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Datasheet for the decision of 9 November 2016

Case Number: T 1904/13 - 3.2.07

Application Number: 98110666.9

Publication Number: 0885851

IPC: C03B23/027, C03B23/025

Language of the proceedings: EN

Title of invention:
Apparatus and method for bending glass sheets

Patent Proprietor:
Pittsburgh Glass Works, LLC

Opponents:
Pilkington Group Limited
SAINT-GOBAIN GLASS FRANCE

Headword:

Relevant legal provisions:
EPC Art. 123(2), 56
RPBA Art. 13(1), 13(3)

Keyword:
Late-filed main request and first auxiliary resquest - admitted (no)
Inventive step - second auxiliary request (no)

Decisions cited:

Catchword:

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Case Number: T 1904/13 - 3.2.07

D E C I S I O N
of Technical Board of Appeal 3.2.07
of 9 November 2016

Appellant I: (Patent Proprietor)	Pittsburgh Glass Works, LLC 30 Isabella Street Suite 500 Pittsburgh, PA 15212 (US)
Representative:	Ring & Weisbrodt Patentanwaltsgesellschaft mbH Hohe Strasse 33 40213 Düsseldorf (DE)
Appellant II: (Opponent 1)	Pilkington Group Limited Prescot Road St. Helens Merseyside WA10 3TT (GB)
Representative:	Pettet, Nicholas Edward Pilkington Group Limited Intellectual Property Pilkington European Technical Centre Hall Lane Lathom Ormskirk, Lancashire L40 5UF (GB)
Appellant III: (Opponent 2)	SAINT-GOBAIN GLASS FRANCE 18, avenue d'Alsace 92400 COURBEVOIE (FR)
Representative:	Saint-Gobain Recherche Département Propriété Industrielle 39 Quai Lucien Lefranc 93300 Aubervilliers (FR)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on**

5 July 2013 concerning maintenance of the European Patent No. 0885851 in amended form.

Composition of the Board:

Chairman	G. Patton
Members:	V. Bevilacqua
	G. Weiss

Summary of Facts and Submissions

I. The first appellant (patentee), second appellant (opponent 1) and third appellant (opponent 2) each lodged appeals against the interlocutory decision maintaining European patent No. 0 885 851 in amended form.

II. The oppositions had been filed against the patent as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step), Article 100(b) EPC (sufficiency of disclosure) and Article 100(c) EPC (allowability of amendments).

III. The opposition division found that the subject-matter of claim 1 of the then auxiliary request III filed during the oral proceedings, corresponding to claim 13 of the patent as granted, met the requirements of the EPC.

IV. The present decision is based on the following documents:

O8: EP 0 448 447 A;
O9: EP 0 640 569 A;
O10: EP 0 705 798 A; and
O12: US 3 281 231 A.

V. All appellants requested, in their statements setting out the grounds of appeal, that the decision under appeal be set aside.

The first appellant additionally requested that, in setting aside the decision under appeal, the patent be maintained on the basis of the main request as filed with its statement setting out the grounds of appeal.

As an auxiliary measure the first appellant also requested that the patent be maintained on the basis of one of auxiliary requests I to V, also filed with the statement setting out the grounds of appeal.

The first appellant then in addition requested reimbursement of the appeal fee, on the basis of a procedural violation allegedly committed by the opposition division.

The second and third appellants requested that the patent be revoked in its entirety.

VI. In the annex to the summons to oral proceedings the board presented its preliminary opinion on these requests of the parties, stating *inter alia* that:

claims 1 and 8 of the main request failed to comply with the requirements of Articles 123(3) EPC;

the subject-matter of claim 13 of the main request lacked inventive step over the content of the disclosure of document O8 taken alone;

none of the auxiliary requests complied with the requirements of Article 123(2) EPC; and

the allegation of procedural violation appeared unfounded.

VII. With letter of 2 November 2016 the first appellant submitted a new main request and replaced all the previous auxiliary requests with new auxiliary requests I to VII.

VIII. Oral proceedings before the board were held on 9 November 2016.

The first appellant requested that the decision under appeal be set aside and that a patent be maintained in amended form on the basis of the main request filed with letter dated and received on 2 November 2016 or on the basis of auxiliary requests I and II submitted at the oral proceedings.

The second and third appellants confirmed their original requests, namely that the decision under appeal be set aside and the patent revoked.

All other initial requests were not maintained by the parties.

The present decision was announced at the end of oral proceedings.

IX. The text of independent **claim 1 according to the main request** reads as follows (amendments with respect to claim 1 of the patent as granted are in bold or strikethrough, emphasis added by the board):

"An apparatus for shaping glass sheet (G), comprising:
a support frame (10);
a**n articulating** ring mold supported on said frame being provided with a shaping rail (20, 24, 26) having a pair of opposed, spaced-apart longitudinally extending center rails (20) and pivotable sections (22) including end rails (26), said pivotable sections (22) provided adjacent ~~and separated from~~ each end of the center rails (20) pivotable relative to said frame between two positions, wherein when the pivotable sections (22) are in an upward position the shaping rail has a sheet

shaping surface (18, 38) that conforms in elevation and outline to a final desired shape of a marginal edge (40) of a glass sheet (G) to be shaped; and at least one auxiliary rail (34) extending along and adjacent to said end rails (26) of said pivotable sections (22), such that the auxiliary rail (34) extends transverse to the longitudinal axis of the center rails (20), wherein said auxiliary rail has a sheet shaping surface (36) generally corresponding to a preliminary shape of a selected portion of said marginal edge of said sheet, said sheet shaping surface (36) being flatter than sheet shaping surface (38) of the adjacent end rail (26), said auxiliary rail (34) being mounted for movement relative to said pivotable section (22) between a raised first position, wherein portions of said sheet shaping surface (36) of said auxiliary rail (34) are above said sheet shaping surface (38) of said end rail (26) such that the auxiliary rail is capable of supporting said selected portion of said marginal edge of said sheet (G) above said end rail (26) and preliminarily shaping said selected portion of said marginal edge, and a lowered second position, wherein said sheet shaping surface (36) of said auxiliary rail (34) is positioned below said sheet shaping surface (38) of said end rail section (26) such that said sheet shaping surface of said end rail is capable of supporting and shaping said selected portion of said marginal edge of said sheet to said final desired shape."

The text of independent **claim 1 according to auxiliary request I** reads as follows (amendments with respect to claim 1 of the main request are in bold, emphasis added by the board):

"An apparatus for shaping glass sheet (G), comprising:

a support frame (10);
an articulating ring mold supported on said frame being provided with a shaping rail (20, 24, 26) having a pair of opposed, spaced-apart longitudinally extending center rails (20) and pivotable sections (22) including end rails (26), said pivotable sections (22) provided adjacent each end of the center rails (20) pivotable relative to said frame **and relative to said center rails (20) around a transversal axis extending parallel to said end rails (26)** between two positions, wherein when the pivotable sections (22) are in an upward position the shaping rail has a sheet shaping surface (18, 38) that conforms in elevation and outline to a final desired shape of a marginal edge (40) of a glass sheet (G) to be shaped; and at least one auxiliary rail (34) extending along and adjacent to said end rails (26) of said pivotable sections (22), such that the auxiliary rail (34) extends transverse to the longitudinal axis of the center rails (20), wherein said auxiliary rail has a sheet shaping surface (36) generally corresponding to a preliminary shape of a selected portion of said marginal edge of said sheet, said sheet shaping surface (36) being flatter than sheet shaping surface (38) of the adjacent end rail (26), said auxiliary rail (34) being mounted for movement relative to said pivotable section (22) between a raised first position, wherein portions of said sheet shaping surface (36) of said auxiliary rail (34) are above said sheet shaping surface (38) of said end rail (26) such that the auxiliary rail is capable of supporting said selected portion of said marginal edge of said sheet (G) above said end rail (26) and preliminarily shaping said selected portion of said marginal edge, and a lowered second position, wherein said sheet shaping surface (36) of said auxiliary rail (34) is positioned below said sheet shaping surface

(38) of said end rail section (26) such that said sheet shaping surface of said end rail is capable of supporting and shaping said selected portion of said marginal edge of said sheet to said final desired shape."

The text of **independent claim 1 of auxiliary request II** reads as follows (amendments with respect to claim 13 of the main request are in bold, emphasis added by the board):

"A method of shaping a glass sheet (G) by gravity sag bending, wherein a shaping ring is provided being a non-articulating ring mold having opposing longitudinally extending rails and opposing transversely extending rails, said rails having an upper shaping surface with an elevational contour generally corresponding to a final desired shape of a portion of the marginal edge (40) of a sheet to be shaped; auxiliary rails (34) each having an upper shaping surface with a straight elevational profile, generally corresponding to a preliminary shape of the selected portion of said marginal edge of the sheet, the auxiliary rails positioned in the first position along **and adjacent** a corresponding transversely extending rail, wherein said upper shaping surface of said auxiliary rails is above said upper shaping surface of said corresponding transversely extending rail; placing said sheet (G) on said ring mold such that at least first selected portions of said marginal edge of said sheet are supported by said upper shaping surface of said auxiliary rails (34) and above said upper shaping surface of said transversely extending rails; heating said sheet (G) to its heat softening temperature such that second portions of said marginal edge of said sheet sag by gravity into contact with

said upper shaping surface of said opposing longitudinally extending rails to impart a generally cylindrical curvature to said sheet and preliminarily shape said sheet; and moving downward said auxiliary rails (34) to a second position, wherein the upper sheet shaping surface of said auxiliary rail is positioned below the sheet shaping surface portion of the adjacent shaping rail section, to deposit said first selected portions of said marginal edge of said sheet onto said transversely extending rails so as to allow said first selected portions of said marginal edge of said sheet to sag into contact with said upper shaping surface of said transversely extending rails and sag to said final desired configuration."

X. Insofar as relevant to the present decision, the first appellant argued substantially as follows:

Admissibility of the main request should be acknowledged, as the amendments contained therein were a direct reaction to the objections contained in the preliminary opinion of the board.

Auxiliary request I should be admitted into the proceedings since it clearly did not contain subject-matter extending beyond the original disclosure. An articulating ring mold where the end sections were pivotable relative to the center rails was clearly derivable from the technical function of the apparatus, which was unambiguously explained in the description and clearly and unambiguously shown in figures 1, 2, 4-6 and 8-11.

Auxiliary request II did not raise issues which could in any way be regarded as new or surprising, as it was based on the patent as maintained by the opposition

division, and the only amendment contained therein was a direct reaction to the preliminary opinion of the board.

Auxiliary request II should therefore be admitted into the proceedings.

Document O10 failed to disclose that the auxiliary rails had an upper surface with a straight elevational profile and that, in the first position, when heating the sheet to its heat softening temperature, second portions of the marginal edge of the sheet sagged by gravity into contact with the upper shaping surface of the opposing longitudinally extending rails to impart a generally cylindrical curvature to said sheet and preliminarily shape said sheet.

Document O10 also failed to disclose that, after lowering, the upper sheet shaping surface of the auxiliary rail was positioned below the sheet shaping surface portion of the adjacent shaping rail section.

The subject-matter of claim 1 of auxiliary request II was therefore novel over the content of the disclosure of document O10.

The subject-matter of claim 1 of auxiliary request II involved an inventive step over the disclosure of document O8 taken in combination with the knowledge of a skilled person.

Document O8 was not a suitable point for discussing inventive step because it related to the problem of limiting counter-bending at the corners of the glass sheet, while the patent in suit addressed the problem

of excessive deformation in the vicinity of the shaping rail.

Document O8 not only failed to disclose that the auxiliary rails had a straight profile but also taught away from that, because it contained a clear indication that some curvature in the transverse direction was mandatory in order to reduce counter-bending.

XI. Insofar as relevant to the present decision, the second and third appellants argued substantially as follows:

Claim 1 of the main request was not clearly allowable as it contained amendments raising new, unforeseen issues related to the knowledge of a skilled person in relation to its compliance with the requirements of Article 123(2) EPC.

The late-filed auxiliary request I was not clearly allowable and should therefore not be admitted into the proceedings.

That was because claim 1 of auxiliary request I clearly contravened the requirements of Article 123(2) EPC, as it extended to apparatuses wherein the pivotable sections rotated in different directions.

Auxiliary request II was based on claim 13 of the main request and therefore referred to a method in which a non-articulating mold was used.

However, method claims based on non-articulating molds had been deleted from previous withdrawn auxiliary requests IV to VII submitted in preparation for oral proceedings (with letter dated 2 November 2016), and so the subject-matter of auxiliary request II, submitted

during oral proceedings, could not be regarded as a convergent development of the case of the first appellant.

Auxiliary request II therefore re-introduced issues related to non-articulating molds which, at the present procedural stage, were of an unforeseen and surprising nature and for that reason should not be admitted into the proceedings.

The subject-matter of claim 1 of auxiliary request II lacked novelty over the content of the disclosure of document O10, and in particular over the embodiment of figures 4-5B.

The subject-matter of claim 1 of auxiliary request II lacked inventive step over the disclosure of document O8 taken in combination with the knowledge of a skilled person.

The only distinguishing feature was that the auxiliary rails had a straight profile.

The technical effect thereof was that the glass sheet initially bent only in a longitudinal direction.

The objective technical problem was how to produce a glass sheet with limited transverse curvature using the known apparatus.

In such a situation, the skilled person would use straight auxiliary rails, because document O8 taught that the curvature of the auxiliary rails had to be less than the requested limited final curvature.

Reasons for the Decision

1. *Admissibility of the main request*

1.1 The first appellant's main request was filed with letter dated 2 November 2016, i.e. after the filing of its reply and after oral proceedings had been arranged. Hence, the board's discretionary power regarding its admission into the proceedings pursuant to Article 13(1) and (3) RPBA applies.

1.2 With respect to previous claims 1 of the set of claims which were withdrawn with letter dated 2 November 2016, claim 1 of the main request has been amended to now refer to "an **articulating** ring mold". This mold is supported on a frame, provided with center rails and pivotable sections. The pivotable sections are provided adjacent each end of the center rails and are pivotable relative to said frame between two positions.

1.3 The first appellant argues that the above-mentioned amendment is a direct reaction to the objections raised by the board in its preliminary opinion and so the main request should be admitted into the proceedings. Further, taking into consideration its well-accepted meaning in the present technical field, the amendment does not contravene Article 123(2) EPC, as there is a basis in the application as originally filed for such an articulating ring mold (see for instance the original figures).

For the first appellant, the expression "articulating ring mold" is well-accepted in the present technical field. It defines a ring mold in which the centre rails are stationary with respect to the frame, and each end of the center rails has a pivotable section adjacent

thereto, said pivotable sections therefore being pivotable not only relative to the frame but also relative to the center rails. This is part of the knowledge of the skilled person in the present technical field, as illustrated for instance by documents O8 (figure 6), O9 (figure 2) and O12 (figure 1). Hence, the skilled person would never construe the expression "articulating ring mold" in any other manner than that disclosed in the application as originally filed and shown in the original figures.

Document O10 (see figure 1) does not disclose an **articulating** ring mold since its center rails (portions 6a and 6b) are **articulated** and pivotable relative to the frame only, i.e. there are no center rails.

1.4 The board cannot follow the first appellant's view for the reasons put forward by the second and third appellants at the oral proceedings that the expression "articulating ring mold" is broad and cannot be seen as restricted to the ring molds disclosed in the documents cited by the first appellant. In fact, the expression merely defines a mold with an articulated portion.

Documents O8, O9 and O12 do not describe the (articulating) molds to which the first appellant refers as something which is generally known, but as their respective inventions, and do not therefore contain any information supporting a particularly restricted definition of what an "articulating mold" is.

The board can find no passage in document O10 on the basis of which the described **articulated** mold (see reference 8, and column 5, line 14) would not be considered by a skilled person as an **articulating** mold.

As a consequence, the position of the first appellant is not supported by the available prior art.

In fact, claim 1 of the main request extends to ring molds in which each end of the center rails has a pivotable section adjacent and integrally connected thereto, said pivotable sections being pivotable, **together with the center rails**, relative to the frame between two positions.

Since such a ring mold is not disclosed in the application as originally filed, claim 1 encompasses embodiments which were neither originally disclosed nor even originally envisaged, contrary to the requirements of Article 123(2) EPC.

The late-filed main request therefore does not overcome the objection which had been raised under Article 123(2) EPC, while at the same time leading to discussion of new issues relating to the definition of the expression "articulating ring mold" and the alleged skilled person's common general knowledge associated therewith at a late stage of the proceedings; so the main request is not admitted into the proceedings pursuant to Article 13(1) RPBA (see Case Law of the Boards of Appeal, 8th edition 2016, IV.E.4.4.2).

2. *Admissibility of auxiliary request I*

2.1 The first appellant's auxiliary request I was filed during the oral proceedings before the board. Hence, the board’s discretionary power regarding its admission into the proceedings pursuant to Article 13(1) and (3) RPBA applies.

2.2 With respect to claim 1 of the main request, claim 1 of auxiliary request I has been further amended to specify that the pivotable sections are pivotable **relative to the center rails around a transversal axis extending parallel to said end rails**.

2.3 The first appellant considers that the second and third appellants should have been prepared for such added features, which in its eyes are clearly and unambiguously disclosed in figures 1, 2, 4-6 and 8-11 of the application as originally filed.

They are also derivable from the technical function of the apparatus as originally disclosed, as unambiguously explained in the description.

These amendments are therefore, still in the eyes of the first appellant, clearly allowable and lead to subject-matter which does not contravene the requirements of Article 123(2) EPC. Auxiliary request I should therefore be admitted into the proceedings.

2.4 The board cannot follow the first appellant's view for the following reasons put forward by the second and third appellants during the oral proceedings.

The general, introductory portion of the description (see the "Summary of the Invention") does not mention pivotable sections at all.

Pivotable sections are to be found in the originally filed claims (see claim 2) and in the description of the figures, but always without any mention of the **parallelism** between the pivoting axis and the end rails.

Transversal pivoting axes parallel to the end rails can be identified only in originally filed figures 1, 2, 3, 4, 5, 6 and 8, where substantially rectangular structures are shown.

According to the established case law of the boards of appeal (see Case Law of the Boards of Appeal, 8th edition 2016, II.E.1.12.1), drawings can offer a basis for adding features to a claim.

In the present case, however, the introduction of only some of the features of these depicted embodiments, a transversal axis extending parallel to said end rails, raises problems of compliance with the requirements of Article 123(2) EPC since it is originally disclosed only in the case of a rectangular structure. Contrary to the first appellant's view, claim 1 of auxiliary request I also covers non-rectangular structures with, as now claimed, the pivotable sections pivotable around a transversal axis extending parallel to said end rails but not perpendicular to the center rails.

Further, since the end rails are physical parts, they consist of three dimensions. Assuming that each end rail presents a plane perpendicular to the center rails leading to a rectangular structure as shown in the original figures, the transversal axis extending parallel to the end rails in claim 1 is then to be interpreted as being merely parallel to said plane, i.e. not necessarily horizontal, contrary to the original figures.

Hence, claim 1 of auxiliary request I clearly encompasses embodiments which were neither originally disclosed nor even originally envisaged, contrary to the requirements of Article 123(2) EPC.

As a consequence, pursuant to Article 13(1) RPBA, auxiliary request I is not admitted into the proceedings, as it would require complex new issues to be discussed for the first time at a late stage of the proceedings.

3. *Auxiliary request II*

3.1 Admissibility

3.1.1 The second and third appellants contest the admissibility of auxiliary request II, on the ground that it surprisingly re-opens the previously abandoned discussion of non-articulating molds, i.e. it lacks convergence with former requests which had been withdrawn.

3.1.2 The board disagrees.

The subject-matter of auxiliary request II constitutes an amendment to the proprietor's case in the sense of Article 13 RPBA. As such, its admission is subject to the board's discretion.

It is established case law of the boards of appeal (see Case Law of the Boards of Appeal, 8th edition 2016, IV.E.4.4.4) that the admissibility of amendments depends, **among other criteria**, on whether the amended claims converge with or diverge from the subject-matter previously claimed.

The subject-matter of claim 1 of auxiliary request II may be regarded as a limitation of the claim that underlay the opposition division's decision to maintain the patent in amended form (the then auxiliary request

III; see points III and IX above) and that was already central to the discussions in the second and third appellants' statements setting out the grounds of appeal.

Auxiliary request II is therefore a convergent development from the subject-matter of the claim on the basis of which the appeals were filed.

The board also notes that the new subject-matter, when compared with the subject-matter of claim 1 of the patent as maintained by the opposition division, is not particularly complex and does not necessitate adjournment of the oral proceedings.

In view of these considerations the board decides to admit auxiliary request II into the proceedings.

3.2 Novelty over document O10

3.2.1 The third appellant has raised an objection of lack of novelty of the subject-matter of claim 1 of auxiliary request II vis-à-vis document O10 by referring to the embodiment of figures 4-5B.

3.2.2 The board disagrees.

According to this embodiment of document O10, a method of shaping a glass sheet by gravity sag bending is provided (see document O10, from column 6, line 44, to column 7, line 58), wherein a shaping ring (29) is provided being a non-articulating ring mold having opposing longitudinally extending rails and opposing transversely extending rails (see figure 4), said rails having an upper shaping surface with an elevational contour generally corresponding to a final desired

shape of a portion of the marginal edge of a sheet to be shaped;

auxiliary rails (26) each having an upper shaping surface, generally corresponding to a preliminary shape of the selected portion of said marginal edge of the sheet, the auxiliary rails (26, see figures 5A and 5B) positioned in the first position along and adjacent a corresponding transversely extending rail, wherein said upper shaping surface of said auxiliary rails is above said upper shaping surface of said corresponding transversely extending rail (see figures 5A and 5B);

placing said sheet on said ring mold (see column 7, from line 32) such that at least first selected portions of said marginal edge of said sheet are supported by said upper shaping surface of said auxiliary rails (26) and above said upper shaping surface of said transversely extending rails;

heating said sheet to its heat softening temperature such that second portions of said marginal edge of said sheet sag by gravity to impart a curvature to said sheet and preliminarily shape said sheet; and

moving downward (see figure 5B and column 7, lines 34-52) said auxiliary rails (26) to a second position, to deposit said first selected portions of said marginal edge of said sheet onto said transversely extending rails so as to allow said first selected portions of said marginal edge of said sheet to sag into contact with said upper shaping surface of said transversely extending rails and sag to said final desired configuration. In this second position, the auxiliary rail is positioned below the sheet shaping surface portion of the adjacent shaping rail section

since, as put forward by the second and third appellants, the glass sheet is supported by the non-articulating mold providing the final desired configuration (column 7, lines 51-52).

Document O10 fails to explicitly disclose that the auxiliary rails have an upper surface with a straight elevational profile. Figure 4, on which the second and third appellants rely in order to allege that this feature is disclosed, is schematic.

Document O10 also fails to disclose that in the first position, when heating said sheet to its heat softening temperature, second portions of said marginal edge of said sheet sag by gravity into contact with said upper shaping surface of said opposing longitudinally extending rails to impart a generally cylindrical curvature to said sheet and preliminarily shape said sheet.

The subject-matter of claim 1 of auxiliary request II is therefore novel over the content of the disclosure of document O10.

3.3 Lack of inventive step

3.3.1 Document O8 as closest prior art

The first appellant argues that document O8 is not a suitable starting point for discussing inventive step, because this document teaches how to avoid counter-bending (see column 2, lines 20-27: "contre-bombage"), which is something completely different from reducing sag bending, which is the aim of the patent in suit (see column 1, lines 41-42).

The board disagrees: any document that forms part of state of the art under Article 54(2) EPC may be taken into consideration for inventive step purposes, as long as it is a plausible starting point (see Case Law of the Boards of Appeal, 8th edition 2016, I.D.3.4.1).

Only a document which is confidential, or so speculative or obviously defective as to be readily recognised as such by those skilled in the art when trying to reproduce its disclosure, cannot be taken as an appropriate starting point.

The respondents did not, however, provide any reason (and none is apparent to the board) on the basis of which a skilled person would immediately consider O8 to be speculative, unreliable or even confidential, merely because it failed to describe sag bending, but rather addressed counter-bending.

Document O8 is therefore a suitable starting point for discussing inventive step, as it discloses a method of shaping a glass sheet by gravity sag bending, comprising features in common with claim 1 of auxiliary request II (see below) and aims at limiting bending and therefore optical defects (see column 1, lines 33-48).

3.3.2 Document O8 - content of the disclosure

The introductory portion of the description of this document discloses (see column 2, lines 20-27) a method of shaping a glass sheet by gravity sag bending, wherein a shaping ring ("cadre fixe" 1, see figures 1, 3 and 4) is provided being a non-articulating ring mold having opposing longitudinally extending rails ("longerons" 2, 3) and opposing transversely extending rails ("traverses d'extrémités" 4, 5), said rails

having an upper shaping surface with an elevational contour generally corresponding to a **preliminary** desired shape of a portion of the marginal edge of a sheet to be shaped (see figures 3 and 4 and figures 7a to 8c); auxiliary rails ("traverses pivotantes" 12,13) each having an upper shaping surface with an elevational profile, generally corresponding to a **final** desired shape of the selected portion of said marginal edge of the sheet, the auxiliary rails (12,13) positioned in the first position (shown in figures 3, 7a and 8a) along and adjacent a corresponding transversely extending rail (3,4), wherein said upper shaping surface of said auxiliary rails (12,13) is **below** said upper shaping surface of said corresponding transversely extending rail (4,5); placing said sheet ("feuille de verre" 60) on said ring mold such that at least first selected portions of said marginal edge of said sheet (see the areas 61 and 63 depicted in figures 7a-8c) are supported by said upper shaping surface of said **transversely extending** rails (4,5) and above said upper shaping surface of said **auxiliary rails**; heating said sheet (60, see column 7, line 25) to its heat softening temperature such that second portions of said marginal edge of said sheet sag by gravity into contact with said upper shaping surface of said opposing longitudinally extending rails to impart a generally cylindrical curvature to said sheet and preliminarily shape said sheet (column 7, lines 25-33); and moving **upward** said auxiliary rails (13, 14) to a second position (the position shown in figures 7c and 8c), wherein the upper sheet shaping surface of said auxiliary rail is positioned **above** the sheet shaping surface portion of the adjacent shaping rail section, to **raise** said first selected portions of said marginal edge of said sheet from said transversely extending rails so as to allow said first selected portions of

said marginal edge of said sheet to **further deform** into contact with said upper shaping surface of said **auxiliary rails** into said final desired configuration.

Document O8 also discloses a further embodiment, **derived from this one** ("une variante"), in which (see column 4, lines 27-32) the auxiliary rails, defining the preliminary shape, are positioned above the transversely extending rails and are lowered, as claimed in claim 13 of the main request, to allow the glass to take the final shape on contacting the non-articulating ring mold.

This corresponds to what is claimed in claim 13 of the main request, where the preliminary shape is defined by the longitudinally extending rails together with the auxiliary rails, and the final desired shape is defined by the longitudinally extending rails together with the transversely extending rails, because the auxiliary rails sink into the second position.

This analysis of document O8 had been provided to the appellants as the board's preliminary opinion in the annex to the summons to oral proceedings. It was not contested by the appellants during the oral proceedings.

3.3.3 Difference

According to the statement at column 3, lines 39-44, the upper surface of the auxiliary rails is **relatively flat** because the angle comprised within its tangent and the horizontal is below 15°.

However, other passages of this document mention the presence of a certain amount of curvature in the profile of the auxiliary rails.

Column 2, lines 40-49, states for example that "the first bending stage producing the shape of a blank consists of bending essentially according to a first curvature generally corresponding to the transverse curvature of the glass sheet, without considerable modification of the **second curvature** then corresponding to the **longitudinal curvature** of the glass sheet, and the second stage consists of finishing the first curvature and making essentially the second curvature." (translation provided by the board and emphasis added). See also column 5, lines 53-55.

Document O8 therefore discloses auxiliary rails whose profiles have a tangent with the horizontal plane comprised within the range from above 0° to below 15°, the limits of the range being excluded.

As 0° is not included in the disclosed range, O8 does not disclose a straight profile of the auxiliary rails.

The board therefore concurs with the appealed decision in the respect that the only difference between the subject-matter of claim 13 and the apparatus disclosed in this particular embodiment of document O8 (column 4, lines 27-32) is that the auxiliary rails have an upper surface with a straight elevational profile.

This has also been acknowledged by the first appellant.

3.3.4 Effect - problem to be solved

From paragraph [26] of the patent in suit it can be inferred that, as long as the glass is supported on the straight auxiliary rails (during bending into the preliminary shape), these edges remain straight. This means that the glass sheet is preliminarily formed mainly about one axis, parallel to the straight edges, and subsequently about a second axis. Consequently, as argued by the first appellant, according to the contested patent, a first curvature is applied longitudinally to the glass sheet, and then a second curvature transversally to the glass sheet, in order to obtain the desired final shape of the glass.

The board therefore concurs with the effect associated with the distinguishing feature and formulated by the second and third appellants, and also mentioned in the appealed decision, that the glass sheet initially bends only in a longitudinal direction.

Based on this effect, the objective technical problem is formulated as: how to produce a glass sheet with limited transverse curvature using the known apparatus.

3.3.5 Discussion of inventive step

The first appellant concurs with the reasons of the appealed decision, where inventive step was acknowledged mainly on the grounds that document O8 (column 2, lines 40-49; claim 2) teaches away from using a straight profile for the auxiliary rail, because bending first occurs along a transverse direction.

The first appellant sees therein a clear indication that some curvature in the transverse direction is mandatory in order to reduce counter-bending, and argues that the use of a straight profile for the auxiliary rails goes against this teaching and cannot be considered obvious over the content of document O8 alone.

The board disagrees.

The passage of column 2, lines 40-49, merely describes an embodiment ("un des aspects de l'invention") and is not formulated in such a way that a skilled reader would understand that an initial transversal bending was an essential feature of the invention described in the document.

Initial transversal bending is mentioned neither in the previous passage (column 2, lines 28-39), where the invention is described in more general terms, nor in claim 1 of the document.

As a consequence, a skilled reader of document O8 would have no reason to exclude *a priori* a straight profile for the auxiliary rails and would see no hindrance in using this feature, should it be required by the circumstances, such as for instance a specific form of a glass sheet for which no or nearly no transversal curvature is foreseen.

Therefore, the subject-matter of claim 1 of auxiliary request II lacks inventive step over the content of document O8 alone for that very reason.

Further, a straight elevational profile corresponds to a profile having a tangent of 0°. This value, although

not explicitly disclosed in document O8, is covered by the disclosure: "below 15°". However, the effect linked to the range disclosed in document O8, namely limiting the curvature of the edge, corresponds to the effect associated with this feature in the description of the patent in suit (achieving straight edges without curvature).

Therefore, the skilled person, faced with the above-mentioned problem of limiting transverse curvature, would immediately think of lowering the curvature of the auxiliary rails as much as possible when carrying out the teaching of document O8, within its disclosure, i.e. down to the lower limit of the disclosed range for the curvature. By doing so, he would arrive at the claimed solution of applying a straight elevational profile to the upper shaping surface of the auxiliary rails, without the need to exercise any inventive activity.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

3. The appeal of the first appellant is dismissed.

The Registrar: The Chairman:

G. Nachtigall G. Patton

Decision electronically authenticated