

1) Family number: 29530040 (US5279635A)

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Title: Method and apparatus for controlling the temperature of glass sheets in press bending

Abstract: A method of and apparatus for establishing a predetermined thermal profile in a glass sheet immediately prior to press bending outside the heating furnace. The press bending members are provided with arrays of heating elements that are individually or zone regulated to assist in establishing an optimum temperature profile in the glass sheet conducive to proper bending. The temperature profile established in the heated sheet by the arrays of heating elements is coordinated with that established in the furnace and subsequently, modified by heat dissipation as the glass sheet advances to the bending station to achieve the proper bending temperature. The heating elements can also be utilized to create a temperature profile in the glass sheet generally higher than that originally established in the furnace. The sheet can be held in contact with one or both of the heated press members for a brief period of time after bending to slow the cooling rate of the sheet and increase the edge strength of the marginal edge area thereof.

Classifications:

International (IPC 8-9): C03B23/023 C03B23/03

H01L33/00 (Advanced/Invention);

C03B23/02 H01L33/00 (Core/Invention);

C03B23/23 (Core/Non-invention)

International (IPC 1-7): C03B C03B23/03 C03B23/23 C03C

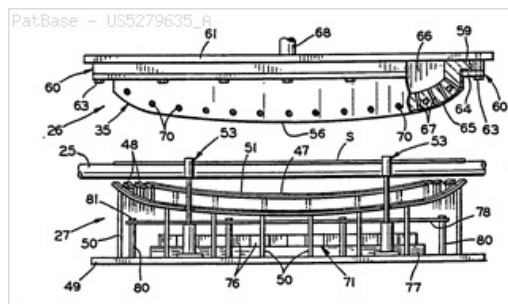
CPC: C03B23/0307 C03B2225/02

European: C03B23/03 C03B23/03D M03B225/02

US: 65/103 65/104 65/106 65/273 65/288 65/355 65/356

JP F-Term: 4G015 4G015/AA09 4G015/AB02 4G015/AB05

JP F-Index: C03B23/03



Family:

Publication number	Publication date	Application number	Application date
AT172443 E	19981115	AT19920925449T	19921125
AU199331500 A1	19930803	AU19930031500	19921125
AU661536 B2	19950727	AU19930031500	19921125
CA2104101 AA	19930813	CA19922104101	19921125
CA2104101 C	20030211	CA19922104101	19921125
DE69227364 D1	19981126	DE19926027364	19921125
DE69227364 T2	19990602	DE19926027364T	19921125
EP0575573 A1	19931229	EP19920925449	19921125
EP0575573 A4	19940615	EP19920925449	19921125
EP0575573 B1	19981021	EP19920925449	19921125
ES2121877 T3	19981216	ES19920925449T	19921125
FI101696 B	19980814	FI19930003924	19930908
FI933924 A	19930908	FI19930003924	19930908
FI933924 A0	19930908	FI19930003924	19930908
JP3427357 B2	20030714	JP19930512426	19921125
JP6508097 T2	19940914	JP19930512426T	19921125
KR100229686 B1	19991115	KR19930702679	19921125
KR19947000297 A	19940221	KR19937002679	19901125
MX9207387 A1	19930701	MX19920007387	19921217
TW232000 B	19941011	TW19920109632	19921201
US5279635 A	19940118	US19920817784	19920108
US5346526 A	19940913	US19930108238	19930819
WO9314038 A1	19930722	WO1992US10266	19921125
ZA9209726 A	19930622	ZA19920009726	19921215

Priority:

WO1992US10266 19901125 US19920817784 19920108 WO1992US10266 19921125
US19930108238 19930819

Probable Assignee: LIBBEY OWENS FORD CO

Assignee(s): (std): LIBBEY OWENS FORD CO

Assignee(s): LIBBEY OWENS FORD CO TOLEDO OHIO US ; LIBBEY OWENS FORD COUS ; NISSEN TIMOTHY A ; PROCACCINI VINCENT N ; DEB SUGATO ; FLAUGHER JEFFREY R

Inventor(s): (std): FLAUGHER JEFFREY R ; NISSEN TIMOTHY A ; PROCACCINI VINCENT N ; DEB SUGATO ; FLAUGHER JEFFREY R ; FLAUGHER JEFFREY ; PROCACCINI VINCENT ; NISSEN TIMOTHY ; SUGATO DEB ; JEFFREY R FLAUGHER

Inventor(s): TIMOTHY A NISSEN ; JEFFREY R FLAUGHER ; VINCENT N PROCACCINI ; PROCACCINI VINCENT N TOLEDO OH 43605 US ; DEB SUGATO PERRYSBURG OH 43551 US ; FLAUGHER JEFFREY R CARLTON MI 48117 US ; NISSEN TIMOTHY A WESTLAND MI 48185 US

Agent(s): PHILLIPS ORMONDE FITZPATRICK; MACRAE AND CO

Designated states: AT AU BE CA CH DE DK ES FI FR GB GR IE IT JP KR LI LU MC NL PT SE

Title: Method and apparatus for handling glass sheets during shaping and cooling

Abstract: This invention relates to improvements in handling glass sheets during shaping and cooling. Each glass sheet in turn is heated to its deformation temperature and conveyed into a glass shaping station. The glass is lifted into engagement with an upper vacuum shaping mold while hot and held against the vacuum shaping mold by vacuum as the glass lifting mechanism retracts downward. A transfer and tempering ring-like member having stop means upstream of an outline supporting surface conforming to and slightly inside the periphery of the bent glass sheet is brought into a position where its stop means are slightly misaligned upstream of the trailing edge of the glass sheet. The vacuum on the upper mold is released to deposit the shaped glass sheet on the ring-like member. The latter starts suddenly to displace the bent glass sheet into proper alignment with the ring-like member for movement into a cooling station where the shaped glass sheet is quenched as rapidly as possible to harden the glass surface and then transferred to an unloading conveyor at a transfer station. The ring-like member starts its rapid return from the transfer station to the shaping station before the shaped glass sheet is transferred to a position completely downstream of the ring-like member.

Classifications:

International (IPC 8-9): C03B23/03 C03B23/035 C03B27/044 C03B35/14 C03B35/16 C03B35/20 F16K31/66 F24D17/00 (Advanced/Invention); C03B23/02 C03B27/00 C03B35/00 (Core/Invention)

International (IPC 1-7): B66C1/02 C03B23/02 C03B23/023 C03B23/025 C03B23/027 C03B23/03 C03B23/035 C03B27/00 C03B27/04 C03B35/00 C03B35/02 C03B35/14 C03B35/16 C03B35/20 F16K31/66 F24D17/00

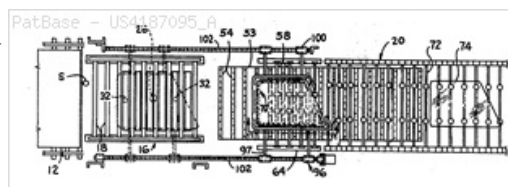
CPC: C03B23/03 C03B27/0404 C03B27/0417 C03B27/0445 C03B35/145 C03B35/202 C03B225/02 C03B23/0302 C03B23/0357 C03B27/0442

European: C03B23/035B C03B23/035B3 C03B23/03B C03B27/044B C03B27/044B2 C03B27/04A C03B27/04C C03B35/14C C03B35/20B M03B225/02

US: 414/782 65/104 65/106 65/107 65/268 65/273 65/287 65/348

JP F-Term: 3H057/3H057/BB02 3H057/BB23 3H057/BB27 3H057/BB32 3H057/BB42 3H057/BB47 3H057/BB49 3H057/CC12 3H057/DD22 3H057/EE03 3H057/FD05 3H057/FD10 3H057/GG06 3H057/GG08 3H057/HH03 3H057/HH12 3L073/3L073/AA15 3L073/AA18 3L073/AB07 3L073/AC04 3L073/AD00 3L073/AD05 3L073/AD06 3L073/AE06

JP F-Index: F16K31/66 F24D17/00/F



Family:

Publication number	Publication date	Application number	Application date
AU197951375 A1	19800508	AU19790051375	19791002
AU198062694 A1	19810409	AU19800062694	19800925
AU520690 B2	19820218	AU19790051375	19791002
AU521326 B2	19820325	AU19800062694	19800925
BE879599 A	19800424	BE19790197793	19791024
BE885388 A	19810325	BE19800202221	19800925
BR7906726 A	19800624	BR19790006726	19791018
BR8006111 A	19810407	BR19800006111	19800924
CA1126960 A1	19820706	CA19790336433	19790926
DE2942724 A1	19800430	DE19792942724	19791023
DE2942724 C2	19821202	DE19792942724	19791023
DE3035973 A1	19810326	DE19803035973	19800924
DE3035973 C2	19830217	DE19803035973	19800924
ES485315 A1	19801001	ES19790485315	19791024
ES492323 A0	19810416	ES19800492323	19800611
ES495295 A0	19811016	ES19800495295	19800924
ES502847 A0	19821101	ES19810502847	19810608
ES8104152 A1	19810416	ES19800492323	19800611
ES8200314 A1	19811016	ES19800495295	19800924
ES8300652 A1	19821101	ES19810502847	19810608
FR2439751 A1	19800523	FR19790025093	19791009
FR2439751 B1	19841207	FR19790025093	19791009
FR2465692 A1	19810327	FR19800020395	19800923
FR2465692 B1	19840615	FR19800020395	19800923
GB2037736 A1	19800716	GB19790036905	19791024
GB2037736 B2	19821110	GB19790036905	19791024
GB2058743 A1	19810415	GB19800030777	19800924
GB2058743 B2	19830302	GB19800030777	19800924
IT1119400 A	19860310	IT19790069050	19791019
IT7969050 A0	19791019	IT19790069050	19791019
JP1085175 C3	19820225	JP19790137539	19791024
JP1266449 A2	19891024	JP19880094987	19880418
JP1266449 C3	19850527	JP19800133651	19800925
JP5060033 A2	19800506	JP19790137539	19791024
JP56028851 B4	19810704	JP19790137539	19791024
JP56050128 A2	19810507	JP19800133651	19800925
JP59043427 B4	19841022	JP19800133651	19800925
MX150492 A	19840515	MX19790179779	19791025
MX154442 A	19870826	MX19800184081	19800925
US4187095 A	19800205	US19780954697	19781025
US4252552 A	19810224	US19790078626	19790925
US4285715 A	19810825	US19800111511	19800111

Priority:

US19780954697 19781025

US19790078626 19790925

CA19790336433 19790926

Probable Assignee: PPG IND OHIO INC**Assignee(s):** (std): PPG IND INC ; PPG INDUSTRIES INC ; TOTO LTD**Assignee(s):** PPG INDUSTRIES INC 15222 PITTSBURGH PA US ; PPG IND OHIO INC ; PPG INDUSTRIES ; FRANK ROBERT G ; PPG IND**Inventor(s):** (std): FRANK R G ; FRANK ROBERT GEORGE ; FRANK ROBERT G ; ROBAATO JIYOOJI FURANKU ; FRANK R ; HARAGA HISATO ; TANAKA SHINGO ; TSUTSUI OSAMU**Inventor(s):** FRANK ROBERT GEORGE MURRYSVILLE PA ; G FRANK ROBERT ; ROBERT GEORGE FRANK ; R G FRANK ; ROBAATO JOOJI FURANKU ; GEORGE FRANK ROBERT ; FRANK ROBERT GEORGE MURRYSVILLE PA US**Agent(s):** COLLISON P CO; COLLISON AND CO; GOWLING LAFLEUR HENDERSON LLP**3) Family number: 42769112 (US2009000334A)**

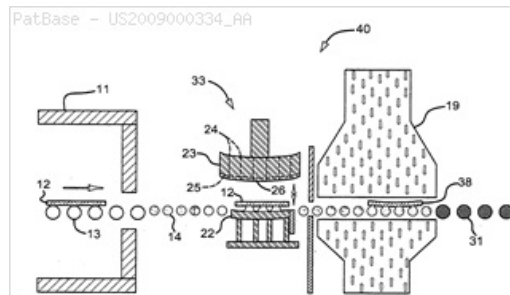
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Title: GLASS BENDING PROCESS

Abstract: A glass bending line for quickly shaping a complex bent glass sheet is provided that includes moving a ring-type female mold, which has a heated glass sheet placed on it, and a full face heated male mold, toward one another. Upon making shaping contact between the glass sheet and the male mold, a vacuum is applied through holes extending through the male mold, for a time sufficient to form the glass sheet to a desired shape. When the glass sheet has been shaped, the vacuum is terminated and pressurized air is connected to the holes to release the bent glass sheet from the male mold. The bent glass sheet is then quickly transported to a quenching station or an annealing station on a continuous conveying device. Hence, the complex bent glass sheet is achieved without the use of a shuttle ring.

Classifications:

International (IPC 8-9): C03B11/00 C03B11/07 C03B23/03 C03B23/035 C03B25/00 C03B35/16 C03B40/00 (Advanced/Invention); C03B23/03 C03B23/035 C03B35/16 (Advanced/Non-invention); C03B23/02 C03B25/00 C03B35/00 (Core/Invention)

International (IPC 1-7): C03B23/03 C03B23/035 C03B35/16**CPC:** C03B23/0352 C03B40/005 C03B2225/02 C03B23/03 C03B35/16**European:** C03B23/03 C03B23/035B C03B35/16 C03B40/00F M03B225/02**US:** 65/104 65/104P 65/106 65/106S**JP F-Term:** 4G015 4G015/AA09 4G015/AB06 4G015/AB07**JP F-Index:** C03B23/03 C03B23/035**Family:**

Publication number	Publication date	Application number	Application date
BRPI0812974 A2	20150218	BR2008PI12974	20080407
BRPI0812974 B1	20190108	BR2008PI12974	20080407
CN101720308 A	20100602	CN200880022275	20080407
CN101720308 B	20130327	CN200880022275	20080407
EP2173675 A1	20100414	EP20080742613	20080407
EP2173675 B1	20181107	EP20080742613	20080407
IN00057KN2010 A	20100430	IN2010KN00057	20100105
IN274391 B	20160729	IN2010KN00057	20100105
JP2010531289 T2	20100924	JP20100514748T	20080407
JP5431317 B2	20140305	JP20100514748T	20080407
KR101474046 B1	20141217	KR20107001734	20080407
KR20100053517 A	20100520	KR20107001734	20080407
MY147562 A	20121231	MY20090005493	20080407
RU2010102136 A	20110810	RU20100102136	20080407
RU2466106 C2	20121110	RU20100102136	20080407
US2009000334 AA	20090101	US20070823409	20070627
US7975509 BB	20110712	US20070823409	20070627
WO09002375 A1	20081231	WO2008US04498	20080407

Priority:

US20070823409 20070627 WO2008US04498 20080407

Probable Assignee: PILKINGTON NORTH AMERICA INC**Assignee(s):** (std): BOISSELLE ROBERT J ; KLEMAN THOMAS G ; LUBELSKI DANIEL P ; PILKINGTON NORT AMERIKA INK ; PILKINGTON NORTH AMERICA INC**Inventor(s):** (std): LUBELSKI DANIEL P ; KLEMAN THOMAS G ; BOISSELLE ROBERT J ; BOJSSELL ROBERT DZH ; KLEMAN TOMAS G ; LJUBEL SKI DANIEL P ; DANIEL P LUBELSKI ; ROBERT J BOISSELLE ; THOMAS G KLEMAN**Inventor(s):** LJUBEL'SKI DANIEL P. ; KLEMAN THOMAS ; BOISSELLE ROBERT ; LUBELSKI DANIEL**Agent(s):** PFENNING MEINIG AND PARTNER GBR; PFENNING MEINIG AND PARTNER MBB; MARSHALL AND MELHORN LLC; SCHURR DONALD A ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: GLASS SHEET CONVEYING AND BENDING APPARATUS

Abstract: A press bending apparatus for shaping heat soften glass sheets between an upper press member and a lower press member is provided. The conveyor system for transferring the sheets of glass in the press bending apparatus includes concave shaped rollers such that the glass sheets tend to sag into conformity with the rolls as the sheets are positioned for bending operations between the upper and lower press members. The lower press member is a continuous press bending ring to prevent improper sagging of the glass sheet around the peripheral edges of the sheet. The concave shape of the rolls mounted inside of the press ring provides maximum support for the formed glass sheet to prevent sagging of the glass. Additional production benefits can be obtained by forming the conveyor system and lower press member as modular unit and the upper press member as a modular unit for each model of bent glass to facilitate changing the press members for production model changes.

Classifications:**International (IPC 8-9):** C03B11/02 C03B23/03 C03B35/00

C03B35/16 (Advanced/Invention);

C03B23/03 C03B35/00 (Advanced/Non-invention);

C03B23/02 (Core/Invention)

International (IPC 1-7): C03B11/02 C03B13/00 C03B15/00 C03B17/00

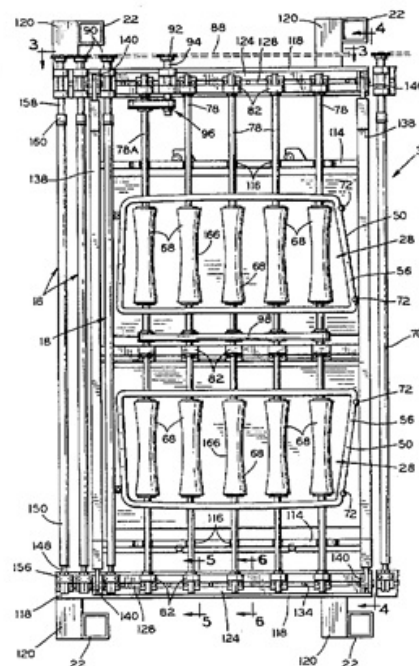
C03B19/00 C03B21/00 C03B23/00 C03B23/02 C03B23/03 C03B23/033

C03B25/00 C03B27/00 C03B29/00 C03B31/00 C03B33/00 C03B35/00

C03B35/16 C03B35/18

CPC: Y02P40/57 C03B23/03 C03B2225/02**European:** C03B23/03 M03B225/02**US:** 65/106 65/273 65/287 65/291**JP F-Term:** 4G015 4G015/AA09 4G015/AB01 4G015/AB03 4G015/AB06 4G015/AB10 4G015/CA01 4G015/CB01 4G015/CC01**JP F-Index:** C03B23/03 C03B23/033 C03B25/00 C03B35/18

PatBase - US5743931_A

**Family:**

Publication number	Publication date	Application number	Application date
AU199666893 A1	19970312	AU19960066893	19960805
AU709605 B2	19990902	AU19960066893	19960805
BRPI9610273 A	19990914	BR1996PI10273	19960805
CA2227821 AA	19980126	CA19962227821	19960805
CN1138712 C	20040218	CN19961097422	19960805
CN1198726 A	19981111	CN19961097422	19960805
DE69625600 D1	20030206	DE19966025600	19960805
DE69625600 T2	20031113	DE19966025600T	19960805
EP0844983 A1	19980603	EP19960926881	19960805
EP0844983 A4	19981118	EP19960926881	19960805
EP0844983 B1	20030102	EP19960926881	19960805
EP0844983 B9	20030813	EP19960926881	19960805
IN190703 A	20030816	IN1996CA01413	19960807
JP2001524062 T2	20011127	JP19970509323T	19960805
KR100427926 B1	20040616	KR19980701065	19960805
KR19990036396 A	19990525	KR19980701065	19960805
MX9801219 A1	19980430	MX19980001219	19960805
PL181998 B1	20011031	PL19960324986	19960805
PL324986 A1	19980706	PL19960324986	19960805
TR9800226 T1	19980521	TR19980000226T	19960805
US5743931 A	19980428	US19950514741	19950814
WO9707066 A1	19970227	WO1996US12696	19960805

Priority:

US19950514741 19950814 WO1996US12696 19960805

Probable Assignee: LIBBEY OWENS FORD CO**Assignee(s):** (std): LIBBERY OWENS FORD CO ; LIBBEY OWENS FORD CO**Assignee(s):** LIBBEY OWENS FORD CO TOLEDO ; LIBBEY OWENS FORD COMPANY ; SKILLITER WILLIAM J ; DEW VINCE ; FLAUGHER JEFFREY RONALD**Inventor(s):** (std): FLAUGHER JEFFREY RONALD ; JEFFREY R FLAUGHER ; JR FLAUGHER ; J R FLAUGHER ; VINCE DEW ; WILLIAM J SKILLITER ; W J SKILLITER ; V DEW ; WJ SKILLITER ; FLAUGHER R ; SKILLITER J ; DEW V ; SKILLITER W J ; FLAUGHER J R ; DEW VINCE ; SKILLITER WILLIAM J ; FLAUGHER JEFFREY R**Agent(s):** SHELSTON IP; SHELSTON IP PTY LTD; MACRAE AND CO**Designated states:** AM AT AU BB BE BG BR BY CA CH CN CZ DE DK EE ES FI FR GB GE GR HU IE IL IS IT JP KE KG KP KR KZ LK LR LT LU LV MC MD MG MN MW MX NL NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN

Title: METHOD AND APPARATUS FOR ANNEALING GLASS PLATE

Abstract: A method and an apparatus for annealing a glass sheet, which can sufficiently reduce ITT formed in the glass sheet, are provided. In the method for annealing a glass sheet G of the present invention, in a state that a heated and bent glass sheet G is placed on a forming mold 16, first, a region of the glass sheet G to be lifted up is cooled by cooling devices 20, 22, to make the temperature of the region to be lifted up to be a temperature of at most the strain point. Next, in this state, a lift-up member 36 is operated to lift up the region of the glass sheet G to be lifted up, by rods 38, 38..., to separate the glass sheet G from the forming mold 16.

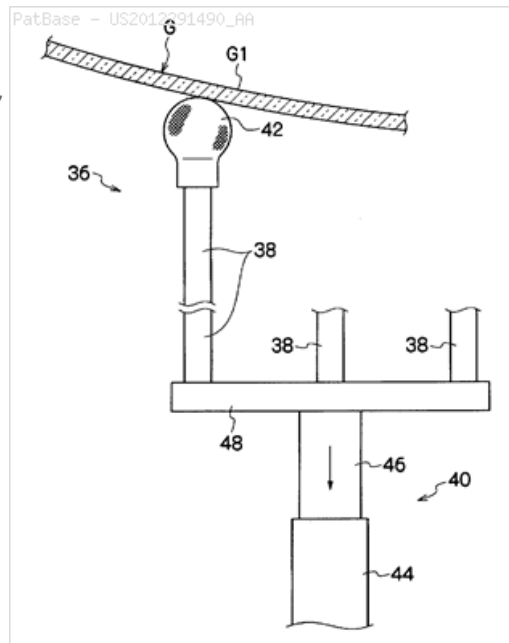
Classifications:**International (IPC 8-9):** B32B17/10 C03B23/023 C03B23/025

C03B23/035 C03B25/00 C03B25/02 C03B25/08 C03B25/12 C03B35/18

C03B35/20 C03C27/12 (Advanced/Invention)

CPC: B32B17/10889 C03B25/025 C03B23/0258 C03B23/035 C03B35/207**European:** C03B23/025D C03B23/035 C03B25/02B C03B35/20B4**US:** 65/117 65/162 65/29.19 65/348 65/93 65/94 65/95**JP F-Term:** 4G015 4G015/AA04 4G015/AB03 4G015/AB10 4G015/CA01

4G015/CA08 4G015/CA10 4G015/CB01 4G015/CB02 4G015/CC02

JP F-Index: C03B23/025 C03B25/08 C03B35/18**Family:**

Publication number	Publication date	Application number	Application date
BR112012019405 A2	20180320	BR20121119405	20110202
CN102741177 A	20121017	CN201180008081	20110202
EP2532625 A1	20121212	EP20110739794	20110202
EP2532625 A4	20140611	EP20110739794	20110202
EP2532625 B1	20190102	EP20110739794	20110202
IN06817CN2012 A	20150109	IN2012CN06817	20120801
JP2011096446 A1	20130610	JP20110552804T	20110202
JP5641254 B1	20141217	JP20110552804T	20110202
RU2012137239 A	20140310	RU20120137239	20110202
RU2540725 C2	20150210	RU20120137239	20110202
US2012291490 AA	20121122	US20120562921	20120731
US8607589 BB	20131217	US20120562921	20120731
WO11096446 A1	20110811	WO2011JP52173	20110202

Priority:JP2010002120 20100203 JP20100022120 20100203 WO2011JP52173 20110202
JP20110552804 20110202**Probable Assignee:** AGC INC**Assignee(s):** (std): AGC INC ; ASAHI GLASS CO LTD ; YAMAKAWA HIROSHI ; SUGAHARA AKIRA ; KATO YASUMASA**Assignee(s):** N A ; ASAHI GLASS COMPANY LIMITED ; ASAKHI GLASS KOMPANI LTD ; ASAHI GLASS CO**Inventor(s):** (std): KATO JASUMASA ; JAMAKAVA KHIROSI ; SUGAKHARA AKIRA ; YASUMASA KATO ; HIROSHI YAMAKAWA ; AKIRA SUGAHARA ; KATO YASUMASA ; SUGAHARA AKIRA ; YAMAKAWA HIROSHI**Agent(s):** MUELLER BORE AND PARTNER PATENTANWALTE; MUELLER BORE AND PARTNER PATENTANWALTE PARTG MBB; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT LLP; SENMYO KENJI ET AL**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**Title:** GLASS PLATE AND PROCESS FOR PRODUCING GLASS PLATE

Abstract: A glass sheet for a laminated glass to be fit into a frame of an automobile in a flash-mount structure, that is a glass

sheet having a good strength, is provided. In the glass sheet of the present invention, the maximum value of the plane compressive stress on the edge of the glass sheet is at least 10 MPa and at most 18 MPa, and the maximum value of the plane compressive stress inside from the edge of the glass sheet is at most 2.4 MPa.

Classifications:

International (IPC 8-9): B32B17/00 B32B17/06 B32B17/10 B32B3/02 B32B37/14 B60J1/00 C03B23/023 C03B23/025 C03B23/035 C03B25/00 C03B25/02 C03B25/08 C03B35/20 C03C27/12 (Advanced/Invention); B60J1/00 (Advanced/Non-invention)

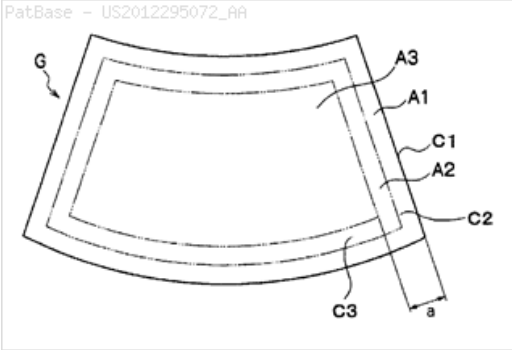
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European: B32B17/10C4 C03B23/025D C03B23/035 C03B25/02B C03B25/08 C03B35/20B4

US: 156/60 428/192 428/212 428/220 428/410 428/426 428/428 428/688 65/104 65/268 65/286 65/64

JP F-Term: 4G015 4G015/AA03 4G015/AB10 4G015/CA01 4G015/CA04 4G015/CA06 4G015/CB01 4G015/CC01 4G061 4G061/AA02 4G061/BA02 4G061/CB19 4G061/CD18

JP F-Index: C03B23/023 C03B25/02 C03C27/12/Z



Family:

Publication number	Publication date	Application number	Application date
CN102741190 A	20121017	CN201180008090	20110202
CN102741190 B	20150422	CN201180008090	20110202
EP2532630 A1	20121212	EP20110739795	20110202
EP2532630 A4	20140611	EP20110739795	20110202
EP2532630 B1	20190403	EP20110739795	20110202
JP2011096447 A1	20130610	JP20110552805T	20110202
JP5641255 B1	20141217	JP20110552805T	20110202
US2012295072 AA	20121122	US20120566001	20120803
US8518544 BB	20130827	US20120566001	20120803
WO11096447 A1	20110811	WO2011JP52174	20110202

Priority:

JP20100022121 20100203 JP20110552805 20110202 WO2011JP52174 20110202

Probable Assignee: AGC INC

Assignee(s): (std): AGC INC ; ASAHI GLASS CO LTD ; KATO YASUMASA ; SUGAHARA AKIRA

Assignee(s): N A ; ASAHI GLASS COMPANY LIMITED ; ASAHI GLASS CO

Inventor(s): (std): SUGAHARA AKIRA ; KATO YASUMASA ; YASUMASA KATO ; AKIRA SUGAHARA

Agent(s): MUELLER BORE AND PARTNER PATENTANWALTE; MUELLER BORE AND PARTNER PATENTANWALTE PARTG MBB; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT LLP; SENMYO KENJI ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

7) Family number: 31379595 (US2004244424A)

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Title: BENDING SYSTEM, BENDING METHOD AND CURVED ROLLER FOR A GLASS SHEET

Abstract: A glass sheet G, which has been heated to the bending temperature by a heating furnace 12, is preliminary bent in the course of being conveyed to a bending position by a roller conveyor for preliminary bending 20. When the glass sheet thus preliminary bent is put on a press ring at the bending position, the glass sheet is pressed against the bending surface 26 of a mold 24 by upward movement of the press ring 22 to be bent so as to have a desired radius of curvature. After that, the press ring 22 is moved toward an air-cooling/tempering apparatus 16. When the press ring 22 is introduced into a certain tempering position S, cooling air is ejected from an upper blowing head 30 and a lower blowing head 32 toward the glass sheet G to air cool and temper the glass sheet G.

Classifications:

International (IPC 8-9): C03B23/025 C03B23/03 C03B23/033 C03B27/044 C03B35/14 C03B35/16 C03B35/18 (Advanced/Invention); C03B23/025 (Advanced/Non-invention); C03B23/02 C03B27/00 C03B35/00 (Core/Invention)

International (IPC 1-7): C03B23/025 C03B23/03 C03B23/033 C03B27/044 C03B29/08 C03B35/16 C03B35/18

CPC: C03B23/0254 C03B23/0305 C03B35/161 C03B35/163 C03B35/164 C03B35/165 C03B35/182 C03B35/185 C03B35/187 C03B35/189 C03B35/145

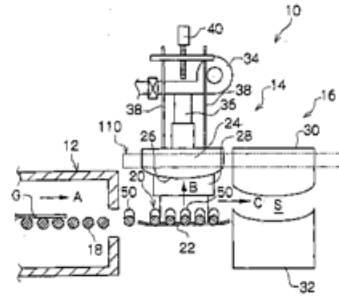
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US: 65/370.1

JP F-Term: 4G015 4G015/AA04 4G015/AA10 4G015/CA04 4G015/CB01 4G015/CC01

JP F-Index: C03B23/025 C03B23/03 C03B27/044

Fig. 1

**Family:**

Publication number	Publication date	Application number	Application date
CN100431990 C	20081112	CN200410048879	20040604
CN1572734 A	20050202	CN200410048879	20040604
EP1484291 A1	20041208	EP20040012944	20040601
EP1484291 B1	20110914	EP20040012944	20040601
JP2005015326 A2	20050120	JP20040147841	20040518
KR20040104930 A	20041213	KR20040040506	20040603
US2004244424 AA	20041209	US20040857916	20040602

Priority:

JP20030159092 20030604 JP20040147841 20040518

Probable Assignee: ASAHI GLASS CO LTD**Assignee(s):** (std): ASAHI GLASS CO LTD**Assignee(s):** ASAHI GLASS COMPANY LIMITED ; ASAHI GLASS COMPANY LTD ; N A ; ASAHI GLASS CO**Inventor(s):** (std): TSUCHIYA MASAHIRO ; MAEDA KENJI ; HORI JUNJI ; HARADA MASANAO ; TOMIOKA MASANORI ; MASAHIRO TSUCHIYA ; KENJI MAEDA ; JUNJI HORI ; MASANAO HARADA ; MASANORI TOMIOKA ; HORI JUNSHI**Agent(s):** MUELLER BORE AND PARTNER PATENTANWAELTE**Designated states:** BE FR**8) Family number: 2875756 (US4756735A)**

© PatBase

Title: IN-LEHR PRESS BENDING

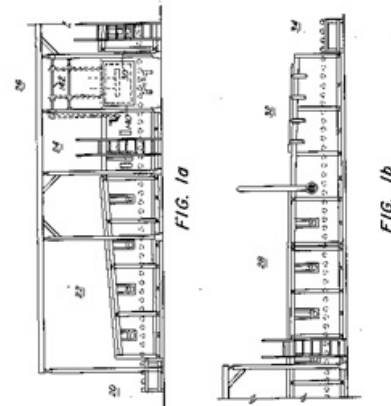
Abstract: Glass sheets are positioned on the shaping rail of an outline shaping mold for movement through a heating lehr and subsequent preliminary sag bending. The mold with the glass sheet supported thereon is then positioned between a pair of vertically aligned full surface pressing molds. The mold includes selected press surface areas that extend outside the perimeter of the outline mold. As the lower mold raises to lift the glass sheet off the outline mold, selected portions of the shaping rail move outwardly to allow the lower mold to pass through the outline mold. The glass sheet is then pressed between the upper and lower pressing molds.

Classifications:**International (IPC 8-9):** C03B23/023 C03B23/025

C03B23/03 (Advanced/Invention);

C03B23/02 (Core/Invention)

International (IPC 1-7): C03B23/023 C03B23/025 C03B23/03 C03B23/23**CPC:** C03B23/027 C03B23/0305 C03B23/023 C03B23/0252**European:** C03B23/023 C03B23/025B C03B23/03 C03B23/03C**US:** 65/106 65/107 65/273 65/289 65/290**JP F-Term:** 4G015 4G015/AA09 4G015/AB06**JP F-Index:** C03B23/025 C03B23/03

**Family:**

Publication number	Publication date	Application number	Application date
BRPI8803663 A	19890214	BR1988PI03663	19880722
CA1311924 A1	19921229	CA19880572807	19880722
DE3865386 D1	19911114	DE19883865386	19880719
EP0300416 A1	19890125	EP19880111555	19880719
EP0300416 B1	19911009	EP19880111555	19880719
JP1051341 A2	19890227	JP19880183381	19880722
JP1919755 C3	19950407	JP19880183381	19880722
JP6047474 B4	19940622	JP19880183381	19880722
JP64051341 A2	19890227	JP19880183381	19880722
KR19890001890 A	19890406	KR19880009323	19880723
KR900006112 B1	19900822	KR19880009323	19880723
US4756735 A	19880712	US19870077152	19870724

Priority:

US19870077152 19870724 CA19880572807 19880722

Probable Assignee: PPG IND OHIO INC**Assignee(s):** (std): PPG IND INC ; PPG INDUSTRIES INC**Assignee(s):** PPG INDUSTRIES INC PITTSBURGH PA US ; REESE THOMAS JONAH ; WEISS RICHARD BRISBEN ; PPG IND OHIO INC ; CATHERS WILLIAM PRESSLEY ; PPG IND**Inventor(s):** (std): CATHERS WILLIAM PRESSLEY ; REESE THOMAS JONAH ; WEISS RICHARD BRISBIN ; CATHERS WILLIAM P ; REESE THOMAS J ; WEISS RICHARD B ; TOOMASU JIYONA RIISU ; UIRIAMU PURESURII KIYASAAZU ; RICHIAADO BURISUBIN UEISU**Inventor(s):** WEISS RICHARD BRISBIN LOWER BURREL PENNSYLVANIA 15 ; REESE THOMAS JONAH SARVER PENNSYLVANIA 16055 US ; CATHERS WILLIAM PRESSLEY ALLISON PARK PENNSYLVANIA ; RICHARD BRISBIN WEISS ; THOMAS JONAH REESE ; WILLIAM PRESSLEY CATHERS ; WEISS RICHARD BRISBIN LOWER BURREL... ; CATHERS WILLIAM PRESSLEY ALLISON PARK... ; WEISS RICHARD BRISBEN ; WEISS RICHARD BRISBIN LOWER BURREL PENNSYLVANIA 15068 US ; CATHERS WILLIAM PRESSLEY ALLISON PARK PENNSYLVANIA 16055 US**Agent(s):** BORDEN LADNER GERVAIS LLP**Designated states:** DE FR GB IT**9) Family number: 56200313 (US2015202854A)**

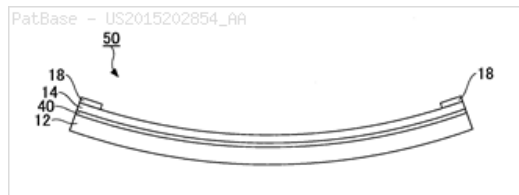
© PatBase

Title: LAMINATED GLASS PRODUCTION METHOD

Abstract: A laminated glass production method includes bending multiple glass plates into a desired shape by heating the glass plates to near a softening point, stacking the bent glass plates in layers with an interlayer interposed therebetween, and forming laminated glass by bonding the glass plates and the interlayer stacked in layers by applying pressure. At least two of the glass plates composing the laminated glass have different thicknesses. Of the two glass plates having different thicknesses, the thicker glass plate has a lower viscosity than the thinner glass plates at a temperature between the annealing point and the softening point of the thicker glass plate. Forming the laminated glass includes forming an uneven temperature distribution on a principal surface of each of the glass plates.

Classifications:

International (IPC 8-9): B32B1/00 B32B17/06 B32B37/18 B32B38/00 C03B23/00 C03B23/025 C03C27/12 C03C3/087 (Advanced/Invention)
CPC: B32B17/10036 B32B17/10889 C03B23/0252 C03B23/0258 B32B37/18 B32B38/0012 B32B1/00 B32B17/06 C03B23/0066 B32B2307/412 B32B2551/00 C03C3/087 Y10T428/24669 B32B38/1866 B32B2315/08
US: 156/102 428/179
JP F-Term: 4G015 4G015/AA04 4G015/AB01 4G061 4G061/AA13 4G061/BA02 4G061/CD18 4G062 4G062/AA01 4G062/BB03 4G062/DA06 4G062/DA07 4G062/DB01 4G062/DB02 4G062/DB03 4G062/DC01 4G062/DD01 4G062/DE01 4G062/DF01 4G062/EA01 4G062/EB04 4G062/EC01 4G062/EC02 4G062/EC03 4G062/ED01 4G062/ED02 4G062/ED03 4G062/EE03 4G062/EE04 4G062/EF01 4G062/EG01 4G062/FA01 4G062/FA10 4G062/FB01 4G062/FC01 4G062/FD01 4G062/FE01 4G062/FF01 4G062/FG01 4G062/FH01 4G062/FJ01 4G062/FK01 4G062/FL01 4G062/GA01 4G062/GA10 4G062/GB01 4G062/GC01 4G062/GD01 4G062/GE01 4G062/HH01 4G062/HH03 4G062/HH05 4G062/HH07 4G062/HH09 4G062/HH11 4G062/HH13 4G062/HH15 4G062/HH17 4G062/HH20 4G062/JJ01 4G062/JJ03 4G062/JJ05 4G062/JJ07 4G062/JJ10 4G062/KK01 4G062/KK03 4G062/KK05 4G062/KK07 4G062/KK10 4G062/MM01 4G062/NN29
JP F-Index: C03B23/025 C03C27/12/R C03C3/087



Family:

Publication number	Publication date	Application number	Application date
CN104703940 A	20150610	CN201380051545	20130924
EP2905267 A1	20150812	EP20130844119	20130924
EP2905267 A4	20160817	EP20130844119	20130924
JP2014054468 A1	20160825	JP20140539672T	20130924
US2015202854 AA	20150723	US20150676134	20150401
WO14054468 A1	20140410	WO2013JP75761	20130924

Priority:

JP20120220711 20121002 WO2013JP75761 20130924

Probable Assignee: ASAHI GLASS CO LTD

Assignee(s): (std): ASAHI GLASS CO LTD

Assignee(s): N A

Inventor(s): (std): AKADA SHUICHI ; YAMAKAWA HIROSHI ; TANAKA JUNJI ; KASAJIMA MASASHI ; KATO YASUMASA ; KITAJIMA YUTAKA ; TSUCHIYA MASAHIRO

Agent(s): MUELLER BORE AND PARTNER PATENTANWALTE PARTG MBB; ITOH TADAHIKO; ITOH TADASHIGE; ITOH TADASHIGE ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY NZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

10) Family number: 1374021 (US4197108A)

© PatBase

Title: Slotted glass sheet shaping mold

Abstract: This invention relates to shaping glass sheets and particularly to a mold capable of shaping glass sheets having many different outline shapes but bent to the same radius of curvature. Such molds have dimensions larger than those of a family of windows of a given radius of curvature but different outline shapes. Such molds need not be removed or replaced until such time as production requirements call for bent windows having a different radius of curvature. A specific embodiment of this invention is provided with a series of transversely extending grooves that extend completely across the entire width of the shaping mold and have sufficient width and depth to permit clearance for raising the mold above a horizontal path of glass sheet travel defined by spaced conveyor rolls. The grooves have a maximum width of one inch (25.4 millimeters) and are separated by a minimum distance approximating the width of said grooves. The shaping mold is preferably constructed of an alumino-silica cement with a smooth upper shaping surface that does not mar hot glass sheets.

Classifications:

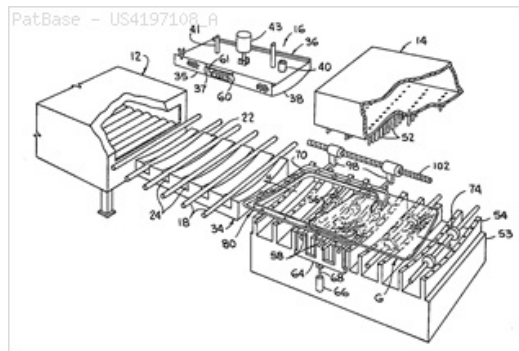
International (IPC 8-9): C03B23/023 C03B23/03 C03B23/035 C03B27/044 C03B35/14 C03B35/16 C03B35/20 (Advanced/Invention); C03B23/02 C03B27/00 C03B35/00 (Core/Invention)

International (IPC 1-7): C03B13/08 C03B23/02 C03B23/023 C03B23/03 C03B23/035 C03B27/00 C03B27/04 C03B35/00 C03B35/02 C03B35/16 F27B7/14

CPC: C03B23/03 C03B27/0417 C03B27/0442 C03B35/145 C03B35/202 C03B23/0302 C03B40/005

European: C03B23/03 C03B23/03B C03B27/044B C03B27/04C C03B35/14C C03B35/20B C03B40/00F

US: 65/273 65/285 65/287 65/291



Family:

Publication number	Publication date	Application number	Application date
AU197951621 A1	19800529	AU19790051621	19791009
AU517528 B2	19810806	AU19790051621	19791009
BE879598 A	19800424	BE19790197792	19791024
BR7906707 A	19800624	BR19790006707	19791018
CA1146358 A1	19830517	CA19790335886	19790918
DE2942738 A1	19800430	DE19792942738	19791023

DE2942738 C2	19820603	DE19792942738	19791023
ES485314 A1	19800516	ES19790485314	19791024
FR2439752 A1	19800523	FR19790024821	19791005
FR2439752 B1	19850628	FR19790024821	19791005
GB2035292 A1	19800618	GB19790036907	19791024
GB2035292 B2	19821110	GB19790036907	19791024
IT1119399 A	19860310	IT19790069049	19791019
IT7969049 A0	19791019	IT19790069049	19791019
JP1118877 C3	19821028	JP19790137538	19791024
JP55060032 A2	19800506	JP19790137538	19791024
JP57011850 B4	19820306	JP19790137538	19791024
MX152888 A	19860627	MX19790179760	19791024
US4197108 A	19800408	US19780954696	19781025
US4272274 A	19810609	US19790078627	19790925

Priority:

US19780954696 19781025 CA19790335886 19790918 US19790078627 19790925

Probable Assignee: PPG INDUSTRIES INC

Assignee(s): (std): IND PPG INC ; PPG INDUSTRIES INC ; PPG IND INC

Assignee(s): PPG INDUSTRIES INC 15222 PITTSBURGH PA US ; PPG IND OHIO INC ; INDUSTRIES PPG INC ; POSNEY RICHARD V ; PPG INC IND ; PPG INDUSTRIES ; CANONACO RUDY ; FRANK ROBERT G

Inventor(s): (std): CANONACO R ; CANONACO ROBERT ; CANONACO ROBERT GEORGE FRANK R ; CANONACO RUDY ; FRANK R G ; FRANK ROBERT G ; FRANK ROBERT GEORGE ; GEORGE FRANK RUDY ; POSNEY R V ; POSNEY RICHARD V ; POSNEY RICHARD VALENTINE ; RICHARD VALENTINE POSNEY ; ROBERT GEORGE FRANK ; RUDY CANONACO ; RUDEI KANONAKO ; ROBAATO JIYOOJI FURANKU ; RICHYAADO BARENTAIN POSUNII ; POSNEY R ; FRANK R

Inventor(s): R V POSNEY ; R G FRANK ; R CANONACO ; V POSNEY RICHARD ; G FRANK ROBERT ; CANONACO RUDY CHESWICK PA

Agent(s): COLLISON AND CO; GOWLING LAFLEUR HENDERSON LLP

11) Family number: 1981498 (US4290796A)

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Title: Mold alignment means for glass sheet shaping apparatus

Abstract: Apparatus for shaping glass sheets to a complicated shape including a longitudinal component of bend and a complicated transverse component of bend within a tunnel-like Lehr. An outline mold with guides for aligning one or more glass sheets for proper orientation and alignment thereon supports the glass while the glass is bent by gravity sagging to provide a longitudinal component of bend and to deliver the sag bent glass to a position between upper and lower pressing molds having complementary shaping surfaces conforming to a complicated bend including a complicated transverse bend component. Special alignment means are provided to orient and align the outline mold relative to said pressing molds so that the lower pressing mold can lift the sag bent glass off the outline mold into engagement with the upper pressing mold to impress the transverse bend component and return the glass with its complicated shape to the outline mold for controlled cooling and removal from the Lehr. When two glass sheets are shaped simultaneously in this manner, they conform exactly to the shape of each other so closely that they can be laminated readily to form a laminated windshield of complicated shape for installation in exact registration with a shaped mounting frame of a vehicle. The upper pressing mold may be omitted in cases where thin glass sheets are bent to relatively shallow curvatures which may involve complicated shapes and/or outlines.

Classifications:

International (IPC 8-9): C03B23/025 C03B23/03

C03B35/20 (Advanced/Invention);

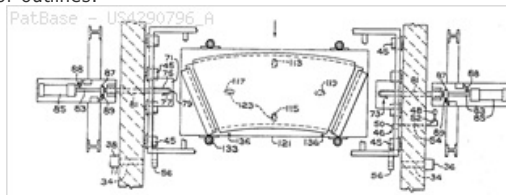
C03B23/02 C03B35/00 (Core/Invention)

International (IPC 1-7): C03B23/023 C03B23/025 C03B23/03 C03B35/14

CPC: C03B23/0252 C03B23/0302 C03B2225/02

European: C03B23/025B C03B23/03B M03B225/02

US: 65/106 65/273 65/287



Family:

Publication number	Publication date	Application number	Application date
CA1150054 A1	19830719	CA19800363891	19801103
FR2468557 A1	19810508	FR19800023323	19801031
FR2468557 B1	19830701	FR19800023323	19801031
GB2063851 A1	19810610	GB19800035047	19801031
GB2063851 B2	19830622	GB19800035047	19801031
IT1129362 A	19860604	IT19800068676	19801031
IT8068676 A0	19801031	IT19800068676	19801031
JP1246061 C3	19841225	JP19800155119	19801104
JP56120524 A2	19810921	JP19800155119	19801104
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US4290796 A	19810922	US19790090943	19791102

Priority:

US19790090943 19791102 CA19800363891 19801103

Probable Assignee: PPG INDUSTRIES INC

Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC

Assignee(s): REESE THOMAS J ; PPG IND OHIO INC ; PPG INDUSTRIES ; FISHER JOSEPH J

Inventor(s): (std): FISHER JOSEPH J ; FISHER JOSEPH JOHN ; JIYOSUFU JIYON FUITSUSHIYAA ; REESE THOMAS J ; REESE THOMAS JONAH ; TOOMASU JIYONA REESE

Inventor(s): TOOMASU JONA REESE ; JOSEFU JON FUITSUSHAA ; THOMAS JONAH REESE ; THOMAS JONAH REESE ET JOSEPH JOHN FISHER ; JOSEPH JOHN FISHER
Agent(s): GOWLING LAFLEUR HENDERSON LLP

12) Family number: 11192312 (US5286271A)

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Title: Method and apparatus for bending glass sheets

Abstract: Glass sheets are heated to their heat softening temperature and transferred to a shaping station having an upper vacuum mold with a downwardly facing shaping surface corresponding to the desired shape of the glass sheet. The glass sheet is lifted into engagement with the shaping surface and held thereagainst by vacuum. The mold and the glass sheet are then moved to a transfer station and the vacuum is released to deposit the shaped glass sheet onto a contoured conveying surface which generally conforms to the shaped glass sheet. The glass sheet is deposited onto the contoured conveying surface as it is moving from the shaping station to the transfer station to impart movement in the glass sheet along the contoured conveying surface and minimize marring of the glass sheet as it contacts the contoured conveying surface.

Classifications:

International (IPC 8-9): B29C51/08 C03B23/03 C03B23/035 C03B35/14 C03B35/16 C03B35/20 (Advanced/Invention); B29C51/08 C03B23/02 C03B35/00 (Core/Invention); C03B (Subclass/Invention)

International (IPC 1-7): B29C51/08 C03B23/02 C03B23/023 C03B23/03 C03B23/033 C03B23/035 C03B23/23 C03B35/14 C03B35/16

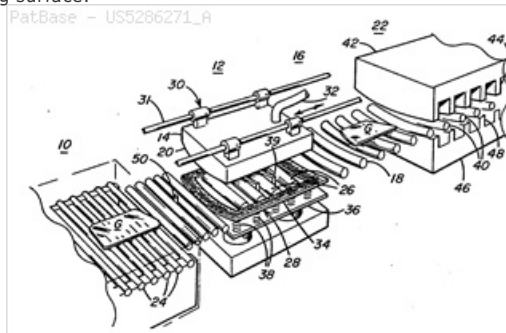
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US: 65/104 65/106 65/268 65/273 65/289

JP F-Term: 4F208 4F208/AC03 4F208/AH17 4F208/AH28 4F208/AH30 4F208/AH31 4F208/AH48 4F208/AJ11 4F208/AP05 4F208/AP06 4F208/AP07 4F208/AP12 4F208/AR06 4F208/AR07 4F208/AR08 4F208/AR13 4F208/MA01 4F208/MA05 4F208/MA08 4F208/MB01 4F208/MC03 4F208/MC10 4F208/MD01 4F208/MH06 4F208/MJ11 4F208/MJ16 4F208/MJ21 4F208/MJ29 4F208/MK03 4F208/MK15 4F208/MW02 4G015 4G015/AA09 4G015/AA14 4G015/AB06 4G015/GA00

JP F-Index: B29C51/08 C03B23/03 C03B35/14 C03B35/16



Family:

Publication number	Publication date	Application number	Application date
BRPI9302720 A	19940201	BR1993PI02720	19930630
CA2098865 AA	19940103	CA19932098865	19930621
CA2098865 C	19961022	CA19932098865	19930621
FR2693184 A1	19940107	FR19930007979	19930630
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ITMI931416 A1	19940303	IT1993MI01416	19930630
JP2034840 C3	19960328	JP19930162610	19930630
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KR19940002180 A	19940216	KR19930012318	19930701
KR940002180 A	19940216	KR19930012318	19930701
KR960008629 B1	19960628	KR19930012318	19930701
US5286271 A	19940215	US19920908150	19920702

Priority:

US19920908150 19920702 US19920980150 19920702 CA19932098865 19930621
KR19930012318 19930701

Probable Assignee: VITRO SAB DE CV

Assignee(s): (std): PPG IND INC

Assignee(s): PPG IND INC A CORP OF PA ; PPG IND OHIO INC ; PPG INDUSTRIE INC ; RUETER RICHARD E ; VITRO SAB DE CV ; FECIK MICHAEL T ; FRANK ROBERT G ; PPG IND

Inventor(s): (std): FECIK MICHAEL T ; FECIK MICHAEL F ; MAIKURU TEII FUESHITSUKU ; RICHIIYAADO II RIYUUTAA ; ROBAATO JII FURANKU ; FRANK ROBERT G ; RUETER RICHARD E

Inventor(s): ROBERT G FRANK ; RICHARD E RUETER ; MICHAEL T FECIK

Agent(s): BORDEN LADNER GERVAIS LLP

13) Family number: 8412854 (US4045103A)

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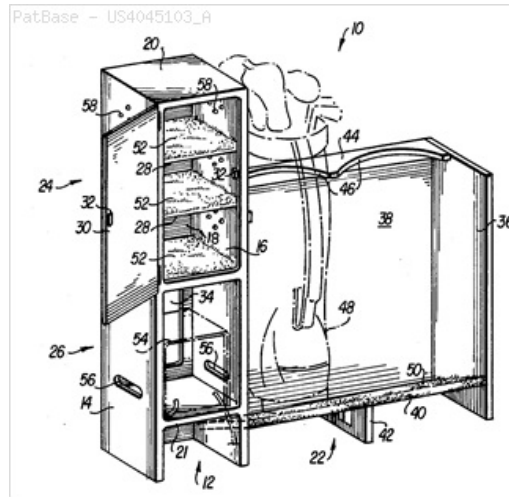
Title: Golf equipment storage device

Abstract: A storage cabinet combination for golf-related equipment is disclosed comprising an upstanding cabinet connected to an adjacently situated rack portion. The upstanding cabinet includes an upper shelved portion having a hinged door closure thereon for the storage of golf shoes, ball bags and the like and a substantially open-ended lower portion for receiving a golf cart battery charger. The rack portion of the storage cabinet includes a lower inclined shelf member upon which one or more golf bags are adapted to rest in an upright position and a plurality of arcuate-shaped members which are adapted to at least partly engage the circumference of a golf bag. The storage cabinet is particularly suited for manufacture and packaging in an unassembled kit form which can be readily assembled and finished by the user.

Classifications:

International (IPC 8-9): A47B81/00 C03B23/035 C10G1/06 C10G47/00

C10G47/22 C10G9/00 (Advanced/Invention);
C10G47/00 (Advanced/Non-invention);
A47B81/00 C03B23/02 (Core/Invention)
International (ipc 1-7): A47B53/00 A47B81/00 B65G47/06 C03B21/00
C03B23/035 C03B25/06 C03B25/06 C03B27/04 C03B35/16 C10G1/06
C10G47/00 C10G47/22 C10G9/00
CPC: C10G9/00 C10G47/22 A47B81/00 C10G1/06 C03B23/0357
European: A47B81/00 C03B23/035B C03B23/035B3 C10G1/06
C10G47/22 C10G9/00
US: 208/107 208/264 208/56 211/85.18 312/198 312/213 65/104 65/106
65/107 65/268 65/273 65/287 65/291 D6/552
JP F-Term: 4H029 4H129 4H129/AA02 4H129/CA01 4H129/CA08
4H129/CA11 4H129/CA21 4H129/DA03 4H129/DA21 4H129/FA07
4H129/NA21
JP F-Index: C10G47/00



Family:

Publication number	Publication date	Application number	Application date
AU198166901 A1	19811022	AU19810066901	19810204
AU522319 B2	19820527	AU19810066901	19810204
CA1152327 A1	19830823	CA19810369325	19810126
CA1153721 A1	19830913	CA19810380506	19810624
DE3109149 A1	19811224	DE19813109149	19810311
DE3109149 C2	19830721	DE19813109149	19810311
EP0068051 A1	19830105	EP19810302923	19810629
FR2478066 A1	19810918	FR19810003914	19810227
FR2478066 B1	19840120	FR19810003914	19810227
GB2072652 A1	19811007	GB19810004846	19810217
GB2072652 B2	19830810	GB19810004846	19810217
IT1194037 A	19880831	IT19810020294	19810311
IT8120294 A0	19810311	IT19810020294	19810311
JP1250812 C3	19850214	JP19810037751	19810316
JP56169138 A2	19811225	JP19810037751	19810316
JP58008788 A2	19830118	JP19810106825	19810708
JP59024090 B4	19840607	JP19810037751	19810316
US4045103 A	19770830	US19760701408	19760630
US4277276 A	19810707	US19800130783	19800317
US4298457 A	19811103	US19800137083	19800317

Priority:

US19760701408 19760630 US19780941840 19780911 US19800130783 19800317
US19800137083 19800317 CA19810369325 19810126 CA19810380506 19810624
EP19810302923 19810629 JP19810106825 19810708

Probable Assignee: PPG IND OHIO INC

Assignee(s): (std): PAOLINO VINCENT J ; PPG IND INC ; UNIV UTAH ; UNI YUTA ; PPG INDUSTRIES INC

Assignee(s): YUNIBAASHITEI OBU YUTA ; PPG IND OHIO INC ; RAMAKRISHNAN RASMASAMY ; SHABTAI JOSEPH ; PPG INDUSTRIES ; PPG INDUSTRIES INC 15222 PITTSBURGH PA US ; THE UNIVERSITY OF UTAH ; UNIVERSITY OF UTAH ; PEREMAN GORDON F ; PPG IND ; KELLAR JOHN D ; OBLAD ALEX G ; OF UTAH UNIV

Inventor(s): (std): KELLAR JOHN D ; PEREMAN GORDON F ; PEREMAN G F ; KELLAR J D ; GOODON FUOSUTAA PEREMAN ; JIYON DONARUDO KERRA ; RASUMASAMII RAMAKURISHIYUNAN ; JIYOUZEFU SHIYABUTAI ; ARETSUKUSU JII OBUURATSUDO ; RAMAKRISHNAN RASMASAMY ; SHABTAI JOSEPH ; OBLAD ALEX G ; JON DONARUDO KERRA ; PEREMAN GORDON FOSTER ; KELLAR JOHN DONALD ; PAOLINO VINCENT J

Inventor(s): JOHN DONALD KELLAR ; GORDON FOSTER PEREMAN ; J D KELLAR ; G F PEREMAN ; JD KELLAR ; GF PEREMAN ; JOHN DONALD KELLAR ET GORDON FOSTER PEREMAN ; DONALD KELLAR JOHN ; FOSTER PEREMAN GORDON ; PEREMAN GORDON FOSTER COLUMBUS ONTARIO CA ; KELLAR JOHN DONALD PONTYPOOL ONTARIO CA

Agent(s): COLLISON AND CO; GOWLING LAFLEUR HENDERSON LLP

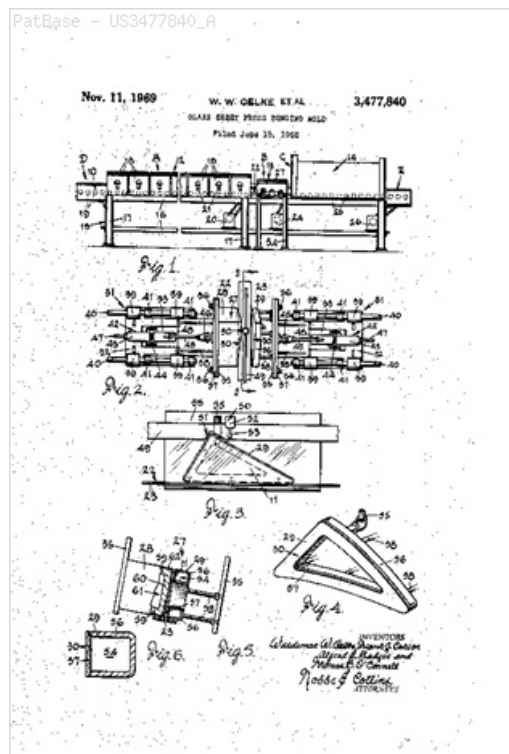
Designated states: BE DE FR GB IT NL SE

14) Family number: 65174 (US3477840A)

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Title: GLASS SHEET PRESS BENDING MOLD

Abstract: (Claim 1) 1. In apparatus for bending glass sheets, a bending mold comprising opposed mold parts aligned with each other and having complemental shaping surfaces formed on the opposed faces thereof, at least one of said mold parts comprising a permeable member having minute tortuous pores therethrough and with said shaping surface formed as one side thereof; means mounting said mold parts for relative movement toward and away from each other between a first position in which said shaping surfaces are spaced apart and a second position in which said shaping surfaces are engageable with opposite surfaces of a glass sheet disposed therebetween to press said sheet between said surfaces; means for moving said mold parts between said first and second positions; and means for introducing a fluid under pressure into said permeable member to seep therethrough and form a thin, quiescent film of fluid on said shaping surface, whereby said film acts as a separator medium between said shaping surface and a surface of a glass sheet as the latter is pressed between said mold parts.

Classifications:**International (IPC 8-9):** C03B23/031 (Advanced/Invention);
C03B23/02 (Core/Invention)**International (IPC 1-7):** C03B23/02 C03B23/03**CPC:** C03B23/0315**European:** C03B23/031B**US:** 65/106 65/182.2 65/273 65/275 65/287 65/374.12**Family:**

Publication number	Publication date	Application number	Application date
BE699833 A	19671213		19670613
DE1596513 A1	19710318	DE19671596513	19670607
ES341231 A1	19680616	ES19670341231	19670531
FR1530762 A	19680628	FR19670110340	19670614
GB1164685 A	19690917	GB19670024109	19670524
LU53870 A	19690422		19670613
NL6708234 A	19671218	NL19670008234	19670614
US3477840 A	19691111	US19660557728	19660615

Priority:

US19660557728 19660615 FR19670110340 19670614

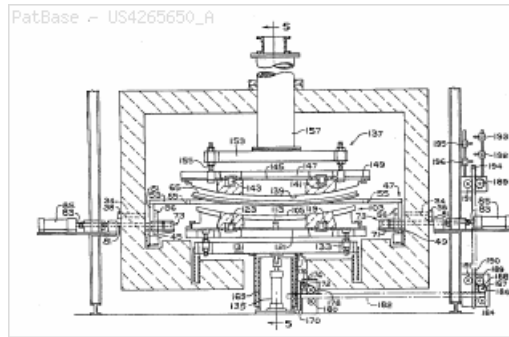
Probable Assignee: LOF GLASS INC**Assignee(s):** (std): LIBBEY OWENS FORD CO ; LIBBEY OWENS FORD GLASS CO**Assignee(s):** LIBBEY OWENS FORD GLASS COMPANY ; LOF GLASS INC ; LIBBEY OWENS FORD COMPANY**Inventor(s):** (std): BADGER ALFRED E ; BERNARD O CONNELL THOMAS ; CARSON FRANK J ; EARL BADGER ALFRED ; JACOB CARSON FRANK ; O CONNELL THOMAS B ; OELKE WALDEMAR W ; WERNER OELKE WALDEMAR**Inventor(s):** ALFRED E BADGER ; THOMAS B O CONNELL ; WALDEMAR W OELKE ; FRANK J CARSON**15) Family number: 8203003 (US4265650A)**

© PatBase

Title: Method of bending glass sheets in unison to complicated shapes

Abstract: In shaping a pair of glass sheets simultaneously to a complicated shape including a longitudinal component of bend and a complicated transverse component of bend such as one that is S-shaped in elevation or other complicated shapes, the pair is sag bent in unison on an outline mold to sag bend the sheets to a shape approximating their longitudinal component of bend, then the pair of sag bent sheets is lifted on a solid mold having a complicated shape including said complicated transverse component of bend to impress said transverse component of bend (into engagement with an upper pressing mold of complementary curvature, if needed) and supported on said solid mold for the minimum time sufficient to develop said complicated shape. The pair of glass sheets bent to said complicated shape is returned as rapidly as possible to said outline mold and cooled at a controlled rate while supported on said outline mold to a temperature below the strain point to insure that the pair of glass sheets retain their complicated conformed shapes so that they can be laminated subsequently with minimum difficulty. The viewing area of the bent glass is engaged with a solid mold while at an elevated temperature at which the glass surface is likely to be marred for a minimum time needed to impart the transverse component of bend thereon.

Classifications:**International (IPC 8-9):** C03B23/025 C03B23/03 (Advanced/Invention)**International (IPC 1-7):** C03B23/025 C03B23/03**CPC:** C03B23/0256 C03B23/0302**European:** C03B23/025C C03B23/03 C03B23/03B**US:** 65/104 65/106 65/107 65/287



Family:

Publication number	Publication date	Application number	Application date
US4265650 A	19810505	US19790090819	19791102

Priority:

US19790090819 19791102

Probable Assignee:

PPG INDUSTRIES INC

Assignee(s): (std):

PPG IND INC ; PPG INDUSTRIES INC

Inventor(s): (std):

REESE THOMAS J ; THOMAS DEAN L

16) Family number: 3623960 (US4526605A)

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Title: Vacuum mold for shaping glass sheets

Abstract: In apparatus for shaping sheets of heat-softenable material, such as glass and plastics, an upper vacuum mold is provided with an apertured wall member of low expansion refractory material to engage a heat-softened sheet during a portion of its shaping. In order to improve its durability, metal clamping devices that cause high local stresses in the refractory wall member are not used to secure the refractory wall member to metal structural elements of the vacuum mold. The present invention comprises novel mold structure to support a lower apertured wall member of refractory material on an inverted metal box member without metal attachment devices that induce high local stresses.

Classifications:

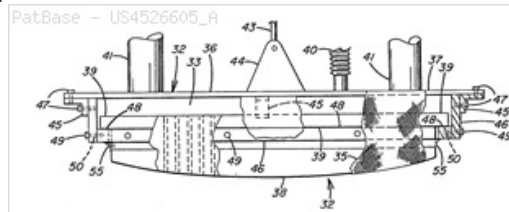
International (IPC 8-9): C03B23/03 C03B23/035 (Advanced/Invention); C03B23/02 (Core/Invention)

International (IPC 1-7): C03B23/035

CPC: C03B23/03 C03B23/0357

European: C03B23/03 C03B23/035B C03B23/035B3

US: 65/104 65/106 65/273 65/287



Family:

Publication number	Publication date	Application number	Application date
CA1241198 A1	19880830	CA19840461408	19840821
FR2552074 A1	19850322	FR19840013734	19840906
FR2552074 B1	19871023	FR19840013734	19840906
IT1182269 A	19871005	IT19840067925	19840914
IT8467925 A0	19840914	IT19840067925	19840914
US4526605 A	19850702	US19830532422	19830915

Priority:

US19830532422 19830915 CA19840461408 19840821

Probable Assignee:

PPG IND OHIO INC

Assignee(s): (std):

PPG INDUSTRIES ; PPG IND OHIO INC

Assignee(s):

PPG INDUSTRIES ; PPG IND OHIO INC ; PPG IND INC PITTSBURGH PA ; EWING JOHN J ; FECIK MICHAEL T ; FRANK ROBERT G ; PPG IND

Inventor(s): (std):

FRANK ROBERT G ; FECIK MICHAEL T ; EWING JOHN J ; EWING JOHN JOSEPH ; FECIK MICHAEL TIMOTHY ; FRANK ROBERT GEORGE

Inventor(s):

ROBERT GEORGE FRANK ; JOHN JOSEPH EWING ; MICHAEL TIMOTHY FECIK ; ROBERT GEORGE FRANK MICHAEL TIMOTHY FECIK ET... ; ROBERT GEORGE FRANK MICHAEL TIMOTHY FECIK ET JOHN

Agent(s):

GOWLING LAFLEUR HENDERSON LLP

17) Family number: 17436814 (US4368065A)

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Title: Method and apparatus to remove bent, tempered glass sheets from a cooling station

Abstract: In the bending and tempering of glass sheets supported on a ring-like member for conveyance of the bent glass sheet through a cooling station, a transfer device for unloading the bent, tempered glass sheet is provided. The transfer device is so constructed and arranged that it does not cause a bottleneck in high speed, mass production of bent, tempered glass sheets, avoids uncontrolled departures from the desired shape of the bent, tempered glass sheets, particularly those that develop in the

marginal edge portion of the glass sheets that must fit exactly into glass sheet receiving frames of installation structures or vehicles, and enables the glass sheet to transfer so gently as to inhibit the likelihood of breakage resulting from uncontrolled dropping of bent, tempered glass sheets during their handling.

Classifications:

International (IPC 8-9): C03B27/044 C03B35/14 C03B35/20

C03B35/24 (Advanced/Invention);

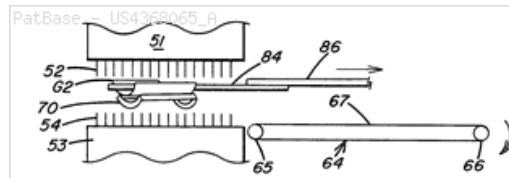
C03B27/00 C03B35/00 (Core/Invention)

International (IPC 1-7): C03B23/035 C03B27/04 C03B35/14 C03B35/20

CPC: C03B27/0442 C03B35/202 C03B35/24

European: C03B27/044B C03B35/20B C03B35/24

US: 65/111 65/114 65/182.2 65/273 65/348 65/351



Family:

Publication number	Publication date	Application number	Application date
CA1176845 A1	19841030	CA19820410693	19820902
FR2516502 A1	19830520	FR19820016872	19821008
FR2516502 B1	19851025	FR19820016872	19821008
IT1157081 A	19870211	IT19820068347	19821118
IT8253963 U0	19821118	IT19820053963U	19821118
IT8268347 A0	19821118	IT19820068347	19821118
US4368065 A	19830111	US19810322787	19811119

Priority:

US19810322787 19811119 CA19820410693 19820902

Probable Assignee: PPG IND OHIO INC

Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC ; PPG INDUSTRIES

Assignee(s): PPG IND OHIO INC ; PPG IND INC A CORP OF PA ; FRANK ROBERT G ; PPG IND

Inventor(s): (std): FRANK ROBERT G ; FRANK ROBERT GEORGE

Inventor(s): ROBERT GEORGE FRANK

Agent(s): GOWLING LAFLEUR HENDERSON LLP

18) Family number: 4215411 (US4430111A)

PatBase

Title: Method and apparatus to remove sharply bent, tempered glass sheets from a cooling station

Abstract: In the bending and tempering of sharply bent glass sheets supported on a ring-like member for conveyance of the bent glass sheet through a cooling station, a transfer device for unloading the sharply bent, tempered glass sheet is provided. The transfer device is so constructed and arranged that it does not cause a bottleneck in high speed, mass production of sharply bent, tempered glass sheets, avoids uncontrolled departures from the desired shape of the bent, tempered glass sheets, particularly those that develop in the marginal edge portion of the glass sheets that must fit exactly into glass sheet receiving frames of installation structures or vehicles, provides clearance for the sharply bent glass sheets and enables the glass sheet to transfer so gently as to inhibit the likelihood of breakage resulting from uncontrolled dropping of bent, tempered glass sheets during their handling.

Classifications:

International (IPC 8-9): B65G49/06 C03B35/20 (Advanced/Invention);

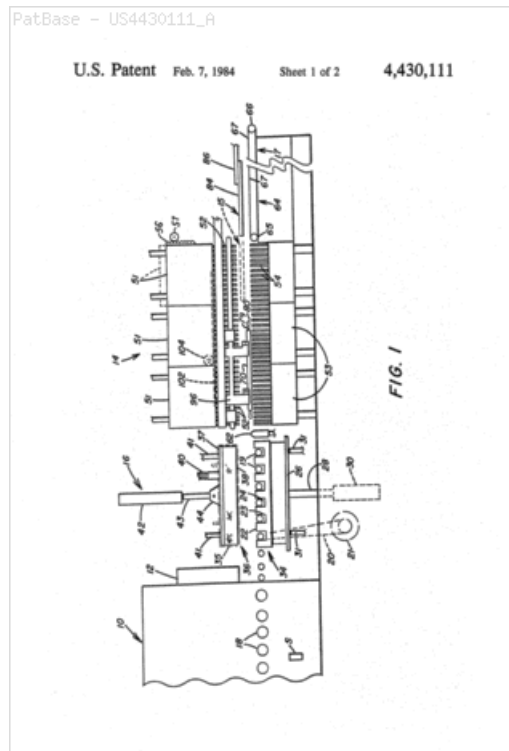
B65G49/05 C03B35/00 (Core/Invention)

International (IPC 1-7): C03B23/035

CPC: B65G49/068 C03B35/202

European: B65G49/06H C03B35/20B

US: 65/104 65/114 65/273 65/351



Family:

Publication number	Publication date	Application number	Application date
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Priority:

US19820402672 19820728

Probable Assignee: PPG IND OHIO INC

Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC

Assignee(s): PPG IND ; PPG IND INC PITTSBURGH PA A CORP OF PA ; PPG IND OHIO INC

Inventor(s): (std): CLAASSEN GEORGE R ; EWING JOHN J

19) Family number: 8163075 (US4260408A)

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Title: Use of speed changes during cycling of a shaping mold

Abstract: When glass sheets are shaped by a bending method in which the glass is first shaped to a longitudinal component of bend by gravity sagging onto an outline mold followed by press bending against a solid lower shaping mold to complete the bend which includes a complicated transverse component of bend, a particular speed cycle is provided to lift and lower the lower shaping mold to minimize the duration of the shaping cycle and to minimize the chance of misaligning the glass relative to the outline mold during transfer of the glass from the outline mold to the lower shaping mold and its return to the outline mold. This speed cycle includes a rapid initial lifting speed and final lowering speed of the lower shaping mold while it is out of contact with the glass and a lower speed of lifting and lowering when the lower shaping mold contacts and supports the glass.

Classifications:

International (IPC 8-9): C03B23/03 (Advanced/Invention);

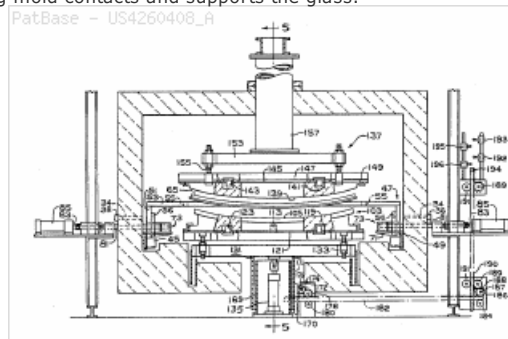
C03B23/02 (Core/Invention)

International (IPC 1-7): C03B23/03

CPC: C03B23/03

European: C03B23/03

US: 65/106 65/107 65/273 65/287 65/289



Family:

Publication number	Publication date	Application number	Application date
US4260408 A	19810407	US19790090944	19791102

Priority:

US19790090944 19791102

Probable Assignee: PPG INDUSTRIES INC

Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC

Inventor(s): (std): FISHER JOSEPH J ; REESE THOMAS J

20) Family number: 13437439 (US5441551A)

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Title: BENDING PRESS FOR THE PRODUCTION OF CURVED GLASS PANES

Abstract: A device for pressing and bending glass panes comprises an upper, solid-faced bending mold and a lower frame-shaped mold. The lower frame mold is mounted horizontally traversable and serves at the same time as a support ring for transferring the bent glass pane into a cooling station. The frame-shaped mold is provided with an electrical heating resistor. In addition, a temperature sensor is disposed in the frame-shaped mold. The temperature of the frame-shaped mold can be regulated to a predetermined temperature by way of a power regulator, which is governed by the temperature sensor.

Classifications:

International (IPC 8-9): C03B23/023 C03B23/03 C03B27/044 C03B35/20

C03B40/02 (Advanced/Invention);

C03B23/02 C03B27/00 C03B35/00 C03B40/00 (Core/Invention)

International (IPC 1-7): B30B15/34 C03B23/023 C03B23/023 C03B23/03

C03B27/044 C03B35/20 C03B40/02

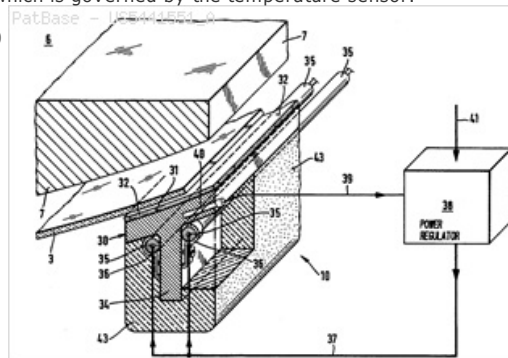
CPC: C03B23/0307

European: C03B23/03 C03B23/03D

US: 65/162 65/289 65/356 65/374.13

JP F-Term: 4G015 4G015/AA09 4G015/AB05 4G015/AB07 4G015/AB10

JP F-Index: C03B23/03



Family:

Publication number	Publication date	Application number	Application date
DE4208219 C1	19930506	DE19924208219	19920314
DE69320225 D1	19980917	DE19936020225T	19930310

DE69320225 T2	19990304	DE19936020225T	19930310
EP0561671 A1	19930922	EP19930400614	19930310
EP0561671 B1	19980812	EP19930400614	19930310
ES2121962 T3	19981216	ES19930400614T	19930310
FI100524 B	19971231	FI19930001121	19930312
FI931121 A	19930915	FI19930001121	19930312
FI931121 A0	19930312	FI19930001121	19930312
JP3571357 B2	20040929	JP19930053546	19930315
JP6009237 A2	19940118	JP19930053546	19930315
US5441551 A	19950815	US19940269622	19940701

Priority:

DE19924208219 19920314 DE19936020225 19930310 US19930031723 19930315
US19940269622 19940701

Probable Assignee: SAINT GOBAIN SA

Assignee(s): (std): SAINT GOBAIN GLASS FRANCE ; SAINT GOBAIN SA ; SAINT GOBAIN VITRAGE ; SAINT GOBAIN VITRAGE INT ; GLASWERKE GMBH VER ; VER GLASWERKE GMBH

Assignee(s): SAINT GOBAIN BITORAAJIYU INTERNATL ; SAINT GOBAIN VITRAGE INTERNATIONAL ; VEGLA VEREINIGTE GLASWERKE GMBH ; VEGLA VEREINIGTE GLASWERKE GMBH 5100 AACHEN DE ; VEGLA VEREINIGTE GLASWERKE GMBH 52066 AACHEN DE ; VEGLA VER GLASWERKE GMBH 5100 AACHEN DE ; VEGLA VER GLASWERKE GMBH ; VEGLA VER GLASWERKE GMBH 52066 AACHEN DE

Inventor(s): (std): KUSTER HANS WERNER ; MUCHA HORST ; NOWOCZYN HANS WERNER ; OLLFISCH KARL JOSEF ; TAUBERT EBERHARD ; NOWOCZYN HANS WERNER DR ; KUSTER HANS WERNER DR ; KAARUUYOOZEFU ORUFUISHIYU ; HORUSUTO MUHIYA ; HANSUUBERUNAA NOBOTSUIN ; HANSUUBERUNAA KUSUTAA ; EEBERUHARUTO TAOBERUTO

Inventor(s): KUSTER HANS WERNER W 5100 AACHEN DE ; TAUBERT EBERHARD 5120 HERZOGENRATH DE ; MUCHA HORST 5100 AACHEN DE ; MUCHA HORST W 5100 AACHEN DE ; OLLFISCH KARL JOSEF W 5100 AACHEN DE ; NOWOCZYN HANS WERNER W 5100 AACHEN DE ; TAUBERT EBERHARD W 5120 HERZOGENRATH DE

Designated states: BE CH DE ES FR GB IT LI LU NL PT SE

21) Family number: 1432997 (US4043784A)

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Title: Shaping glass sheets

Abstract: Shaping glass sheets of soda-lime-silica compositions by gravity sagging into complicated shapes having a portion of convex curvature and another portion of concave curvature requires a continuous shaping surface onto which a supported glass sheet is heated and sags. The present invention provides a method of bending soda-lime-silica glass sheets onto curved molds of a complicated curvature comprising a previously shaped sheet of a glassy composition having a heat capacity approximating that of the soda-lime-silica composition and a lower coefficient of thermal expansion and a higher deformation temperature than those of the soda-lime-silica composition of the glass sheet to be bent. The layer of glassy composition which provides the mold shaping surface is in turn supported on a metal frame of outline configuration conforming in elevation and outline to the shape of the layer of the special glassy composition, and preferably has a minimum thickness at least equal to the glass sheet to be shaped to insure that when the composite mold comprising the shaped outline metal frame and the superimposed shaped layer supporting a glass sheet to be shaped is heated to the deformation temperature of the glass sheet, the layer retains its shape sufficiently to be used as part of the composite mold in subsequent bending operations.

Classifications:

International (IPC 8-9): C03B23/025 (Advanced/Invention); C03B23/02 (Core/Invention)

International (IPC 1-7): C03B23/02

CPC: C03B23/0252

European: C03B23/025B

US: 65/107 65/288 65/291 65/374.11

Family:

Publication number	Publication date	Application number	Application date
US4043784 A	19770823	US19760701465	19760701

Priority:

US19760701465 19760701

Probable Assignee: PPG INDUSTRIES INC

Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC

Inventor(s): (std): MORTIMER JAMES R ; REESE THOMAS J ; TOBIN MELVIN W

22) Family number: 8258686 (US4272275A)

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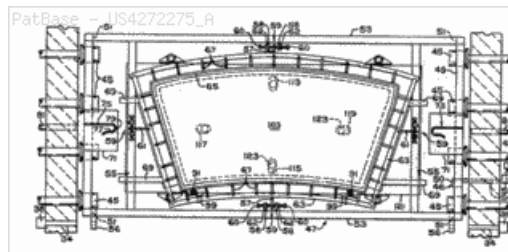
Title: Aligning glass sheets on an outline mold prior to transfer to shaping mold

Abstract: In bending glass sheets to a complicated shape by a combination of gravity sagging the glass to a longitudinal component of bend while supported on an upward facing shaping surface of an outline mold and then lifting the glass so shaped off the outline mold onto a solid shaping mold of continuous extent to impress a complicated transverse component of bend, glass edge engaging members are provided closely adjacent to said outline mold to the outside thereof, means is provided to support said glass edge engaging members so that the upper edges thereof are located in position to abut the edge of one or more glass sheets as the latter sag toward said outline mold and to remove said glass edge engaging members suddenly and automatically from the vicinity of the edge of the supported glass sheets just before the glass sheets are lifted from said outline mold to said solid shaping mold to reduce edge distortion of the mold supported glass sheets.

Classifications:

International (IPC 8-9): C03B23/025 C03B23/03 (Advanced/Invention); C03B23/02 (Core/Invention)

International (IPC 1-7): C03B23/025 C03B23/03
CPC: C03B23/0256 C03B23/03
European: C03B23/025C C03B23/03
US: 65/273 65/289 65/290



Family:

Publication number	Publication date	Application number	Application date
US4272275 A	19810609	US19790091002	19791102

Priority:

US19790091002 19791102

Probable Assignee: PPG INDUSTRIES INC
Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC
Inventor(s): (std): REESE THOMAS J

23) Family number: 1540335 (US4119428A)

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Title: Apparatus for bending glass sheets

Abstract: A gravity sag bending mold of the outline type for bending glass sheets is provided with the following improvements: (1) A plurality of rod-like glass supporting members are affixed outwardly and slightly above the shaping surfaces of the bending mold to reduce glass slippage and mold marking. (2) The bending mold is comprised of a plurality of rigid shaping rail sections, each independently mounted so that the outline dimensions can be adjusted slightly. (3) The bending mold is tilted downwardly in the direction of travel a maximum of 5 degrees to reduce glass slippage.

Classifications:

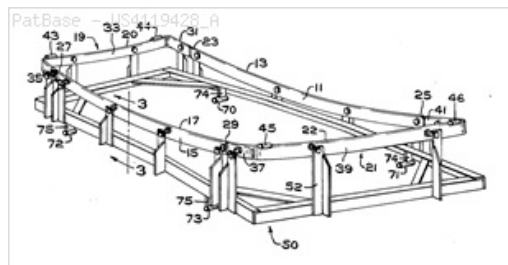
International (IPC 8-9): C03B23/02 C03B23/025 (Advanced/Invention); C03B23/02 (Core/Invention)

International (IPC 1-7): C03B23/02

CPC: C03B23/0252

European: C03B23/025B

US: 65/107 65/273 65/287



Family:

Publication number	Publication date	Application number	Application date
CA1102135 A1	19810602	CA19770283228	19770721
US4119428 A	19781010	US19770827523	19770825

Priority:

US19760716416 19760823 CA19770283228 19770721

Probable Assignee: PPG INDUSTRIES INC
Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC
Assignee(s): CROWE EDWARD R ; DEANGELIS WILLIE G
Inventor(s): (std): DEANGELIS WILLIE G ; CROWE EDWARD R
Agent(s): GOWLING LAFLEUR HENDERSON LLP

24) Family number: 7877086 (US4221580A)

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Title: Glass sheet vacuum molding apparatus with uniform release means

Abstract: This invention relates to improvements in handling glass sheets during shaping. Each glass sheet in turn is heated to its deformation temperature and conveyed into a glass shaping station. The glass is lifted into engagement with an upper vacuum shaping mold while hot and held against the vacuum shaping mold by vacuum as the glass lifting mechanism retracts downward. A transfer and tempering ring-like member having an outline supporting surface conforming to and slightly inside the periphery of the bent glass sheet is brought into a position below the upper vacuum shaping mold. The vacuum on the upper mold is released to deposit the shaped glass sheet on the ring-like member. In case the outline of the glass sheet is irregular, the shaped glass may become tilted as it falls toward the ring-like member and be deposited in a misaligned position relative to said ring-like member. The present invention provides means for the upper vacuum shaping mold that reduces the tendency of glass sheets of irregular outline to tilt during their transfer to the ring-like member with minimum expenditure of power to insure a non-tilting transfer.

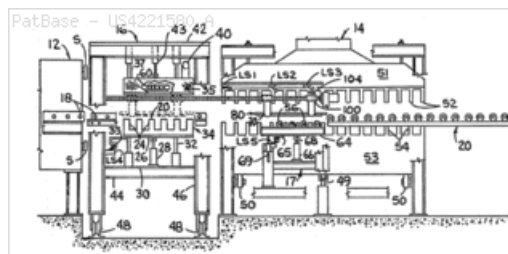
Classifications:

International (IPC 8-9): C03B23/03 C03B23/035 C03B27/044 C03B35/14 C03B35/20 (Advanced/Invention)

International (IPC 1-7): C03B23/02

CPC: C03B23/03 C03B23/0357 C03B27/0442 C03B35/145 C03B35/202 C03B40/005

European: C03B23/03 C03B23/035B C03B23/035B3 C03B27/044B
C03B35/14C C03B35/20B C03B40/00F
US: 65/273 65/287 65/349



Family:

Publication number	Publication date	Application number	Application date
US4221580 A	19800909	US19780954695	19781025

Priority:

US19780954695 19781025

Probable Assignee: PPG INDUSTRIES INC
Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC
Inventor(s): (std): FRANK ROBERT G

25) Family number: 2886724 (US4447252A)

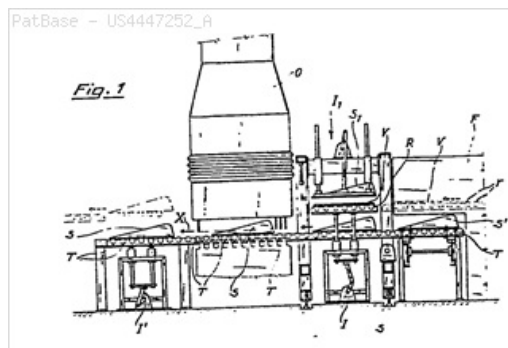
© PatBase

Title: Apparatus for curving and tempering or heat toughening thin glass sheets

Abstract: An apparatus is provided for curving and tempering or heat toughening thin glass sheets, with thickness less than 4 mm and with camber over 60 mm, regardless of the type of curve described by their profile (cylindrical, parabolic, etc.). A continuous feed system is provided for curving rings, such system including a horizontal carrousel which permits individual curving rings to pass under a forming station every 3 seconds. Rolls are provided in the curve forming station designed to pass across the curving ring or forming mould, regardless of the camber of the latter, even if it exceeds 60 mm, as the rolls are not secured to the rings. The carrousel includes the combination of two racks or horizontal chain conveyors with two pairs of roller conveyors. Means are provided for the rapid lowering and subsequent unloading of the glass sheet, so that during its heating in a furnace and after an unloading phase, the glass sheet is located at a higher level with respect to the path it follows in the curve forming and in quenching stations.

Classifications:

International (IPC 8-9): C03B23/03 C03B35/20 (Advanced/Invention);
C03B23/02 C03B35/00 (Core/Invention)
International (IPC 1-7): C03B23/023 C03B23/03 C03B27/04 C03B35/14
C03B35/20
CPC: C03B23/03 C03B35/202
European: C03B23/03 C03B35/20B
US: 65/104 65/268 65/273 65/287



Family:

Publication number	Publication date	Application number	Application date
DE3262193 D1	19850321	DE19823262193	19820326
EP0062814 A1	19821020	EP19820102574	19820326
EP0062814 B1	19850206	EP19820102574	19820326
ES511160 A0	19830216	ES19820511160	19820405
ES8304042 A1	19830216	ES19820511160	19820405
IT1138266 A	19860917	IT19810020938	19810406
IT8120938 A0	19810406	IT19810020938	19810406
US4447252 A	19840508	US19820362131	19820326

Priority:

IT19810020938 19810406

Probable Assignee: SIV SOC ITALIANA VETRO
Assignee(s): (std): SIV SOC ITALIANA VETRO
Assignee(s): SOCIETA ITALIANA VETRO SIV S P A ; SOCIETA ITALIANA VETRO SIV SPA ; VETRO SIV S P A SOC IT ; VETRO SIV SOC IT SPA ; VETRO SIV SOC IT ; IETA ITALIANA VETRO SIV SOC SPA
Inventor(s): (std): DELLE DONNE NICOLA ; DI NOCCO DINO ; DINO DI NOCCO ; DONNE NICOLA DELLE ; NICOLA DELLE DONNE ; NOCCO DINO DI
Designated states: BE DE FR GB LU NL

26) Family number: 7637002 (US4185986A)

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Title: Apparatus for handling glass sheets during shaping and cooling

Abstract: This invention relates to apparatus for handling glass sheets during shaping and cooling, and in particular to a ring-like member having stop means spaced upstream of an outline supporting surface conforming to and slightly inside the periphery of a bent glass sheet supported thereon to define a position for engaging the trailing edge of the glass sheet while conveying the latter in a downstream direction from a shaping station to a cooling station. The ring-like member has a pair of downstream end portions that are transversely spaced from one another to provide a clearance space to permit the ring-like member to begin to return in an upstream direction to the shaping station before the shaped glass sheet is transferred to a position completely downstream of the ring-like member.

Classifications:

International (IPC 8-9): C03B23/03 C03B27/044

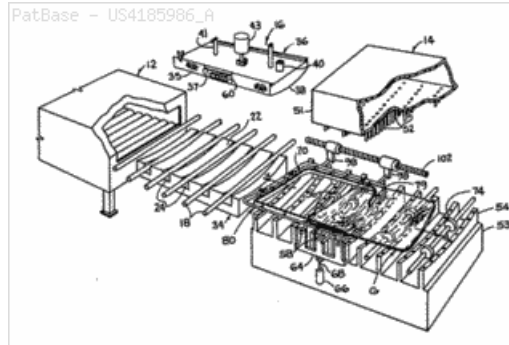
C03B35/20 (Advanced/Invention)

International (IPC 1-7): C03B23/02 C03B27/00

CPC: C03B23/03 C03B27/0404 C03B27/0445 C03B35/202 C03B2225/02

European: C03B23/03 C03B27/044B2 C03B27/04A C03B35/20B
M03B225/02

US: 65/273 65/286 65/287 65/348



Family:

Publication number	Publication date	Application number	Application date
US4185986 A	19800129	US19780954693	19781025

Priority:

US19780954693 19781025

Probable Assignee:

PPG INDUSTRIES INC

Assignee(s): (std):

PPG INDUSTRIES INC

Assignee(s):

PPG IND INC

Inventor(s): (std):

FRANK ROBERT G

27) Family number: 8163077 (US4260409A)

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Title: Attaching flexible cover to mold for shaping glass

Abstract: This invention relates to securing a cover of flexible material such as fiber glass cloth tightly against a shaping surface of a solid mold used to shape glass sheets. The securing means is located within the outline of the solid mold to avoid having cover attachment means beyond the solid mold outline. This permits the use of a solid mold of maximum size compared to that of an outline mold when glass sheets are shaped by a process that requires the solid mold to pass through a position occupied by an outline mold.

Classifications:

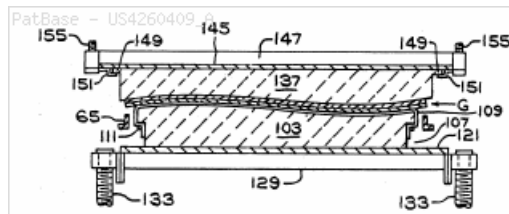
International (IPC 8-9): C03B23/03 (Advanced/Invention)

International (IPC 1-7): C03B23/03

CPC: C03B23/03 C03B40/005

European: C03B23/03 C03B40/00F

US: 65/106 65/273 65/287 65/289



Family:

Publication number	Publication date	Application number	Application date
US4260409 A	19810407	US19790091001	19791102

Priority:

US19790091001 19791102

Probable Assignee:

PPG INDUSTRIES INC

Assignee(s): (std):

PPG IND INC ; PPG INDUSTRIES INC

Inventor(s): (std):

REESE THOMAS J ; RODGERS EDWARD R

28) Family number: 62056076 (US2016096766A)

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Title: GLASS QUENCH APPARATUS

Abstract: A glass quench apparatus according to the present disclosure includes lower and upper quench heads configured to supply upward and downward gas flows to a heated glass sheet, and each quench head has multiple quench fins for distributing gas. For each quench head, adjacent quench fins are spaced apart center to center by a distance in the range of 0.87 to 1.15 inches, and each quench fin has multiple outlet openings that each have a diameter in the range of 0.25 to 0.36 inches. Furthermore, for each quench fin, the outlet openings are configured to provide spaced apart impingement points on the glass sheet such that adjacent impingement points are spaced apart by a distance in the range of 0.82 to 1.15 inches.

Classifications:

Publication number	Publication date	Application number	Application date
US2016096766 AA	20160407	US20140504731	20141002
US9611166 BB	20170404	US20140504731	20141002
WO16054482 A1	20160407	WO2015US53676	20151002

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Abstract: A lifesaving device having: (1) at least one set of flatwise, doughnut-shaped tubes of rubber, other plastic or thin metal, inflated with gas preferably at a pressure well above that of the atmosphere, having peripheries that are bonded together and tied by bands, cords or wire; (2) skin means comprising joined skins of plastic-impregnated fabric, plastic sheeting, plywood, thin metal or the like; (3) in some cases foamed plastic within the doughnut-shaped holes; (4) optionally, helium balloons in the foamed plastic; and, where the device serves as an article of furniture (table, chair or bed) until its use in life-preserving, (5) lower framework, comprising stacked doughnut-shaped tubes and a survival-kit storage container in this framework. The article of furniture may be inverted and floated as a life preserver. The structure of the invention also may be used as a life buoy or other buoy, a floatable mattress or part of a boat.

Publication number	Publication date	Application number	Application date
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US3503825 A	19700331	US19660531564	19660303
US3670349 A	19720620	US19700023789	19700330
US3798690 A	19740326	US19720225387	19720211
US3803651 A	19740416	US19720225386	19720211
US3939509 A	19760224	US19750552621	19750224

Priority:

US19660531564 19660303 US19700023789 19700330 US19720225386 19720211
US19720225387 19720211 US19730414441 19731109 US19750552621 19750224

Probable Assignee: ALVIN E MOORE

Assignee(s): (std): MOORE A ; MOORE ALVIN E

Assignee(s): MOORE ALVIN EDWARD ; MOORE A US ; ALVIN E MOORE ; ALVIN EDWARD MOORE

Inventor(s): (std): MOORE A ; MOORE ALVIN EDWARD ; MOORE ALVIN E

Inventor(s): MOORE A US ; ALVIN EDWARD MOORE ; ALVIN E MOORE

30) Family number: 7905914 (US4225333A)

© PatBase

Title: Glass sheet tempering apparatus

Abstract: This invention relates to tempering curved, hot glass sheets supported with their concavely shaped major surfaces facing a first set of pipe-type nozzles and their convexly shaped major surfaces facing a second set of bar-type nozzle housings while tempering medium is applied simultaneously under pressure against said major surfaces.

Classifications:

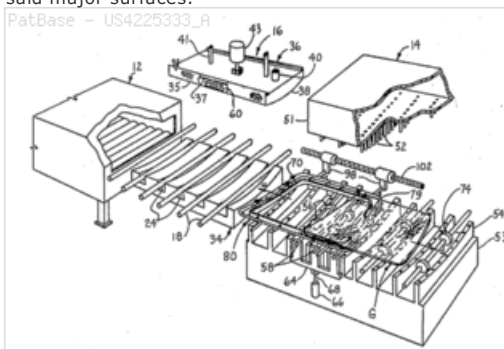
International (IPC 8-9): C03B27/044 (Advanced/Invention)

International (IPC 1-7): C03B27/00

CPC: C03B27/0404 C03B27/0445

European: C03B27/044B2 C03B27/04A

US: 65/273 65/348 65/351



Family:

Publication number	Publication date	Application number	Application date
US4225333 A	19800930	US19780961079	19781115

Priority:

US19780954694 19781025 US19780961079 19781115

Probable Assignee: PPG INDUSTRIES INC

Assignee(s): (std): PPG IND INC ; PPG INDUSTRIES INC

Inventor(s): (std): FRANK ROBERT G

31) Family number: 1989919 (US4543283A)

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Title: ENCAPSULATED GLAZING PRODUCT

Abstract: A glazing unit comprised of a glass substrate and a laceration inhibiting shield supported by and extending over what would otherwise be an exposed surface of the substrate. A gasket or frame member composed of a synthetic polymer extends around a major portion of the periphery of the glass substrate and shield and is adhered to the marginal edge surfaces of each, such gasket having been polymerized in situ adjacent the said periphery and having assumed through the autogenous mechanism incident to its polymerization and cure, while confined intimate contact with the portions to which it is adhered.

Classifications:

International (IPC 8-9): B29C33/00 B29C45/14 B29C70/76 B32B17/10

B60J1/00 B60J10/02 C03C27/12 (Advanced/Invention);

B60J1/00 (Advanced/Non-invention);

B29C33/00 B29C45/14 B29C70/00 B32B17/06 B60J1/00 B60J10/02

C03C27/12 (Core/Invention)

International (IPC 1-7): B29C45/14 B32B17/00 B32B17/10 B32B3/02

B32B3/08 B32B31/00 B60J1/00 B60J1/02 C03C17/32 C03C27/00

C03C27/12 C08J5/12 E06B3/58 E06B3/62

CPC: Y10T428/24777 B29C33/0044 B29C45/14434 B29C70/763

B29K2075/00 B29K2709/08 B32B17/10018 B32B17/10302 B32B17/1033

B60J10/70 B32B7/12 B32B2307/554 B32B2581/00 B32B2605/08

B32B17/10761 B32B2367/00

European: B29C33/00E2 B29C45/14F8 B29C70/76A B32B17/10C2

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L29K75/00 L32B367/00

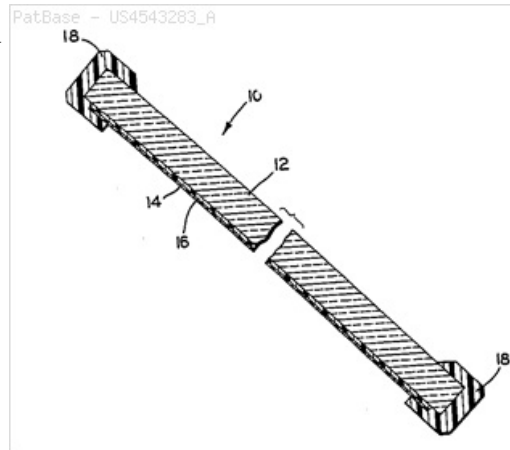
US: 156/104 156/107 428/192 428/38 428/83 52/786.12 52/800.14

JP F-Term: 3D127 4F001 4F100 4F100/AG00 4F100/AH06 4F100/AK01

4F100/AK23 4F100/AK41 4F100/AK51 4F100/AR00 4F100/AT00

4F100/BA02 4F100/BA03 4F100/BA04 4F100/BA07 4F100/BA10

4F100/BA13 4F100/DB17 4F100/EC05 4F100/GA04 4F100/GA12
 4F100/GB08 4F100/GB32 4F100/JE01 4F100/JK09 4F100/JK10 4F100/JN01
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 4F206/JM04 4F206/JN11 4F206/JN41 4F212
JP F-Index: B29C44/00 B29C44/00/D B29C44/02 B29C44/12
 B29C44/34 B29C44/60 B29C45/14 B32B17/10 B60J1/00/M



Family:

Publication number	Publication date	Application number	Application date
AU198542803 A1	19860313	AU19850042803	19850523
AU581661 B2	19890302	AU19850042803	19850523
BE902540 A	19850916	BE19850215096	19850530
BRPI8503518 A	19860422	BR1985PI03518	19850724
CA1243060 A1	19881011	CA19850481690	19850516
DE3521115 A1	19860313	DE19853521115	19850610
ES543479 A0	19871201	ES19850543479	19850524
ES8800870 A1	19871201	ES19850543479	19850524
FR2569625 A1	19860307	FR19850010952	19850717
GB2164080 A1	19860312	GB19850013511	19850529
GB2164080 B2	19880525	GB19850013511	19850529
GB8513511 A0	19850703	GB19850013511	19850529
IT1182049 A	19870930	IT19850048330	19850710
IT8548330 A0	19850710	IT19850048330	19850710
JP61066645 A2	19860405	JP19850153927	19850712
KR19860002432 A	19860426	KR19850004462	19850624
LU85932 A	19860122	LU19850085932	19850604
NL8501622 A	19860401	NL19850001622	19850605
SE462846 B	19900910	SE19850002480	19850521
SE462846 C	19910117	SE19850002480	19850521
SE8502480 A	19860305	SE19850002480	19850521
SE8502480 A0	19850521	SE19850002480	19850521
SE8502480 L	19860305	SE19850002480	19850521
US4543283 A	19850924	US19840646942	19840904

Priority:

US19840646942 19840904 CA19850481690 19850516

Probable Assignee: LOF GLASS INC

Assignee(s): (std): LIBBEY OWENS FORD CO ; LOF GLASS INC

Assignee(s): LIBBEY OWENS FORD COMPANY TE TOLEDO OHIO VER ST V AM ; LIBBEY OWENS FORD CY ; LIBBEY OWENS FORD COMPANY TE TOLEDO OHIO VER ST V ; CURTZE EDWARD W ; HERLICZEK SIEGFRIED H ; LIBBEY OWENS FORD CO A CORP OF OH ; LIBBEY OWENS FORD CO TE TOLEDO OHIO VER ST V AM ; LIBBEY OWENS FORD COMPANY

Inventor(s): (std): CURTZE EDWARD WILLIAM ; HERLICZEK SIEFRIED HARRI ; CURTZE E W ; HERLICZEK S H ; JIIGUFURIIDO HARRI HEERIJITSUK ; EDOWAADO UIRIAMU KAATSUE ; HERLICZEK SIEGFRIED H ; CURTZE EDWARD W ; HERLICZEK SIEGFRIED HARRI

Inventor(s): EDWARD WILLIAM CURTZE ; SIEFRIED HARRI HERLICZEK ; EW CURTZE ; SH HERLICZEK ; SIEGFRIED HARRI HERLICZEK ; EDWARD WILLIAM CURTZE ET SIEGFRIED HARRI HERLICZEK ; E W CURTZE ; S H HERLICZEK ; WILLIAM CURTZE EDWARD ; HARRI HERLICZEK SIEGFRIED ; JIIGUFURIIDO HARRI HEERIJITSUKU

Agent(s): PHILLIPS ORMONDE FITZPATRICK; MACRAE AND CO