

12 Documents

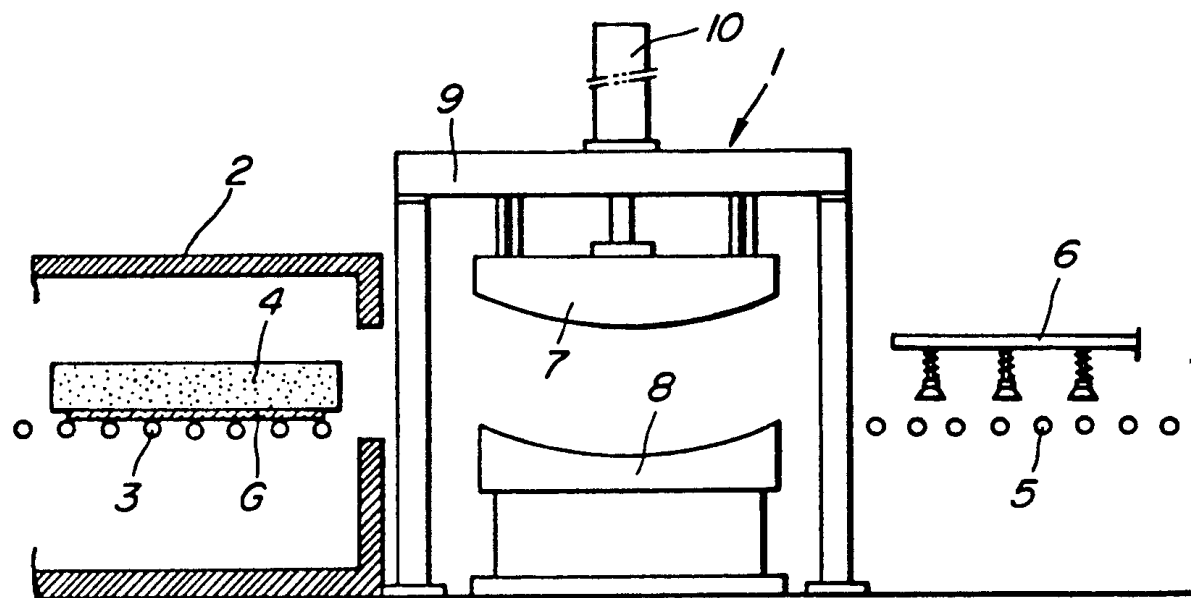
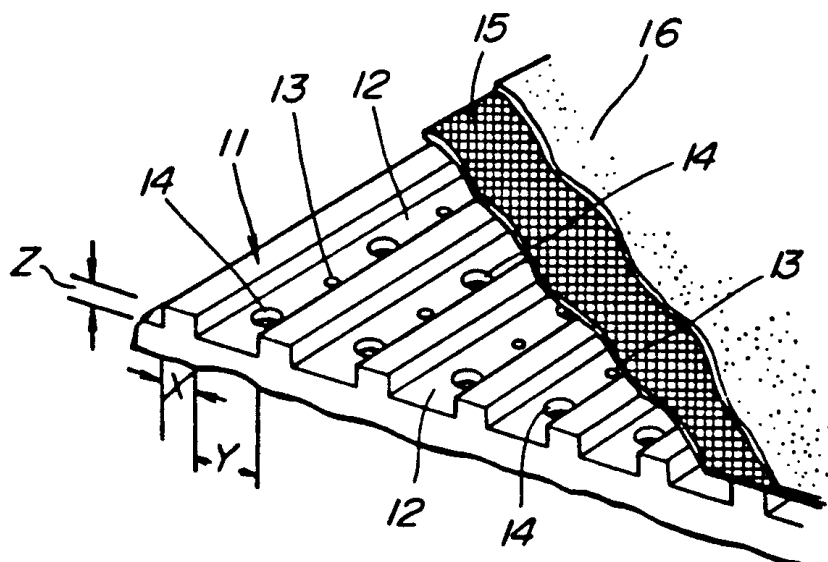
Publication numbers	Title	Current assignees
EP-431895 A2	Method of and apparatus for bending and tempering sheet glass	NIPPON SHEET GLASS
EP3212585 A1	Tool for a glass bending process	SAINT GOBAIN GLASS
EP2463247 A1	Method and device for bending discs	SAINT GOBAIN GLASS
EP1836136 A1	Method for cambering glass sheets by suction	SAINT GOBAIN GLASS
EP-324690 A1	Method and apparatus for bending and tempering glass-sheets	SAINT GOBAIN VITRAGE
EP-830322 A1	Method of bending glass sheets	PILKINGTON GLASS
EP3584224 A1	Apparatus for press forming glass sheets	GLASSTECH
EP2627612 A1	Bending method and thermal tempering support	SAINT GOBAIN GLASS
JP2014051417 A	Supporting ring for glass molding, apparatus for bending molding of glass, and method for bending molding of glass	ASAHI GLASS
EP2794498 A1	Heat-regulating glass bending apparatus and method	SUNPOWER
KR20140085901 A	Apparatus and method for bending glass	CRUCIALTEC
EP-561671 A1	Method and apparatus for bending glass sheets	SAINT GOBAIN VITRAGE, ...

Family 1/12 - FAMPAT - ©Questel

Title

(EP-431895)

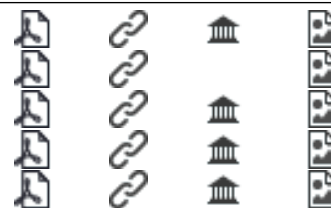
Method of and apparatus for bending and tempering sheet glass

Images**FIG.1****FIG.2****Publication numbers with kind code & date**

JP2766355	B2	1998-06-18	JP2766355
JP1994317	C	1995-11-22	JP1994317
JP7029794	B2	1995-04-05	JP95029794
US5139552	A	1992-08-18	US5139552
EP0431895	A3	1991-08-21	EP-431895
JP03187939	A	1991-08-15	JP03187939



JP03183628	A	1991-08-09	JP03183628
KR910011664	A	1991-08-07	KR19910011664
JP03177326	A	1991-08-01	JP03177326
EP0431895	A2	1991-06-12	EP-431895
CA2041059	A1	1991-06-06	CA2041059



Abstract

(EP0431895)

A glass sheet such as an automobile window glass sheet is bent to shape and tempered at one stage by a sheet glass bending and tempering apparatus. The sheet glass bending and tempering apparatus has solid contact members for pressing a glass sheet, which has been heated nearly to its softening point, to a desired shape and depriving the glass sheet of heat to cool the glass sheet quickly, the solid contact means having a **contact surface** for contacting the glass sheet and depriving the glass heat of heat therethrough. The **contact surface** has a plurality of grooves defined therein, and a plurality of air outlet ports defined in each of the grooves, for applying cooling air to the glass sheet, and a plurality of air inlet ports defined in each of the grooves, for drawing the air applied to the glass sheet. When the opposite surfaces of the glass sheet are pressed by the solid contact members, the pressure is temporarily reduced and then increased again to cool the glass sheet. The peripheral edge of the glass sheet, which requires a high degree of shaping accuracy, is cooled quickly by the solid contact members, and the central region of the glass sheet, which requires high optical properties, is cooled quickly by air jets. <IMAGE>

Inventors

YOSHIZAWA, HIDEO C/O NIPPON SHEET GLASS CO.,LTD.

KASUGAI, TORU C/O NIPPON SHEET GLASS CO., LTD.

Latest standardized assignees - inventors removed

NIPPON SHEET GLASS

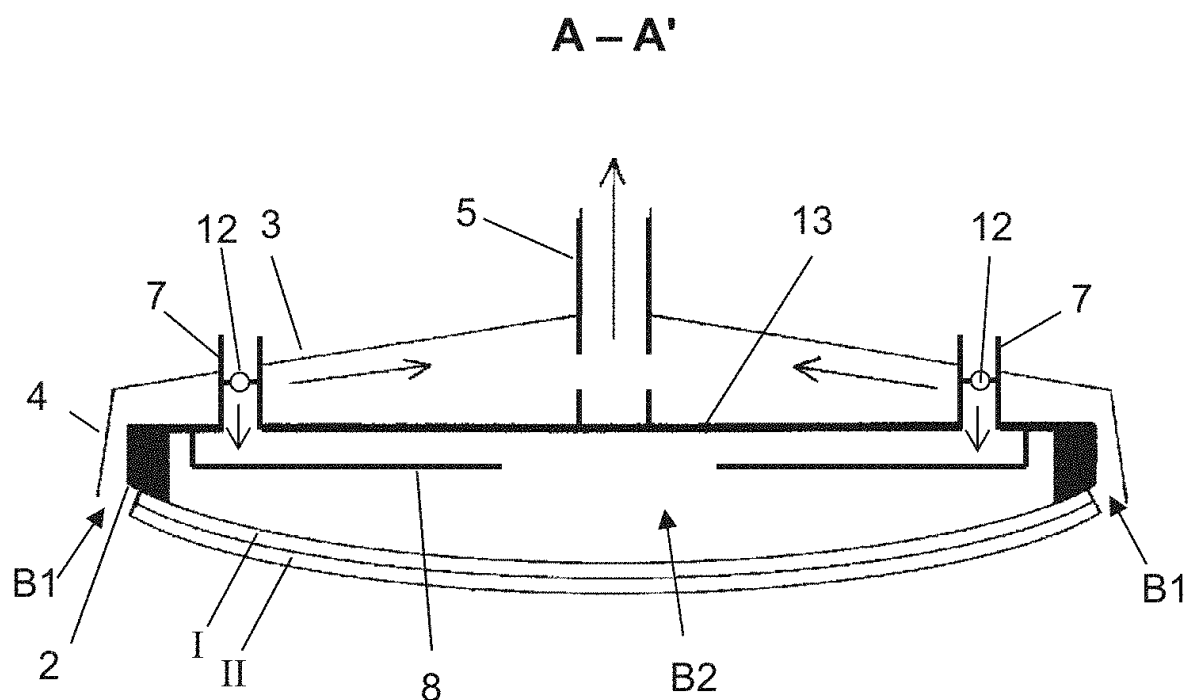
Family 2/12 - FAMPAT - ©Questel

Title

(EP3212585)

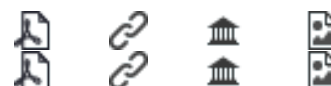
Tool for a glass bending process

Images



Publication numbers with kind code & date

IN336364	B	2020-04-30	IN-336364
US10562803	B2	2020-02-18	US10562803



BR112017001769	A2	2019-11-12	BR112017001769				
BR112017001769	A1	2019-10-22	BR112017001769				
EA032544	B1	2019-06-28	EA--32544				
CN106458686	B	2019-06-18	CN106458686B				
PL3212585	T3	2019-05-31	PL3212585				
ES2713032	T3	2019-05-17	ES2713032				
TR201902286	T4	2019-03-21	TR201902286				
PT3212585	T	2019-03-01	PT3212585T				
CA2956049	C	2019-01-08	CA2956049				
EP3212585	B1	2018-12-26	EP3212585				
KR10-1911654	B1	2018-12-19	KR101911654				
JP6362777	B2	2018-07-25	JP6362777				
JP2017537864	A	2017-12-21	JP2017537864				
EP3212585	A1	2017-09-06	EP3212585				
EA201790260	A1	2017-08-31	EA201790260				
US20170217820	A1	2017-08-03	US20170217820				
MX2017005445	A	2017-06-29	MX2017005445				
KR20170057425	A	2017-05-24	KR20170057425				
IN201737003690	A	2017-05-12	IN201737003690				
CN106458686	A	2017-02-22	CN106458686				
CA2956049	A1	2016-05-06	CA2956049				
WO2016/066309	A1	2016-05-06	WO201666309				

Abstract

(EP3212585)

The invention relates to a tool (1) for holding at least one glass pane (1, 11) by means of a suction effect in a bending process, comprising a frame-like, **convex contact surface** (2) and a cover (3), which has a peripheral air-guiding plate (4) that surrounds the **contact surface** (2) at least in some regions, wherein the tool (1) is suitable for producing a first, reduced pressure (p1) in a first pressure region (B1) between the air-guiding plate (4) and the **contact surface** (2); producing a second pressure (p2) in a second pressure region (B2), which is arranged in a central region inside the **contact surface** (2), wherein the second pressure (p2) is greater than the first pressure (p1).

Inventors

BALDUIN MICHAEL

LE NY JEAN-MARIE

SCHALL GÜNTHER

Latest standardized assignees - inventors removed

SAINT GOBAIN GLASS

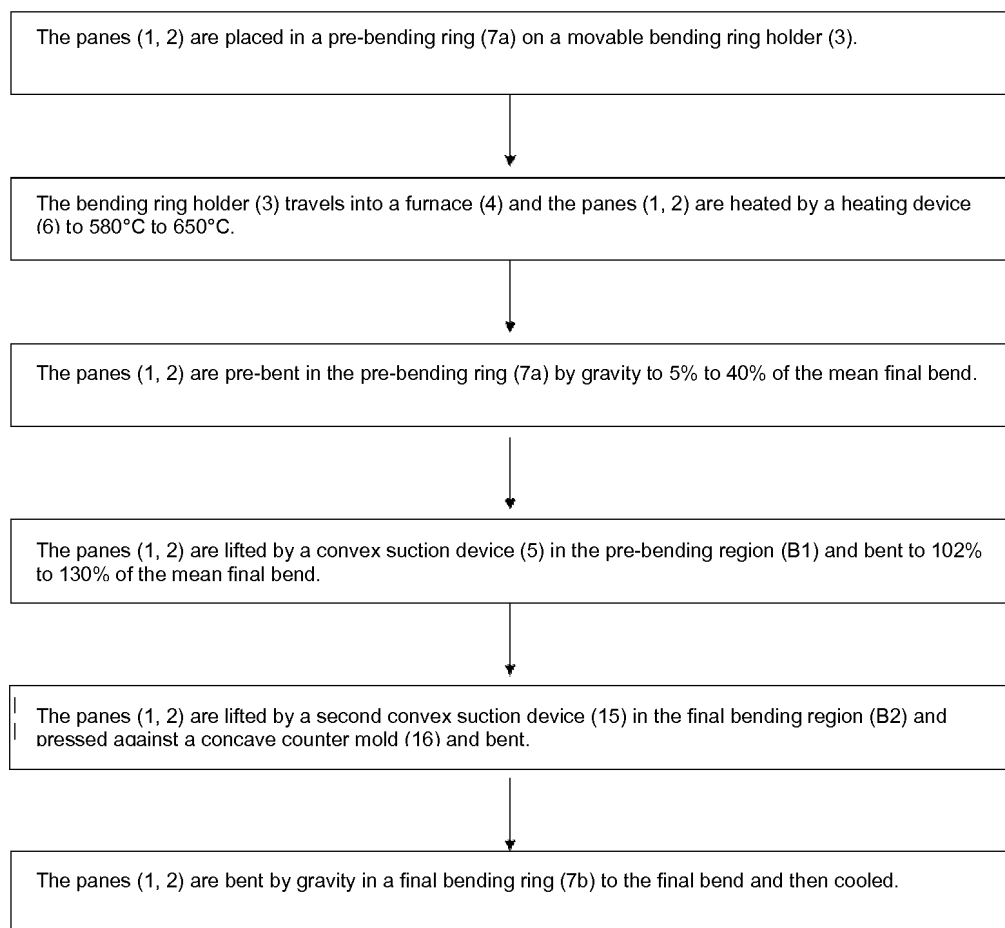
Family 3/12 - FAMPAT - ©Questel

Title

(EP2463247)

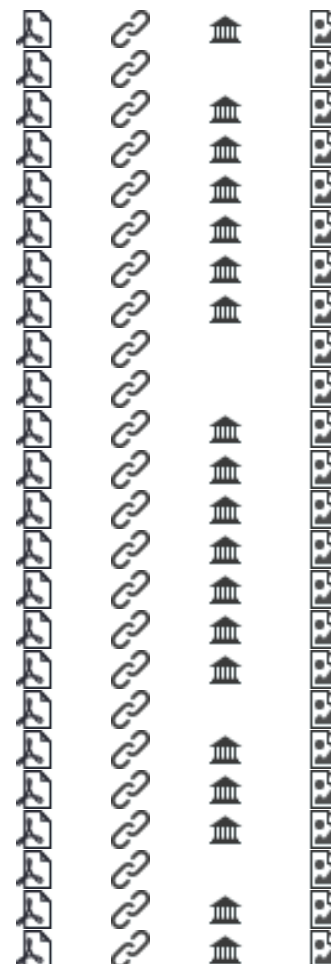
Method and device for bending discs

Images



Publication numbers with kind code & date

EA030887	B1	2018-10-31	EA--30887
PL2651837	T3	2018-07-31	PL2651837
PT2651837	T	2018-04-30	PT2651837T
ES2663722	T3	2018-04-16	ES2663722
EP2651837	B1	2018-01-24	EP2651837
US9650279	B2	2017-05-16	US9650279
BR112013013249	A2	2016-09-13	BR112013013249
CN103237770	B	2016-04-06	CN103237770B
MX337354	B	2016-02-29	MX-337354
KR101553455	B1	2015-09-15	KR101553455
JP5714719	B2	2015-03-20	JP5714719
US8978418	B2	2015-03-17	US8978418
JP2014500222	A	2014-01-09	JP2014500222
BR112013013249	A1	2014-01-07	BR112013013249
US20130340479	A1	2013-12-26	US20130340479
EA201390864	A1	2013-11-29	EA201390864
US20130313852	A1	2013-11-28	US20130313852
KR20130117832	A	2013-10-28	KR20130117832
EP2651837	A1	2013-10-23	EP2651837
IN1663/KOLNP/2013	A	2013-10-11	IN2013KN01663
CN103237770	A	2013-08-07	CN103237770
MX2013006560	A	2013-07-03	MX2013006560
WO2012/080072	A1	2012-06-21	WO201280072
EP2463247	A1	2012-06-13	EP2463247



Abstract

(EP2463247)

The glass sheets (1,2) are placed in a ring (7a) that is on a movable bending ring holder (3), and ring holder is moved to a furnace. The glass sheet is heated to softening temperature and is pre-bent to 5-50% of edge final bend. The glass sheet is raised by a suction device (5) and bent by ring. The minimum distance is maintained between the glass sheet and an air baffle in suction device. The glass sheet is placed in a bending ring (7b) and bent by heat radiation. The glass sheet is raised from bending ring (7b) and pressed in a counter-mold (16), and then cooled. An independent claim is included for device for bending glass sheet.

(From EP2463247 A1)

Inventors

BALDUIN MICHAEL

DUNKMANN BENNO

LE NY JEAN-MARIE

DR SCHMIDT LOTHAR

RADERMACHER HERBERT

Latest standardized assignees - inventors removed

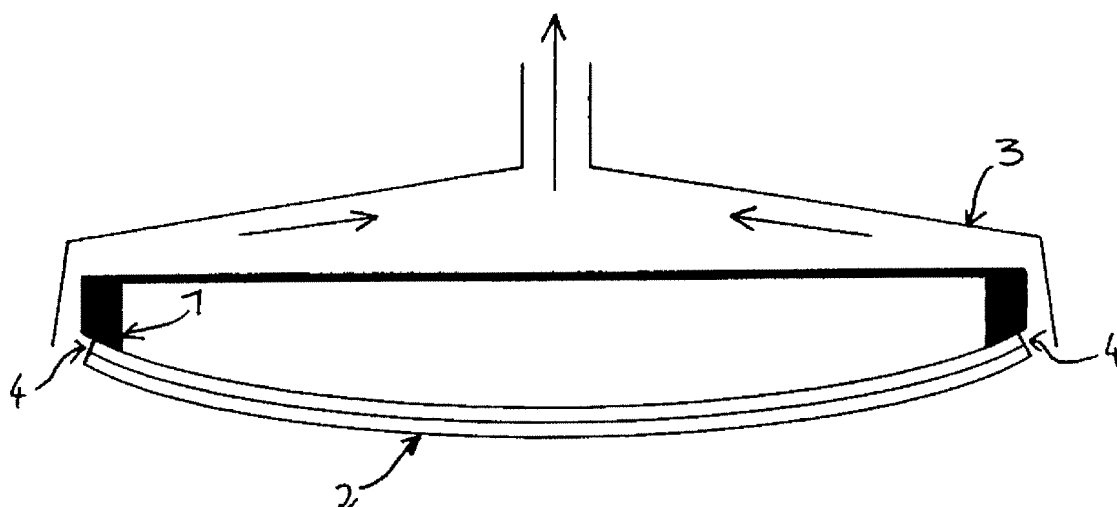
SAINT GOBAIN GLASS

Family 4/12 - FAMPAT - ©Questel

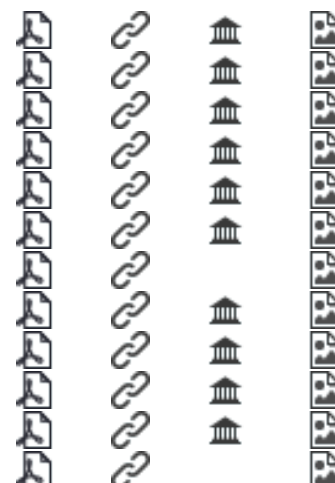
Title

(EP1836136)

Method for cambering glass sheets by suction

Images**Publication numbers with kind code & date**

US9771297	B2	2017-09-26	US9771297
BRPI0519484	B1	2016-11-22	BR200519484
IN273941	B	2016-07-01	IN-273941
US20140230493	A1	2014-08-21	US20140230493
US8746011	B2	2014-06-10	US8746011
JP5339727	B2	2013-08-16	JP5339727
KR101272623	B1	2013-06-07	KR101272623
CN101094817	B	2012-06-27	CN101094817B
US20120055197	A1	2012-03-08	US20120055197
US8109117	B2	2012-02-07	US8109117
ES2365721	T3	2011-10-10	ES2365721
PL1836136	T3	2011-09-30	PL1836136



SI1836136	T1	2011-09-30	SI1836136T				
DE602005027903	D1	2011-06-16	DE602005027903				
AT508098	T	2011-05-15	ATE508098				
EP1836136	B1	2011-05-04	EP1836136				
BRPI0519484	A2	2009-02-03	BR200519484				
ZA200704675	B	2008-08-27	ZA200704675				
JP2008526659	A	2008-07-24	JP2008526659				
EA010208	B1	2008-06-30	EA--10208				
US20080134722	A1	2008-06-12	US20080134722				
EA200701424	A1	2007-12-28	EA200701424				
CN101094817	A	2007-12-26	CN101094817				
EP1836136	A1	2007-09-26	EP1836136				
KR20070088745	A	2007-08-29	KR20070088745				
IN1999/KOLNP/2007	A	2007-08-10	IN2007KN01999				
MX2007007791	A	2007-08-03	MX2007007791				
FR2880343	B1	2007-06-22	FR2880343				
WO2006/072721	A1	2006-07-13	WO200672721				
FR2880343	A1	2006-07-07	FR2880343				

Abstract

(EP1836136)

The invention relates to a method and device for cambering superimposed glass sheets. The inventive method consists in picking up the sheets by a top mould provided with a suction means producing an upwardly directed airflow which passes over the sheet edges, wherein said suction is sufficient for lifting and holding the superimposed sheets by said top mould, in pressing the sheets between the top mould and an entire lower concave mould provided with holes in such a way that the pressing is started when the suction of a previous step is not yet finished or near to be finished, in shaping the superimposed sheets by sucking the main surface of a lower sheet through the holes of a lower concave mould in such a way that the forming by suction is started when the pressing is not yet finished and in cooling the sheets. Said invention makes it possible to produce optical defect-free windscreens

Inventors

BALDUIN MICHAEL

LABROT MICHAEL

OLLFISCH KARL-JOSEF

RADERMACHER HERBERT

SCHALL GUENTHER

Latest standardized assignees - inventors removed

SAINT GOBAIN GLASS

Family 5/12 - FAMPAT - ©Questel

Title

(EP-324690)

Method and apparatus for bending and tempering glass-sheets

Images

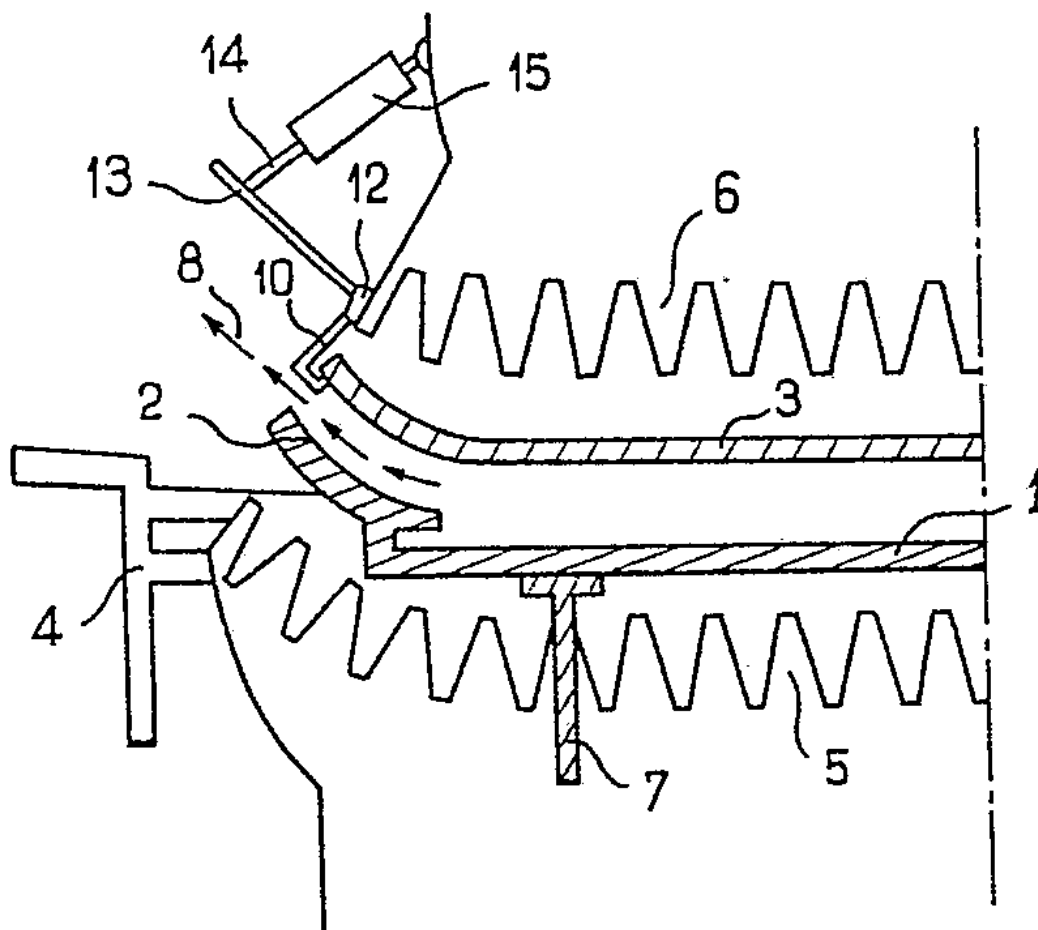
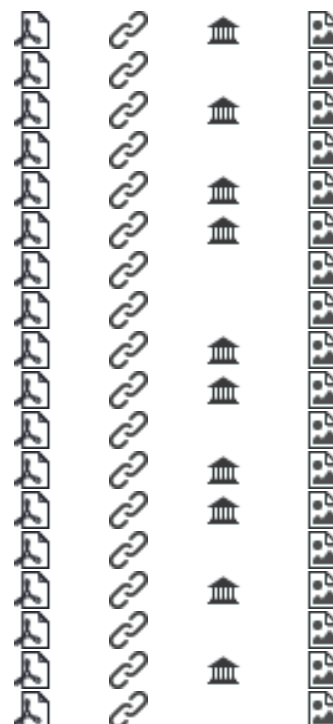


FIG. 3

Publication numbers with kind code & date

JP2636030	B2	1997-07-30	JP2636030
KR960013570	B1	1996-10-09	KR960013570
CA1337239	C	1995-10-10	CA1337239
YU47014	B	1994-11-15	YU--47014
FR2625740	B1	1993-01-29	FR2625740
ES2031365	T3	1992-12-01	ES2031365
FI86709	C	1992-10-12	FI--86709
FI86709	B	1992-06-30	FI--86709
DE68901041	D1	1992-04-30	DE68901041
EP0324690	B1	1992-03-25	EP-324690
YU3689	A	1990-10-31	YU8900036
JPH01308841	A	1989-12-13	JP01308841
BR8900110	A	1989-09-05	BR8900110
KR890011786	A	1989-08-22	KR19890011786
EP0324690	A1	1989-07-19	EP-324690
FI890135	A	1989-07-13	FI8900135
FR2625740	A1	1989-07-13	FR2625740
FI890135	A0	1989-01-11	FI8900135



Abstract

(EP0324690)

Processes for bending/quenching sheets of glass with a view to obtaining motor vehicle glazing. According to the invention the sheet of glass (3) is transferred from the bending cell to the quenching cell on a continuous frame (1, 2) and is then taken over during the quenching by noncontinuous means of prehension (9). <IMAGE>

Inventors

LISSILLOUR, JEAN

PETITCOLLIN, JEAN-MARC

Latest standardized assignees - inventors removed

SAINT GOBAIN VITRAGE

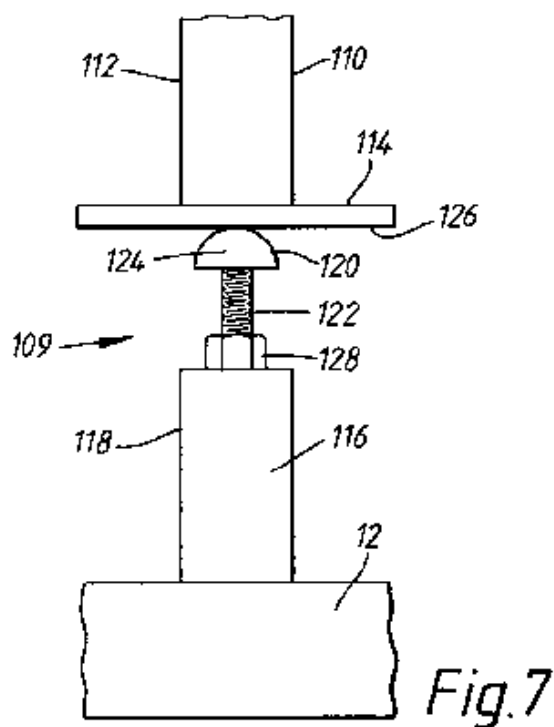
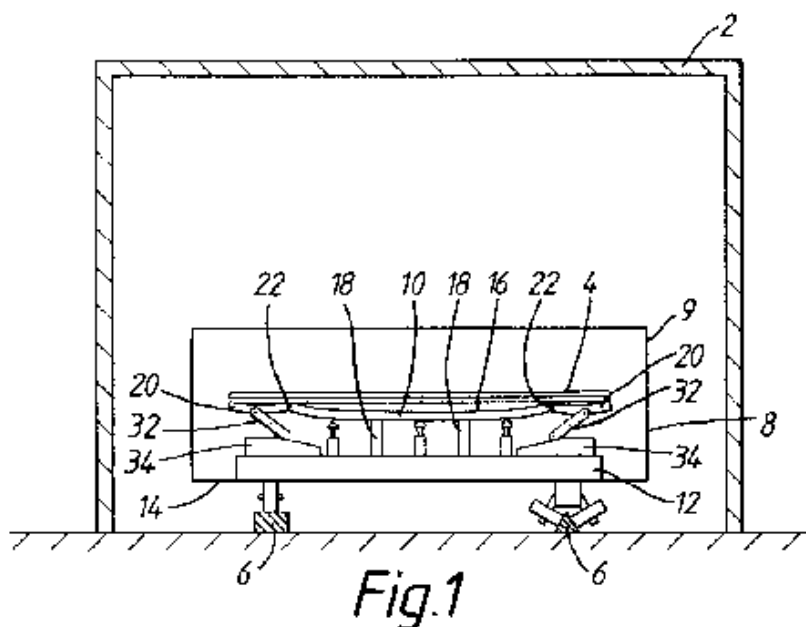
Family 6/12 - FAMPAT - ©Questel

Title

(EP-830322)

Method of bending glass sheets

Images


Publication numbers with kind code & date

IN193075	B	2009-07-24	IN-193075
JP4264132	B2	2009-02-20	JP4264132
CA2222173	C	2006-06-27	CA2222173
CN1144763	C	2004-04-07	CN1144763C
CZ293088	B6	2004-02-18	CZ-293088
KR100355917	B1	2003-01-29	KR100355917
PL182069	B1	2001-10-31	PL-182069
JP2001508386	A	2001-06-26	JP2001508386
TW432022	B	2001-05-01	TW-432022
DE69601267	T2	1999-07-08	DE69601267
BR9609409	A	1999-05-11	BR9609409



ES2127015	T3	1999-04-01	ES2127015				
KR19990022322	A	1999-03-25	KR19990022322				
US5882370	A	1999-03-16	US5882370				
DE69601267	D1	1999-02-11	DE69601267				
AT175173	T	1999-01-15	ATE175173				
PL327996	A1	1999-01-04	PL96327996				
EP0830322	B1	1998-12-30	EP-830322				
CN1187173	A	1998-07-08	CN1187173				
CZ385697	A3	1998-05-13	CZ9703856				
MX9709500	A	1998-03-31	MX9709500				
EP0830322	A1	1998-03-25	EP-830322				
AR002367	A1	1998-03-11	AR---2367				
TR199701523	T1	1998-02-21	TR199701523				
AU5507896	A	1996-12-30	AU9655078				
CA2222173	A1	1996-12-19	CA2222173				
WO96/40594	A1	1996-12-19	WO9640594				
ZA9604450	B	1996-08-29	ZA9604450				
GB9511555	D0	1995-08-02	GB9511555				

Abstract

(EP0830322)

A method of bending glass sheets, the method comprising the steps of gravity bending a glass sheet at elevated temperature on a gravity bending mould in a gravity bending zone of a furnace, press bending the gravity bent glass sheet to a desired shape with an upper mould while the glass sheet is supported by the gravity bending mould as a lower mould in a press bending zone of the furnace and controlling the ambient temperature in the press bending zone thereby to control the cooling rate of the glass sheet in the press bending zone. The invention also provides a method of press bending glass sheets, the method comprising providing an initially bent glass sheet carried on an articulated gravity bending mould and press bending the glass sheet to a final bent shape by an upper press bending mould which is lowered onto the upper surface of the glass sheet, the upper press bending mould having a net weight of from 50 to 150 kg.

Inventors

GARNER JEFFREY

TETLOW IAN

Latest standardized assignees - inventors removed

PILKINGTON GLASS

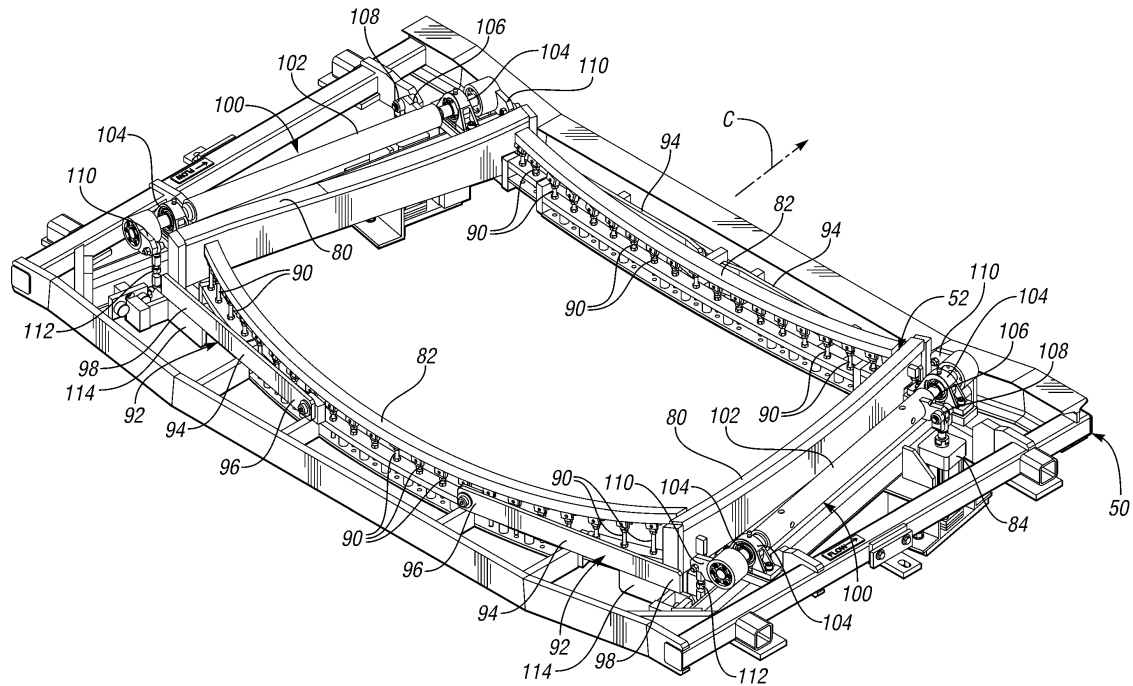
Family 7/12 - FAMPAT - ©Questel

Title

(EP3584224)

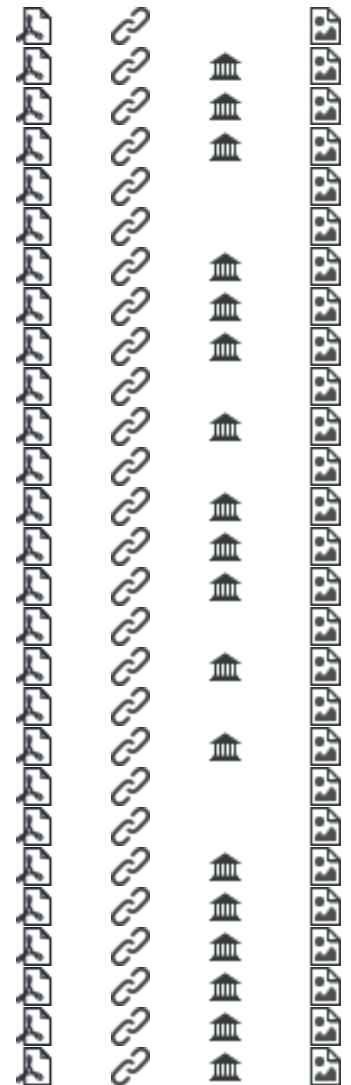
Apparatus for press forming glass sheets

Images



Publication numbers with kind code & date

HUE046650	T2	2020-03-30	HUE046650
ES2745744	T3	2020-03-03	ES2745744
EP3584224	A1	2019-12-25	EP3584224
BR112012031111	B1	2019-11-26	BR112012031111
PL2580170	T3	2019-10-31	PL2580170
TR201911316	T4	2019-08-21	TR201911316
US10377657	B2	2019-08-13	US10377657
EP2580170	B1	2019-07-17	EP2580170
CA2801529	C	2019-01-08	CA2801529
KR101767708	B1	2017-08-11	KR101767708
EP2580170	A4	2017-04-19	EP2580170
MX345151	B	2017-01-18	MX-345151
US20160168004	A1	2016-06-16	US20160168004
US9296637	B2	2016-03-29	US9296637
JP5850537	B2	2015-12-11	JP5850537
RU2565704	C2	2015-10-20	RU2565704
CN102917990	B	2015-09-30	CN102917990B
RU2012153929	A	2014-07-20	RU2012153929
JP2013534503	A	2013-09-05	JP2013534503
KR20130094282	A	2013-08-23	KR20130094282
MX2012014285	A	2013-04-29	MX2012014285
BR112012031111	A1	2013-04-24	BR112012031111
EP2580170	A1	2013-04-17	EP2580170
CN102917990	A	2013-02-06	CN102917990
CA2801529	A1	2011-12-15	CA2801529
US20110302964	A1	2011-12-15	US20110302964
WO2011/156058	A1	2011-12-15	WO2011156058



Abstract

(EP3584224)

A method, press station (12), and system (10) for forming glass sheets that are initially formed with an upwardly concave curved shape with end portions (86) and an intermediate portion (88) having straight line elements that are subsequently

formed with curved shapes to provide curvature along transverse directions. The forming is performed by initially providing curvature to the straight line elements of the glass sheet end portions while the intermediate portion (88) still has the straight line elements. The glass sheet intermediate portion is subsequently formed to provide curvature to its straight line elements so the glass sheet has curvature in transverse directions.

Inventors

NITSCHKE DAVID B

NITSCHKE DEAN M

ODNEAL MACE L

JINKA ASHOKA G

Latest standardized assignees - inventors removed

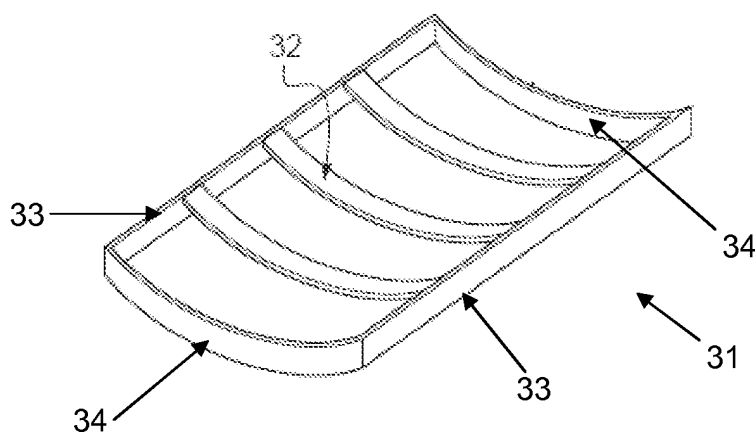
GLASSTECH

Family 8/12 - FAMPAT - ©Questel

Title

(EP2627612)

Bending method and thermal tempering support

Images**Publication numbers with kind code & date**

FR2966147	B1	2016-05-27	FR2966147
EP2627612	A1	2013-08-21	EP2627612
FR2966147	A1	2012-04-20	FR2966147
WO2012/049433	A1	2012-04-19	WO201249433

**Abstract**

(EP2627612)

The invention relates to a method for producing a tempered, bent sheet of glass, comprising bending a flat sheet of glass by pressing it against a solid bending mould, following by tempering the sheet of glass on a tempering support comprising a frame and at least one additional support connected to two points on the frame, the right-hand segment connecting said two points of the frame, passing through the inside of the frame. The invention also relates to a support for the thermal tempering of a sheet of glass, comprising a frame and at least one additional support connected to two points on the frame, the right-hand segment connecting said two points of the frame, passing through the inside of the frame, characterised in that the additional support comprises a **contact surface** for the sheet of glass, and a structural part that is more rigid than the **contact surface** and arranged beneath the **contact surface**, the position of the **contact surface** being adjustable by pressing on the structural part. The invention enables the bending of sheets of glass with a high level of precision, especially for the production of solar mirrors.

Inventors

BOUILLE GUENAE
BORDERIOU ARNAUD
GRILO DUARTE
MAURER MARC

Latest standardized assignees - inventors removed

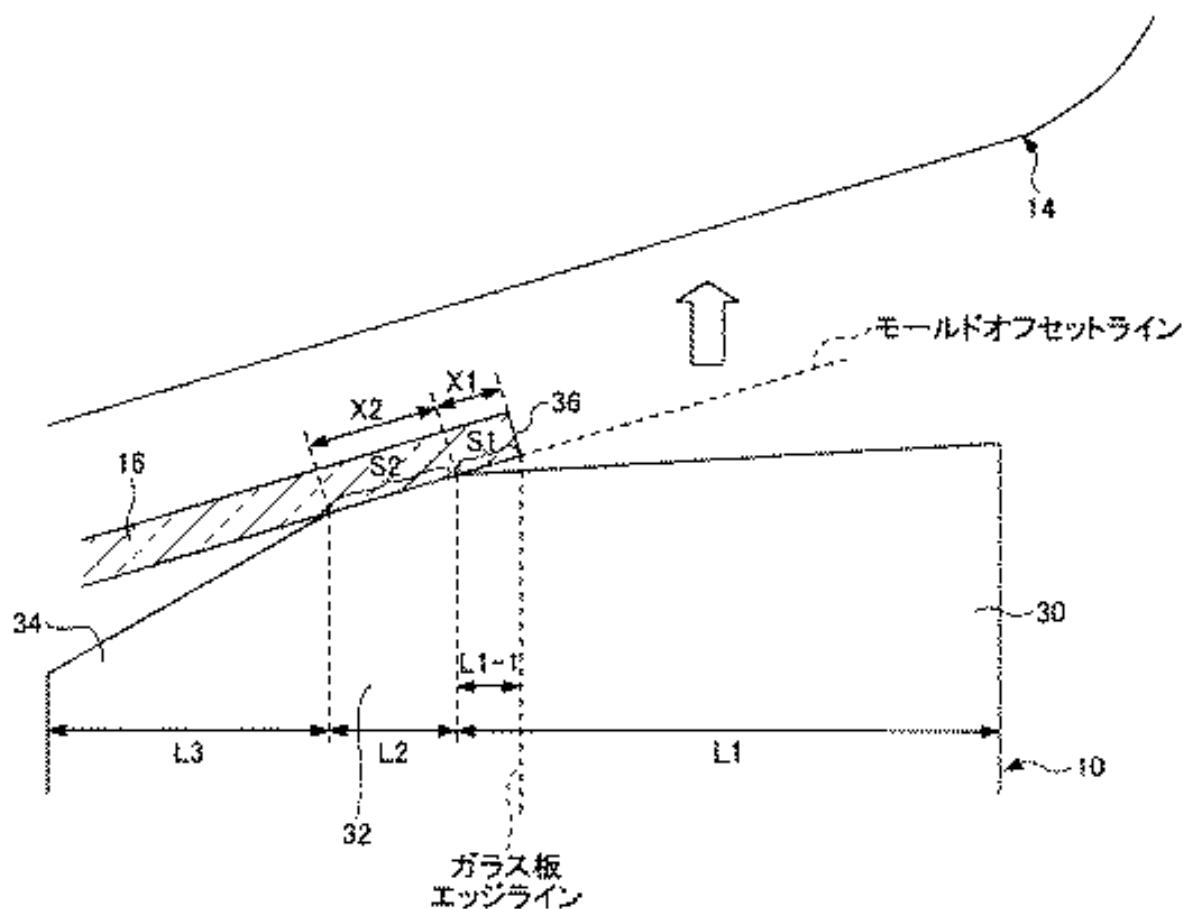
SAINT GOBAIN GLASS

Family 9/12 - FAMPAT - ©Questel

Title

(JP2014051417)

Supporting ring for glass molding, apparatus for bending molding of glass, and method for bending molding of glass

Images**Publication numbers with kind code & date**

JP5966785	B2	2016-07-15	JP5966785
JP2014051417	A	2014-03-20	JP2014051417

**Abstract**

(JP2014051417)

PROBLEM TO BE SOLVED: To provide a supporting ring for glass molding, an apparatus for bending molding of glass and a method for bending molding of glass in order to increase the effect of preventing cracks and chips which tend to occur in the peripheral portion of a glass plate.

SOLUTION: The supporting ring, which is used for forming a glass plate by supporting the peripheral portion of a glass plate heated at a specified temperature and moving relatively closer to an upper mold having a downward **convex** shape in order to bend the glass plate by pressing the glass plate against the upper mold, comprises a contact part and non-contact

parts excluding the contact part. The contact part is formed such that the ring does not make contact with a first zone which covers a specific first distance inwardly from the edge when the glass plate is pressed by the supporting ring for glass molding and the upper mold, but makes contact with a second zone that covers a specific second distance from the inner edge of the first zone. The width of the contact part is less than that of the non-contact parts.

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Inventors

Koji Takatsu

OGAWA NAOKI

ONO KAZUHIKO

IMAI TORU

Latest standardized assignees - inventors removed

ASAHI GLASS

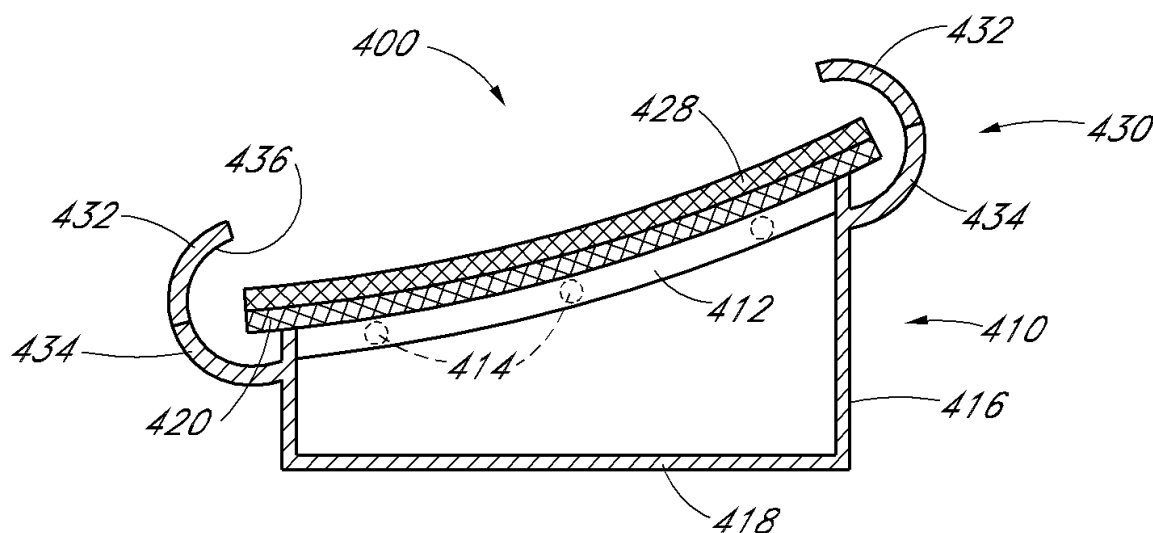
Family 10/12 - FAMPAT - ©Questel

Title

(EP2794498)

Heat-regulating glass bending apparatus and method

Images



Publication numbers with kind code & date

CN103172254	B	2017-04-19	CN103172254B
IN11155/DELNP/2012	A	2016-02-05	IN2012DN11155
EP2794498	A4	2015-07-29	EP2794498
JP2015505294	A	2015-02-19	JP2015505294
EP2794498	A1	2014-10-29	EP2794498
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Abstract

(EP2794498)

A sag-bending system is disclosed. The sag-bending system comprises a sag-bending glass support mold and a perimeter thermal manager. The sag-bending glass support mold has a quadrilateral shape, a collective upper surface, and a periphery. The support mold comprises a plurality of rib members extending in a first direction, each of the plurality of rib members having a curved upper surface shaped to form the collective upper surface having a position and shape to support a quadrilateral-shaped sag-bent glass sheet into a desired contour, each of the rib members further having a lower surface, and a plurality of support members extending in a second direction between at least two of the plurality of rib members, the second direction traverse to the first direction. The periphery of the support mold is formed by the edges of the rib members. The perimeter thermal manager is sized and positioned to surround, to extend at least partially over, and to extend at least partially under the periphery of the support mold. The thermal manager comprises an upper portion sized and positioned to extend over the periphery portion of the collective upper surface, the upper portion extending over the upper surface of at least one rib member, and a lower portion sized and positioned to extend under the periphery portion of the support mold, the lower portion extending under the lower surface of the at least one rib member.

Inventors

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Latest standardized assignees - inventors removed

SUNPOWER

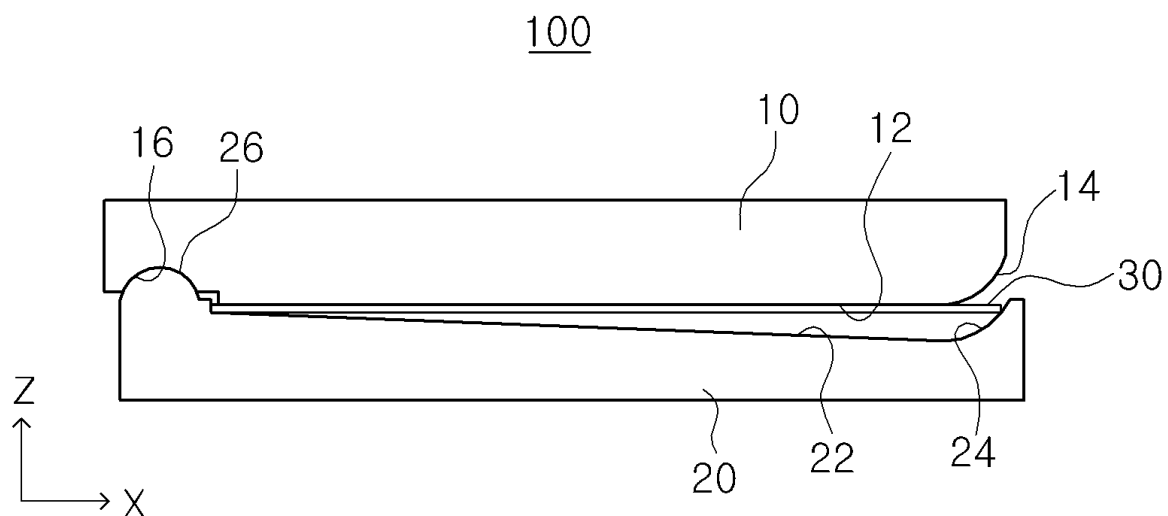
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Title

(KR101603885)

Apparatus and method for bending glass

Images



Publication numbers with kind code & date

[KR101603885](#)

B1

2016-03-16

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[KR20140085901](#)

A

2014-07-08

KR20140085901



Abstract

(KR20140085901)

The present invention relates to an apparatus and a method for bending a glass substrate which prevent damage of the glass substrate and facilitate arrangement of the glass substrate in molds. The apparatus for bending the glass substrate comprises: a lower mold having inclined planes and curved surfaces extended from the planes; and an upper mold having a shape corresponding to the curved surfaces. A hinge unit is formed on one side of the upper and lower molds, and the upper mold is arranged on top of the lower mold to be able to rotate.

Inventors

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Latest standardized assignees - inventors removed

CRUCIALTEC

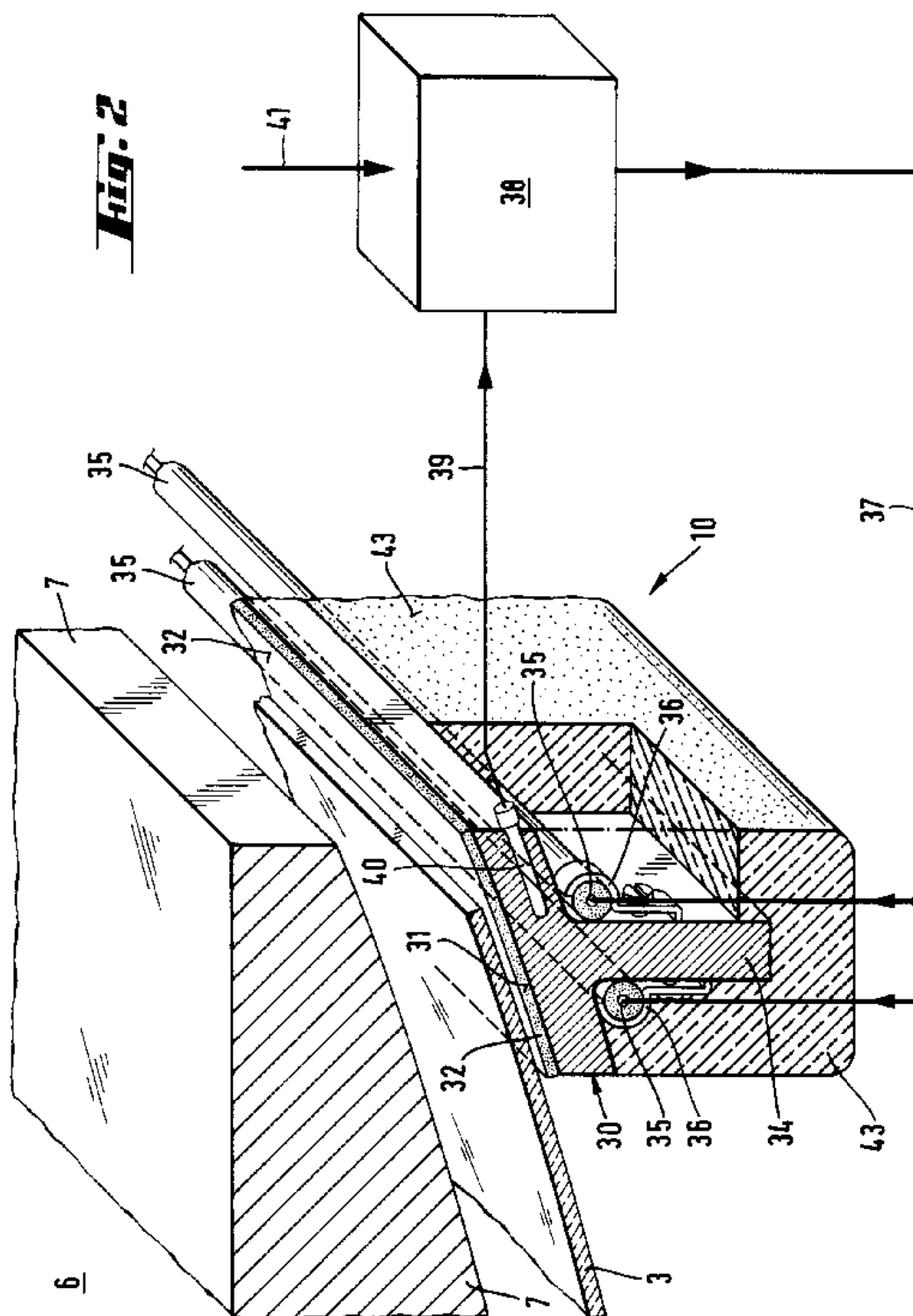
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Title

(EP-561671)

Method and apparatus for bending glass sheets

Images



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Abstract

(EP0561671)

Process for obtaining bent windowpanes according to which the windowpane (3) is heated in an oven, pressed between a solid upper former (7) and a lower annular mould (10) and then conducted, with the aid of the said lower annular mould (10) to a controlled cooling station, the annular mould (10) being maintained at a temperature chosen in a precise region during the pressing operation and the transfer to the cooling station. The invention also relates to a bending device comprising an annular mould (10) provided with an electrical resistance heater (35). The invention applies more particularly to the production of laminated windowpanes. <IMAGE>

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