Federal Court  Cour fédérale

**Date: 20101126**

**Docket: T-1108-07**

**Citation: 2010 FC 1191**

**Ottawa, Ontario, November 26, 2010**

**PRESENT: The Honourable Mr. Justice Mandamin**

**BETWEEN:**

**GLASTON SERVICES LTD. OY**

**Plaintiff**

**and**

**HORIZON GLASS & MIRRORS LTD. AND SHANGHAI NORTHGLASS TECHNOLOGY & INDUSTRY CO., LTD.**

**Defendants**

## REASONS FOR JUDGMENT AND JUDGMENT

### Introduction

[1] The Plaintiff, Glaston Services Ltd. Oy, (Glaston) brings this lawsuit against the Defendants, Horizon Glass & Mirror Ltd. (Horizon Glass) and Shanghai Northglass Technology & Industry Co., Ltd. (Shanghai Northglass) for infringement of two of its glass treatment patents, Canadian patent numbers 1,308,257 (the ‘257 Patent) and 2,146,628 (the ‘628 Patent).

[2] Glaston is a Finnish company which is the owner of the ‘257 and ‘628 Patents describing a method and apparatus for bending and tempering glass sheets.

[3] Horizon Glass is an Ontario company which carried on business as a custom fabricator of glass and mirror products. Shanghai Northglass is a Chinese company which is a supplier of glass processing machinery.

[4] Glaston claims Shanghai Northglass has infringed and induced Horizon Glass to infringe Gaston’s ‘257 Patent and ‘628 Patent by selling, installing and commissioning an infringing glass bending and tempering production line at Horizon Glass’s premises in Toronto.

[5] Horizon Glass made an assignment in bankruptcy and has not defended in this action. Shanghai Northglass was not to be represented by legal counsel and applied to the Court to be represented in this action by a business representative which was denied. Neither filed a statement of defence with the Court.

[6] Glaston seeks judgment in this trial of an undefended action.

**Background**

The Parties

[7] The Plaintiff Glaston is a company organized under the laws of Finland having its principal place of business at Vehmaistenkatu 5, 33730, Tampere, Finland. It is a supplier of machinery used in the production of architectural, appliance and automotive glass.

[8] Glaston is the owner of the ‘257 Patent and the ‘628 Patent. The corporate ownership history of the two patents is as follows:

- On September 1, 1987, the named inventors of the ‘257 Patent, Pauli Tapani Reunamaki and Jouko Kalevi Jarvinen, assigned their rights in the invention of the ‘257 Patent to O/Y Kyro A/B Tamglass;
- On September 2, 1987, O/Y Kyro A/B Tamglass filed for the ‘257 Patent;
- On November 9, 1988, O/Y Kyro A/B Tamglass changed its name to O/Y Kyro A/B;
- On December 28, 1988 O/Y Kyro A/B transferred its assets to Tamglass Oy, including its rights and title to the application for the ‘257 Patent;
- On May 19, 1989, O/Y Kyro A/B executed a confirmatory assignment to Tamglass Oy of its rights and title to the application for the ‘257 Patent;
- On October 16, 1992, Tamglass Oy assigned its rights and title to the application for the ‘257 Patent to Tamglass Engineering Oy;
- On March 27, 1995, the named inventor of the ‘628 Patent, Esko Lehto, assigned his rights in the invention of the ‘628 Patent to Tamglass Engineering Oy;
- On April 7, 1995, Tamglass Engineering Oy filed for the ‘628 Patent;
- On March 5, 1998, Tamglass Engineering Oy changed its name to Tamglass Ltd Oy;
- On March 12, 1998, Tamglass Ltd Oy changed its name to Tamglass Ltd. Oy;
- On July 2, 2007, Tamglass Ltd. Oy changed its name to Glaston Services Ltd. Oy.

[9] The Defendant Shanghai Northglass has its place of business at No. 14, A-district, Songjiang Science & Technology Zone, Shanghai, China. Shanghai Northglass is a joint venture involving the North Glass group, of which Luoyang North Glass Technology Co. Ltd. is a member. Shanghai Northglass is a supplier of glass processing machinery and is also known as Shanghai North Glass Technology Industrial Co., Ltd.

[10] The Defendant Horizon Glass is an Ontario corporation with a registered office at 91 Crockford Blvd., Unit 9, Toronto, Ontario M1R 3B7. Horizon Glass has a business name registration for and carries on business under the name Adel Glass & Mirror Products. Horizon

Glass is a custom fabricator of glass and mirror products for the glass jobber, architectural, appliance and automotive and other specialty markets.

The Proceedings

[11] On June 14, 2007 the Plaintiff Tamglass Ltd. Oy, now Glaston, filed a Statement of Claim in Federal Court claiming the Defendant Shanghai Northglass infringed its Canadian patent, Patent '257, and induced Horizon Glass to also infringe the Glaston patent by selling, installing and commissioning an infringing glass bending and tempering production line at Horizon Glass's premises in Toronto, Ontario.

[12] On June 15, 2007, the Statement of Claim was served on Horizon Glass. On August 7, 2007, Horizon Glass filed an assignment in bankruptcy. It never filed a statement of defence.

[13] On October 16, 2007, pursuant to the *Hague Convention*, the Chinese Central Authority served Shanghai Northglass with a Mandarin translation of the Statement of Claim. In addition, Prothonotary Aalto ordered on May 28, 2008 that the Order, the Amended Statement of Claim in this action dated June 23, 2008, together with accurate Mandarin translations of those documents be served on Shanghai Northglass, which was done on June 26, 2008. The Amended Statement of Claim adds a claim for infringement of the '628 Patent. The Amended Statement of Claim was not served on Horizon Glass.

[14] On December 10, 2008, the Court dismissed a motion by Shanghai Northglass to be represented by "the manager of Shanghai North Glass Technology & Industry Co., Ltd." The Court

had previously refused to accept for filing another such motion. Shanghai Northglass had sent four purported statements of defence and counterclaim to Glaston's solicitors. None has been accepted by the Court for filing. Shanghai Northglass has not appointed a Canadian solicitor, nor has it filed a statement of defence in Federal Court.

[15] In September of 2009 Glaston brought a motion for default judgment as against Shanghai Northglass and filed three Affidavits in support of the motion. The first was from Ms. Jaclyn Edgerton, attaching correspondence and orders relating to the service of the claim, the amended Statement of Claim, and default by Shanghai Northglass. The second Affidavit was from Mr. Brian Rockefeller, an investigator who took both video and photographs of the allegedly infringing equipment, and also obtained some documents relating to the equipment from the receiver in bankruptcy of Horizon Glass. The third Affidavit was from Mr. Harri Perämaa, an expert who explained the technology and the patents, and gave an opinion that the Shanghai Northglass equipment and its operation are covered by claims in each of the two Glaston patents. On the return of the default judgment motion, Justice Kelen granted an interlocutory injunction and ordered a one day trial with leave to read in these Affidavits as evidence at the trial as long as Mr. Rockefeller and Mr. Perämaa were available to answer questions.

Prior Art

[16] The automotive industry served as the impetus for the developments in glass treatment that led to the patents that are the subject of this action.

[17] *Tempered Glass:* Prior to the 1960's, most cars had flat tempered side windows. Tempering is a process where glass is heated to approximately 650 degrees centigrade, then rapidly cooled with blowing air. This causes the center of the glass to cool more gradually than the surface. As the center cools, it contracts, which compresses the outer surfaces of the glass and creates a stress pattern along the mid-plane of the glass. The tempering process results in glass many times stronger than annealed glass (where the glass is cooled more slowly) of the same thickness. Upon impact, tempered glass is designed to disintegrate into small pieces of glass. The properties of tempered glass make it extremely valuable for automotive purposes. The production of high optical quality bent tempered glass has always been a challenge.

[18] *Vertical Moulding:* In the 1970's, automotive manufacturers started designing more aerodynamic cars and required curved side windows and thinner glass with better optical properties. In the 1960's and 1970's, glass treatment machines carried glass sheets held in a vertical plane by tongs and conveyed by a laundry rope-type conveyor. After heating, the glass sheets were placed between a pair of complementary moulds that shaped the glass when pressure was applied. After shaping the glass, the moulds moved back and the glass was cooled from air blown onto the shaped sheet. These vertical glass bending machines would only produce 50-100 sheets of glass in an eight-hour period.

[19] *Horizontal Moulding:* Glass bending in the horizontal plane was achieved using ceramic rollers instead of tongs to transport the glass sheet. The heated glass was pressed between the top and bottom mould. Once the glass was shaped or bent, the bottom mould moved down and the glass rested again on ceramic rollers. The disadvantages of this approach included the expensive

cost of ceramic rollers, the requirement of new moulds for each different curvature of glass, and the significant set up time and testing required for each production run.

[20] *Horizontal Pressure-Moulding Rolls:* Horizontal bending and tempering was also achieved by passing the heated glass sheet through top and bottom pressure-forming rolls. The pressure-forming rolls, arcuate rods, were manufactured in the bent or curved shape required. The glass was bent around an axis parallel to the direction of travel as it traveled between the top and bottom pressing-forming rolls. The pressure-forming rolls had to be individually adjusted or even replaced for each type of glass and desired curvature. Arcuate rolls are expensive to make and also involve extensive set up and testing for production runs.

[21] *Gravity Bending Furnaces:* Finally, in gravity bending furnaces, glass bending was achieved by using supporting ring moulds utilizing gravity without a press. The furnace contained a mould and heaters on top. Glass was bent by adjusting the heating: the greater the heat provided to an area, the more the glass bent in that area. The glass would be placed on the bending ring mould inside a wagon which traveled though the pre-heating, bending and cooling stages. The glass was not tempered after bending. These furnaces were used mainly for automotive laminated windshield production with the bent sheets of glass laminated together to achieve desired automotive strength and safety requirements. However, windshield gravity bending furnaces are not suitable for producing tempered car side windows.

The Glaston Patents

[22] The Glaston ‘257 Patent is a method and apparatus for bending and tempering glass sheets. The ‘257 Patent, together with the ‘628 Patent refinement, was a novel method of bending and tempering glass sheets. A sheet of glass to be bent and tempered is moved by a conveyor from the heating furnace on to a bending and tempering section while flat and horizontal. Once the heated glass sheet has passed into the bending and tempering section, the section arches, bending the heated glass around a horizontal axis transverse to the direction of travel. Hot air is blown onto the bending glass, maintaining the temperature and augmenting the bending force of gravity. Once the desired curvature has been reached, tempering is commenced by cool air blown onto the glass. Throughout the bending and tempering process, the glass is oscillated on the rollers of the bending and tempering section. Once the process is completed, the top of the section is lifted and the bottom of the section returned to the horizontal so that the bent and tempered glass can be conveyed away.

[23] Prior to the ‘257 Patent, no glass treatment machine had used oscillating rollers in a bending and tempering section. Oscillation had been used in flat tempering machines only. Glass bending and tempering machines before the ‘257 Patent used either a pair of complementary press moulds without rolls or used pressure-forming rolls in a continuous apparatus where the glass continues to travel in the forward direction forming the curve. Because of the shape and placement of the pressing-forming rolls, the bending began at the leading edge of the bending section and curvature progressively increased around the axis of travel as the glass sheet moved forward. Consequently, oscillation was not possible.

[24] The ‘257 Patent primarily achieved glass bending by gravity. The ‘628 Patent improved on this process by providing mechanical pressure bending in addition, thereby shortening the time for bending and allowing the treatment to occur with lower and more constant temperatures. This would result in improved optical quality of the glass.

[25] The glass bending and tempering approach in the ‘257 and ’628 Patents overcome limitations that exist with other prior processes. The method and apparatus does not require different moulds or setting of rollers for each shape of glass. It allows a glass manufacturer to switch production from one specification of glass to another by comparatively straightforward adjustments. While the Glaston apparatus is attractive to small manufacturers, it is also utilized by big manufacturers because of the ease of use of the machine and the quality of the glass made by it.

Events

[26] The application in Canada for the ‘257 Patent was filed on September 2, 1987 before October 1, 1989, and issued on October 6, 1992. The ‘628 Patent was filed on April 7, 1995, after the October 1, 1989 date differentiating the term of a patent as set out in sections 44 and 45 of the *Patent Act*, R.S.C. 1985 c. P-4 (Patent Act).

[27] By uncontested evidence introduced by Notice to Admit Facts, Glaston has established salient facts set out in the following paragraphs.

[28] Horizon Glass agreed to purchase and Shanghai Northglass agreed to manufacture and sell glass-processing equipment referred to as a “Horizontal Roller Hearth Reversible-Direction

Flat/Bent Glass Tempering Furnace Model No. SNG-12B3617 (4-19mm)" (the North Glass Machinery) pursuant to a written agreement of purchase and sale dated October 6, 2005 between Horizon Glass and Shanghai Northglass (the Contract). The contract price for the North Glass Machinery was US $405,000.

[29] Shanghai Northglass manufactured the North Glass Machinery in China. After the machinery had arrived at the Horizon Glass premises in Toronto, Shanghai Northglass set up the North Glass Machinery at the Horizon Glass premises and conducted acceptance tests in Toronto to ensure the machinery was operating properly. Shanghai Northglass also provided training to Horizon Glass personnel on how to operate the North Glass Machinery.

[30] Shanghai Northglass technicians installed and commissioned the North Glass Machinery at the Horizon Glass premises, including performing acceptance tests, and also trained Horizon Glass employees on the operation of the equipment.

[31] The structure and function of the North Glass Machinery is described in the following documents:

(a) Part Two of the October 6, 2005 contract entitled "Technical Contract";

(b) The "Glass Tempering System Technical Manual CA51047-12B3617"

[32] Shanghai Northglass continues to offer for sale equipment similar to the North Glass Machinery.

**Issues**

[33] Rule 210(4) of the *Federal Courts Rules,* SOR/98-106 provides that on a motion for default, the Court may order "that the action proceed to trial and that the plaintiff prove its case in such a manner as the Court may direct."

[34] Upon Glaston's motion for default judgment, Justice Kelen issued an order that the action would proceed to trial under Federal Court Rule 210(4) and that the issues for trial are:

- Default by Shanghai Northglass and Horizon Glass;
- Validity of the '257 Patent and the '628 Patent;
- Construction of claims 1 to 3, 7, 12, 14 and 15 of the '257 Patent and claims 1 to 3, 5, and 6 of the '628 Patent;
- Infringement by Shanghai Northglass of claims of the '257 Patent and claims of the '628 Patent;
- Inducement of defendant, Horizon Glass, to infringe claims of the '257 Patent and claims of the '628 Patent; and
- Costs.

[35] Justice Kelen further ordered that the issue of damages was to be determined by way of reference to a Prothonotary on a finding of liability at trial.

**Analysis**

Default

[36] The approach to be taken on a motion for default judgment and the applicable test was summarized by Snider J. in *Louis Vuitton Malletier S.A. v. Lin,* 2007 FC 1179 at para 4 as follows:

> On a motion for default judgment, where no Statement of Defence has been filed, every allegation in the Statement of Claim must be treated as denied. A plaintiff must first establish that the defendant was served with the Statement of Claim and has not filed a defence within the deadline specified in Rule 204 of the Federal Courts Rules, SOR/98-106. Evidence must be led that enables the Court to find, on a balance of probabilities, that infringement has occurred within the meaning of the relevant statute...

[37] Glaston has established on the facts set out above, which are not disputed, that both Defendants, Shanghai Northglass and Horizon Glass, have been served with the Statement of Claim, and Shanghai Northglass has been served with the Amended Statement of Claim. Shanghai Northglass has not filed a Statement of Defence with the Federal Court. Neither has Horizon Northglass.

Expert Witness

[38] I am assisted in describing the ‘257 and ‘628 Patents by the expert evidence of Mr. Harri Ensio Perämaa as set out in his Affidavit and his testimony. During trial I accepted Mr. Perämaa generally as an expert in mechanical engineering and more specifically on glass bending and tempering technology.

[39] The Supreme Court found in *R. v. Mohan*, [1994] 2 S.C.R. 9, 29 C.R. ($4^{th}$) 243 admission of expert evidence depends on the relevance, necessity in assisting the trier of fact, the absence of an exclusionary rule and the proper qualifications of the expert.

[40] Mr. Perämaa has extensive experience in the relevant area of expertise. From 1984 until 1989 Mr. Perämaa worked in the research and development department at Tamglass Engineering

Oy as a research and development engineer in the field of bending and tempering glass. He was involved in the development of a horizontal tempering furnace, a horizontal tempering system machine and later a horizontal tempering and bending system. His work in relation to the horizontal bending and tempering system was to develop and design mechanical parts of the bending section.

[41] Mr. Perämaa also worked on designing and developing a heat strengthening tempering machine and he is an inventor on patents relating to this machine.

[42] From 1989 to 1992 Mr. Perämaa worked as a factory set up consultant, installation supervisor and project manager for Tamglass Engineering Oy's overseas projects. The focus of his work was on installing and setting up tempering and bending machines. In 1992 he left Tamglass and joined National Glass and Mirrors in Saudi Arabia, working as a factory manager until 1994. Since then Mr. Perämaa has been involved in different glass enterprises in the Arabian Peninsula and North Africa as a consultant, project manager, and investor.

[43] As I understand it, Mr. Perämaa was intimately involved as an engineer in the design of the glass bending and tempering machine in this case. He has continued to apply his expertise as an engineer in the field of glass manufacturing to the present day. I consider his expertise relevant and of assistance to help me understand the purpose, construction and history of the ‘257 and ‘628 Patents and to construe the claims at issue here.

The Patents

[44] Turning to the relevant specifics of the Glaston patents, they are as presented in the evidence deposed and testified to by Mr. Perämaa as follows:

> 1. *The '257 Patent:* the '257 Patent is entitled "Method of and Apparatus for Bending and Tempering Glass Sheets". The application for the '257 Patent was filed in Canada on September 2, 1987. The '257 Patent issued and was published on October 6, 1992.
>
> 2. The '257 Patent provides a novel method and apparatus for making bent, tempered glass of high optical quality. The '257 Patent provides a brief description of the design and operation of a complete bending and tempering line, of which the bending and tempering section itself is part (3):

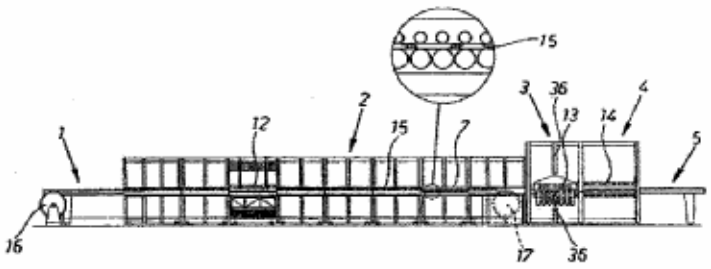



*Fig.1*

> The apparatus comprises a loading section 1, a heating furnace 2, a bending and tempering section 3, a postchilling or annealing section 4 and an unloading section 5. Each section and the heating furnace are provided with conveyors consisting of horizontal rollers extending crosswise to the traveling direction, namely a loading section conveyor 6, a furnace conveyor 7, an intermediate conveyor 8 at the downstream end of the furnace, a bending and tempering section conveyor 9, an annealing section conveyor 10 and an unloading section conveyor 11.
>
> 3. In the method, a sheet of glass to be bent and tempered is moved from left to right through the line. In the heating furnace, the sheet of glass travels on the furnace conveyor in an oscillating fashion such that the forward oscillating stroke is longer than the return stoke and the sheet advances. When the sheet enters the bending and tempering section of the line, the bending and

tempering section (and the glass sheet) is flat and in a horizontal state, as shown below in Figure 3.

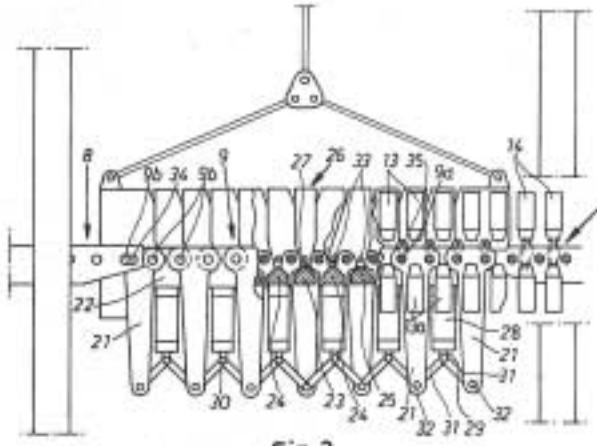


Fig. 3

4. The section then arches (see Figure 4 below). Once the desired curvature has been reached, tempering is commenced by blowing cool air onto the glass. During the bending and tempering process, the glass is oscillated from left-to-right on the rollers of the bending and tempering section around an axis of curvature transverse to the traveling direction (in Figure 4, the axis comes straight out of the page).

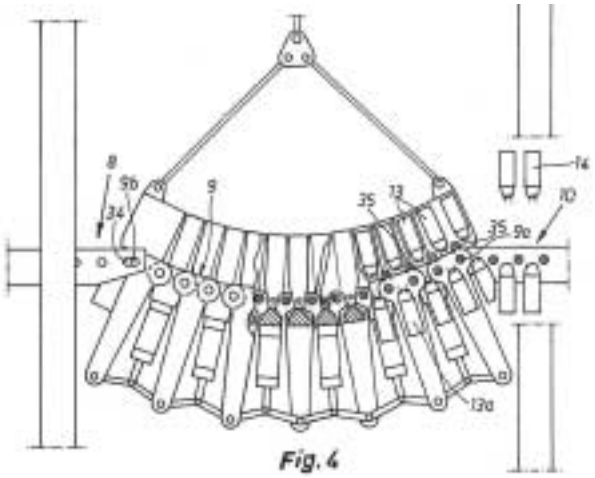


Fig. 4

5. Following the completion of the bending and tempering process, the top portion of the bending and tempering section is lifted and the bottom portion is returned to horizontal so that the bent and tempered glass sheet can be conveyed away (to the right as shown by the arrow in Figure 5 below):

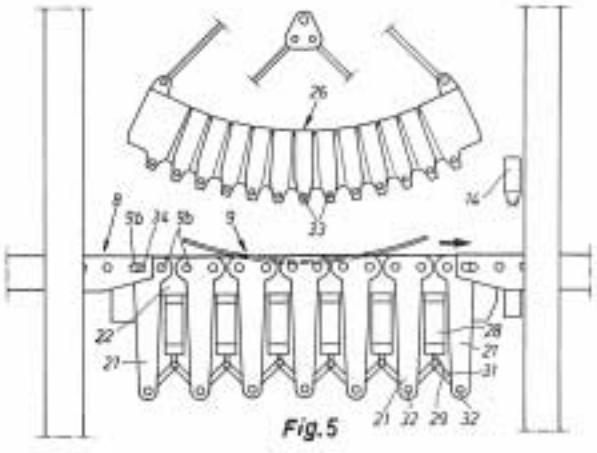


Fig.5

6. *The '628 Patent:* the ‘628 Patent is entitled “Bending and Tempering Station for Glass Sheets”. The application for the ‘628 Patent was filed in Canada on April 7, 1995, and open to public inspection on October 27, 1995. The ‘628 Patent issued on December 20, 2005. The ‘628 Patent concerns an improvement over the ‘257 Patent.

7. As discussed in the disclosure of the ‘628 Patent, the ‘257 Patent relates to an apparatus for bending and tempering a glass sheet based on gravitational bending of the glass. Although the ‘257 Patent reduces the need for overheating, it is sometimes necessary to heat the glass above the required tempering temperature to compensate for heat loses while the glass bends. This increase in temperature can create optical errors in the final product.

8. The ‘628 Patent further reduces the need for overheating by replacing gravitational bending with mechanical press bending with upper “press” rollers that act on the glass while it is being bent. By using press rollers a sheet of glass can be bent more quickly and thus heat loss prior to tempering is minimized and the glass can be heated to a lower initial temperature, resulting in greater optical quality. For example, this is advantageous for bending thin glass on which gravity has a lesser effect bending effect as compared to heavier, thicker glass. It is also advantageous for bending shaped glass, like that used in sports car windows, on which gravity has uneven bending effects.

9. Operation of the apparatus is described in reference to Figures 2A, 2B, and 3 below as follows:

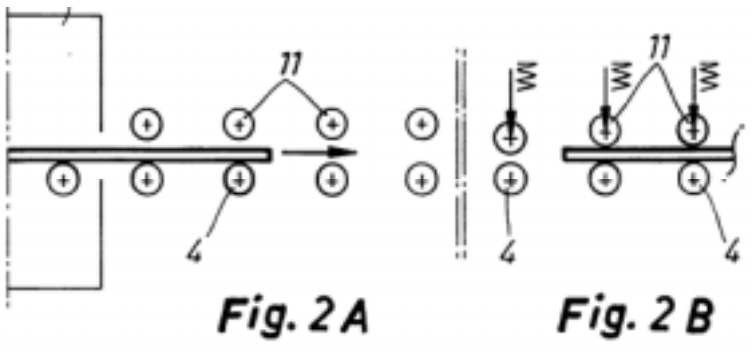



Fig. 2A Fig. 2B

As shown in FIG. 2A, upon the arrival of a glass sheet in the bending and tempering station, the press wheels 11 are in their top position slightly off the glass surface or they can also be in a light contact therewith. When the glass is completely inside the bending station (FIG. 2B), the bending commences. The press wheels 11 are simultaneously provided with a desired and adjustable down-force forcing the glass to conform to the rollers 4 of the flexing conveyor. However, the glass reciprocates in an oscillating fashion during the course of bending. In the illustrated case, the press rollers 11 and conveyor rollers 4 are on top of each other and, in the bottom position of rollers 11, the distance there between is slightly less than the thickness of a glass sheet to be bent. When the leading edge of a glass sheet arrives between roll 4 and rollers 11, the rollers shift a small distance upwards against the force of the pneumatic spring 17.

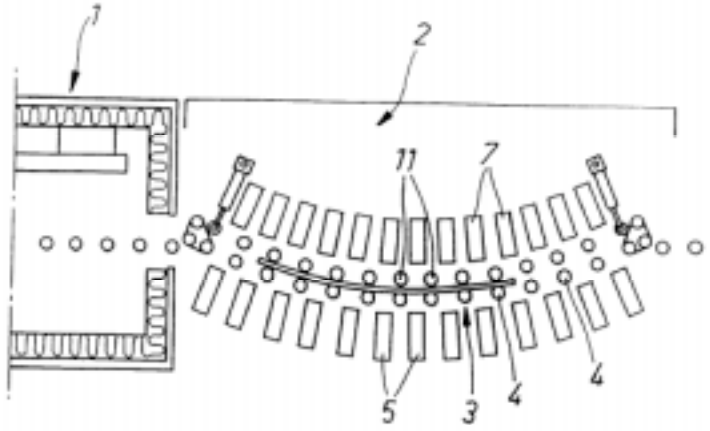



Fig. 3

FIG. 3 illustrates a situation in which the glass has reached a certain degree of bending. Upon reaching the final degree of bending, the tempering blast is commenced while the glass continues oscillation between rollers 4 and rollers 11. As the tempering operation is finished, the upper press rollers 11 are lifted and returned to their top position. Thus, the bottom

> position of rollers 11 is a working position and the top position is a rest position.

Construction of Patents

[45] In *Bristol-Myers Squibb Canada Co. v. Apotex*, 2009 FC 137, [2009] 243 F.T.R. 161,

Justice Hughes succinctly summarized applicable jurisprudence concerning claim construction:

> 37 The Supreme Court of Canada has instructed that the Court must first construe the claims at issue before moving to consideration of issues such as validity and infringement of those claims, the purpose in doing so is to identify what it is in the claims that the inventor considered to be essential. This construction is to be conducted in a purposive manner so as to endeavour to be fair to both the patentee and the public per Binnie J. for the Court in Whirlpool Inc. v. Camco Inc., [2000] 2 S.C.R. 1067 at paragraphs 42 to 50. I repeat part of paragraphs 43 and 45:
>
> > 43 The first step in a patent suit is therefore to construe the claims. Claims construction is antecedent to consideration of both validity and infringement issues. The appellants' argument is that these two inquiries -- validity and infringement -- are distinct, and that if the principles of "purposive construction" derived from Catnic are to be adopted at all, they should properly be confined to infringement issues only. The principle of "purposive construction", they say, has no role to play in the determination of validity, and its misapplication is fatal to the judgment under appeal.
> >
> > …
> > 45 The key to purposive construction is therefore the identification by the court, with the assistance of the skilled reader, of the particular words or phrases in the claims that describe what the inventor considered to be the "essential" elements of his invention.
>
> 38 The '288 patent is governed by the provisions of the old Patent Act, thus is to be construed by the Court as of the date of its grant, March 31, 1992, through the eyes of a person skilled in the art, assisted if needed by expert evidence as to the meaning of certain terms and the knowledge that a person skilled in the art would have had as of trial date. As Sharlow JA. for the Federal Court of Appeal wrote at paragraph 4 of Novopharm Limited v. Janssen-Ortho Inc.,

(2007), 59 C.P.R. (4th) 116, 2007 FCA 217 respecting an old Patent Act patent:

> 4 In any case in which the validity or infringement of a patent claim is in issue, it is necessary to construe the claim: Whirlpool Corp. v. Camco Inc., [2000] 2 S.C.R. 1067 at paragraph 43. The relevant date for the construction of the 080 patent is the date of its issuance, June 23, 1992. The patent must be understood as being addressed to a person skilled in the art, taking into consideration the knowledge that such a person is expected to possess on that date. The construction of a patent claim is a task for the Court and must be based on the whole of the disclosure and the claim, assisted by expert evidence as to the meaning of certain terms and the knowledge that a person skilled in the art is expected to possess on the relevant date.

[46] Justice Laydon-Stevenson, now of the Federal Court of Appeal, had earlier elaborated on the reasoning behind purposive construction in *Canamould Extrusions Ltd. v. Driangle Inc.,* 2003 FCT 244, aff'd 2004 FCA 63 (*Canamould)*, at paras. 31-33:

> 31 Patent construction is antecedent to issues of validity and infringement. The patent is to be construed as of the date of its publication. The Patent Act, R.S.C. 1985, c. P-4 (the Act) and purposive construction promote adherence to the claims and this in turn promotes fairness and predictability. The claims perform a public notice function by setting out the scope of the monopoly so that the public may know where it may go with impunity. The claim language must be read in an informed and purposive way. Claim interpretation is neither literal nor based on vague notions such as the "spirit of the invention". The more scope for searching for the "spirit of the invention" and the "pith and substance" of the invention, the less the claims can perform their public function. A patent falls within the definition of "regulation" in the Interpretation Act, R.S.C. 1985, c. I-21 and as such merits a construction that best assures attainment of its objects. The inventor's intention is manifested in the patent claims as interpreted by a person skilled in the art. The average person skilled in the particular art of the patent is not a grammarian or etymologist and does not indulge in a meticulous and verbal analysis.

> 32 The content of a patent specification is regulated by section 27 of the Act. The disclosure is the quid provided by the inventor in exchange for the quo of the monopoly. An inventor is not obliged to claim a monopoly on everything new, ingenious and useful disclosed in the specification. The usual rule is that what is not claimed is considered disclaimed. Regard may be had to the specification to understand what is meant by a word in a claim, but not to enlarge or contract the scope of the claim as written and thus understood. The claims and the disclosure are construed with a mind willing to understand. The words chosen by the inventor will be read in the sense that the inventor intended and in a way that is sympathetic to the accomplishment of the inventor's purpose, expressed or implicit, in the text of the claims. If the inventor, however, has misspoken or otherwise created an unnecessary or troublesome limitation in the claims, it is a self-inflicted wound. The public is entitled to rely on the words used provided the words used are interpreted fairly and knowledgeably.
>
> 33 As part of the informed and purposive construction of a claim, elements in the claim will be found to be essential or non-essential. There is no infringement if an essential element is different or omitted. There may still be infringement, however, if non-essential elements are substituted or omitted. An element in a claim will be considered non-essential and substitutable if either: (i) on a purposive construction of the words of the claim it was clearly not intended to be essential, or (ii) that at the date of publication of the patent, the skilled addressee would have appreciated that a particular element could be substituted without affecting the working of the invention i.e., had the skilled worker at that time been told of both the element specified in the claim and the variant and "asked whether the variant would obviously work in the same way", the answer would be yes.

[47] The ‘257 Patent has 15 claims and Glaston is asserting 7 of them: method claims 1 to 3, and 15, and apparatus claims 7, 12 and 14. These are the claims identified as at issue in Justice Kelen’s Order. These claims as set out in the ‘257 Patent are:

> Method Claims:
>
> 1. A method of bending a glass sheet to be tempered, comprising the steps of
>
> - carrying the glass sheet on horizontal rollers
> - heating the glass sheet for bending and tempering

- curving the heated glass sheet around an axis of curvature transverse to the traveling direction
- effecting the tempering of the curved glass sheet while keeping the glass sheet in a reciprocating or oscillating motion by means of rollers carrying the glass sheet.

Characterized in the said curving direction around an axis of curvature transverse to traveling direction is effected in a manner that it takes place simultaneously and at substantially the same rate over the entire glass sheet area while moving said glass sheet by means of rollers carrying it.

2. A method of bending a glass sheet to be tempered, comprising the steps of

- carrying the glass sheet on horizontal rollers
- heating the glass sheet for bending and tempering
- curving the heated glass sheet around an axis of curvature transverse to the traveling direction
- effecting the tempering of the curved glass sheet while keeping the glass sheet in a reciprocating or oscillating motion by means of rollers carrying the glass sheet.

Characterized in that the said curving around an axis of curvature transverse to traveling direction is effected by arching the plane of a conveyor roller line at least over a distance corresponding to the added-up length of its oscillating stroke in a manner that, beginning from a horizontal plane, the plane of the roller curves with a continuously diminishing radius of curvature until a desired final radius of curvature is reached, and during the curving process, the tangent of the mid-portion of a curved conveyor section is maintained substantially in a horizontal plane.

3. A method as set forth in claim 2,

Characterized in that the curved plane of the conveyor roller line is returned to flat after tempering but before carrying a bent and tempered glass sheet out of the bending and tempering section.

15. A method of bending a glass sheet to be tempered, comprising the steps of

- carrying the glass sheet on horizontal rollers
- heating the glass sheet for bending and tempering
- curving the heated glass sheet around an axis of curvature transverse to the traveling direction

- effecting the tempering of the curved glass sheet while keeping the glass sheet in a reciprocating or oscillating motion by means of rollers carrying the glass sheet.

Characterized in that the glass sheet is carried onto a bending and tempering section roller conveyor as the latter is in flat condition, whereafter said flat roller conveyor is curved or arched around the axis of curvature transverse to traveling direction while moving the glass sheet, curving of said conveyor is stopped and blowing of cooling air is started to both surfaces of the glass sheet while maintaining said glass sheet in an oscillating motion by means of the rollers of said curved roller conveyor.

Apparatus Claims:

7. A bending and tempering apparatus for glass sheets, comprising a loading station (1), a heating furnace (2), a bending and tempering section (3) and an unloading station(5), heating means (12) in the furnace for heating glass sheets, chilling means (13) in the bending and tempering section for tempering a bent glass sheet, roller conveyors (6 to 11) consisting of horizontal rollers for carrying glass sheets from the loading station (1) to the unloading station (15) through the furnace (2) and the bending and tempering section (3), drive means (M1, M2) for operating the roller conveyors, adapted to drive in an oscillating fashion at least a bending and tempering section roller conveyor (9), characterized in the rollers (9a) of said bending and tempering section roller conveyor (9) are carried by support members (21,22) which are connected with the links (9b) and lever arms (31) are connected to build a support beam, which extends in the traveling direction by varying the angle between the individual support members (21, 22) of the said support beam by means of lever arms (31) and power units (28).

12. An apparatus as set forth in claim 7,

Characterized in that above said roller conveyor (9) to be curved is provided a curved array of air-blowing means (13), that this curved array of air plowing means can be picked up and lowered as a whole, that in a lowered position the curvature of said curved array conforms with the curvature of said conveyor track and in a picked-up position said curved array is adapted to settle in a curvature substantially corresponding to the maximum curvature of conveyor (9).

14. An apparatus as set forth in claim 7,

Characterized in that said cooling-air blower means (13a) below the conveyor are mounted to be pivotable along with the support members (21, 22) of conveyor (9).

[48] The ‘628 Patent has 7 claims and Glaston is asserting 5 of them: claims 1 to 3, 5 and 6. Those claims as set out in the ‘628 Patent are:

> 1. A bending and tempering station for glass sheets, comprising a roll conveyer (3) in which the relative vertical position of the roles (4) is adjustable for arching the conveyor to the curvature corresponding to a desired degree of bending, lower tempering boxes (5) having top surfaces (9) provided with tempering orifices (6) , and upper tempering boxes (7) having bottom surfaces (10) provided with tempering orifices (8), and tempering boxes (5,7) being movable for bringing said top and bottom surfaces in conformity to the arching of the conveyor (3, characterized in that a number of press rollers (11) are mounted on the upper tempering boxes (7), wherein the rollers (11) are movable between an upper rest position and a lower working position in which the rollers (11) are resiliently pinned down by a spring force.
> 2. A bending and tempering station as set forth in claim 1, characterized in that said pneumatic spring is a pneumatic cylinder (17).
> 3. A bending and tempering station as set forth in claim 2, characterized in that said pneumatic spring is a pneumatic cylinder (17) for carrying the roller (11) between the rest position and the working position.
> 5. A bending and tempering station as set forth in any one of the claims 1-4, characterized in that the rollers (11) are shifted after a glass sheet to be bent to the working position after a glass sheet to be bent has arrived from a furnace (1) onto the conveyor (3) and below the rollers (11).
> 6. A bending and tempering station as set forth in any one of the claims 3-5, characterized in that a plurality of press rollers (11) is mounted on a common horizontal axle (13) which is reciprocated vertically by means of the pneumatic cylinder (17).

A Person Skilled in the Art

[49] A patent is to be considered from the viewpoint of a person skilled in the art. In this case, the area of expertise is that of glass bending and tempering. Mr. Perämaa gave evidence that a person skilled in the art of glass bending and tempering would be a person involved in the design and development of glass bending and glass tempering machines. This person would be familiar

with the mechanical properties of glass and have a background in mechanical engineering and experience in automated glass production. There is no issue that Mr. Perämaa is such a person.

[50] Mr. Perämaa gave evidence that the meaning of the terms used in the ‘257 claims would be understood by “person of ordinary skill” (which I take to be a person skilled in the art) to correspond with the mechanical engineering definitions of the terms. He stated that some terms required further explanation as follows:

> ‘257 Patent Method Claims
>
> Claims 1, 2, 3, and 15 are for a method of bending glass sheets. Claims 1, 2, and 15 are independent claims. Claim 3 depends on claim 2. All four claims include the following steps:
>
> - carrying the glass sheet on horizontal rollers
> - heating the glass sheet for bending and tempering
> - curving the heated glass sheet around an axis of curvature transverse to the traveling direction
> - effecting the tempering of the curved glass sheet while keeping said glass sheet in a reciprocating or oscillating motion by means of rollers carrying the glass sheet
>
> Claim 1 includes the following additional limitation:
>
> > … said curving around an axis of curvature transverse to traveling direction is effected in a manner that it takes place simultaneously and at substantially the same rate over the entire glass sheet area while moving said glass sheet by means of rollers carrying it.
>
> At page 13, the disclosure describes an embodiment allowing for simultaneous and even curving of a glass sheet:
>
> > Immediately when the trailing edge of a glass sheet reaches conveyor 9, or slightly before that, the arching of conveyor 9 is begun. Simultaneously, nozzles 35 are operated to blow hot air to the upper surface of a glass sheet. This increases the pressure

> applied to said upper surface and retards the cooling rate of a glass sheet. Through the action of gravity and assisted by said blowing pressure applied to the upper surface, the arching of a glass sheet follows the arching of conveyor track 9 while, at the same time, a glass sheet advances towards the downstream end of conveyor track 9. The final curvature is generally attained even before conveyor 9 stops for a return stroke. If necessary, the conveyor arching and glass sheet bending can be continued even during a return stroke. As soon as the final curvature has been attained, hot-air blowing from nozzles 35 is stopped and cooling-air blowing from nozzles 13 and 13a is started to both surfaces of a glass sheet.

The patent does not provide any numerical information regarding the meaning of "simultaneously and at substantially the same rate over the entire glass sheet area". A person of ordinary skill would, however, understand this to mean that a sheet of glass would be curved such that there would be no local deformations in the glass as result of the curvature that would, depending on the intended use of the glass, have an unacceptable effect on the optical quality of the curved glass. An advantage of bending glass in this way is explained at page 3 of the '257 Patent:

> If, instead, each point in a glass sheet can be curved simultaneously at the same speed, the bending can be effected at a substantially lower temperature and thus it is possible to avoid the extra increase in glass temperature, which is required by an excessively high bending rate and which increases corrugation and so impairs the optical quality of glass. Prior to the present invention, this has not been possible when bending glass sheets around an axis of curvature transverse to the traveling direction.

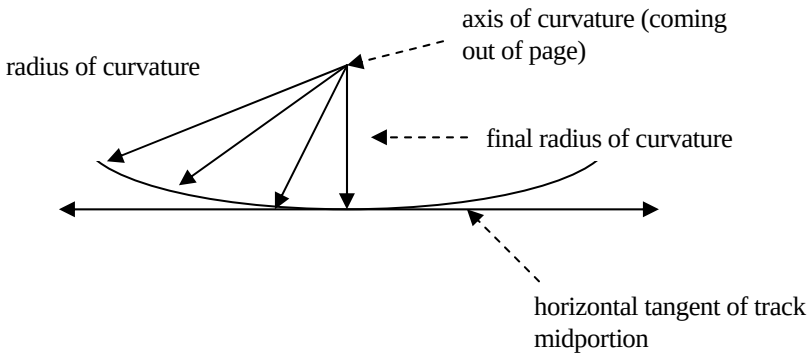
Claim 2 adds the following additional limitation to the steps of the general method, which relates to the way in which the roller line (conveyor track) curves about the glass sheet being carried:

> … said curving around an axis of curvature transverse to traveling direction is effected by arching the plane of a conveyor roller line at least over a distance corresponding to the added-up length of the length of the glass sheet and the length of its oscillating stroke in a manner that, beginning

> from a horizontal plane, the plane of the roller line curves with a continuously diminishing radius of curvature until a desired final radius of curvature is reached, and during the curving process, the tangent of the mid-portion of a curved conveyor section is maintained substantially in a horizontal plane.

The aspect of the method of the ‘257 Patent illustrated below:

> [T]he tangent of the track midportion is substantially horizontal and the downstream end of track rises upwards. Thus, the conveying track can be arched even with quite a small radius of curvature without making the angle of the downstream end of track relative to the horizontal plane too great.




Claim 3 (which is dependant on claim 2) further requires:

> that the curved plane of the conveyor roller line is returned to flat after tempering but before carrying a bent and tempered glass sheet out of the bending and tempering section.

Claim 15 adds the following requirements to the steps of the general method:

> the glass sheet is carried onto a bending and tempering section roller conveyor as the latter is in flat condition, whereafter said flat roller conveyor is curved or arched around an axis of curvature transverse to traveling direction while moving the glass sheet, curving of said conveyor is stopped and blowing of cooling air is started to both surfaces of

> the glass sheet while maintaining said glass sheet in an oscillating motion by means of the rollers of said curved roller conveyor.

Claim 15, therefore, has the additional requirements that the bending and tempering section be in the flat position when a glass sheet is carried onto it, and that when cooling air is applied it is to both sides of the curved glass sheet, while the glass sheet moves back and forth on the conveyors.

‘257 Patent Apparatus Claims

Claims 7, 12, and 14 are for a bending and tempering apparatus. Claim 7 is an independent claim. Claims 12 and 14 depend on claim 7.

Claim 7 specifies the elements of a bending and tempering apparatus for glass sheets (see pages 16 to 17 of the ‘257 Patent), with reference to the parts described in the disclosure and drawings.

One of the terms in claim 7 that warrants some further clarification as to its meaning to a person of ordinary skill is “chilling means”. A person of ordinary skill would understand the “chilling means” to provide a way of cooling a glass sheet to cause it to be tempered, such as cool air. For example, as stated at page 7 of the patent: “the bending and tempering section is provided with cooling air blowing means 13”.

Claim 7 further specifies:

the rollers (9a) of said bending and tempering section roller conveyor (9) are carried by support members (21, 22), which are connected together with links (9b) and lever arms (31) to build a support beam, which extends in the traveling direction and can be curved around an axis of curvature transverse to the traveling direction by varying the angle between the individual support members (21, 22) of said support beam by means of lever arms (31) and power units (28).

This describes a construction that permits the roller conveyor to curve uniformly in order to bend a piece of glass. Figures 3 and 4, shown above, illustrate the point. Figure 3 shows a roller conveyor in the flat position. In Figure 4, it can be seen that piston rods (item 29 in Figure 3) are extended from cylinders (item 28 in Figure 3) and have pushed support members (items 21 and 22 in

> Figure 3) apart by pressing on lever arms (item 31 in Figure 3). As a result, the roller conveyor is in a curved position.
>
> A person of ordinary skill would understand the "power units (28)" referred to in the claim as units that supply the power necessary to vary the angle between the individual support members to cause the roller conveyor to curve. At page 11, the disclosure describes "piston rods 29 of cylinders 28" as the means by which the power is supplied. This suggests that the pistons may be powered by either a pneumatic or hydraulic cylinder, however, in my opinion a person of ordinary skill would also understand the term "power units" to include any means that supply the power for the purpose of curving the roller conveyor. For example, a mechanically driven piston would be included within the meaning of the term, as it would serve the purpose of curving the roller conveyor.
>
> Claim 12 claims the apparatus of claim 7, with the further limitation that the:
>
> roller conveyor (9) to be curved is provided a curved array of air-blowing means (13), that this curved array of air-blowing means can be picked up and lowered as a whole, that in a lowered position the curvature of said curved array conforms with the curvature of said conveyor track and in a picked-up position said curved array is adapted to settle in a curvature substantially corresponding to the maximum curvature of conveyor (9).
>
> An embodiment of this is shown in figures 3 to 5, above. Figure 3 shows the air-blowing means as item 13 (or nozzles) with the roller conveyor in the flat position. Figure 4 shows the roller conveyor in a curved position with the air blowing means in the same curved position as the conveyor track. Figure 5 shows a picked-up position.
>
> Claim 14 adds to claim 7 the requirement that "cooling-air blower means (13a) below the conveyor are mounted to be pivotable along with the support members (21, 22) of conveyor (9)." This would mean to a person of ordinary skill that the air blower means (or nozzles) move with the roller conveyor as it moves from the flat to a curved position, as shown for example in Figures 3 and 4, above.

[51] As with the '257 Patent, Mr Perämaa gave evidence that for the most part the meaning of terms used in the claims of the '628 patent would be understood by a person skilled in the art to

correspond with the mechanical engineering terms. As to the terms that would require further explanation he deposed:

> ‘628 Patent Claims
>
> The ‘628 Patent claims are for an apparatus for bending and tempering glass sheets. Claim 1 is the only independent claim. Claims 2, 3, 5, and 6 are dependent.
>
> Claim 1 claims a tempering station for glass sheets as follows:
>
> A bending and tempering station for glass sheets, comprising a roll conveyor (3) in which the relative vertical position of the rolls (4) is adjustable for arching the conveyor to a curvature corresponding to a desired degree of bending, lower tempering boxes (5) having top surfaces (9) provided with tempering orifices (6), and upper tempering boxes (7) having bottom surfaces (10) provided with tempering orifices (8), said tempering boxes (5, 7) being movable for bringing said top and bottom surfaces (9, 10) in conformity to the arching of the conveyor (3), characterized in that a number of press rollers (11) are mounted on the upper tempering boxes (7), wherein the rollers (11) are movable between an upper rest position and a lower working position in which the rollers (11) are resiliently pinned down by a spring force.

Figure 1 and 3 (below) from the patent are illustrative:

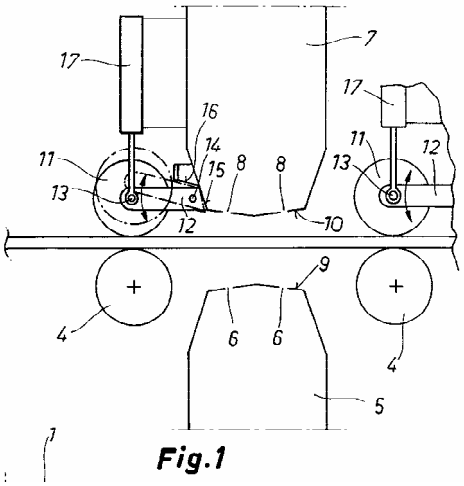



Fig.1

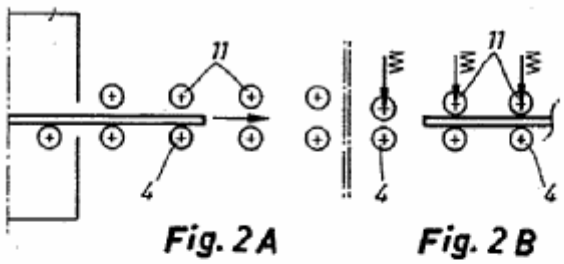



Fig. 2A Fig. 2B

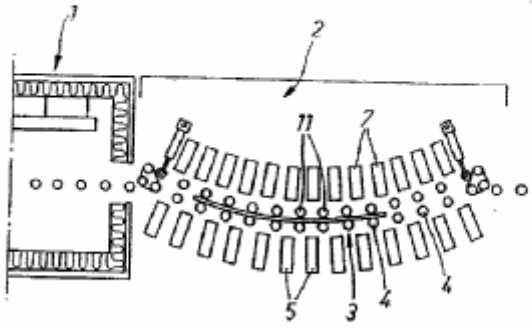



Fig. 3

The upper tempering box (item 7) – through the nozzle orifices shown at item 8 – is used to deliver a “tempering blast” of cooling air to a sheet of glass that has reached a desired degree of curvature. During the bending process, the press rollers (item 11) are used to apply force to a sheet of glass, which forces the glass to conform to the curve defined by the rollers (item 4), as shown in Figure 3 above. During the bending process, the press rollers are in the bottom “working position”. The press rollers are in the top “rest position” prior to a sheet of glass entering the bending and tempering station. After the tempering operation is finished, the press rollers are lifted and returned to the “rest position”.

Claim 2 relates to the bending and tempering station of claim 1, “characterized in that said spring force is produced by means of a pneumatic spring”. Claim 3 specifies that “the pneumatic spring is a pneumatic cylinder”. A person of ordinary skill would understand a “pneumatic spring” to be a device that creates a spring force using air pressure, such as from a source of compressed air. A pneumatic cylinder would be understood as a cylinder having a piston on which the air pressure acts to create the force.

Claim 5 requires that the rollers shift from the rest position to the working position only after the glass sheet to be bent has arrived from a furnace onto the glass conveyor and below the rollers.

> Claim 6 requires that "a plurality of press rollers (11) is mounted on a common horizontal axle (13) which is reciprocated vertically by means of the pneumatic cylinder (17)". Figure 1, above, illustrates the vertical movement of press rollers in connection with a pneumatic cylinder.

[52] The '257 claims asserted describe a method for bending and tempering glass in a production line apparatus that simultaneously bends a heated glass sheet over its entire surface and tempers the glass by subsequent cooling all the while oscillating the glass back and forth on the conveyor rollers. The '628' claims augment the glass bending by gravity with applied mechanical pressure by upper rollers.

[53] The '257 independent method claims are 1, 2, and 15. I would construe them according to the claims aided by the patent disclosure and Mr. Perämaa's evidence as:

> Claim 1 (construed) - A method of bending and tempering a glass sheet using a roller conveyor line with horizontal rollers that extend crosswise to the traveling direction and that carry the sheet of glass. After heating in the furnace the glass sheet is bent around an axis of curvature that is parallel to the rollers. All points of the glass sheet are bent simultaneously and at substantially the same rate while it is moving back and forth. The glass sheet is then tempered while continuing to move back and forth on the rollers.

> Claim 2 (construed) - A method of bending and tempering a glass sheet using a roller conveyor line with horizontal rollers that extend crosswise to the traveling direction and that carry the sheet of glass. After heating the glass sheet is bent around an axis of curvature that is parallel to the rollers. The glass sheet moves back

and forth on the rollers during bending. The glass sheet is bent by arching the plane of the roller conveyor line over a length corresponding to at least the added up length of the glass sheet and the length of its oscillating stroke. During the bending process, the plane of the roller conveyor line curves with a continually diminishing radius of curvature or meaning the arch continuously increases from flat to the desired curve until a desired final radius of curvature is reached. While curving, the mid-point of the curved section is maintained substantially in a horizontal plane. After bending, the glass sheet is tempered while continuing to move back and forth on the arched rollers.

Claim 15 (construed) - A method of bending and tempering a glass sheet using a roller conveyor line with horizontal rollers that extend crosswise to the traveling direction and carry the sheet of glass. After heating the glass sheet is bent around an axis of curvature that is parallel to the rollers. The glass sheet moves back and forth on the rollers during bending. The glass sheet is bent by arching the plane of the roller conveyor line. After the bending stops, cool air is blown onto both surfaces of the glass sheet while the sheet moves back and forth on the rollers.

[54] Claim 3 is dependent on Claim 2, and I would construe it as follows:

Claim 3 (construed) – A method according to claim 2, where the curved plane of the conveyor roller line returns to flat after tempering. It then carries the bent and tempered glass out of the bending and tempering section.

[55] The ‘257 independent apparatus claim is claim 7. Again, construing the independent claim as aided by the patent disclosure and Mr. Perämaa’s evidence, it is:

> Claim 7 (construed) - A bending and tempering apparatus for glass sheets comprising a loading station, a heating furnace, a bending and tempering section and an unloading station. The apparatus includes heating means in the furnace for heating the glass sheets and chilling means for blowing cool air onto the bending and tempering section to cause them to become tempered. The apparatus also includes rollers, conveyors consisting of horizontal rollers that carry the glass sheets from the loading to the unloading station to the furnace in the bending and tempering section. The apparatus uses drive means to operate the roller conveyors. The drive means are adapted to drive at least the bending and tempering section roller conveyor in an oscillating fashion. The rollers of the bending and tempering section are carried on support members that are connected together with links and lever arms to build a support beam. The support beam extends in the traveling direction of the glass sheets. The support beam can be curved around an axis of curvature parallel to the rollers by using power means to vary the angle between the individual support members using the lever arms.

[56] Claims 12 and 14 are dependent on claim 7 and are construed as follows:

> Claim 12 (construed) – An apparatus according to claim 7, where a curved array of air-blowing means can be picked up and lowered as a whole. In its lowered position, the curvature of the array conforms with the curvature of the conveyor

track. In its picked up position, the array is adapted to settle in a curvature substantially corresponding to the maximum curvature of the conveyor.

Claim 14 (construed) – An apparatus according to claim 7, where the cooling air blower means moves with the roller conveyor as it moves from the flat to a curved position.

[57] The ‘628 independent apparatus claims is claim 1. Again, construing the independent claim as aided by the patent disclosure and Mr Perämaa’s evidence, it is:

Claim 1 (construed) - A bending and tempering station for glass sheets comprising a roller conveyer in which the relative position of the rolls is adjustable for arching the conveyor to a curvature corresponding to a desired degree of bending. The station has upper and lower tempering boxes that deliver cooling air from the respective bottom and top surfaces through holes in the boxes. The tempering boxes can be moved to bring the surfaces of the boxes into conformity with the arch of the conveyor. The upper tempering boxes are fitted with a number of press rollers that can be moved from a top rest position to a bottom working position against a spring force.

[58] Claims 2, 5, and 6 are dependent on claim 1 and are construed as follows:

Claim 2 (construed) – A bending and tempering station according to claim 1 where the spring force is produced by means of a pneumatic spring

Claim 5 (construed) – A bending and tempering station according to claim 1, where the rollers shift from rest position to the working position after the glass sheet to be bent has arrived from the furnace onto the conveyor and below the rollers.

Claim 6 (construed) – A bending and tempering station where a plurality of press rollers is mounted on a common horizontal axle which is reciprocated vertically by means of the pneumatic cylinder.

[59] Claim 3 is further dependent on claim 2 and is construed as follows:

Claim 3 (construed) – A bending and tempering station according to claim 2, where the pneumatic spring is a pneumatic cylinder for carrying the roller between the rest position and the working position.

[60] In *Canamould*, Justice Layden-Stevenson went on to consider the law concerning essential and non-essential elements of the claim. She stated at para 33:

> As part of the informed and purposive construction of a claim, elements in the claim will be found to be essential or non-essential. There is no infringement if an essential element is different or omitted. There may still be infringement, however, if non-essential elements are substituted or omitted. An element in a claim will be considered non-essential and substitutable if either: (i) on a purposive construction of the words of the claim it was clearly not intended to be essential, or (ii) that at the date of publication of the patent, the skilled addressee would have appreciated that a particular element could be substituted without affecting the working of the invention i.e., had the skilled worker at that time been told of both the element specified in the claim and the variant and "asked whether the variant would obviously work in the same way", the answer would be yes.

[61] The primary claim in the ‘257 Patent is Claim 2 and involves the following essential elements:

a. Conveying the heated glass on horizontal rollers aligned on an axis transverse to the direction of travel;
b. Curving the glass in a horizontal position on an axis parallel to the horizontal rollers;
c. Arching and flattening of the conveyer rollers;
d. Oscillation of the glass during the bending and tempering.

[62] The ‘257 claims are somewhat repetitious. Claim 1 adds an essential element that the bending is simultaneous across the entire sheet of glass. Claim 15 adds that the arched conveyor roller flattens at the completion of tempering. Claim 7 provides for essential elements of a bending and tempering section including a means of heating the glass before entering the bending section, a chilling means for tempering the bent glass, conveyors with a motor drive consisting of horizontal rollers with a means of oscillating the rollers in the bending and tempering section, support beam parallel to the direction of travel carrying the rollers capable of arching and flattening with a power source means of varying the angle between individual support members to arch and unarch the support beams.

[63] An example of a non-essential element is the nature of the power source in claim 7 for the curving of the support beams discussed as pneumatic in the ‘257 Patent which, as Mr. Perämaa explained, could be mechanical (such as a screw drive) instead. It is essential to have a power source but the specific use of pneumatic power source is not in claim 7 of the patent.

[64] The essential elements of the primary claim 1 of the ‘628 Patent are:

a. Pressure applied by upper rolls to the sheet of glass during bending

b. By adjustable upper pneumatic spring force rollers
c. With cooling tempering boxes above and below capable of following the arching bending conveyor.

[65] Unlike the claim 7 of the ‘257 Patent, an essential element of claim 3 of the ‘628 Patent is the requirement that the pneumatic spring on the upper rollers is provided by a pneumatic cylinder since it is specifically claimed in the ‘628 Patent.

[66] Complementary elements such as the loading station, heating furnace, conveyor rolls outside the bending and tempering section and unloading station, while integral to the operation of the apparatus, are not essential to the bending and tempering invention itself given that they are all elements of earlier known technology which are not claimed.

Validity of the Patent

[67] Glaston has provided evidence that it is the owner of the ‘257 and ‘628 Patents. Since the Defendants are silent with respect to the validity of the Glaston’s patents, Glaston benefits from a presumption of validity of its patents pursuant to section 43 (2) of the *Patent Act*, R.S.C., 1985, c. P-4 which provides:

| | |
|---|---|
| (2) After the patent is issued, it shall, in the absence of any evidence to the contrary, be valid and avail the patentee and the legal representatives of the patentee for the term mentioned in section 44 or 45, whichever is applicable. | (2) Une fois délivré, le brevet est, sauf preuve contraire, valide et acquis au breveté ou à ses représentants légaux pour la période mentionnée aux articles 44 ou 45. |

[68] Accordingly, both the ‘257 Patent and the ‘628 Patent are valid.

Infringement

[69] The relevant date for the ‘257 Patent is its date of issue, October 6, 1992. The term of the duration of the ‘257 Patent is until October 6, 2009. The relevant date for the ‘628 Patent is its date of filing, April 7, 1995 and its term of duration is April 7, 2015. Both the ‘257 Patent and the ‘628 Patent were in effect at the relevant time, October 6, 2005, being the date of the written purchase and sale agreement between Horizon Glass and Shanghai Northglass for the glass bending machine.

[70] Section 42 of the *Patent Act* provides;

| | |
|---|---|
| 42. Every patent granted under this Act shall contain the title or name of the invention, with a reference to the specification, and shall, subject to this Act, grant to the patentee and the patentee's legal representatives for the term of the patent, from the granting of the patent, the exclusive right, privilege and liberty of making, constructing and using the invention and selling it to others to be used, subject to adjudication in respect thereof before any court of competent jurisdiction. | 42. Tout brevet accordé en vertu de la présente loi contient le titre ou le nom de l’invention avec renvoi au mémoire descriptif et accorde, sous réserve des autres dispositions de la présente loi, au breveté et à ses représentants légaux, pour la durée du brevet à compter de la date où il a été accordé, le droit, la faculté et le privilège exclusif de fabriquer, construire, exploiter et vendre à d’autres, pour qu’ils l’exploitent, l’objet de l’invention, sauf jugement en l’espèce par un tribunal compétent. |

[71] As stated by Justice Layden-Stevenson in *Canamould* at para 51: “This is a monopoly that Parliament gives an inventor for disclosing the invention to the public: *Monsanto Canada Inc. v. Schmeiser*, (2002), 21 C.P.R. (4th) 1 (F.C.A.).” Justice Layden-Stevenson continued at para 52:

> After the claims are construed, infringement is determined by comparing the allegedly infringing article with the words of the claims. There is infringement if the article includes all the essential elements of at least one of the patent claims: Free World Trust. A mere finding of similarity is insufficient to support a finding of infringement. A machine, in broad terms, that is similar in purpose and nature to the apparatus described in the patent does not lead to a finding of infringement: Visx Inc. v. Nidek Co. (1999), 3 C.P.R. (4th) 417 (F.C.T.D.) aff'd (2001) 16 C.P.R. (4th) 251 (F.C.A.). The task of determining whether a claim has been infringed becomes "essentially one of fact": TRW Inc. v. Walbar of Canada Inc. (1991), 39 C.P.R. (3d) 176 (F.C.A.).

[72] Glaston's expert witness, Mr. Perämaa, attended Horizon's premises and inspected the bending and tempering section of the North Glass Machinery. Based on his personal inspection of the bending and tempering section of the North Glass Machinery and review of the documents and photographs taken by Mr. Rockefeller, Mr. Perämaa provides a comparison of the North Glass Machinery with the claims of the '257 and '628 Patents. His evidence is that the North Glass Machinery has the same structure and function as the apparatuses covered by claims 7, 12 and 14 of the '257 Patent and claims 1, 2, 3, 5 and 6 of the '628 Patent. It is also his evidence that the North Glass Machinery functions in accordance with the methods of claims 1, 2, 3 and 15 of the '257 Patent and that the equipment was used to make bent, tempered glass. I accept his evidence.

[73] Based on the North Glass User Guide, photographs, and observations provided by Mr. Perämaa based on his inspection of the North Glass Machinery, I make the following findings about the North Glass Machinery glass bending method:

- The glass is heated before it is carried into the glass bending and tempering machine section on horizontal rollers
- The glass bending and tempering machine section curves the glass around an axis of curvature that is transverse to the traveling direction but parallel to the rollers

- The rollers move into the curved position with the glass and subsequently flatten
- The tempering is effected while the glass sheet is kept in an oscillating motion.

[74] I also find that the North Glass Machinery contains the following apparatus components:

- A heating means for the glass sheet
- A chilling means for tempering the bent glass sheet
- A motor drive means that would cause the conveyor rolls in the bending section to oscillate
- Support beams carrying rollers which can be curved around the axis of curvature transverse to the traveling direction by varying the angle between the individual support members by means of a power source.

[75] When compared to the primary claims 2 and 7 in the ‘257 Patent, it is clear that the North Glass Machinery includes all of the essential elements of these claims. I conclude the North Glass Machinery thus infringes on claim 2 and 7.

[76] Given the presence of press rollers, pneumatic cylinder powered rollers which are adjustable, and upper and lower tempering boxes which can move in conformity with the arching of the conveyor, I also find that the North Glass Machinery includes the essential elements of claim 1 of the ’628 Patent. In this regard, I also conclude the North Glass Machinery infringes on claim 1 of the ‘628 Patent.

[77] I would note that the evidence discloses that the North Glass Machinery uses a screw drive means to adjust the lower conveyor rollers in the bending and tempering section instead of a pneumatic drive. Since the latter is a non-essential element, it has no bearing on the question of infringement of claim 7 of the ‘257 Patent. On the other hand, the North Glass Machinery uses

pneumatic spring force delivered by pneumatic cylinders for the upper pressure rollers, which is an essential element of claim 3 of the ‘628 Patent.

[78] Finally, on the question of whether the North Glass Machinery infringes on the remaining claims, I conclude, based on the documents and Mr. Perämaa’s evidence, the North Glass Machinery also infringes on the remaining claims advanced on both the ‘257 Patent and the ‘628 Patent.

[79] Given that the North Glass Machinery is an infringing device manufactured in China, did infringement occur in Canada?

[80] The Contract for the purchase and sale agreement introduced as evidence provided an overview of North Glass Machinery:

> The furnace is the new product produced by the joint venture includes loading table, heating section, flat quenching, cylindrical bent formation & cooling section, blast heads, unloading table, blowing & cooling system and control system. It is used to manufacture flat and bent tempered glass for furniture, home appliance, architecture glass, etc.

[81] Pursuant to the terms of the Contract, Shanghai Northglass installed and commissioned the North Glass Machinery at Horizon’s premises and trained Horizon's technicians on the equipment. Paragraph 3.1.1 of Part Two of the Contract sets out Shanghai Northglass’s responsibilities as follows:

> 1) Manufacturing and delivery of equipment according to the contract.

> 2) Packaging, loading, delivery to the shipping port and sea transportation according to the contract.
>
> 3) Provide 60 person – day (2-3 technicians) free installation guidance, commissioning and training. If it is over 60 person – day for the Buyer's reason, the Buyer has to pay USD100 per person-day to the Seller; for the Seller's reason, the technicians will stay until installation, commissioning, and training are finished.
>
> 4) Provide the design of the plant layout of the equipment and consultations needed by the Buyer.
>
> 5) Provide full sets of operation manuals, including electric diagrams, guidance of operation and maintenance, main process parameter setting.
>
> 6) Provide one year guarantee and one year free spare parts supply, as well as the guarantee of compensation parts.
>
> 7) Long term technical support and spare parts supply as well as settling of the eventual new problem happens in the production.
>
> 8) Technical training for the Buyer's personnel:
>
> > *15 days in prior to equipment delivery, the Buyer may send 2 technicians to the Seller's site for theoretical and practical training course, it is about 10 days. …
> >
> > *After commissioning of the equipment, one of the Seller's technicians will stay one more week for the site processing instruction and training.

[82] Glaston submits that it was an infringement for Shanghai Northglass to install and commission the North Glass Machinery at Horizon's premises in Canada. Under the Contract, Shanghai Northglass was required to have two to three technicians attend at Horizon for 60 workdays in order to install and commission the equipment. By installing and commissioning the North Glass Machinery in Canada, Shanghai Northglass made and constructed an apparatus covered by the claims of the Glaston '257 and '628 Patents.

[83] Glaston further submits that Shanghai Northglass is liable for infringement for using the North Glass Machinery at Horizon's premises. The "Acceptance Test" required under the Contract required Shanghai Northglass's technicians to continuously produce three (3) different glass products for two to eight hours each. It is admitted that Shanghai Northglass performed acceptance tests of the North Glass Machinery at the Horizon premises in Canada. The logical inference from this admitted fact is that Shanghai Northglass itself operated the bending and tempering station of the North Glass Machinery to produce bent and tempered glass in Canada and, thereby, used an apparatus covered by the claims of both patents, and practicing the methods covered by the claims of the '257 Patent. With respect to use for the purpose of furthering a business interest, in *Monsanto Canada Inc. v. Schmeiser*, 2004 SCC 34, [2004] 1 S.C.R. 902 (*Monsanto Canada Inc*) at para. 37, the Supreme Court of Canada stated:

> As a practical matter, inventors are normally deprived of the fruits of their invention and the full enjoyment of their monopoly when another person, without licence or permission, uses the invention to further a business interest. Where the defendant's impugned activities furthered its own commercial interests, we should therefore be particularly alert to the possibility that the defendant has committed an infringing use.

[84] The "use" of the North Glass Machinery by Shanghai Northglass in the Acceptance Tests occurred in a commercial context. Shanghai Northglass ran the Acceptance Test for the purpose of concluding the sale of the North Glass Machinery to Horizon. Shanghai Northglass has therefore committed an infringing use of the North Glass Machinery in Canada, therefore infringing the Glaston Canadian '257 and '628 Patents.

[85] Horizon Glass also directly infringed the '257 patent by possessing the North Glass Machinery. The evidence of Mr. Perämaa that the North Glass Machinery at the Horizon

premises was used to make bent, tempered glass supports this conclusion. Mr. Perämaa observed that the Kevlar rope wrapped around the rollers was worn, and that there were shards of glass in the machine that appeared to be from broken sheets of tempered glass. There was also a sheet of bent, tempered glass at Horizon's premises. The evidence supports the inference that Horizon Glass made use of the North Glass Machinery

[86] Also, as stated above, "possession, at least in commercial circumstances, raises a rebuttable presumption of 'use'": *Monsanto Canada Inc.* at para. 58. This presumption has not been rebutted.

[87] However, the initial Statement of Claim served on Horizon Glass only claims infringement of the '257 Patent. There is no evidence that the Amended Statement of Claim, which adds the '628 Patent to the initial claim, was ever served on Horizon Glass. Since the '628 Patent claim is a separate claim for which there was no notice to this defendant, Horizon Glass can only be found to be liable for infringement of the '257 claim.

Inducement

[88] Glaston submits that Shanghai Northglass induced Horizon to infringe the '257 and '628 Patents. A three pronged test is applied to establish infringement by inducement:

> First, there must be an act of infringement by the direct infringer.
>
> Second, this act must be influenced by the seller to the point where, without this influence, infringement by the buyer would not otherwise take place.

> Last, the influence must be knowingly exercised by the seller, i.e., the seller knows that this influence will result in the completion of the act of infringement.
>
> *MacLennan v. Produits Gilbert Inc*., 2008 FCA 35 at para. 13.

[89] Inducement has been found in cases where an article is sold to a customer for an infringing purpose, together with instructions to use the article in an infringing way. Inducement has also been found where a seller provides a purchaser with instructions or directions for using an infringing method: *Windsurfing International Inc. v. Triatlantic Corporation* (now Bic Sports Inc.), [1984] 63 N.R. 218, 8 C.P.R. (3d) 241 at 264 to 266 (F.C.A.), *Baker Petrolite Corp. et al. v. Canwell Enviro-Industries Ltd. et al.* 2001 FCT 889, [2002] 2 F.C. 3 at paras. 135 to 139 (F.C.T.D.), rev'd on other grounds 2002 FCA 148, [2002] 17 C.P.R. (4th) 478.

[90] In terms of Shanghai Northglass's "influence" over Horizon, the evidence establishes that:

a) Shanghai Northglass sold to Horizon the North Glass Machinery for the purpose of making bent, tempered glass;

b) Shanghai Northglass installed the North Glass Machinery at Horizon's premises;

c) Shanghai Northglass provided training to Horizon's personnel on how to operate the North Glass Machinery; and

d) Shanghai Northglass provided a technical manual to Horizon detailing the operation of the North Glass Machinery.

[91] With respect to Shanghai Northglass knowingly exercising its influence, the act of infringement by Horizon Glass was using the North Glass Machinery. By the uncontested Notice to Admit Facts, it is admitted that Shanghai Northglass knew of the '257 and '628 Patents

before selling the North Glass Machinery to Horizon and commissioning the North Glass Machinery at the Horizon facility. Shanghai Northglass would have had to have known and intended that its influence – exercised through the acts listed above – would result in Horizon infringing the Glaston patents.

Prior Knowledge

[92] On the question of whether Shanghai Northglass was aware of the Glaston patents, I am asked to consider proceedings in the United Kingdom where a joint venture participant in Shanghai Northglass, Luoyang North Glass Technology Company Limited, was previously sued by the Plaintiff in the UK for infringement of the European (UK) patent for the same invention as the '257 Patent. The Chancery Division upheld the validity of the patent and found that Luoyang North Glass Technology Company Limited and its customer in the UK had infringed the patent. The UK proceedings were well underway in October 2005 and judgment issued in December 2005.

[93] I have difficulty with this submission. The defendant in that action was not Shanghai Northglass but a participant in the joint venture. The UK judgment is persuasive but not determinative. However, I am satisfied that Shanghai Northglass was well aware of the Glaston technology having regard to the many commonalities between the North Glass Machinery and the Glaston apparatus especially with the high degree of correspondence between the specific methods and apparatus for glass bending and tempering. I reject any suggestion that a party engaged in conducting business in the international arena can be unaware of these significant

Glaston patents in what is a competitive and specialized industry involving manufacture of complex glass bending and tempering machinery.

[94] I therefore conclude that Shanghai Northglass has the requisite knowledge about the Glaston patents and is therefore liable for inducing Horizon Glass to infringe on the ‘257 and ‘628 Patents.

**Conclusion**

[95] I find Shanghai Northglass sold, installed and operated the North Glass Machinery at the Horizon Glass Premises and is liable for infringement of claims 1 to 3, 7, 12, 14, and 15 of the ‘257 Patent and claims 1 to 3, 5, and 6 of the ‘628 Patent.

[96] I also find Shanghai Northglass induced, by sale, installation and commissioning of the North Glass Machinery, Horizon Glass to infringe the ‘257 Patent.

[97] I find Horizon Glass was in possession of and operated the North Glass Machinery and is liable for infringement of claims 1 to 3, 7, 12, 14, and 15 of the ‘257 Patent.

Remedies

[98] Glaston seeks against a declaration of infringement, an injunction, an order that it be permitted to seek monetary compensation by way of a reference, and costs.

[99] As I have found that Shanghai Northglass has infringed on Glaston's '257 Patent and '628 Patent, there will be a declaration of infringement against Shanghai Northglass.

[100] I had noted that Horizon Glass was never served with the Amended Statement of Claim adding the claims in the '628 Patent to the issues in the proceedings. As such, there will also be a declaration of infringement against Horizon Glass for the infringement of the claims of the '257 Patent, but not for the claims of the '628 Patent.

[101] Section 57(1)(a) of the *Patent Act* provides for injunctive relief:

| | |
|---|---|
| 57. (1) In any action for infringement of a patent, the court, or any judge thereof, may, on the application of the plaintiff or defendant, make such order as the court or judge sees fit, | 57. (1) Dans toute action en contrefaçon de brevet, le tribunal, ou l'un de ses juges, peut, sur requête du plaignant ou du défendeur, rendre l'ordonnance qu'il juge à propos de rendre : |
| (a) restraining or enjoining the opposite party from further use, manufacture or sale of the subject-matter of the patent, and for his punishment in the event of disobedience of that order, | a) pour interdire ou défendre à la partie adverse de continuer à exploiter, fabriquer ou vendre l'article qui fait l'objet du brevet, et pour prescrire la peine à subir dans le cas de désobéissance à cette ordonnance; |

[102] It is admitted that Shanghai Northglass continues to offer for sale equipment similar to the North Glass Machinery. An injunction is necessary to protect Glaston's rights in the event that Shanghai Northglass again sells infringing equipment into Canada and I will so order.

[103] I direct damages are to be determined in accordance with Justice Kelen's Order, to wit:

> "The issue of damages shall be determined by way of reference to a Prothonotary if the trial Judge finds liability."

Considerations in any award of damages are my findings that Shanghai Northglass is liable for infringement and inducement of Horizon Glass to infringe.

[104] While Shanghai Northglass chose not to defend, Glaston was put to the expense of proving its case. This is a patent case of some complexity and required the preparation of expert evidence. Glaston has incurred costs in prosecuting the action and I conclude it is entitled to its costs at the high-end of column IV, with an allowance for first and second counsel at trial.

## JUDGMENT

**THIS COURT ORDERS AND ADJUDGES that**:

1. A declaration is made against Shanghai Northglass for infringement of Glaston's '257 Patent and '628 Patent.
2. A declaration is also made against Horizon Glass for the infringement of the claims of the '257 Patent.
3. An injunction is granted, prohibiting Shanghai Northglass from in any way selling infringing equipment into Canada.
4. Damages are to be determined by a Prothonotary, with consideration to the finding that Shanghai Northglass is liable for infringement and inducement of Horizon Glass to infringe.
5. Costs are awarded to Glaston at the high-end of column IV, with an allowance for first and second counsel at trial.

"Leonard S. Mandamin"
Judge

**FEDERAL COURT**

**SOLICITORS OF RECORD**

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|---|---|
| **DOCKET:** | T-1108-07 |
| **STYLE OF CAUSE:** | GLASTON SERVICES LTD. OY v. HORIZON GLASS & MIRROR LTD. and SHANGHAI NORTHGLASS TECHNOLOGY & INDUSTRY CO., LTD. |
| **PLACE OF HEARING:** | TORONTO, ONTARIO |
| **DATE OF HEARING:** | MARCH 23, 2010 |
| **REASONS FOR JUDGMENT AND JUDGMENT:** | MANDAMIN J. |
| **DATED:** | NOVEMBER 26, 2010 |

**APPEARANCES:**

| | |
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| N/A | FOR THE DEFENDANTS |

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