document was *inter alia* referred to in the appeal proceedings:

D1 19 unnumbered pages (plus front page) of the printed entries "after", "when" and "immediately" in the Oxford English Dictionary on CD-ROM, second edition, Version 3.1, Oxford University Press 2004.

V. Claims 1 and 8 of the appellant's main request (claims as granted) read as follows:

"1. A method of cooling a molded article (48) having a first region (22) at a relatively high heat and an adjacent region at a relatively lower heat, the method comprising:

removing a molded article (48) from a mold comprised from mold halves (16, 18, 32, 36), the molded article (48) removed into a holder (62) of an end-of-arm tool (60) while said molded article retains an amount of heat, the end-of-arm tool operational between a first position between the mold halves (16, 18, 32 36) where the holder (62) receives the molded article (48) and a second position outside of the mold (16, 18, 32 36);

withdrawing the end-of-arm tool from between the mold halves (16, 18, 32, 36) to the second position;

at a time after withdrawal of the end-of-arm tool (60) to the second position, inserting a tip of a

cooling pin (74, 174) into the molded article (48) while the molded article is held within the holder; the method characterized by:

forming an open system in relation to the cooling pin and the molded article, the open system having a passageway allowing venting of gaseous cooling fluid from an interior of the molded article (48) to an ambient environment, the open system formed by positioning the cooling pin relative to an open end of said molded article (48) to define a space between a region of an external surface of the cooling pin and the open end of said molded article (48) adjacent the region of the external surface, wherein the space defines the passageway; and

forcing a gaseous cooling fluid along an internal channel (90) of the cooling pin, the internal channel terminating at the tip (92) that, upon insertion into the molded article (48), is spaced away from the first region (22), the gaseous cooling fluid expelled from the tip (92) mostly in a direction of the first region to accentuate cooling within at least the first region (22), and whereby the gaseous cooling fluid is allowed to flow from the interior of the molded article and via the passageway to vent into the ambient environment and wherein cooperation of the internal channel and the tip, when located within the molded article, focuses the cooling fluid on the first region."

"8. Apparatus for cooling a molded article (48) made in an injection mold formed from mold halves (16, 18, 32 36), the molded article having a first region (22) at a relatively high heat and an adjacent region at a relatively lower heat, the apparatus comprising:

an end-of-arm tool (60) having at least one holder (62), the end-of-arm tool (60) operational, in use, between a first position between the mold halves (16, 18, 32 36) where it receives the molded article (48) into a respective one of the at least one holder (62) and a second position outside of the mold (16, 18, 32 36), the molded article (48) located, in use, into the respective one of the at least one holder (62) at a time when the molded article retains an amount of heat;

a cooling pin (74, 174) on a frame (98) located adjacent the second position, the cooling pin having a tip (92) and the frame arranged (98), in use, to move relative to the end-of-arm tool (60) to cause insertion of the tip of the cooling pin (74, 174) into the molded article (48) after the end-of-arm tool (60) reaches the second position;

characterized in that:

the cooling pin (74, 174) has an internal channel (90) terminating at the tip (92) that, upon insertion into the molded article (48) by relative movement of the frame (98) and the end-of-arm tool (60), is within the molded article but spaced away from the first region (22) and wherein the cooling pin (74, 174), in use, is connectable to a cooling fluid delivery system arranged to force gaseous cooling fluid along the internal channel (90) to cause expulsion of the gaseous cooling fluid from the tip (92) mostly in a direction of the first region to accentuate cooling within at least the first region;

the frame (98) is positioned, during the expulsion of the gaseous cooling fluid from the tip (92), with respect to the end-of-arm tool such as to define, in use, an open system having a passageway allowing venting of gaseous cooling fluid from an interior of

the molded article (48) to an ambient environment; and wherein the apparatus is operational, during the expulsion of gaseous cooling fluid from the tip (92), to distance the frame from the end-of-arm tool (60) and the passageway of the open system is produced by formation of a space between a region of an external surface of the cooling pin (74, 174) and an open end of the molded article both located, in use, within the respective holder and positioned adjacent said region of the external surface of the cooling pin (74, 174)."

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the expression "at a time" has been deleted. In addition, in claims 1 and 8 of the first auxiliary request a comma has been inserted between the reference numerals 32 and 36, where previously there was none.

VI. The appellant argued in writing and at the oral proceedings essentially as follows:

The sole reason for rejecting claim 1 as granted was that the Opposition Division held that the phrase "at a time after" in said claim implied a waiting time between the withdrawal of the end-of-arm tool to the second position and the insertion of a tip of a cooling pin into the molded article, for which there was no basis in the application as filed, in breach of Article 123(2) EPC. However, the correct and normal interpretation of the phrase "at a time after" meant that the subsequent event could not occur before the previous event, nor could it occur instantaneously with the previous event. There was no suggestion in said phrase of any form of delay between the two events. All

this was entirely consistent with the overall teaching of the application as filed, see in particular column 12, line 56, to column 13, line 6, column 15, lines 11 to 14, and column 18, lines 41 to 48 (all references pertain to the published version of the application as filed). The person skilled in the art was expressly taught that the subsequent event could not occur instantaneously after the previous event, because of the necessity of, firstly, moving the cooling pins towards the preforms (see column 14, lines 27 to 57, and Figures 11 (a) to (l)); secondly, mechanically aligning the cooling pins and the preforms (see Figure 9 (a) showing a cooling pin positioned within a preform and spaced from the inner wall of said preform by a small distance); and, thirdly, letting vibrations dampen out (see column 17, lines 32 to 37).

The principal object of the present invention was to reduce the overall cycle time of an injection molding cycle for the production of molded articles (see paragraphs [0010] to [0012] of the application as filed). Whilst the issue of crystallization had to be addressed in an early demolding process (see paragraph [0003]), productivity rather than "producing articles substantially free of any crystallized portion" was the main issue of the invention.

It followed that method claim 1 as granted (main request) did not contravene the requirements of Article 123(2) EPC. This conclusion applied *a fortiori* to apparatus claim 8 of the main request, since that claim used the term "after", for which there was a clear disclosure in the application as filed (see column 15, lines 11 to 14).

In claim 1 of the first auxiliary request the wording of the disputed phrase "at a time after" was replaced by the synonymous term "after", said term being disclosed in column 15, lines 11 to 14. Claims 1 and 8 of the first auxiliary request thus met the requirements of Article 123(2) EPC.

VII. The respondent argued in writing and at the oral proceedings essentially as follows:

According to the application as filed, the problem the invention sought to solve was to provide a method and apparatus for producing better-quality preforms having improved cooling efficiency and a reduced overall cycle time, see paragraphs [0010] to [0012]. In all independent claims of the application as filed it was emphasized that the molded article was free of crystallized portions (cf. *thereby form a molded article which is substantially free of any crystallized portion* (claim 1), *so as to form a molded article substantially free of any crystallized portion* (claim 28), *so as to prevent crystallization at least within said dome portion* (claims 62 and 65)). These requirements implied that the post-mold cooling operation had to take place without delay after opening of the mold. Increasing the productivity was not the principal technical problem to be solved - this was merely a secondary goal: the technical problem was to prevent crystallization in an early demolding operation. The solution to this problem was rapid and aggressive cooling.

According to claim 1 of the main request, the cooling pins were inserted "at a time after withdrawal of the end-of-arm tool (60) to the second position". This claim encompassed a method of cooling a molded article whereby the cooling pins were inserted at an arbitrary point in time after the end-of-arm tool had reached the second position. There was no basis in the application as filed for deliberately waiting to insert the cooling pins. The subject-matter of claim 1 of the main request thus extended beyond the content of the application as filed. The subject-matter of claim 8 of the main request also extended beyond the content of the application as filed, because the term "after" did not preclude the insertion of the cooling pins at an arbitrary point in time after the end-of-arm tool had reached the second position.

Claim 1 of the first auxiliary request contravened the requirements of Article 123 (3) EPC since the expression "at a time after" precluded the insertion of the cooling pins *immediately* after the end-of-arm tool had reached the second position, whereas the term "after" did not.

Reasons for the Decision

1. *Objection of inadmissible extension beyond the content of the application as filed (Article 123(2) EPC)*

1.1 What is in dispute between the parties in these appeal proceedings is whether the temporal relation between the two events defined in the last feature of the preamble of claim 1 and of claim 8 (all requests),

respectively, is disclosed in the application documents as filed. The events described in claim 1 are the following: "*withdrawal of the end-of-arm tool (60) to the second position*" (first event) and "*inserting a tip of a cooling pin (74, 174) into the molded article (48)*" (second event). The corresponding events described in claim 8 are: "*the end-of-arm tool (60) reaches the second position*" (first event), and "*insertion of the tip of the cooling pin (74, 174) into the molded article*" (second event).

1.2 Content of the application as filed

These events are described in the application as filed (published version) in the following passages with respect to Figures 6 and 7 as follows (emphasis added by the Board):

(i) *According to the present invention, the cooling frame 98 can be operated in either a vertical or a horizontal position. In both cases, the frame 98 is movable towards the take-off plate 60* ***when*** *the take-off plate 60 reaches its final out of mold position. Any suitable means known in the art may be used to move the frame 98 so as to advance it at a high speed so that the cooling pins 74 can be* ***immediately*** *introduced inside the molded article.* (column 12, line 56, to column 13, line 6)

(ii) ***After*** *the take-off plate 60 reaches the out of the mold position, the cooling pins 74 are engaged with the molded articles for cooling, especially in the dome area 22 of each article or preform.* (column 15, lines 11 to 14)

With respect to the embodiment shown in Figure 15, which eliminates the need for a separate frame for holding the cooling pins, the following is stated about the two events identified above (emphasis added by the Board):

(iii) ***Immediately after*** *the preforms 98 are retained in the take-off plate 60, the cooling pins 174 attached to the plate 60 are moved forward by the piston BB and the strip 176 and when they reach a certain height which allows ARM "A" to be on top of the preform, they are rotated in axial alignment with the preforms and finally introduced inside the preforms through the retreat of the piston BB.* (column 18, lines 41 to 48)

It may be noted that the expressions "take-off plate" and "(final) out of (the) mold position" in the cited passages correspond to the expressions "end-of-arm tool (60)" and "second position", respectively, cf. paragraph [0024] of the application as filed.

1.3 In the Board's view, the application as filed discloses (cf. passage (iii)) directly and unambiguously that immediately after the take-off plate reaches its final out-of-mold position, the cooling pins are advanced towards the molded article. There is no disclosure of a possible delay between the point in time that the take-off plate reaches its final out-of-mold position and the point in time that the cooling pins are advanced towards the take-off plate. There is no disclosure in the application as filed that the pins should not be inserted as quickly as possible; the out-of-mold

cooling should be fast and aggressive (see paragraphs [0003], [0005], [0010], and [0055] to [0057] of the application as filed). This is also in line with the object expressed in the independent claims of the application as filed, namely to substantially prevent crystallization. As is generally known, any substantial delay of the cooling process would give rise to an increase in crystallization.

1.4 Whilst it makes perfect sense to interpret the term "immediately" in passage (iii) rigorously as meaning "Without any delay or lapse of time; instantly, directly, straightforward; at once" (see document D1 under entry "immediately", point 3), there is a slight inaccuracy in the use of the term "immediately" in the expression "*the cooling pins 74 can be immediately introduced inside the molded article*" (cf. passage (i)) that needs qualification.

The person skilled in the art will appreciate that it takes a finite, i.e. non-zero, amount of time to move the frame 98 from an initial position adjacent to the second position (cf. claim 8 of the main request) towards the second position where the take-off plate retaining the molded article is located. This implies that there is a short "inevitable" delay due to physical constraints (resulting from the laws of physics, operational constraints or the physical inertia of the mechanical system) between the point in time that a cooling pin starts to move towards the molded article and the point in time that the tip of said cooling pin arrives – and is inserted into – the molded article. The expression "inevitable delay" is used here to distinguish the delay resulting from the

time it takes for the cooling pins to advance to, and to be ready to be inserted into the molded article, such time depending *inter alia* on the average speed and the distance to be covered, from any further deliberate delay resulting from, for example, the introduction of a waiting time.

In the Board's view, the expression "*the cooling pins 74 can be immediately introduced inside the molded article*" in passage (i) will be understood by the person skilled in the art as "*the cooling pins 74 can be immediately,* i.e. apart from, or ignoring, the inevitable delay due to physical constraints*, introduced inside the molded article*".

The term "after" is used in passage (ii) to describe the temporal relationship between the events "*the take-off plate 60 reaches the out of the mold position*" and "*the cooling pins 74 are engaged with the molded articles for cooling*". In the context of the disclosure of the application as a whole, this term has to be interpreted more specifically as meaning "immediately after, apart from, or ignoring, the inevitable delay due to physical constraints".

1.5 Consequently, where the term "after" is used to describe the temporal relationship between the events "inserting a tip of a cooling pin into the molded article" and "withdrawing the end-of-arm tool from between the mold halves to the second position outside of the mold", this term has to be interpreted as stated above. A deliberate delay between the two events over and above the inevitable delay due to physical

constraints is not disclosed in the application as filed.

Admittedly, the Oxford English Dictionary on CD-ROM (document D1) defines the word "after" used as an adverb of time *inter alia* as "*subsequently, at a later time; afterwards*" and *inter alia* gives two examples of modern English: "*I never spoke to him after; I was never so treated either before or after*" (see Section A, point 2). However, in the Board's view it is not always possible to come to a correct interpretation of a word or expression used in a claim solely on the basis of a dictionary meaning, if said word or expression can have many different meanings, as the word "after" in document D1 illustrates.

2. *Claim 1 of the main request*

2.1 The appellant has submitted that the expression "at a time after" in the last feature of the preamble of claim 1 of the main request, viz. "*at a time after withdrawal of the end-of-arm tool (60) to the second position, inserting a tip of a cooling pin (74, 174) into the molded article (48) while the molded article is held within the holder*" (henceforth referred to as "the timing feature"), was synonymous with the term "after", and that there was irrefutable evidence in the application as filed that the pins were inserted after withdrawal of the end-of-arm tool to the second position.

The appellant does not dispute that the expression "at a time after" was not used in the application as filed. However, Article 123(2) EPC does not require that

subject-matter is disclosed *verbatim* in the description of the application as filed. Article 123(2) EPC merely stipulates that "*... a European patent may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed*".

2.2 The timing feature defines two events (cf. point 1.1 above). The first event is the "*withdrawal of the end-of-arm tool (60) to the second position*", say at time t_0; the second event is "*inserting a tip of a cooling pin (74, 174) into the molded article (48)*", say at time t_1. The second event is claimed in claim 1 to take place "at a time after" the first event.

The use of the expression "at a time" in front of the term "after" suggests that it was not intended that the timing feature should simply be read or understood as "**after** withdrawal of the end-of-arm tool (60) to the second position, inserting a tip of a cooling pin ...". The Board already concluded (see above) that, in the context of the invention as disclosed in the application as filed, the term "after" means not only "at a later time" but more specifically "immediately after, apart from, or ignoring, the inevitable delay due to physical constraints".

The expression "at a time after" gives a new semantic quality to the timing feature, namely that a deliberate delay, in addition to the inevitable delay due to physical constraints, is encompassed by the claim. This additional deliberate delay, or waiting time, may be zero seconds, but does not need to be zero seconds. The literal wording of the expression "at a time after"

merely defines the temporal order of the two events, viz. $t_1 > t_0$. It does not put a constraint on the lapse of time between the two events, i.e. the time delay $t_1 - t_0$. In the Board's view, claim 1 does not preclude a deliberate delay between the events "the end-of-arm tool reaching the second position" and "inserting a tip of a cooling pin into the molded article".

However, the application as filed discloses that the time delay $t_1 - t_0$ is substantially equal to the inevitable delay due to physical constraints. A deliberate delay or waiting time, over and above the inevitable delay, is not disclosed in the application as filed (see point 1.5 above).

For this reason, the Board has come to the conclusion that claim 1 of the main request contains subject-matter which extends beyond the content of the application as filed, in breach of Article 123(2) EPC.

It should be noted that in contrast to the term "after", the expression "at a time after" is not disclosed in the application as filed. Consequently, in the Board's view it was not possible to interpret the expression "at a time after" as having the meaning of the term "after" as seen in the context of the application documents as a whole and with due regard to its normal or dictionary meaning.

2.3 In paragraph [0017] of the patent as granted, the wording of claim 1 has been reiterated. It follows that the description also extends beyond the content of the application as filed.

2.4 It follows from the above that the appellant's main request is not allowable.

3. *Claims 1 and 8 of the first auxiliary request*

3.1 Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the expression "at a time" has been deleted. Thus, both claim 1 and claim 8 contain the term "after". There is an explicit disclosure of this term employed in the same context, see paragraph [0050] of the application as filed (published version), in particular column 15, lines 11 to 14 (corresponding to passage (ii) reiterated in point 1.3 above).

Claims 1 and 8 of the first auxiliary request therefore do not contain subject-matter which extends beyond the content of the application as filed as per Article 123(2) EPC, provided that the term "after" in claim 1 cannot be interpreted, in the light of the patent specification as a whole, as meaning anything other than the preclusion of a deliberate delay between "the end-of-arm tool reaching the second position" and "inserting a tip of a cooling pin into the molded article" over and above the inevitable delay due to physical constraints. In the context of apparatus claim 8 this means that the apparatus must be capable of causing "*insertion of the tip of the cooling pin (74, 174) into the molded article (48)* immediately, i.e. apart from, or ignoring, the inevitable delay due to physical constraints, *after the end-of-arm tool (60) reaches the second position*".

3.2 The respondent argued that claim 1 of the main request precluded that the event *"inserting a tip of a cooling pin (74, 174) into the molded article (48)*" immediately followed the event "*withdrawal of the end-of-arm tool (60) to the second position*", whereas claim 1 of the first auxiliary request did not, in breach of Article 123(3) EPC.

The correct interpretation of the term "after" in claim 1 of the first auxiliary request, however, is that "after" cannot mean "instantaneously after": there is an inevitable delay between the two events owing to physical constraints. By deleting the expression "at a time", a deliberate delay between "the end-of-arm tool reaching the second position" and "inserting a tip of a cooling pin into the molded article" is now precluded.

It follows that the scope of protection of claim 1 of the first auxiliary request has not been extended with respect to claim 1 of the main request, i.e. claim 1 as granted.

Claim 8 of the first auxiliary request has not been amended with respect to claim 8 of the main request (apart from inserting a comma between the reference numerals 32 and 36, where previously there was none).

Claims 1 and 8 therefore meet the requirements of Article 123(3) EPC.

4. *Second to fourth auxiliary requests*

Since claims 1 and 8 of the first auxiliary request meet the requirements of Article 123(2) and (3) EPC, there is no need to consider the appellant's further auxiliary requests.

5. *Remittal to the department of first instance*

Since the grounds mentioned in Article 100(a) EPC (lack of novelty, Article 54 EPC, and lack of inventive step, Article 56 EPC) were not examined by the Opposition Division, the Board considers it appropriate to make use of its discretionary powers under Article 111(1) EPC and to remit the case to the department of first instance for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution.

The Registrar: The Chairman:

D. Meyfarth W. Zellhuber