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D E C I S I O N
of 17 July 1995

Case Number: T 0251/93 - 3.2.5

Application Number: 84303756.5

Publication Number: 0128722

IPC: B29C 45/17

Language of the proceedings: EN

Title of invention:
Method for supervision of injection molding by use of waveform of internal die pressure

Patentee:
TECHNOPLAS INC.

Opponent:
Gebrüder Bühler AG
Battenfeld GmbH
Machinenfabrik Müller-Weingarten AG

Headword:
-

Relevant legal provisions:
EPC Art. 111(1), 123(2) and (3)
EPC R. 88

Keyword:
"Correction under Rule 88 EPC - allowable"
"Amendments - added subject-matter (no)"
"Amendments - broadening of claim (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0251/93 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 17 July 1995

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office given orally on 1 September 1992 and posted on 11 January 1993 revoking European patent No. 0 128 722 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: C. V. Payraudeau
Members: A. Burkhart
W. D. Weiß

Summary of Facts and Submissions

I. The appellant (proprietor of the patent) lodged an appeal against the decision of the opposition division, by which the European patent No. 0 128 722 had been revoked on the ground that the amended claims according to the main, first and second auxiliary request, respectively, contained subject-matter which extended beyond the content of the application as filed.

II. Oral proceedings were held on 17 July 1995. Respondent III (Opponent III) informed the board by telefax of 14 July 1995 that he would not attend the oral proceedings.

III. The appellant requested that the decision under appeal be set aside, that the correction of two obvious errors, one at page 9, line 29, and one in Figure 4 of the application as filed be allowed under Rule 88 EPC, and that the case be remitted to the first instance for further prosecution on the basis of the amended claim submitted during the oral proceedings.

The requested corrections are the following:

(i) In the flow chart of Figure 4, "$S_I = S_{II} + 1$" should read "$S_I = S_I + 1$", cf. the amended Figure 4 filed with telefax of 10 May 1993.

(ii) On page 9, line 29, the word "deviation" should read "sampling", cf. the amended page 9 filed with telefax of 9 December 1993.

The respondents requested that the appeal be dismissed.

IV. The single claim according to the sole request of the appellant reads as follows (the features of the claim are labelled (a) through (o) by the board for later reference):

(a) "A method for the supervision of injection moulding in which an actual internal passageway pressure of molten resin is continuously detected during an injection moulding process period, said molten resin being injected into a mould (d) through a resin passageway, said method comprising the steps of:

(b) determining, for the entirety of said process period, a reference waveform pattern defined by an optimum internal passageway pressure representing an internal resin pressure under which moulded articles of good quality are produced;

(c) dividing said reference waveform into two process parts consisting of a filling process part (I) in which said internal pressure is rapidly varied and a dwelling process part (II) in which said internal pressure is gradually varied;

(d) dividing said reference waveform into n sampling time intervals;

(e) detecting continuously the actual internal die pressure of molten resin being injected into said mould through said resin passageway by means of a sensor (1) to determine a monitored waveform pattern of the detected actual internal die pressure at each moulding process period;

(f) determining reference pressure values (P_i) at each sampling time (i) in the respective process parts in accordance with said reference waveform pattern;

(g) detecting successively internal passageway resin pressures at each sampling time (i) in the respective process parts (I, II) to obtain detected pressure values (p_i), which resin pressures are actually detected during said injection moulding process period;

(h) setting to zero a sampling count (S_I, S_{II}) for each respective process part (I, II) ($S_I = S_{II} = 0$);

(i) determining successively, at each sampling time, a deviation value ($|\epsilon_i|$) between said detected pressure value (p_i) and said reference pressure value (P_i);

(j) comparing each deviation value ($|\epsilon_i|$) with a predetermined allowable value (E) to determine whether the deviation value ($|\epsilon_i|$) is larger than the allowable value (E);

(k) determining in which process part (I, II) a deviation value ($|\epsilon_i|$) larger than the allowable value (E) occurs;

(l) adding "1" to said sampling count (S_I, S_{II}) for the respective process part (I, II), at every sampling time (i), when the deviation value ($|\epsilon_i|$) exceeds the allowable value (E);

(m) comparing the sampling count (S_I, S_{II}), for each "process part (I, II), with a respective preset criterional value (a_I; a_{II}) to determine an abnormality when the sampling count exceeds the respective criterional value (a_I; a_{II});

(n) delivering a command signal to an output unit (8) when an abnormality is detected as aforesaid, in either process part (I, II); and

(o) displaying said monitored waveform pattern of said detected actual internal die pressure together with said predetermined reference waveform pattern on a display means (7)."

V. The appellant submitted essentially the following:

The new claim was restricted to the embodiment of the invention according to the flow chart of Figure 4. The new claim was based on the description of the supervision method in the patent application as filed (see page 7, line 25, to page 9, line 34), and as such did not contravene the requirements of Article 123(2) EPC. In order to overcome a clarity objection raised by the board, the term "sampling value" was replaced by the term "sampling count" (cf. page 9, line 22, of the application as filed), since the corresponding symbols S_I and S_{II} merely represented numerical values (0, 1, 2, ..) in a register.

The first correction requested under Rule 88 EPC, i.e. to replace "$S_I = S_{II} + 1$" by "$S_I = S_I + 1$" in Figure 4, would follow from page 9, lines 21 to 24. The second correction, i.e to replace "deviation value" by "sampling value" (or, more precisely, by sampling count), would follow from the flow chart of Figure 4, where the sampling counts S_I and S_{II} (and not the

deviation values ($|\epsilon_i|$) are compared with the preset numbers ("criterional values") a_I and a_{II}, respectively.

VI. The respondents submitted that the proposed corrections should not be allowed, since these corrections would entail inadmissible amendments within the meaning of Article 123(2) EPC.

The person skilled in the art would have no reason to question the clear teaching on page 9, lines 28 to 30, viz. "to compare the deviation value described above with criterional values a_I and a_{II}", since this would be a feasible technical possibility. From the phrase on page 7, lines 29 to 30, viz. "the sampled signal representing pressure value P_i" it would be clear that the sampling values S_I and S_{II} represented measured pressure values, rather than the number of times that the deviation value ($|\epsilon_i|$) exceeds the allowable value (E). This view that the sampling values represented measured values would be confirmed by the phrase on page 9, lines 21 to 24, viz. "the count of the value exceeding the allowable value is measured every time renewed by adding 1 to the foregoing sampling value S_I". For these reasons the person skilled in the art would not consider to replace "deviation value" by "sampling value" on page 9, line 29. Similarly, there would not be any indication in the application documents as filed that the flow chart would be incorrect with respect to the block labelled "$S_I = S_{II} + 1$".

Since the requested corrections should not be allowed, the new claim, which was based on these corrections, should not be allowed either.

Reasons for the Decision

1. *Corrections under Rule 88 EPC*

1.1 The appellant requests the correction under Rule 88 EPC of two errors in the description and drawings of the application.

Rule 88, second sentence, EPC requires in such a case that the correction must be obvious in the sense that nothing else would have been intended that what is offered as the correction.

This means that a correction is only admissible if it is evident to a person skilled in the art:

(a) that an error has occured, and

(b) what the correction should be.

1.2 The invention relates to a method for supervising an injection moulding shot.

The person skilled in the art reading the description of the supervision method in the patent application as filed (see page 8, line 29, to page 9, line 34) in conjunction with the flow chart of Figure 4 will readily understand that the supervision method according to the invention works as follows:

In order to determine whether an abnormal moulding shot has occurred, and if so, in which part - the filling part I and/or the dwelling part II - the abnormality has occurred, the detected waveform of actual internal die pressure as a function of time is compared, at n discrete sampling times (i), with a reference waveform,

for which moulded articles of good quality are produced. To this end, two registers, one for each process part, are provided to count the number of times the deviation $|\epsilon_i|$ between the actual die pressure pi and the reference die pressure P_i is larger than a preset allowable value E. From the flow chart of Figure 4, it is clear that when these sampling counts S_I and S_{II} exceed given maximum values a_I and a_{II}, respectively, the respective process part is rated "abnormal", otherwise the shot is rated "normal".

Thus, as a final step of the evaluation process - after the deviation value $|\epsilon_i|$ has been compared, at sampling times i = 1, .. , n, with a preset allowable deviation E - the sampling counts ("values") S_I and S_{II} are compared with the criterional values a_I and a_{II}, respectively.

The sentence on page 9, lines 28 to 30, for which the correction is requested reads (uncorrected) "The judgement for evaluating the result of the moulding shot is formed by comparing the deviation value described above with criterional values a_I and a_{II}".

The person skilled in the art will readily understand that comparing, at this stage of the method, the deviation values $|\epsilon_i|$ with criterional values a_I and a_{II} does not make any technical sense for the following reasons.

As described on page 9, lines 13 to 27 (i.e. before the disputed sentence) every deviation value $|\epsilon_i|$ is compared with a preset value E, and the sampling count S_I or S_{II} is increased every time $|\epsilon_i| > E$, depending on in which part the overshoot occurs. The procedure to compare $|\epsilon_i|$ with E is said to be repeated n times (one for each sampling time). Hence, it would not be rational to compare once again, as a final step of the evaluation

procedure, the deviation value $|\epsilon_i|$ with preset values (this time with a_I and a_{II}). The skilled person will readily understand that the sampling values S_I and S_{II} ("as described above") must be compared with the criterional values a_I and a_{II}, and, by taking recourse to the flow chart of Figure 4, will see this view confirmed.

The person skilled in the art will therefore immediately understand that an error has been made, and, with reference to Figure 4, that the correct sentence must read "The judgement for evaluating the result of the moulding shot is formed by comparing the sampling value (count) described above with criterional values a_I and a_{II}".

1.3 In the description (see page 9, lines 18 to 24) it is stated that, depending on in which part of the moulding shot - the filling part or the dwelling part - an overshoot $|\epsilon_i| > \underline{E}$ occurs, "the count of the value exceeding the allowable value is measured every time renewed by adding 1 to the foregoing sampling value S_I". It follows that the block labelled "$S_I = S_{II} + 1$" in the flow chart of Figure 4 should read "$S_I = S_I + 1$" (analogously to the block "$S_{II} = S_{II} + 1$").

In the view of the Board, the person skilled in the art would immediately recognise that an error has been made in Figure 4 (adding "1" to the "dwelling part" counter S_{II}, when an overshoot occurred in the filling part would not make sense), and what the correction should be.

1.4 The correction of the two obvious errors, one at page 9, line 29, and one in Figure 4 of the application as filed (see Summary of Facts and Submissions, point III), are therefore allowed under Rule 88 EPC.

2. *Admissibility of the new claim with respect to Article 123 EPC*

The subject-matter of the new claim is based on the following passages of the application as originally filed:

Preamble (a):	Page 2, lines 1 to 7; page 6, lines 16 to 25
Step (b):	Page 6, lines 28 to 30; Page 7, lines 22 to 25; Figure 5
Step (c):	Page 8, lines 11 to 17
Step (d):	Page 7, lines 27 to 28
Step (e):	Page 6, lines 22 to 25
Step (f):	Page 7, lines 29 to 34
Step (g):	Page 8, lines 21 to 26
Step (h):	Page 9, line 9; Figure 4
Step (i):	Page 9, lines 9 to 12
Step (j):	Page 9, lines 13 to 15
Step (k):	Page 9, lines 18 to 21
Step (l):	Page 9, lines 21 to 24
Step (m):	Page 9, lines 28 to 30
Step (n):	Page 9, lines 32 to 34
Step (o):	Page 9, line 35 to page 10, line 4.

The term "(sampling) count", used in steps (h), (l) and (m) to denote S_I and S_{II}, is disclosed on page 9, line 22. Since S_I and S_{II} represent merely counters to count the numbers of overshoots (cf. step (j)) as explained by the appellant (see point V.), the term sampling count is more appropriate than the term "sampling value" as previously used.

Consequently, the claim does not contain subject-matter which extends beyond the content of the application as filed.

Furthermore, the steps (f) through (m) of the amended claim restrict the scope of protection of Claim 1 of the patent as granted.

The amendments of the claim therefore do not infringe the provisions of Articles 123(2) and (3) EPC.

3. *Remittal to the first instance*

In the contested decision (see point 5 of the reasons), the opposition division stated: "As the infringement of Article 123(2) EPC gives reason for the revocation of the patent, the argumentation of the opponents relating to lack of inventive step have not yet been taken into account."

In the present case a new claim has been submitted by the appellant, which does not contravene the provisions of Article 123(2) and (3) EPC and which is sufficiently clear to allow a substantive examination.

Accordingly, the Board deems it appropriate to make use of the power conferred upon it by Article 111(1) EPC to remit the case to the opposition division for further prosecution as requested by the appellant.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The request for correction of errors is allowed.

3. The case is remitted to the first instance for further prosecution on the basis of the amended claim submitted during the oral proceedings.

The Registrar:

A. Townend

The Chairman:

C. Payraudeau