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D E C I S I O N
of 18 May 1994

Case Number: T 0738/92 - 3.2.2

Application Number: 89300642.9

Publication Number: 0327240

IPC: C03B 9/40

Language of the proceedings: EN

Title of invention:
Individual section glass forming machine

Applicant:
Emhart Glass Machinery Investments Inc.

Opponent:
-

Headword:
-

Relevant legal norms:
EPC Art. 56

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

Case Number: T 0738/92 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 18 May 1994

Appellant: Emhart Glass Machinery Investments Inc.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 30 March 1992 refusing European patent application No. 89 300 642.9 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: H.J. Seidenschwarz
Members: M.G. Noël
J. van Moer

Summary of Facts and Submissions

I. European patent application No. 89 300 642.9 (publication No. 0 327 240) was refused by a decision of the Examining Division on the ground that its subject-matter did not involve an inventive step having regard to the prior document:

(1) US-A-4 662 923.

II. The single claim under dispute reads as follows:

"An individual section glass forming machine comprising at least one parison mould assembly (10) having

a plunger (20) displaceable from a retracted position to a fully inserted position,

a piston and cylinder device (30, 32) for advancing the plunger from the retracted to the fully inserted position,

a controller for controlling operation of the piston and cylinder device and a pressure setting mechanism for applying a selected pressure to said plunger,

means (50) for sensing the actual position of the plunger through at least the last portion of its displacement, the plunger in its operation advancing to a parison formation point, where the mould cavity is completely full, and then moving with a reduced, constant velocity to the fully inserted position as the formed parison cools,

characterized in that,

the machine comprises computer means (60) for determining when the displacement of the plunger

against time becomes linear to determine the parison formation point and means for reducing the pressure applied to the plunger by a predetermined amount when the computer means determines that the plunger has been displaced to its parison formation point."

III. The Appellant lodged an appeal against this decision, paid the fee and submitted a Statement of Grounds in due time.

It requests that the decision under appeal be set aside and that a patent be granted on the basis of the patent application in the version as refused.

IV. The Appellant argued substantially as follows:

Document (1) suggests neither that the point at which linear movement begins is significant as being the parison formation point nor that the linear movement arises from cooling the glass.

The statement of the Examining Division is based on a misunderstanding of the operation of the plunger mechanism disclosed in document (1). The curve in figure 2 is the predetermined position against time curve which is stored in the computer. It thus represents the desired movement, rather than the actual movement of the plunger, so that the danger exists that with bigger gobs the parison formation point is reached earlier and undesirable seams are formed.

In contrast to that, the concept of the present invention is to monitor the plunger movement for each individual parison formation operation and to arrange

for correction of the applied pressure dependent on the actual time when the parison formation point is reached. Thus, variations in gob and/or mould size can be dealt with by using the parison formation point to control when the plunger pressure should be reduced.

Reasons for the Decision

1. The appeal is admissible.

2. *Interpretation of the claim*

The single claim defines the parison formation point (A) as being the point where the mould cavity is completely full and when the displacement of the plunger against time becomes linear, in accordance with the description, page 5 and figure 2.

More specifically, a gob of molten metal is dropped into the mould cavity as the plunger 20 is in its "intermediate position". This position corresponds to the flat portion shown in figure 2. Then the plunger is advanced from the intermediate to the "operative position" with the plunger controller defining the desired feed pressure P_1 for the pressure setting mechanism (page 4, lines 16 to 20). The "operative position" thus begins at the time the reduced pressure $X\%P_1$ is set, that is from the position of point A. From point A to point B, the glass is cooling, and hence, shrinking, while the plunger slightly moves at a constant speed (segment AB linear) under the reduced pressure. Once arrived in its fully inserted position at point B, the plunger is retracted.

3. *Closest prior art*

Document (1) which belongs to the Appellant represents the closest prior art document. It describes an individual section glass forming machine comprising a parison mould assembly 10 having a plunger 20 displaceable from a retracted position to a fully inserted position, a piston and cylinder device, a controller 70 and a pressure setting mechanism for applying a selected pressure to the plunger (column 7, lines 36 to 45). Hall sensor means 60 are provided for sensing the actual position of the plunger (from column 5, line 66 to column 6, line 6).

With reference to figure 2 of document (1), the plunger moves from an intermediate position (102), where a gob of molten glass is dropped, to an operative position in which the plunger presses the glass against the walls of the mould cavity to fill it up. The portion 104 thus represents the movement of the plunger to its operative position and the portion 106 the dwell period of the plunger in its operative position, during which it moves slightly into the mould cavity (column 7, lines 2 to 23). Therefore, the end of portion 106 represents the fully inserted position of the plunger. Observation of the straight portion 106 in figure 2 clearly shows that the plunger is moving linearly with a reduced, constant, velocity.

Further, the known machine comprises computer means 70 to monitor the output of the Hall sensor 60 and to control the servo-mechanism 58 in response to the signals from the Hall sensor, so that the plunger moves in accordance with a predetermined position against

time curve stored in the computer (column 6, lines 24 to 34 and lines 55 to 60). Since the time of arrival of the plunger at its various position can be controlled (column 2, lines 34 to 35), the computer also controls the starting point of the operative portion 106, in other words when the displacement of the plunger against time becomes linear.

Furthermore, the computer comprises means for reducing the pressure applied to the plunger by a predetermined amount when the computer determines that the plunger has been displaced to the point where the displacement becomes linear. In figure 3, which represents the pressure applied to the plunger against time, this point is identified by the reference 116 and corresponds to the beginning of the operative portion 106 of the linear displacement of the plunger (column 7, lines 36 to 54).

4. *Novelty*

With respect to the teaching of document (1), the claim under consideration

(a) defines the point at which linear movement of the plunger begins, as being the "parison formation point" (A), and

(b) specifies that the linear movement of the plunger arises "as the formed parison cools".

These features are not disclosed *expressis verbis* in document (1) nor in other prior art documents considered during the proceedings. Since the assessment

of novelty requires a strict approach, the subject-matter of the claim is novel within the meaning of Article 54(1) EPC.

5. *Inventive step*

5.1 Starting from document (1), once the gob of molten glass has been dropped onto the top of the plunger in the intermediate position (portion 102), it is evident that it cools. Hence, as the plunger arrives in its operative position in which the glass is pressed against the walls of the mould cavity so as to form a parison, cooling of the parison continues throughout the linear portion 106.

5.2 As seen in point 3 above, in the machine according to document (1) the filling of the cavity is achieved during the displacement of the plunger from the intermediate to the operative position, so that at the beginning of the operative position (portion 106) the cavity is completely full. Since the subsequent displacement of the plunger is linear throughout the portion 106, the parison formation point can also logically be defined as the point at which linear movement of the plunger begins.

It follows that feature (a) is limited to introducing in the claim new terminology to define a feature otherwise suggested by the closest prior art document. For a skilled person such a modification is to be regarded as purely formal and requires no additional technical contribution with respect to what was already known.

5.3 The Appellant's arguments are not relevant. Besides the fact that the technical differences put forward by the Appellant are not claimed, the opinion of the Board is that both control systems operate substantially in the same way in the application and in the prior art document.

According to the application (page 4, second paragraph), the pressure is applied to the plunger by a control valve controlled in its turn by a plunger controller via a pressure setting mechanism (a restrictor operated, for example, by a servo-mechanism). The set pressure is predetermined by the plunger controller whereas the reduced pressure $X\%P_1$ is defined by the computer means 60 in response to the plunger position. However, the description is silent about how said controller and computer means actually work.

In document (1) the position of the plunger is also controlled by the computer 70 via a servo-mechanism 58, in response to the actual values of the plunger position measured by the Hall sensor 60 (column 6, lines 55 to 60). This means that the plunger displacement is monitored for each individual parison formation operation, as is the case in the present application. The actual measured values are then compared with a predetermined plunger position curve stored in the computer so that a controlled value operates the servo-mechanism. This is the very principle of any control system.

Taking account of the functional wordings of the claim in suit and in the absence of more explicit details in

the description regarding the functioning of the computer means and of the plunger controller, it is quite impossible to determine whether the control system according to the present application actually works in a different way from that of document (1) since, according to the application, the pressure setting mechanism is also monitored by predetermined, possibly stored, pressure values from the plunger controller and the computer means. Under these circumstances, the Appellant's arguments based on a presumed distinction of function are not accepted.

5.4 For all the foregoing reasons, the subject-matter of the single claim does not involve an inventive step within the meaning of Article 56 EPC.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani H. Seidenschwarz